

How to Cite:

Jabbar, A., Hussain, G., Shereen, S., Tariq, J., Islam, F., & Mushtaq, M. (2023). Perception of smile esthetics by patients reporting for orthodontic treatment. *International Journal of Health Sciences*, 6(S8), 6851–6866.
<https://doi.org/10.53730/ijhs.v6nS8.14032>

Perception of smile esthetics by patients reporting for orthodontic treatment

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Abstract---Objective: The main objective of this study was to evaluate smile esthetics in terms of midline diastema, smile arc and gingival display during smile by patients reporting for orthodontic treatment. Study design: A cross-sectional study. Setting: Out Patient Door, Orthodontic Department Liaquat University of Medical and Health Sciences, Jamshoro Sindh. Duration: The study was conducted within 06 months after the approval of synopsis i-e from Dec 2020, to May

2021. Sample size: Out measures were 1) midline diastema, 2) Gingival Display during smile, 3) smile arc. Sample size calculation was done by using "Openepi" software with 5% margin of error and 95 % confident value, Mean 0.95, Sample size was n= 126. Sample technique: Non-Probability consecutive sampling technique. Data collection method: After approval of this study from Ethical Review Committee of LUMHS study was conducted at Orthodontic Department, Institute of Dentistry, Liaquat University of Medical and Health Sciences Jamshoro. There were total of 126 participants in this study, Data was collected showing three different front smiling photographs with various degrees of; Gingival Show During Smile i-e A= 0mm B =0.5mm C=1.5mm D=2mm E=2.5mm Smile Arc i-e A. Convex/Curved B. Plan/Straight C. Inverted/Reverse. Midline Diastema i-e A. 0.5mm B. 1mm C. 1.5mm D. 2mm to the patients reported for orthodontic treatment, proforma was provided to patients and they were asked to score the attractiveness of smile individually by using visual analogue scale (VAS). Data analysis: After collecting data, the analysis was carried out by using statistical package for social science (SPSS) software version 16.0. The standard deviation (SD) and means were calculated. The influence of independent factors on smile esthetics as well as collaboration among these factors. P-value < 0.05 were taken as a significant. Results: Total 126 participants undergoing orthodontic treatment were shown different pictures of smile showing various degree of midline diastema, gingival show, and smile arc, and were asked to choose one picture which was the most attractive towards them with respect to esthetics, 99 patients found midline diastema lesser than 0.5mm to be most attractive, and according to 41 patients no gingival show during smile was appealing whereas 36 said 0.5mm gingival show is attractive. Majority of the patients i-e 64 preferred convex smile arc over straight and concave to be attractive. Conclusion: Patients in the 1st years of the treatment preferred smiles with minimum or no gingival show, no midline diastema and convex smile arc. Excessive midline diastema, reverse smile arc and excessive gingival show was rated to be unattractive.

Keywords---smile, gingival show, spacing, attractiveness.

Introduction

The main purpose of orthodontic treatment is not necessarily only to address functional problems but also to enhance facial attractiveness and appreciation of differences between perceptions of lay people and professionals. Facial attractiveness, over and above smile esthetics, has strong influence over the well-being of several patients and pulls the Orthodontist to be alert about the fact that it's necessary to stay up to date.¹The facial esthetics is a perception of mind driven by ones' own thinking; for that reason beauty remains a particular idea.² The word esthetics is derived a Greek word "aesthesis", that means observation, impression and for being such a subjective concept due to variances in taste and attitude, it generates disagreement among patients and dentists. For

