

KAP SURVEY EVALUATING THE PERCEPTION OF UNDERGRADUATE STUDENTS ON THE SMILE ESTHETICS OF PATIENTS AFTER ORTHODONTIC TREATMENT

Type of manuscript: Research Article

Running title: Survey on the smile esthetics of patients after orthodontic treatment.

RESHMA HARIKRISHNAN

Graduate Student

Saveetha Dental College, Saveetha Institute Of Medical And Technical Science, Saveetha University.

DR. A. SUMATHI FELICITA

Reader,

Department of Orthodontics

Saveetha Dental College, Saveetha Institute Of Medical And Technical Science, Saveetha University.

DR. SARAVANA PANDIAN

Senior lecturer

Department of Orthodontics

Saveetha Dental College, Saveetha Institute Of Medical And Technical Science, Saveetha University.

Corresponding Author

DR. A. SUMATHI FELICITA

Reader,

Department of orthodontics

Saveetha Dental College

Saveetha Institute Of Medical And Technical Science

Saveetha University

162, Poonamallee High Road

Chennai 600077

Tamilnadu, India

Abstract: A smile is one of the most important traits of a person's face. It is considered one of the key elements in the context of dentofacial esthetics. It can be evaluated with the help of photographs and it is done in dentistry mostly for registering the patients data. Perception of an esthetic smile varies from person to person, and it depends a lot on people's experiences, social status, race and culture. This study is done in order to evaluate how an orthodontically treated smile is, in comparison with that of a normal occlusion. It helps determine the ideal position of the anterior teeth during treatment to get an esthetic appearance. 50 orthodontic patients reporting to the Department of Orthodontics, Saveetha Dental College were evaluated. The pre-treatment and post-treatment frontal photographs of the patients while smiling were taken from records and used to conduct a survey. The survey was conducted among 100 undergraduate students to assess their knowledge and perspective regarding smile esthetics. 10 questions pertaining to various aspects of an esthetic smile were included in the survey. Majority of the undergraduate students were of the opinion that orthodontic treatment improved the smile esthetics of the patient.

Keywords: Smile, Orthodontic, Fixed appliance, Esthetics, Ideal smile

INTRODUCTION

A person's smile is one of their most important traits, and improving the appearance of the smile is one of the main reasons patients seek orthodontic treatments. It is said that "The smile is our business card". It is a means of communication, an important factor influencing esthetic attractiveness of the face and effects the success of social relations and oral health[1]. It is considered one of the key elements in the context of dentofacial esthetics[2]. A smile can be evaluated with the help of photographs and it is done in dentistry mostly for registering the patients data. Perception of an esthetic smile varies from person to person, and it depends a lot of people's experiences, social status, race and culture.[3]

In addition to aligning the teeth for optimum function, orthodontics play a vital role in controlling and modifying facial growth and improving the harmony between facial components that include both hard and soft tissues. Smile analysis has always been of interest to orthodontists and has recently become one of the key elements of orthodontic treatment planning.[4]

Smiles can be classified as Stage I and Stage II. Stage I is a posed smile and is repeatable. Stage II is an unposed smile and comes spontaneously [5]. An esthetic smile is attained when there is a harmonious balance between the hard and soft tissues, and this

would require thorough knowledge regarding the principles that manage the balance between the teeth and soft tissues during a person's smile. [6]

According to previous studies, there are ten commandments of smile esthetics[7], and they are: smile arc, maxillary central incisors ratio and symmetry, anterosuperior teeth ratio, presence of anterosuperior space, gingival design, levels of gingival exposure, buccal corridor, midline and tooth angulation, details like tooth colour and anatomical shape, and lip volume. It is very common for patients to visit an orthodontist to correct their teeth to improve their smile. These parameters should be considered while correcting it. The art of smile design lies in the clinicians ability to recognize the element of beauty in each patient, and their ability to create a proper treatment plan[8].

This study was done in order to evaluate the perception of undergraduate students in the field of smile esthetics. An assessment was made with regard to their perception of parameters that make a smile esthetic after a patient undergoes orthodontic treatment.

