

Gender Based Comparison of Unstrained Upper Lip Length and Thickness among Adolescent Patients

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Abstract

Introduction: One of the major reasons patient seek orthodontic management is facial aesthetics. Therefore, it is of great necessity to define major goals of beauty and understand factors related to it. Facial charisma may govern job opportunities, job/business performance, personality grooming and psychosocial well-being. Hence, orthodontic management has earned momentum, in recent years and is gaining attention in years to come.

Material and Methods: Probability sample of 100 subjects (50 males and 50 females); mean age 12-16 years was selected on the basis of the selection criteria through random sampling for this cross sectional study conducted at orthodontic department of Children Hospital Lahore. Sample was calculated through WHO calculator based upon number of such patients reported in the department in the given time.

Results: Unstrained Upper lip length and thickness were statistically significantly less in females as compared to males in 12-16 years age group.

Conclusion: Unstrained upper lip is thicker and longer in males as compared to females in 12-16 years age group.

Keywords: lip length, thickness, aesthetics

Introduction

Ethetics is now a day's major idea behind seeking orthodontic treatment. This is why, it is so important to establish a personalized profile beauty standard and isolate the underlying factors associated with it.

Facial profile is believed to be determined by the dento-skeletal structures and overlying soft tissues.¹ A research conducted on an Indonesian population concluded that upper lip is more prominent in Class II as compared to in class III.² Likewise, soft tissue thickness

of face, particularly in the sub-mental area, has been shown to vary in different models of vertical development and to be lower in hyper-divergent models.^{3,4}

Excessive gingival exposure (EGD), commonly referred to as "gingival smile," results in poor smile and is therefore becomes a major problem for a person who is seeking to be aesthetically pleasing. It is one of many developmental problems and diseases that occur in the periodontium. In addition, a large number of people are affected by this, with a prevalence between 10.5% and 29%.⁵

Gummy smile in most patients may result due to a short lip, an overly mobile lip, or both. Lip length assessed in one of the studies was (females: 18-22 mm and 20-24 mm in males). Lesser values than norms in this study were considered sub-normal i.e. short lip length. Hega et al in another study found that

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upper lip length in males was 3.1mm more than females.⁶ Increased activity of lifting muscles of upper lip during smiling results in having a hypermobile lip (also called overactive lip). Muscle involved most commonly in lip hypermobility is levator labii superioris.⁷

Facial skeleton grows at a faster rate than lips until puberty, after lips start growing at a faster rate with maximum thickness during adolescence. Lips decrease, in thickness with aging and some women seek treatment to increase it.⁸

Understanding the structure and movements of the lips is often found to be useful before discussing any aesthetic procedure with the patient so patient can be conveyed how much of his demands can be met realistically. Upper lip is one of the most important component of smile. Therefore, you should choose the length and thickness proportionally to achieve an aesthetically pleasing smile. Upper lip can be measured by means of a number of ways. Measurement is generally taken from the sub-nasale (Sn) and the superior point of the stoma (Sts), and various measurements have been proposed.⁹ More specifically, the thickness of the upper lip corresponds to the distance between the vestibular area of the upper incisor and the upper lip. The anteroposterior position of the upper incisors directly affects the lip thickness.

Prothero, Nicholas et al. placed upper central incisors vertically so that up to 2mm of incisors should be visible below upper lip.¹⁰ Upper lip dimensions and its mobility have a direct influence on the resting gum show. Heartwell CW in another study found that the position of the central incisors is dependent on the support they get from upper lip, regardless of age and gender.⁹

Upper lip is one of the major component of facial attractiveness.¹¹ Current research on soft tissue association with skeletal models mainly focuses on the nose and chin region, while research on the upper lip region is relatively rare and even incomplete due to limited sample size.¹²

Therefore, the reason behind this research was to find out the mean upper lip length and thickness with respect to gender, in the Pakistani population. This would help us in defining smile characteristics to achieve optimal effects in aesthetic oral rehabilitation during orthodontic treatment.¹³

Material and Methods

Probability sample of 100 subjects (50 males and 50 females); mean age 12-16 years was selected on the basis of the selection criteria through random sampling for this cross sectional study conducted at orthodontic department of Children Hospital Lahore. Sample was calculated through WHO calculator based upon number of such patients reported in the department in the given time.