Orthodontists the facial soft tissues and smile are of great importance as they are directly related to the emotional expression and social communication. Therefore It is mandatory and it's a responsibility of an Orthodontist to improve and create a balance in the result that is more acceptable and pleasant smile is developed for all the people undergoing Orthodontic treatment. Without any doubt when an ugly/poor smile is enhanced with orthodontic treatment, the patient naturally becomes more confident and become overwhelming. Above all the characteristics of pleasant smile the most important one for an orthodontist are the buccal corridors and smile arc up to the date.³ An attractive smile depends on three main components: i-e the teeth, gums, and lips.⁴ With the advent of time we have seen that the definition for beauty keeps changing constantly. Similarly dental beauty also differs with time, religion, nationality and demographics⁵. There are four main aspects of aesthetic perception of smile: facial aesthetics, gingival aesthetics, micro aesthetics and macro-aesthetics.⁶ People are strongly influenced by their surroundings and social circle than by Dentist or Orthodontist alone and start to be more preoccupied with the appealing smile and attractiveness of the face. Moreover it has always been documented that social status, level of education and a culture has strong influence on perception of smile esthetics. For that reason the post orthodontic treatment results might be of different value for Patients and Orthodontist.⁷ It will be a huge blander if an Orthodontist starts believing that their perception of esthetics is similar to the patients perception of esthetics.⁸ it has been observed that the facial and dental appearance has been documented to influence common peoples' perception about others and have strong influence on others quality of life.^{9,10} In the earlier decades it has been given an utmost importance to improve the facial appearance and smile esthetics and given special emphasis on diagnosis and treatment planning of orthodontic patient.¹¹ So far now, very less literature is available on how perception of smile esthetics is influenced by various variables. Kokich et al.¹² reviewed and revised the measures to enumerate these issues by using modified digital images of oral and perioral structures. Numerous latest tools are available now to control variables and present images digitally.^{13,14} Along with various factors, the face type and face height has also played vital role in the attractiveness of smile. Its stated at various places in literature that dental and facial esthetics has strong influence on patients' life. Shaw¹ did study and found that pleasant appearance of people play an important role in social success. He took total four full head frontal photographs of boys and girls, along with good-looking and unappealing models. Then he altered the photographs and had five series for each photo with respect to face i-e normal maxillary incisors, proclined maxillary incisors, missing maxillary lateral incisors, extreme crowding in incisors, and unilateral cleft lip. Every photo was shown individually to total 42 children who were in between 11 and 13 years of age, they were asked various questions like let's suppose this boy wants to be your friend will you be his friend? Do you like him? Is he good looking? Likewise identical photographs were shown to different 42 adults and they were also asked various questions like what do you think will this boy be friend to anybody easily, and is he seems to be intelligent? The results of this survey showed according to children, people having normal dental appearance are thought to be good friends, less aggressive, more attractive and more intelligent. Shaw believed that poor facial and dental esthetics can results in social handicapping. Obviously dental esthetics has worth, kayak. clearly stated that orthodontic treatment has a strong impact on quality of life. She further stated

that majority of patients undergoing orthodontic treatment wish for their pleasant appearance of their face and social acceptance more than their general health or oral function. She talked about the importance of facial attractiveness on social and interpersonal success. With reference to meta analysis⁷ summarized that good looking children and adults are more appreciated in life than those having poor esthetics. With this regard attractive people are more confident. Teeth and smile are the critical components of facial esthetics ² Furthermore she presented the consequences of pre orthodontic and post orthodontic assessments done by children who were undergoing interceptive treatment. They revealed significant improvements in teeth and facial images, and their overall image score was unchanged. She concluded that patients who receive orthodontic treatment undergo a significant facial change with respect to esthetics and function. Havens et al ⁸ presented 6 changed photographs to the raters to examine the importance of smile in overall facial attractiveness. pretreatment and post-treatment respectively. They focused on a close by view of the smile (the lower face), and a complete photo of face with blocked out area of smile. And complete face photo with full smile, for before and after treatment. The complete face photographs before treatment were rated to be least attractive in comparison with the blocked out smile. In complete face photographs, presenting as forms of malocclusion weakened the overall facial appeal. No difference was found in the post orthodontic treatment photographs, representing that the by correction of the malocclusion the smile esthetics comes in harmony with the full face.