II. MATERIALS AND METHOD

A survey was conducted in an institutional setting. The ethical clearance was received from the institution's ethical committee.

IIa. Study design

50 Preoperative and Postoperative photographs of patients were selected randomly from digital archives of the Department of Orthodontics, Saveetha Dental College was used for this survey. The pictures were shown to 100 undergraduate dental students and they were asked to fill out a survey with a series of questions that evaluate their perspective of the esthetics of a smile. The questions included:

1. Does the arc of the smile play an important role in orthodontic treatment?
2. Does the symmetry of the smile play an important role in orthodontic treatment?
3. Does the distance between the canine teeth play any significant role in the esthetic evaluation of a smile?
4. Does the height of the upper lip play an important role in orthodontic treatment?
5. Does the curvature of the upper lip play any significant role in the esthetic value of the smile?
6. According to you, does an orthodontic treatment improve a smile's esthetic value?
7. Does orthodontic treatment improve the lateral negative space in a patient's dentition?
8. Does orthodontic treatment cause black triangles in a patient's dentition?
9. Does orthodontic treatment increase a patient's confidence?
10. Do you think orthodontic treatment is painful? YES/NO

IIb. Inclusion Criteria

The patient photographs were selected from the age group of 13-20 years of age and that they had no previous orthodontic treatment done.

IIc. Exclusion Criteria

The patients with discontinued treatment and cases with reported relapse in malocclusion were not taken into consideration. The data received was tabulated in Microsoft Excel and frequency distribution was determined.

III. RESULTS

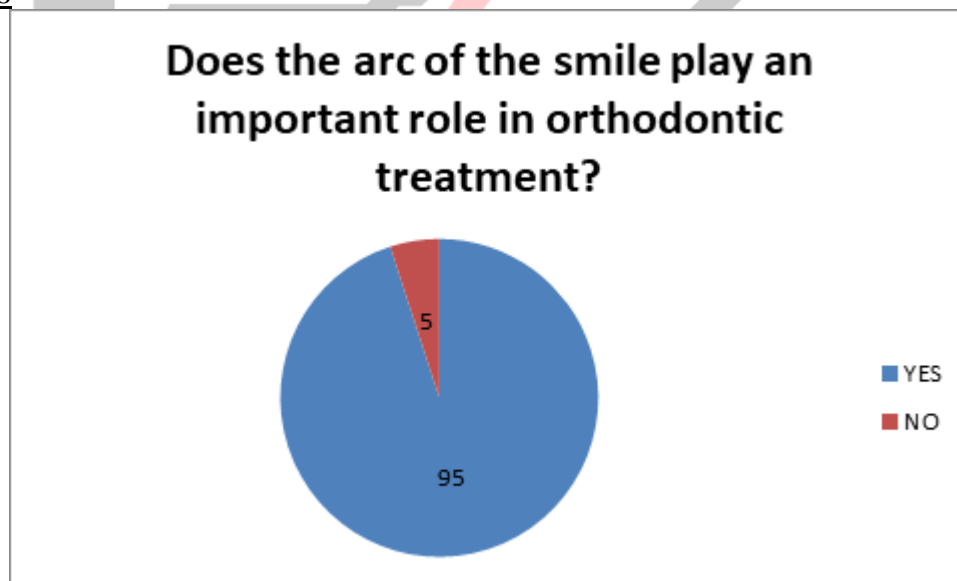


Figure 1: 95% of the students stated that the arc of the smile plays an important role in orthodontic treatment. 5% said it does not.

