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EVALUATION THE LIP LINE AMONG YOUNG ADULTS

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ABSTRACT:

Aim & Objective: To evaluate the lip line among male and female young adults, and to compare the gender lip line.

Methodology: A total sample of 154 students was selected from dental College in an age range of 21-26years of age. The subject is then requested to simulate a "natural smile" and that is recorded by the observer. A photograph of the subject is then taken with a camera that is placed in a fixed position at a distance of 1.0m measured from the tripod's column to the dental chair. The different type of lip lines produced is then classified into each types of lip line classification 1, 2 & 3 respectively.

Results: According to our result, young female adults have a higher lip line compared to young adult males. Males that have not undergone any orthodontic treatment show the highest percentage in Class 3 lip line, 33.9%; whereas females whom have not undergone any orthodontic treatment have the highest percentage in the Class 2 lip line, 35.6%.

On the other hand, among the subjects that have undergone orthodontic treatment, males displayed highest percentage in Class 3 (50%) whereas females showed highest percentage in Class 2 (34%) lip line.

Conclusion: We conclude that young female adults have more gingival display during natural smile, which is an important aspect for treatment consideration. Especially since a socially pleasing smile is not only an important tool of communication but also a boost for an individual's confidence.

Keywords: Lip Line, orthodontic treatment, gingival display.

INTRODUCTION

The principles of visual perception states that, for a harmonic and symmetric composition of teeth, factors such as tooth size, shape, colour, and position, the amount of visible gingiva, buccal corridors, and lips are vital requirements for an aesthetically pleasing smile [(1)]. This "smile composition" is framed by the lips, in which the teeth arrangement and the gingival visibility are limited by the outline of the lips and the height of the lip line [(2)]. So the higher the lip is elevated when smiling, the more visible the teeth and gingiva are, the greater their importance become in the aesthetic value of the smile. A smile that displays the entire length of the teeth and some gingival tissue is associated with a youthful smile [(3)].

Smile line is defined as an imaginary line along the incisal edges of the maxillary anterior teeth. This imaginary line should mimic the curvature of the superior border of the lower lip while smiling for an aesthetically pleasing smile.

Lip line, however, refers to the position of the inferior border of the upper lip during smile formation. Lip line

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determines the amount of display of tooth or gingiva at the hard and soft tissue interface. Under ideal conditions, the gingival margin and the lip line should be congruent or there can be a 1–2 mm display of the gingival tissue. Showing 3–4 mm or more of the gingiva (gummy smile) often requires cosmetic periodontal recontouring to achieve an ideal result [4].

Recent study concluded that the size and visibility of teeth, and upper lip position were instrumental in the self-perception of smile attractiveness [5]. Participants, smiling with their teeth entirely displayed including some gingival display, perceived their smile line as the most aesthetic.

However, in the field of prosthodontic, the average dental components of a prosthesis may be selected and adjusted by the prosthodontist themselves, but the gingival architecture exposure is mostly limited by the patient's oral musculature, which is under the control of the patient themselves, short of an invasive surgical correction. This study aims to reveal the amount of gingival exposure among young adults during natural smile based on the classification adapted and modified from adapted and modified from Liebhart [6], to give a clearer picture of the lip line among young adults.

Aims and objectives

1) To evaluate the lip line among male young adults.

2) To evaluate the lip line among female young adults.

3) To compare the gender lip line

MATERIALS AND METHODS

A total sample of 154 students was selected from Dental College in an age range of 21-26years of age

Criteria for sample selection:

1. No anterior prosthesis or large dental restorations.
2. Full permanent dentition, excluding third molars.
3. Overjet and overbite of 2-4 mm.
4. Healthy periodontium.
5. Not undergoing active orthodontic treatment.
6. Competent and normal function of lips and absence of gross asymmetry of the face and the jaws with acceptable facial aesthetic.

Instruments and Equipment's:

The following equipments were used:

1. A set of plane dental mouth mirrors and kidney trays
2. Sterilizer.
3. Digital camera (Sony CyberShot).
4. A height adjustable tripod for fixing the camera in position.