Literature review

Today, in an Orthodontic practice the Adult orthodontics have been rapidly grown up to be an integral part of practice. In early 1970's Adult Orthodontic treatment was rare, and today main stream of the patients experiencing orthodontic treatment are young adults their estimated age is 18 years, and approximately 30% of patients are above 18 years of age.²⁶ people usually seek orthodontic treatment with the desire of having more pleasing and appealing smile, and they are more concerned about their Esthetics ^{27,28} Now It is frequently apprehended and experienced that soft tissue profile and attractiveness of face should be on the top of to do list while planning orthodontic treatment.^{27,29} Ackerman et al³ added that the developing facial soft-tissue architype in treatment planning and diagnosing seats superior importance while doing examining facial profile and attractiveness with comparison of the earlier cases and sets alarming situation for updated knowledge and information in such areas. Several writers and researchers have responded, that in an orthodontic literature the esthetics of smile has been a famous topic. It should be specified that a mystifying factor impelling any research done on the esthetics defines the beauty as that there can be a great difference among esthetics of individuals' social economic and racial groups respectively. ^{30,35} Moreover , there are substantial amount of agreement on attractiveness throughout the several social and ethnic sets.⁵ more research are conducted in posed smile with respect to the attractiveness of smile. The posed smile is reproduced consistently^{9, 36,37} which gives it efficacy in research accomplishments. Ackerman et al ³⁸ added the posed smile to be recorded in orthodontic records back 1998. Walder et al ³⁹ contributed that the posed smile can be reproduced consistently when its measured objectively, and warned that individual analysis can distinguish differences among repeated posed smiles.

They assessed posed smile on basis of chief two factors while planning orthodontics treatment, the degree of gingival and maxillary incisors display and transverse dimensions or the broadness of the smile.⁴⁰

Smile arc

According to Sarver smile arc is defined as, it is the inferior curvature of maxillary anterior incisor teeth with respect to the upper curvature of the lower lip.⁴¹ Hulsey,⁴² observed that those who undergo orthodontic treatment have flat smile arc than those who do not receive orthodontic treatment. Earlier documented in the earlier studies that flat or straight smile arc are find to be unaesthetic and non-pleasant.^{41,44} convex smile arcs were preferred over straight smile arcs.⁴¹ as it's hard to calculate the lower lip relationship with the incisal edges of maxillary incisors , various levels for smile arcs are to be used i-e ideal smile arc(convex), the upper smile arc (straight), and lower smile arc (reverse).

Buccal corridor

Smile in transverse plan is defined as broadness and specifically by width of buccal corridors⁴³ Frush and Fisher introduced the buccal corridor in the prosthodontic literature⁴⁵ and defined it as the space present between the posterior teeth buccal surface and the corner of the lips during smile. Buccal corridors are affected by variety of factors one of those is maxillary width.⁴⁶ Ackerman and Ackerman⁴⁴ renowned that the presence of buccal corridors is intensely influenced by lighting. Buccal corridors appear greater in encircling light but become lesser and can disappear completely if enough light can penetrate into the smile from the forward-facing. Buccal corridors are also influenced by muscular factors which are involved in smile.⁴⁵⁻⁴⁷ Smile esthetics is also influenced by the style or way of smile a patient has stated by Rubin⁴⁵, that is also determined by which muscle group and to what extent every muscle group function is recruited during smile. Lip position with respect to anterior-posterior positioning of the maxilla is another crucial element in the appearance of buccal corridors.⁴⁸⁻⁵⁰ If there is retrognathic maxilla, the wider part of the dental arch is definitely positioned more posterior with respect to the anterior oral commissure. With reference to this case, the buccal corridors appear wider. If the position of maxilla is more anterior or prognathic , that means the broader portion of the arch is closer to the lips, and buccal corridors look as if reduced in a smile.¹⁸⁻²⁰ another factor is arch form that has an influence on buccal corridors. For aforementioned patient, when the arch is broader in premolar area smaller is the width of buccal corridors.⁵⁰ several studies have proposed that orthodontic treatment involving the extraction of premolars end up having broader buccal corridors and narrow maxillary arch, well various studies disproved this argument.⁵¹⁻⁵⁴ Isiksal et al⁵³ said that those patients who undergo orthodontic treatment by extraction of various teeth resulted in narrow buccal corridor in the comparison to those who has non extraction treatment plan or no treatment at all. A various other researchers like Johnson and Smith⁵⁴ assessed the frontal photographs with smile of patients undergoing treatment, they concluded there was no difference in width of buccal corridors for those being treated with extraction and non-extraction pattern of premolars. Likewise Gianelly⁵¹ took the post treatment cast of patients undergone extraction and non-extraction pattern