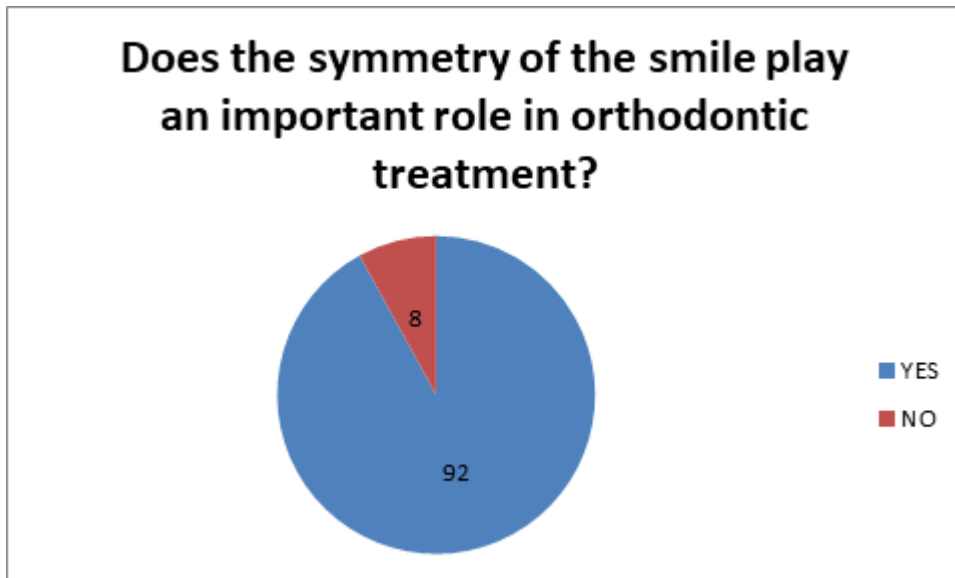


Figure 2: 92% of the students thought that the symmetry of the smile plays a major role in orthodontics. 8% did not think it was important.

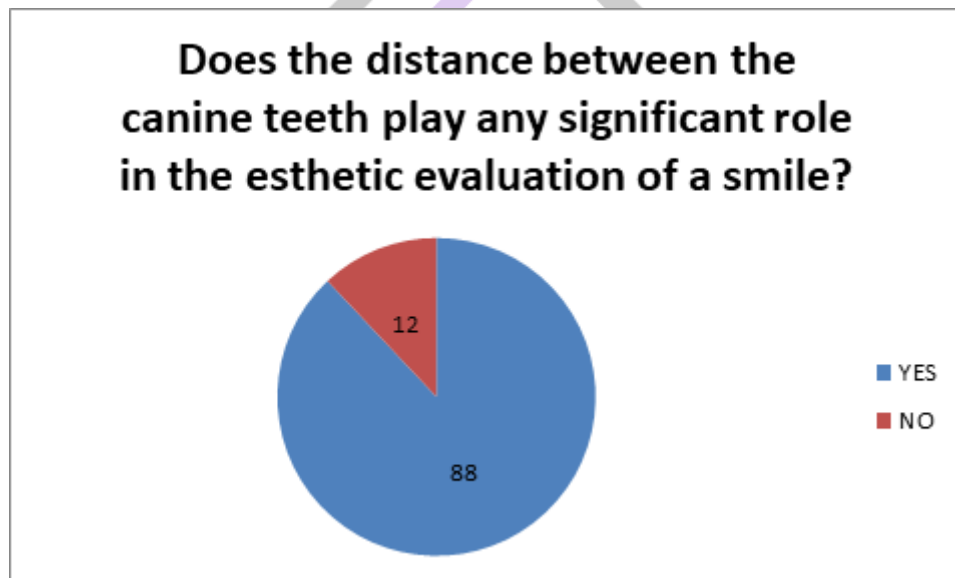


Figure 3: 88% of the students thought that distance between canine teeth are important in smile esthetics. 12% stated otherwise.