Patients which were included in this study had normal occlusion and pleasing facial appearance. Age 12- 16 years, straight profile, Skeletal Class I (ANB: 0-4⁰) and normal vertical pattern (SN-M: 32⁰±4). While patients with carious anterior teeth, restorations and congenital dental anomalies were excluded.

Written consent was taken from every person after explaining to them type of study and effects of radiography. Lateral cephalometric radiographs were used for this study with the subject in natural head position.

Lateral cephalograms were taken and cephalometric landmarks were traced on an acetate sheet and upper lip thickness was taken on it, measured in millimeters from highest contour of upper incisor to highest contour of labrale superioris while upper lip length taken clinically from subnasale inferiorly to stomion superius using digitized calibre as shown in Fig-1. Normal values considered were 18-22mm for females and 20-24mm for males. SPSS 23 was used for statistical purpose and T-test to compare upper lip length and thickness between two genders.

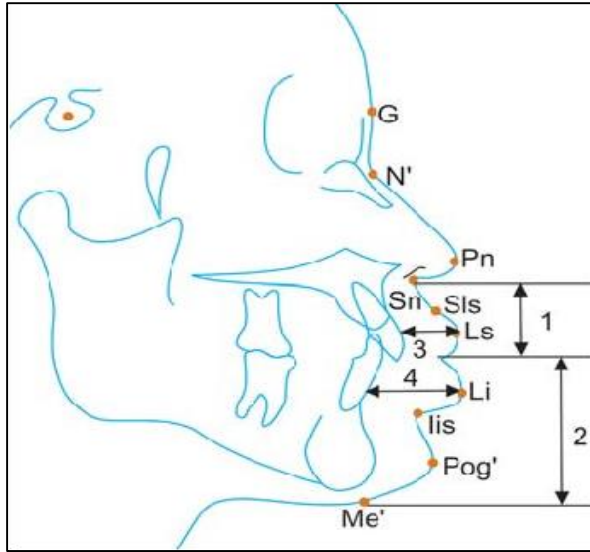


Fig. 1: (1) Upper lip length, (3) Upper lip thickness

Result

Sample size of 100 was used with equal distribution between both genders i-e 50 males and 50 females. Mean value of upper lip length and thickness was 25.58 ± 3.10 and 23.66 ± 2.31 in males respectively. Females showed the mean upper lip length of 15.06 ± 1.66 and thickness was found to be 10.93 ± 1.99 . Table I will help us to understand the results.

Measurements (mm)	Males n=50	Females n=50	Significance
	Mean \pm S.D	Mean \pm S.D	p-value
Upper lip length	25.58 ± 3.10	23.66 ± 2.31	0.001
Upper lip thickness	15.06 ± 1.66	10.93 ± 1.99	0.000

Table I: T-Test for males and females

Discussion

One of major cause for orthodontic treatment is facial functionality and aesthetics. A smile is created by the combination of different components, with the position and size of the incisors playing a crucial role. The soft lip influences the exposure of the incisors and is characterized by length and mobility.

Facial aesthetics is considered one of the most important aspect of personality evaluation, performance and employment prospects.

Therefore, there is an increased demand of orthodontic treatment and this trend will tend to increase in future. The evaluation of orthodontic treatment is done through smile, and the smile is controlled by lips. According to Wylie the goal of orthodontic treatment is to have best aesthetics dentally and facially.¹⁴ In Class II division 1 pre-treatment, upper lip is more protruded. It may result from increased inclination of upper incisors which makes the upper lip protruded. Cummins et al found that after treatment corners of mouth became wide.¹⁵

Otta found that men on average smile less than females.¹⁶ Johnston et al. also found that women smile more than males.¹⁷ Frush and Fisher found that major factors defining smile were femininity and masculinity.¹⁸ Rigsbee and colleagues examined changes in orofacial soft tissue following the transition from resting to smiling and concluded that ladies showed higher levels of facial expression than men.¹⁹ Al-T'aani found that there was marked difference between upper lip lengths among both genders.²⁰

Conclusion

In females, unstrained upper lip length and thickness at rest was smaller in comparison to males. These findings can help orthodontists in treatment planning before starting orthodontic treatment.

Ethical Approval

The study was approved by the Institutional Ethical Review committee of Children Hospital Lahore, University of Child Health Sciences. (No. 58751/UCHS-CH)

Disclaimer

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Conflict of Interest

It is declared that the authors don't have any conflict of interest.