5. Ruler (15 cm in length).

Methodology

Each subject was seated on a dental chair in an upright position and their history was recorded (Name, age, gender, medical history, dental history, history of previous orthodontic treatment). The subject was then requested to seat upright while looking straight ahead. This position should ensure that the Frankfort Horizontal plane is approximately parallel to the floor , and the head in natural (relaxed) position. This was further confirmed by an assistant standing by the side of the subject. The subject was then requested to simulate a natural smile and the smile was recorded by an observer. A photograph of the subject's smile was taken when the patient smiles.

The lip lines were analyzed according to the following classification:-

Class I: Very high lip line: More than 2mm of marginal gingival visible. this could be the 'gummy smile'. (Figure A)

Class II: High lip line: Between 0-2mm marginal gingival visible (Figure B)

Class III: Average lip line: Gingival embrasures only visible. (Figure C)

Class IV: Low lip line: Gingival embrasures and cement enamel junctions not visible. (Figure D)

Standardization of photograph:

The position of the camera was fixed at a distance of about 1.0m measured from the tripod's column to the dental chair. Using the height adjustable tripod, the height was adjusted to be at the level of subject's eyes. The camera setting was set on manual exposure shooting.

Camera details:

The camera used is Sony NEX-C3, on Auto ISO (200-12800), with shutter speed ranging from 30-1/4000 sec, and min aperture F22-F32. We also used a zoom lens, model E18-55mm F3.5-5.6 OSS, with 49mm UV Filter for improved image capture.

RESULTS:

Lip line among Males

Out of 154 subjects, 53 are males with age range 21-26. Among male subjects, 28.3% displayed Class I lip line, 32.1% displayed Class II lip line, while 33.9% displayed Class III lip line, with the remaining 5.7% displaying Class IV lip line (Bar Chart 1). Out of 53 male subjects, 41 had no prior orthodontic treatment, 26.8% among which displayed Class I lip line, 39% displayed Class II lip line, while 29.3% displayed Class III lip line, with the remaining 4.9% displaying Class IV lip line (Bar Chart 2). Among the remaining 12 males whom had previous orthodontic treatment, 33.4% displayed Class I lip line, 8.3% displayed Class II lip line, while 50% displayed Class III lip line, with the remaining 8.3% displaying Class IV lip line (Bar Chart 3& Table 1).

Lip line among Females

Out of 154 subjects, 101 are females with age range 21-25. Among the female subjects, 28.3% displayed Class I lip line, 32.1% displayed Class II lip line, while 33.9% displayed Class III lip line, with the remaining 8% displaying Class IV lip line (Bar Chart 1). Out of 101 female subjects, 51 had no prior orthodontic treatment, out of which, 29.4% displayed Class I lip line, 37.3% displayed Class II lip line, while 19.6% displayed Class III lip line, with the remaining 13.7% displaying Class IV lip line(Bar Chart 2). Among the 50 females who had previous orthodontic treatment, 36% displayed Class I lip line, 34% displayed Class II lip line, while 22% displayed Class III lip line, with the remaining 8% displaying Class IV lip line (Bar Chart 3& Table 1).

DISCUSSION :

In a broad sense, Class I and Class II lip line reflects gingival exposure during smile, whereas Class III and Class IV reflects a more 'toothy' smile. Using Liebhart's Classification, our results reveals that 90.9% of our subjects display their periodontium during smile. This is similar to Liebhart's result of 89.06%. Our results shows that young females tend to show more gingival exposure during smile when compared to males. Forced smile was not considered because it was demonstrated that the lip line for forced smile was not influenced by age and gender [6].

According to our study, females show more gingival display during spontaneous smile when compared to males. This is because of the presence of Class I lip line, "Gummy smile", seems to be more prevalent among the females. It may be due to females showing a higher percentage of lip elevation compared to males during smiling [7], resulting in an average of 1.5mm higher lip lines than that of males [7]. On the other hand, males tend to present with a Class III lip line. We believe this decreased gingival display (Class III) is due to the two main factors, namely males have longer upper lip length as compared to that of females and a higher value of average vertical crown height than females [7].