and measured the anterior posterior arch width, he concluded that there was only one difference among both groups that was mandibular inter canine width was 1mm larger in those who underwent extraction, beside that there was no any difference in width of the arch. extension in patients having narrow maxilla.^{60, 63}

Midline diastema

Diastema is a Greek word which means space or gap two or more than two sequential teeth, its mostly found in the midline of the maxillary arch in between two maxillary incisors.⁷¹ Maxillary midline diastema happens to appear with the eruption of permanent maxillary central incisors, and it reduces with the eruption of maxillary canines⁷². Its usually seen in the children with early mixed dentition, decrease as the child grows with the permanent dentition^{73,74,75} beside the transitional appearance and gradual closure it can persist even after the exfoliation of permanent canine and disturbs the harmony of arch. ⁷⁶ racial and sexual predilection are documented in literature for maxillary midline diastema (MMD). Richardson et al ⁷⁷ stated it is more prevalent at younger age in females i-e 6 years , and in males it happen to occur more with 14 years of the age. MMD is more prevalent in west African than in Chinese and Birtish⁷⁸ various factors are associated with the etiology of MMD such as dental abnormalities, hereditary predilection and environmental influences⁸⁰ variation in the size, position and anatomy of the maxillary incisors influences the arch continuity and leads to the diastema⁸¹ presence of thick frenum and supernumery teeth specifically mesodens results in MMD^{82,83}

Gingival display

Few of the chief vertical factors like amount of gingival display and maxillary incisors, are used in assessment of posed smile are.⁶⁷ Analogous to the aforementioned conversation of buccal corridors, there are numerous characteristics which strongly affect display of gingiva during smile. Other several factors are: height of upper lip and philtrum, angulation of maxillary incisors, VME, muscles involved.^{15, 34, 67} According to Sarver⁶⁷ there are several factors involved more gingival show during smile, such as vertical maxillary excess VME, excessive animation, short philtrum, too upright position of incisor angulation. And the reverse of such characteristics results in the inadequate maxillary incisor show. Rubin's¹⁵ conclusions stated that gingival display is also influenced by smile style along with muscles involved in function. Dickens et al³⁸ said that display of gingiva and upper incisors is highly influenced by soft tissue facial dimensions. They further recommended an orthodontist should consult plastic surgeon for the patients who have disproportionate dentofacial structures. Peck et al⁶⁹ demonstrated that there is a direct relation between gingival display and anterior vertical maxillary excess VME and it influences the upper lip elevation as well. They found that those with more gingival display during smile had hyperactive upper lip then those have average or low smile line. Even there was a sexual differentiation it was observed that female had more gum show during smile than men.^{9, 10, 41-43} Rigsbee et al⁹ said that female have higher facial liveliness during smile as compared to men. Brundo and Vig¹⁰ studied participants of different ages, below 30 years and above 60 years of age, and concluded that female are more likely to show at rest and function than does

man. Tjan et al⁴¹ presented a sample of 454 of dental hygienist and dental students with the age range of 7 to 20 years, and 30 years, women had high smile line and men had low smile line. Peck et al⁴² also did an study on 88 participants with the mean age of 15 years stated that women most likely have high smile lines, and men had low smile lines. Peck and Peck⁴³ quantified average display of gingiva to be approx -1mm for male and 1mm for males with average age of 15 years.