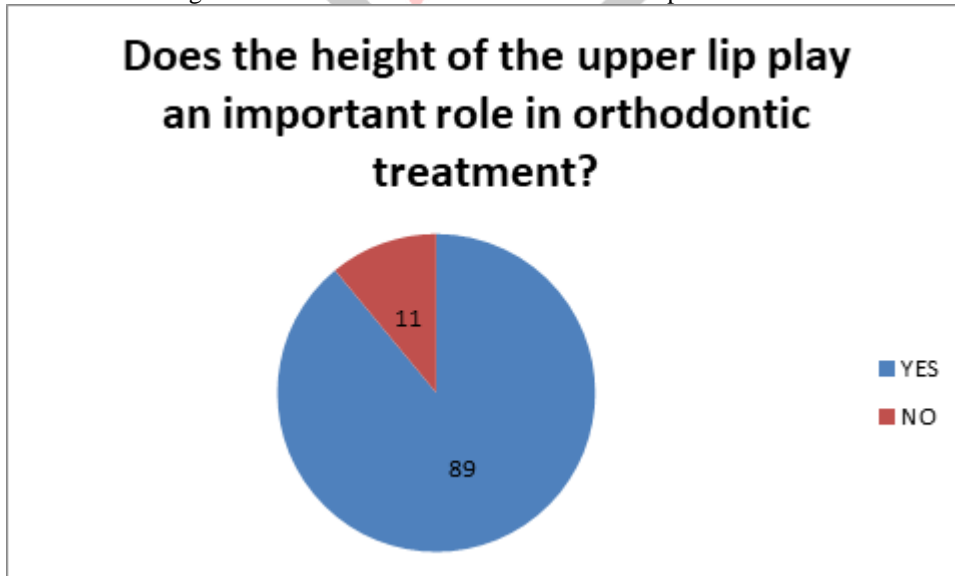


Figure 4: the height of the upper lip was stated to be important in orthodontic treatment for 89% of the students. The remaining 11% did not think it was important.

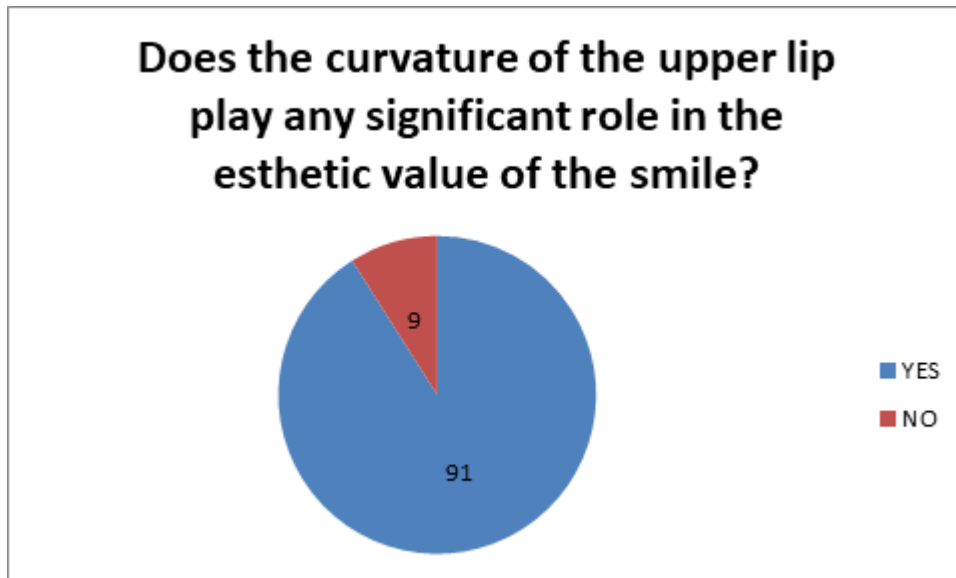


Figure 5: The smile curve was seen to be important by 91% of the students. 9% did not think it was important.