Our study reveals that orthodontic treatment have an impact on the subject's lip line. Young female adults who have undergone orthodontic treatment, have a higher percentage of Class I smile line (36%) in comparison to those without prior orthodontic treatment (29.4%). After orthodontic treatment, female lip line seemed to have increased, with a higher percentage of Class I smile line, 36% when compared to those without prior orthodontic treatment, 29.4%. However, male lip line seems to have skewed towards Class I and Class III lip line statistically, with an equal distribution in Class II and Class IV. However, this may be due to the lack of equal gender distribution, which may have affected the outcome of our study. These changes may be due to changes of the facial skeleton as an outcome of the orthodontic treatment.

Clinical Implication

Lip line is higher in younger patients when compared to older patients [6]. While certain amount of gingival exposure is actually acceptable by most people, too much gingival display leads to the 'gummy smile', which is considered unaesthetic. However, a gingival exposure is attributed as youthful smile. Studies revealed that participants, with their teeth entirely displayed (including some gingival display) during a smile, perceived their smile line as the most aesthetic [5]. To draw a conclusion from these two statements, we can conclude that Class II lip is the desired lip line.

Consideration of the criteria of a smile obtained from this study may be very useful in improving the aesthetic value of restorations; for example, establishing the length of the maxillary teeth and the interincisal distances between the anterior teeth. A correct interincisal distance among the centrals, laterals, and canines is necessary to create an attractive incisal curvature that parallels the inner curvature of the lower lip [8].

In Prosthodontics, care should be taken when selecting anterior artificial teeth and arranging the teeth in the sagittal plane in order to maintain a natural appearing lip line and form as studies have shown that lip shape and contour vary from individual to another individual, and the lip line can be influenced by the position of anterior teeth. Artificial teeth that are placed incorrectly in the sagittal plane (too far forward or retruded) provide insufficient lip support needed for natural appearance. Consequently, the upper lip may appear flat or protruded leading to an unaesthetic and unnatural appearance [7].

In the combined approach of orthodontic and periodontal surgery in crown-lengthening, the precise measurements of tooth display and their gingival margins in the most attractive way relative to the lip line are needed for optimal planning of tooth length and gingival contour. In other words, the amount of tooth and gingiva display for an aesthetic smile are crucial during treatment planning , especially in patients with reduced tooth display, unharmonious gingival contour, exposed posterior gingiva, occlusal cant, asymmetry of the upper lip when smiling, and gummy smile [9].

Another important clinical significance of the implication of lip line and smile line in this study is in the field of oral and maxillofacial surgery. In treating cleft lip and palate (CLP) patients, such patients are often psychologically influenced by negative self-esteem based on facial disfigurement. However, studies analyzing smile line and smile aesthetics are relatively rare. Thus,further scientific research in lip and tooth characteristics and facial aesthetics is needed in groups such as cleft lip and palate (CLP) patients, and facial paralysis and trauma patients[9].

CONCLUSIONS:

From this study, we conclude that female young adults have more gingival display during natural smile when compared to male young adults, which is an important aspect for treatment consideration. Especially since a socially pleasing smile is an important tool of communication and a boost for an individual's confidence. However, a study to demonstrate the amount of lip movement during smile may provide a clearer picture of the role of oral musculature and its relationship with the smile components in presenting a socially pleasing smile.