Smile with respect to aging

The facial soft tissue plays a vital role in the esthetics of an individual smile, it effectively influences the transverse and vertical appearance of smile.^{25-27, 37-40} several writers took an interest in measuring the changes of facial soft tissues with aging and compared the younger patients with the older one, but were unable to show any data in younger adults.^{50- 52} Another author Mamandras⁵⁰ studied the soft tissue lip changes along with aging with the help of serial cephalometric radiographs of 32 subjects which were not treated orthodontically. He concluded that the lips become thick and long with respect to time and age i-e lips were more thin and small in the subjects aged 8 than those 18 years old. In another study Cohen and Vig studied serial cephalometric radiographs of people aged from 4 to 20 and concluded that lips come more closer with the age, they become more competent. Likewise, Genecov et al⁵² collected lateral cephalograms of 64 people who were in between 7 to 18 years of life, he concluded that the growth of soft tissue nose continued after skeletal growth in both sexes i-e male and female, he further stated that lip position remained constant with the reference to vertical plane in antero posterior direction. The authors further distinguished that the relative position and shape of facial soft tissues like lips nose and chin remained persistent during the course of developmental period. Soft tissues of perioral structures losses its elasticity and drops down with the passage of time as one gets older.⁵³ Previous literature on Plastic surgery frequently discussed facial soft tissues changes with respect to age such as sagging and dropping of corner of mouth.⁵⁴ and these age related changes directly affects the esthetics of smile. Moreover Formby et al⁵⁵ analyzed the lateral cephalograms of patients with the age range of 18 to 40 years, and concluded that as one grows older their lips become thinner. Bishara et al⁵⁶ studied lateral cephalometric radiographs of patients at age of 25 and 46 and found that the lips become more retrocumbent with the passage of age. As adults become older, the length of philtrum, commissure and upper lip increases,^{17, 20, 38, 57} moreover the muscular ability to raise the upper lip during smile decreases.^{16, 17, 58} Janzen⁵⁸ observed that as the facial muscles loses their tonicity the lip movement decrease.. Chetan et al¹⁷ made digital video recordings of total 241 patients with age range of 0-50 years, he found that with the passage of time as the one gets older the maxillary incisor show and gingival show decreases and the upper lip lengthen on smile in both male and female, and these age related changes appeared earlier in men than female. He also renowned that the inter commissural width but decreased on smile and increased at rest with advancing age. The authors accomplished that variation in the elevation of lip had lesser role in minimizing the lip line during smile while aging as compare to sagging of upper lip. Dickens et al³⁸ did cross sectional study on many patients undergoing orthodontic treatment at private setups about 1367 individuals, he assessed the