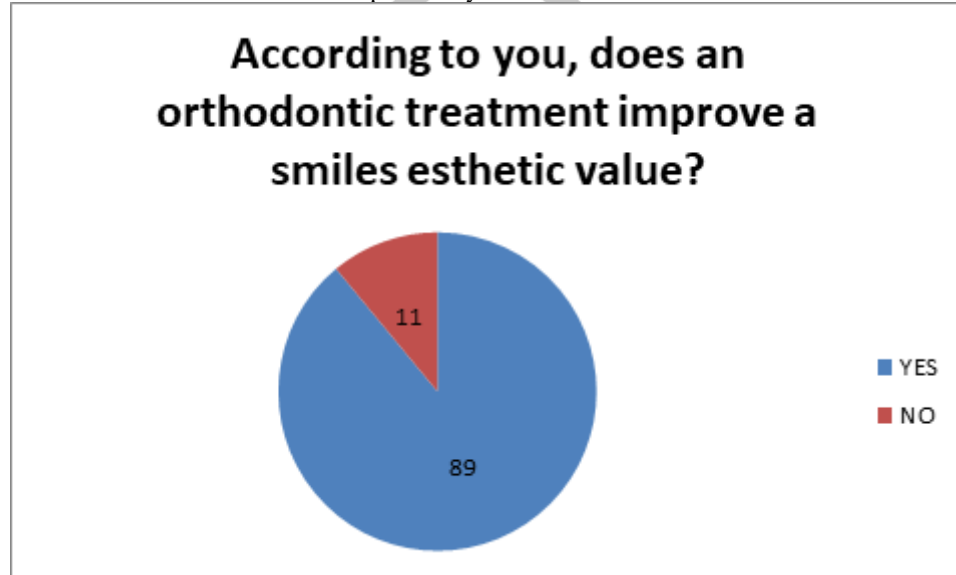


Figure 6: 89% of the students stated that orthodontic treatment would improve smile esthetics. 11% stated otherwise.

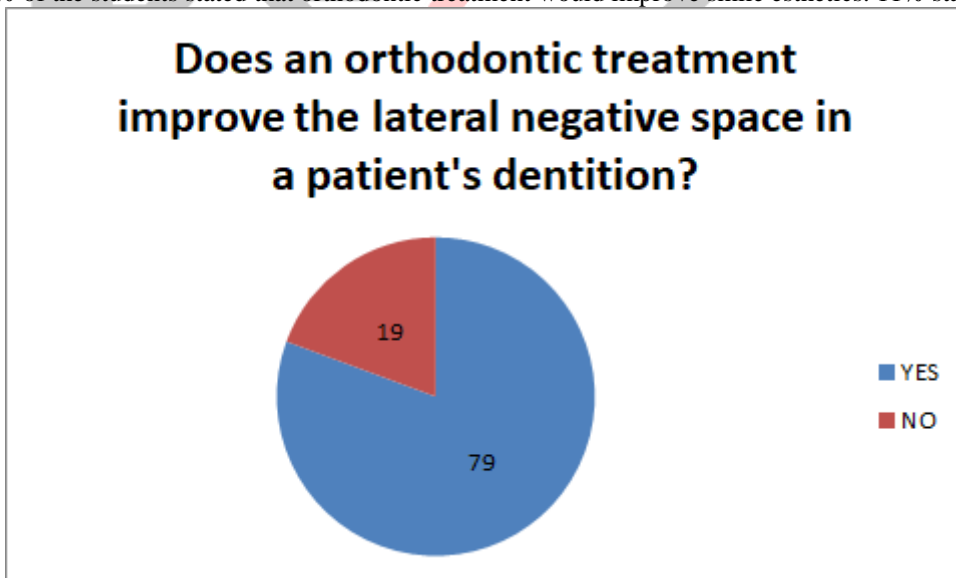


Figure 7: 79% of the students thought that orthodontic treatment would improve the lateral negative space in a patient's dentition. 19% did not think it was possible.