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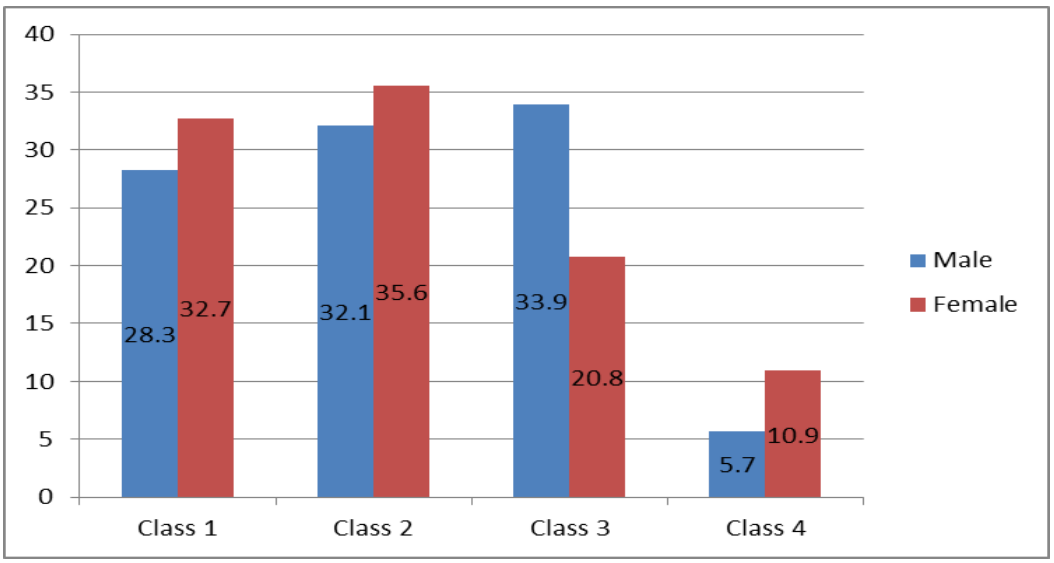
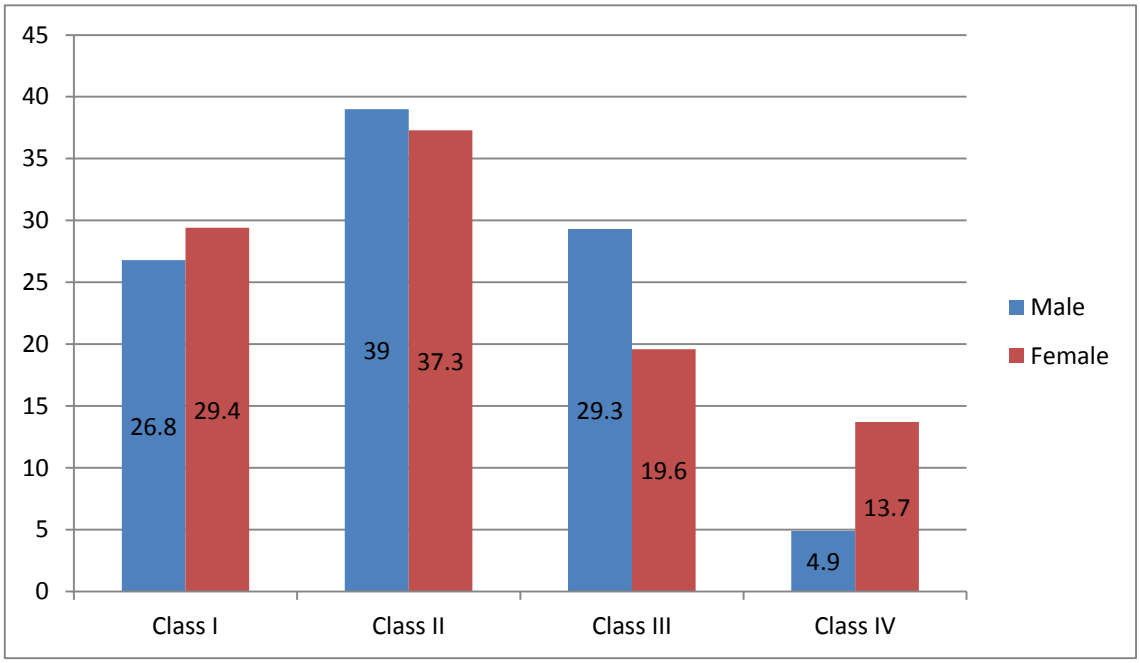
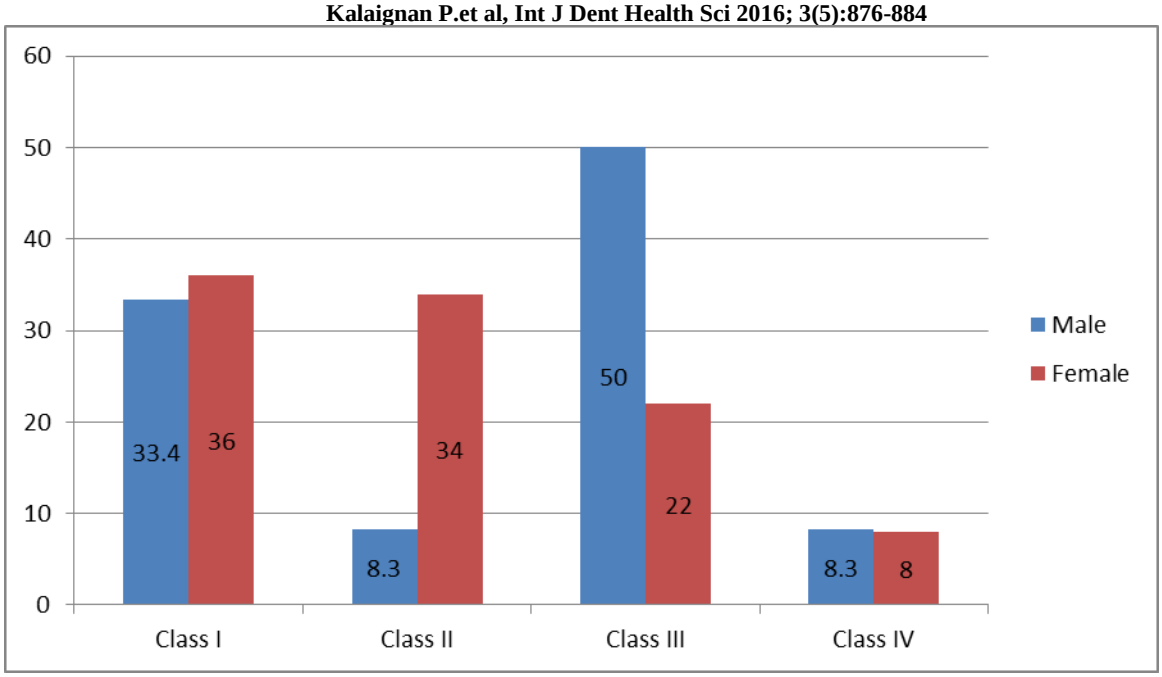
GRAPHS:



Bar Chart 1 Showing Lip Line Distribution Percentage According To Gender



Bar Chart 2 Showing Gender Lip Line Distribution Percentage Without Orthodontic Treatment



Bar Chart 3 Showing Gender Lip Line Distribution Percentage with Previous Orthodontic Treatment

TABLES:

Lip Line											
	Class I		Class II		Class III		Class IV				
	M	*F*	M	F	M	F	M	F	Total Male	Total Female	Grand Total
Gender	15	*33*	17	36	18	21	3	11	53	101	154
%	28.3	32.7	32.1	35.6	33.9	20.8	5.7	10.9	100	100	
With Previous Ortho	4	*18*	1	17	6	11	1	4	12	50	62
%	33.4	36	8.3	34	50	22	8.3	8	100	100	
Without Previous Ortho	11	15	16	19	12	10	2	7	41	51	92
%	26.8	29.4	39	37.3	29.3	19.6	4.9	13.7	100	100	

Table 1 – Table showing frequency and percentage distribution of lip line according to gender, and previous history of orthodontic treatment.

FIGURES:

Figure A: Class I -Very High Lip Line

Figure B: Class II - High Lip Line

Figure C: Class III - Medium Lip Line

Figure D: Class IV- Low Lip Line