Authors' Contribution

AA: Conceptualization, original draft preparation, Data Collection.

AR: Data Collection, Data Entry, and Literature Search.

MB: Writing review, editing, visualization supervision, formal analysis.

SQ: Project administration, resources, software validation, data interpretation.

AT: Methodology, investigation, data interpretation.

FZ: Methodology, investigation, data interpretation.

References

1. Yan X, Zhang X, Chen Y, Long H, Lai W. Association of upper lip morphology characteristics with sagittal and vertical skeletal patterns: a cross sectional study. *Diagnostics*. 2021 Sep 18;11(9):1713.
2. Sarilita E, Rynn C, Mossey PA, Black S, Oscandar F. Facial average soft tissue depth variation based on skeletal classes in Indonesian adult population: a retrospective lateral cephalometric study. *Legal Medicine*. 2020 Mar 1;43:101665.
3. Perović TM, Blažej M, Jovanović I. The influence of mandibular divergence on facial soft tissue thickness in class I patients: a cephalometric study. *Folia Morphologica*. 2022;81(2):472-80.
4. Macari AT, Hanna AE. Comparisons of soft tissue chin thickness in adult patients with various mandibular divergence patterns. *Angle Orthodontist*. 2014 Jul 1;84(4):708-14.
5. Dayakar MM, Gupta S, Shivananda H. Lip repositioning: An alternative cosmetic treatment for gummy smile. *Journal of Indian Society of Periodontology*. 2014 Jul 1;18(4):520-3.
6. Roe P, Rungcharassaeng K, Kan JY, Patel RD, Campagni WV, Brudvik JS. The influence of upper lip length and lip mobility on maxillary incisal exposure. *Am J Esthet Dent*. 2012 Jun 1;2(2):116-25.
7. Brizuela M, Ines D. Excessive gingival display. *InStatPearls [Internet]* 2023 Mar 19. StatPearls Publishing.
8. Proffit WR, Fields H, Msd DM, Larson B, Sarver DM. *Contemporary Orthodontics*, 6e: South Asia Edition-E-Book. Elsevier India; 2019 Jun 29.
9. Sapkota B, Rimal U. Lip length and its correlation among different age group and gender in Nepalese Population. *Orthodontic Journal of Nepal*. 2021 Dec 31;11(2):25-8.
10. Padmasree S, Rekha B, Rajesh S, Ranukumari A. Incisal Show-A Decrease with an Increase in Lines of Life. *Int J Sci Study*. 2016 Apr 1;4:215-9.
11. Ghorbanyjavadpour F, Rakhshan V. Factors associated with the beauty of soft-tissue profile. *American Journal of Orthodontics and Dentofacial Orthopedics*. 2019 Jun 1;155(6):832-43.
12. Liu ZY, Chen G, Dai FF, Xu TM, Jiang RP. Analysis of correlation of 3-dimensional lip vermilion morphology and dentoskeletal forms in young Chinese adults on the basis of sex and skeletal patterns. *American Journal of Orthodontics and Dentofacial Orthopedics*. 2021 May 1;159(5):e423-37.
13. Jeelani W, Fida M, Shaikh A. The maxillary incisor display at rest: analysis of the underlying components. *Dental press journal of orthodontics*. 2018 Nov;23:48-55.
14. Wylie WL. The mandibular incisor--Its role in facial esthetics. *The Angle Orthodontist*. 1955 Jan 1;25(1):32-41.
15. Cummins DM, Bishara SE, Jakobsen JR. A computer assisted photogrammetric analysis of soft tissue changes after orthodontic treatment: part II results. *American Journal of Orthodontics and Dentofacial Orthopedics*. 1995 Jul 1;108(1):38-47.
16. E. O. Sex differences over age groups in selfposed smiling photographs. *Psychol Rep*. 1998; 83: 907-913.
17. Johnston DJ MDAA. Are facial expressions reproducible? *Cleft Palate Craniofac J*. 2003; 40:291-296.
18. Frush JP FR. The dynesthetic interpretation of the dentogenic concept. *J Prosthet Dent*. 1958; 8: 558-581.
19. Rigsbee OH STBE. The influence of facial animation on smile characteristics. *Int J Adult Orthodon Orthognath Surg*. 1998; 3: 233-239.
20. MM. A. Soft tissue facial profile analysis: cephalometric study of Iraqi adults. *College of Dentistry*. University of Baghdad. 1996.