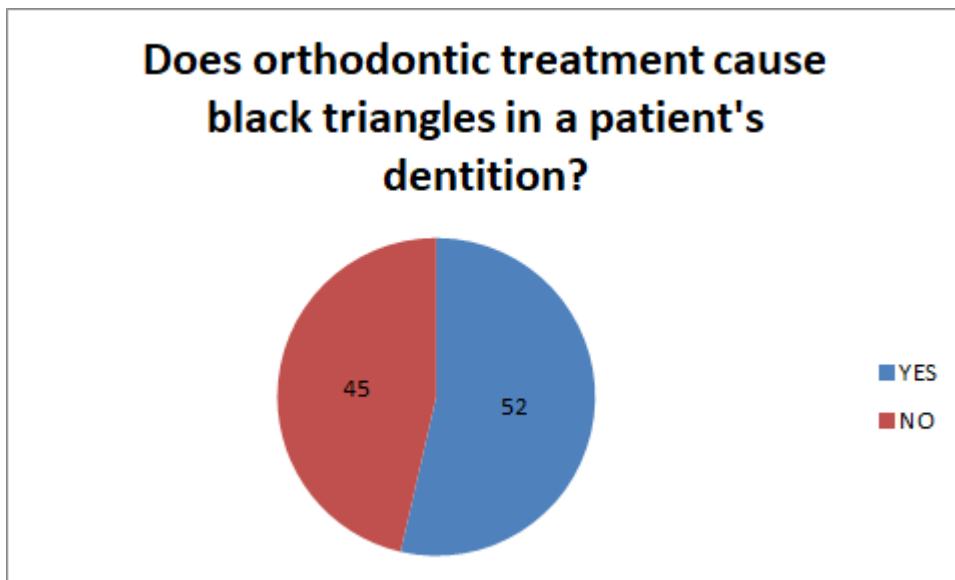


Figure 8: 52% of the students stated that orthodontic treatment would cause black triangles in the dentition. 45% of the students did not think so.

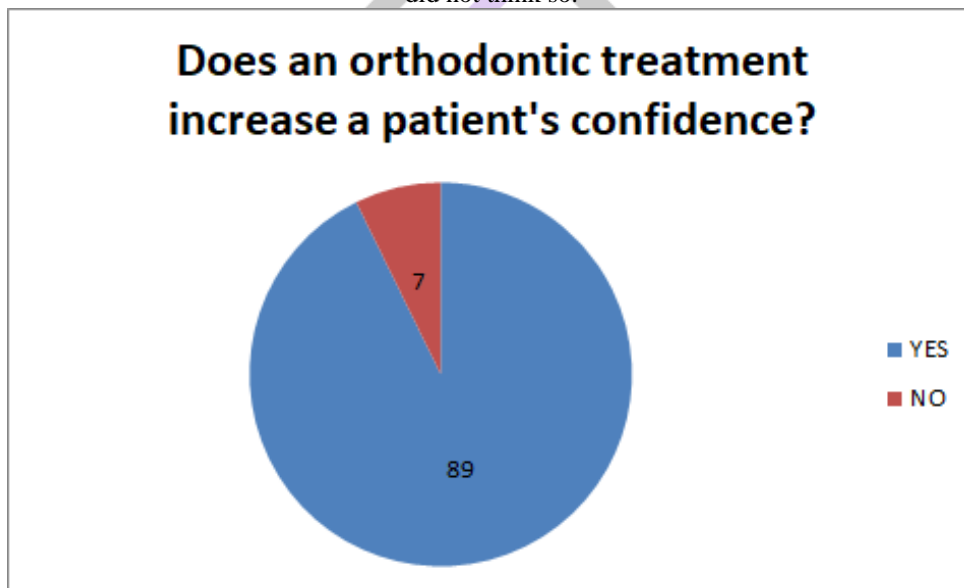


Figure 9: 89% of the students stated that orthodontic treatment would improve a patient's confidence. 7% did not think so