changes of facial soft tissues specifically in lower one third of face with respect to aging, they concluded that the length of philtrum of upper lip was short initially, but it lengthen faster than the commissure with respect to growth, in the result of which maxillary incisor display at rest and smile increases in both sexes. This continued growth of commissure and philtrum results in decrease in incisal and gingival show during smile and at rest as the person ages. These findings are an eye opener for the Orthodontist to carefully examine and make suitable treatment plane and when planning maxillary incisor intrusion for the patient after considering these age related changes. Singh et al⁵⁷ recorded several videos of 195 people at different age group of same people and measured the smile esthetically, he documented that with the passage of time the length of upper lip increases in both gender, but maxillary incisor show decreases more in males than females. By concluding the observation, they stated that the smile line narrows vertically with the passage of age, specifically in men. Its documented in several other literature and studies and by various authors that with the passage of time soft tissue changes occurs. more specifically age related changes are decrease upper incisors show and decrease gingival display on smile.^{10, 13, 16, 20, 39, 41} One of the many studies demonstrated an increase in the width of the buccal corridor size with increasing age.¹⁶ Vig and Brundo contributed that this timely decrease in upper incisors show with age on smile is accompanied with gradual increase in mandibular incisor show. Desai et al¹⁶ recorded several videos of almost 221 people who ranged from 15 to 70 years of age, and measured them at rest and during smile. They realized that as the people gets older more specifically when they reach their 40, their muscles become weaker and they lack their ability of raising the lips during smile. The maxillary incisor show decreases by 10.5mm to 2mm with aging. And very little increase in the width of buccal corridors occur with advancing age. At the end the authors summarized that with respect to aging, the smile becomes moderately wider transversally and narrower vertically. Younger people show more gingiva and incisors during smile while adult and older people show less. Another author Peck et al³⁹ also did study on younger and older age groups for assessing smile esthetics, he found that the older patients had three times less gingival show and incisor display than the younger patients. While Sarver and Ackerman²⁰ in their study concised with the aging and maturation various changes occur among them few are commissure and philtrum length increase, and decrease in maxillary show on smile and at rest and reduction in gum show on smile. They concluded and said time is of utmost importance, one should be very careful in doing orthodontic treatment planning while considering smile esthetics because these are dynamic factors.

Material and Methods

Study design

A cross sectional study.

Setting

Out Patient Door, Orthodontic Department Liaquat University of Medical and Health Sciences Jamshoro

Duration

The study was conducted from December 2020 to may 2021

Sample size

Out measures were 1) midline diastema, 2) Gingival Display during smile, 3) smile arc. Sample size calculation was done by using "Openepi" software with 5% margin of error and 95 % confident value, Mean 0.95, Sample size is n= 126.

Sample technique

Non-Probability consecutive sampling technique.

Sample selection

Inclusion criteria

1. Age: 15-30 years
2. Gender: male and female
3. Patients reporting for orthodontic treatment

Exclusion criteria

1. Patients not undergoing orthodontic treatment
2. Non-compliant patient

Data collection method

After approval of this study from Ethical Review Committee of LUMHS study was conducted at Department of Orthodontics, Institute of Dentistry Liaquat University of Medical Health Sciences Jamshoro. There were total of 126 participants in this study, Data was collected by showing three different front smiling photographs with various degrees of;

Gingival show during smile i-e A. 0mm B. 0.5mm C. 1.5mm D. 2mm E. 2.5mm

Smile Arc i-e A. Convex/Curved B. Plan/Straight C. Inverted/Reverse

Midline Diastema i-e A. 0.5mm B. 1mm C. 1.5mm D. 2mm

To the patients reporting for orthodontic treatment, patients were provided proforma and were asked to rate the esthetics and attractiveness of smile using visual analogue scale (VAS) individually.

Data analysis

After collecting data, the data was analysed by using statistical package for social science (SPSS) software version 16.0. The standard deviation (SD) and mean were calculated. Interaction and effect of dependent variables P-value <0.05 were taken as significant.

Results

Table 4.1: Frequency distribution of gender (n=126)

Gender	Frequency	Percent
Male	60	47.6
Female	66	52.4
Total	126	100.0

Table-2 shows that represent the gender distribution among them 60 (47.6%) were male and 66 (52.4%) were female tabular representation of gender.

Table 4.2: Descriptive Statistics of Duration of Treatment (N=126)

Duration of Treatment	Frequency	Percent
1 to 12 M	71	56.3
1 to 2 Y	38	30.2
2-3 Y	15	11.9
3 onwards	2	1.6
Total	126	100.0

The frequency of total duration of treatment of patients undergoing orthodontic treatment is shown 71 (56%) participants were those who just had treatment from 1 month to 1 year there were only 2 patients who were undergoing orthodontic treatment longer than 3 years, the descriptive statistics are given in Table 2