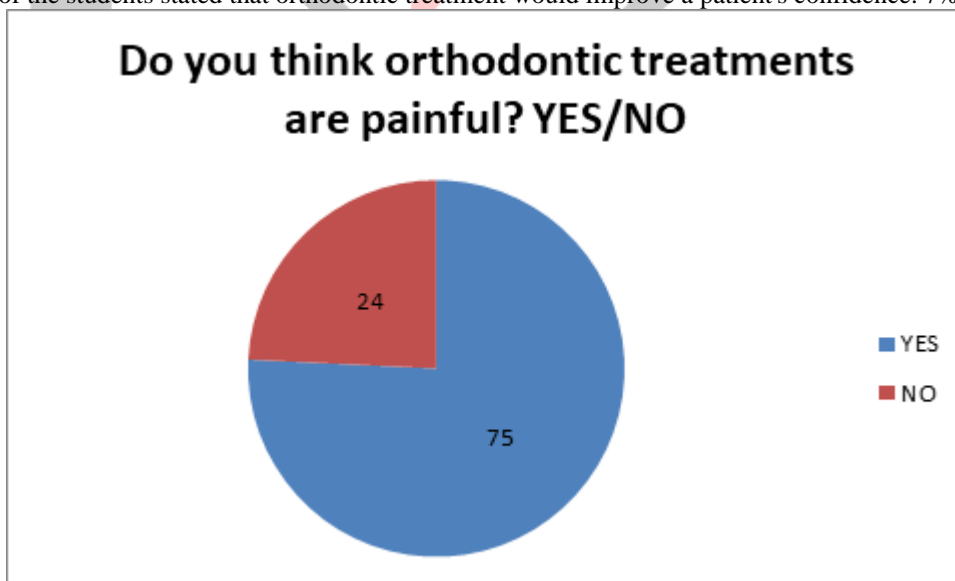


Figure 10: 75% of the students stated that orthodontic treatment was painful and the remaining 24% did not think it was painful.

IV. DISCUSSION

These days malocclusion is mostly seen in adult patients as it is treated at a younger age for the present generation [9]. Orthodontic treatment is very common among the younger as well as the older generations [10]. This is due to the drastic increase in the knowledge regarding the advantages of proper dentition, occlusion, and its effect on appearance. This drastic change is mostly due to four factors. The first being the preventive measures in dentistry. It is possible for patients to maintain proper dentition due to various advances in treatment and hygiene techniques. Second is due to the increase in the esthetic demand by people. Third is due to the fact that people have more knowledge regarding orthodontic treatments these days and there are more patients who are able to afford it. The fourth factor is because of the advances in various orthodontic treatment and the availability of more comfortable orthodontic appliances [11,12].

Knowledge regarding the characteristics of a smile of each patient will help the clinician to visualize the required treatment plan. There are six major lines that an orthodontist should consider while treating a patient(9) to ensure an optimal esthetic outcome for the patient. The six horizontal lines include: cervical line, papillary line, contact point line, incisal line, upper lip line and lower lip line [13].

The ten commandments that should be considered while analyzing the esthetic value of a patient's smile are: smile arc, maxillary central incisors ratio and symmetry, anterosuperior teeth ratio, presence of anterosuperior space, gingival design, levels of gingival exposure, buccal corridor, midline and tooth angulation, tooth color, anatomical shape of the tooth and lip volume [7,14]. In this study, we asked undergraduate students whether they truly thought an orthodontically treated dentition is esthetically better than the normal dentition and a majority of them found orthodontic treatment to improve smile esthetics.

Similar studies have been conducted with orthodontically treated dentition. One such study was conducted by Seong-Mu An, et al, in 2014 [11]. They compared the opinion of people regarding smile esthetics with and without orthodontic treatment. In the study, a woman's smile was digitally altered to look different. The things that were altered include, gingival margin height, crown width and length, incisal plane canting, and dental midline of the maxillary anterior teeth. In order to investigate the effects of orthodontically treated smile esthetics, five variables were considered in this study. They were the arc of the smile, distance between the canine teeth, height of the upper lip, curvature of the upper lip and the symmetry of the smile [15].

The smile arc is the curve that passes along the incisal edges of the maxillary anterior teeth. It is evaluated in relation to the curvature of the lower lip [16,17]. Depending on this, there are various forms of smile lines and they include: consonant smile arc, straight smile arc and reverse smile arc [16]. From the study conducted, about 95% of the students in the college stated that they found the arc of the smile to be an important factor to be considered during orthodontic treatment. When compared to other studies, we can see that the arc of a smile plays an important role in having an optimal smile. The percentage of people who thought that a proper arc is necessary for an ideal smile was about 88%.