Table 4.3: Cross-tabulation of Duration of Treatment and Midline Diastema (N=126)

Years		Midline Diastema			Total
		0.5	1	1.5	
Duration of treatment	1 to 12 M	59	12	0	71
	1 to 2 Y	28	10	0	38
	2-3 Y	10	4	1	15
	3 onwards	2	0	0	2
Total		99	26	1	126

Table-3 demonstrates the crosstabulation of the duration of treatment with midline diastema, it was found that those who were in the initial 12 months of the treatment i-e 59 patients chose 0.5mm or less diastema to be attractive

Table 4.4: Cross-tabulation of Duration of Treatment with Gingival show on Smile (N=126)

Duration of treatment		Gingival show					Total
		0	0.5	1.5	2	2.5	
	1 to 12 M	25	24	12	5	5	71
	1 to 2 Y	9	10	9	8	2	38
	2-3 Y	6	2	4	3	0	15

	3 onwards	1	0	0	1	0	2
Total		41	36	25	17	7	126

Crosstabulation of duration of treatment with gingival show on smile is given in Table-4 , its illustrated that majority of patients who were in the initial months of the treatment found no gingival show during smile to be pleasant , and those who were in 2nd year of treatment found 2mm gum show to be attractive

Table 4.5: Cross-tabulation of Duration of Treatment with Smile Arc (N=126)

Duration of treatment		Smile arc				Total
		convex	straight	reverse	4.00	
	1 to 12 M	29	25	15	2	71
	1 to 2 Y	21	11	6	0	38
	2-3 Y	12	3	0	0	15
	3 onwards	2	0	0	0	2
Total		64	39	21	2	126

Table-5 shows the crosstabulation of duration of treatment with smile arc likewise results were found those who were in initial months of treatment found convex smile arc to be pleasant.

Discussion

Facial esthetics play a huge role in peoples' life as it is most important for social and professional connections. This why dental and facial wellbeing have a strong influence and utmost importance in society. The primary moto of the orthodontic treatment is to improve the facial and dental esthetics, it is crucial to identify and minimize the adverse effects on facial attractiveness due to orthodontic mechanics, and it can only be achieved once an orthodontist understands the factors that correlate between oral hard and soft tissues during smile and at rest. There are several studies in past literature in which perception of smile esthetics have been analyzed among dental students or laypersons, but the perception of smile esthetics with respect to midline diastema, smile arc and gingival display using visual analogue scale by patients undergoing orthodontic treatment has not been done locally yet.

The present study was taken up with the objective of assessment of the perception of smile esthetics by the patients undergoing orthodontic treatment, the patients aged from 15 to 30 years of age were shown different pictures of smile, one had various degree of midline diastema, other had various degree of gingival show, and one with the different types of smile arc were shown. Patients were asked to choose the one most appealing picture according to them through visual analogue scale VAS. Total 126 participants were involved in the this study, with more ratio of females as compare to male, the mean age of the sample was 20 years. According to 99 patients the most attractive smile had no midline diastema, they found smile very unattractive with the midline diastema.

Nocqueira et al did a study in which, the perception of esthetic components of smile including midline diastema and crown length or gingival show during smile were evaluated, the viewers were asked to rate the most appealing smile photograph from 13 altered photos of the same smile, the photos were classified according to the VAS ranging from 1 to 10, excessive midline diastema and gingival show was considered to be least attractive during smile. Our second variable was the gingival show during smile, most of the patients found no gingival show and less than 1mm gingival show to be appealing, according to the people the more the gum show the less attractive the smile is. Reverse or straight smile arc was the least preferred by the patients they rated the convex smile arc to be appealing.

Conclusion

Patients in the 1st years of the treatment prefer smiles without gingival show, no midline diastema and convex smile arc. A huge midline diastema, reverse smile arc and excessive gingival show was rated to be unattractive. Mild flattening of smile arc can drastically affect the smile esthetics. >All raters preferred fuller smiles.

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