According to the undergraduate students, the symmetry of the smile is also important, 92% of the students stated that an orthodontist should consider the symmetry of the dentition while making the treatment plan. The starting point of any orthodontic treatment plan is the facial midline [18]. This will determine proper symmetry. It will contribute to balance and harmony of the dental composition [19]. Asymmetrical smiles are mostly due to deficiency of muscular tones on either side of the face. This can be changed by doing recommended myofunctional exercises that will help overcome the deficiency and restore smile symmetry. It is estimated that about 8.7% of the adults have asymmetrical smiles. According to the survey conducted, about 92% of the people who participated thought that having a proper symmetrical smile is more esthetic compared to asymmetrical smiles. Other studies have also proved that symmetry plays an important role in esthetics. Symmetry can be influenced by the midline, positioning of the teeth, tilt of teeth, presence or absence of teeth, etc [19].

The distance between the canines is the next factor that was considered. These anterior teeth play a major role in esthetics as it is the most visible teeth while a person smiles. According to the survey conducted, about 88% of the students thought that the distance between canines played a role in esthetics. The variables that could affect these factors include tooth colour, gingival exposure, and size of the teeth [11]. The canines are referred to as the cornerstones of the dentition. The distance between the two canines will determine how narrow or broad the arch is. This would determine the shape of the face. Various studies have shown that people give more importance to anterior teeth as they are the most visible. It is also a known fact that dentists take immense care while restoring anterior teeth due to esthetic reasons.

Some patients have very minute spacing between the incisal edges of their teeth and the border of the upper lip. Some have a gummy smile where the distance is excessive [8][20]. The ideal height of the upper lip should be at about the middle third of the central incisors. This would provide sufficient exposure of the teeth and also provide a good smile arc. 89% of the undergraduate students thought that the height of the upper lip plays a role in determining the esthetics of a smile.

Orthodontic treatments help improve a patient's appearance [21]. It's benefits include the correction of dental crowding and straightening of the teeth, correction of the bite so that the back teeth meet evenly, reducing damage to prominent teeth and also to improve the smile. According to our survey, 89% of the students thought that orthodontic treatment is capable of improving a person's appearance. It is possible to alter a person's dentition according to their facial profile and provide a better appearance. This would depend on the skill of the dentist and the treatment plan.

Lateral negative spaces are also known as buccal corridors [22]. They refer to the dark space that's visible during smile formation, between the corners of the mouth and the buccal surfaces of the maxillary teeth. It is measured from the mesial line angle of the maxillary first premolar to the interior portion of the commissure of the lips. It is influenced by the width of the smile and the maxillary arch, tone of facial muscles, position of the premolars, prominence of the canines, position of the maxilla. It directly influences arch symmetry and form. 79% of the students thought that orthodontic treatment can influence the lateral negative spaces as well. It contributes to the smile esthetic as its presence will show a wide smile. According to other studies that have been done, the majority of the people have stated that the presence of the buccal corridor as an esthetic component of a smile.

The presence of interproximal papilla is another factor that could affect a smile's esthetics. The absence of it would lead to a cosmetic deformity known as "black triangle" [23]. These spaces have been a topic of discussion to determine esthetics for the past many years. In orthodontics, it's mostly seen when rotated teeth are realigned or straightened. This would lead to a gap or space in between the teeth. Further orthodontic treatments can fix the problem. According to the study, about 52% of the students know that orthodontic treatment can correct the presence of black triangles. From other studies, we can see that the presence of black triangles are not considered esthetic according to many people.

It is a known fact that with better appearance, a person's confidence will increase. Orthodontic treatments give a chance for people with misaligned teeth to fix their dentition and have a better smile [17]. Though it is a topic of discussion to many, that natural dentition is a beauty in its own. Majority of the students that were surveyed stated that an orthodontically treated smile gives a person more confidence.

Study Limitation

This study had a small sample size and was only inclusive of undergraduate students.

V. CONCLUSION

This study shows the perception of undergraduate students regarding the various factors that could influence a patient's smile esthetics due to orthodontic treatment. It is important for an orthodontist and general dentist to have thorough knowledge regarding the various aspects of smile and the layman perception of smile esthetics. Conducting educational programs or conferences regarding this topic is essential to provide sufficient knowledge to dental practitioners to complete orthodontic treatment with a better smile at the end of orthodontic treatment.

ACKNOWLEDGEMENT

The authors are thankful to Saveetha Dental College for providing a platform to express our knowledge

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