

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service Available Online at: www.ijdsir.com

Volume – 5, Issue – 4, August - 2022, Page No. : 192 - 198

Perception of Nasolabial Angle amongst Orthodontist, Dentist and Layman

¹Dr. Swapnil Andhale, PG student, Department of Orthodontics and Dento facial Orthopedics, Late Shri Yashwantrao Chavan dental college, Ahmednagar

²Dr. Abhijit Misal, Professor and Guide, Department of Orthodontics and Dentofacial Orthopedics, Late Shri Yashwantrao Chavan dental college, Ahmednagar

³Dr. Tushar Patil, Professor & HOD, Department of Orthodontics and Dentofacial Orthopedics, Late Shri Yashwantrao Chavan dental college, Ahmednagar.

⁴Dr. Rajlaxmi Rai, Assistant professor, Department of Orthodontics and Dentofacial Orthopedics, Late Shri Yashwantrao Chavan dental college, Ahmednagar.

⁵Dr. Surbhi Deshmukh, PG student, Department of Orthodontics and Dentofacial Orthopedics, Late Shri Yashwantrao Chavan dental college, Ahmednagar

⁶Dr. Shruti tale, PG student, Department of Orthodontics and Dentofacial Orthopedics, Late Shri Yashwantrao Chavan dental college, Ahmednagar

Corresponding Author: Dr. Rajlaxmi Rai, Assistant professor, Department of Orthodontics and Dentofacial Orthopedics, Late Shri Yashwantrao Chavan dental college, Ahmednagar

Citation of this Article: Dr. Swapnil Andhale, Dr. Abhijit Misal, Dr. Tushar Patil, Dr. Rajlaxmi Rai, Dr. Surbhi Deshmukh, Dr. Shruti tale, "Perception of Nasolabial Angle amongst Orthodontist, Dentist and Layman", IJDSIR- August - 2022, Vol. – 5, Issue - 4, P. No. 192 – 198.

Copyright: © 2022, Dr. Rajlaxmi Rai, et al. This is an open access journal and article distributed under the terms of the creative commons attribution non-commercial License. Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Introduction: The nose and lips play an important role in facial appearance. Nasolabial angle (NLA) can be considered as a determinant factor for attractiveness. The perception of different nasolabial angles differs amongst orthodontist, dentist and layman. The NLA is one of the key factors to be considered in an orthodontic diagnosis and treatment planning.

Material and Methods: This study was conducted in the Department of Orthodontics and Dentofacial

Orthopedics in Ycdc dental college, Ahmednagar. It was a cross sectional descriptive study.

Over time and in different ethnic groups. The study is in three groups of evaluators: Orthodontist (n=40), Dentist (n=40) and Layman (n=40). The photographs were circulated among 120 evaluators which are further divided into three groups orthodontist, dentist and layman. Each group were given 9 photographs of different nasolabial angle to evaluate.

After viewing each picture, participants are asked to subjectively rank each photograph and make a marking on corresponding point on a 4.5 cm scale ranging from most, moderate and least esthetics, according to their perception on nasolabial angle (facial pleasantness). Scores in the scale are grouped into 3 categories. 0 to 1.5 Least aesthetic, 1.6 to 3.0 moderate aesthetic and 3.1 to 4.5 most aesthetic.

Results: Overall study states that the Naso labial Angle perception score by orthodontist > Naso labial Angle perception score by Dentist > Naso labial Angle perception score by Layman.

The perception of naso labial angle by orthodontist and Dentist is also statistically highly significant and by layman is also statistically significant.

Conclusions: Cross-sectional studies selected compared orthodontists, dentists and layman regarding perception of Naso labial angle through photo graphs, to assess whether orthodontist are more critical and accurate in assessing Nasolabial angle than dentist and layman, and also dentist in assessing Nasolabial angle than layman.

Keywords: NLA, Syndromic, Orthodontic, Diagnosis **Introduction**

Esthetics is one of the major motivating factors for patients seeking orthodontic treatment. Hard tissue and soft tissue both determine the facial esthetics¹. Facial appearance plays a significant role in perceptions of society and influences the level of acceptance of an individual². Angle, the father of modern orthodontics has stated that beauty, balance and harmony are the important points to be considered in facial profiles. The facial analysis is currently used as an essential additional examination in the orthodontic treatment plan³.

The evaluation of the facial profile is an important factor in any orthodontic diagnosis, considering that an extreme advancement in the position of the upper lip can determine the patient's profile and aesthetic results. There are many factors to consider to preserve the aesthetics of the facial profile: the nasolabial angle (NLA), the nasal prominence, the position of the upper and lower lip and the depth of the chin-labial sulcus⁴.

The NLA is one of the key factors to be considered in an orthodontic diagnosis as a guidance for the aesthetics of the nose and facial profile. It is defined as the angle formed by the two lines passing through the lower edge of the nose (the columella) and the edge of the upper lip (as shown in Figure 1). As described in literature, the ideal naso labial angle ranges from 90°-95° for males and $95^{\circ}-115^{\circ}$ for females, although these values may vary among the various phenotypic groups⁴ (races).

• The soft tissue Cephalometric analysis is widely employed in orthodontics to evaluate facial harmony and aesthetics.

Materials and Method

It is a descriptive cross-sectional study. The study is in three groups of evaluators: Orthodontist (n=40), Dentist (n=40) and Layman (n=40).

Inclusion criteria

The perception of facial esthetics (Nasolabial angle) among orthodontist, dentist and layman using digital photographs of patients.

Exclusion criteria

Studies of patients with cleft lip and palate or syndromic. The photographs were circulated among 120 evaluators which are further divided into three groups orthodontist, dentist and layman. Each group were given 9 photographs of different nasolabial angle to evaluate.

After viewing each picture, participants are asked to subjectively rank each photograph and make a marking on corresponding points on a 4.5 cm scale ranging from most, moderate and least esthetics, according to their perception on nasolabial angle (facial pleasantness).

Acute nasolabial angle photograph= A1, Average nasolabial angle photograph= A2 and Obtuse nasolabial angle photograph= A3.

The NLA is formed by the lower base of the nose (Sn-Cm) and the upper lip (Sn-Ls). In harmonic profile; it ranges from 90 to 110.

The score values between orthodontist, dentist and layman are compared using the scores for each photograph in each group. Scores in the scale are grouped into 3 categories. 0 to 1.5 Least aesthetic, 1.6 to 3.0 moderate aesthetic and 3.1 to 4.5 most aesthetic.

Nasolabial angle

Three Nasolabial angles; acute, average and obtuse.



Figure 1:

Statistical analysis

Data obtained was compiled on a MS Office Excel Sheet (v 2010, Micro soft Red Mond Campus, Redmond, Washington, United States). Data was subjected to statistical analysis using the Statistical package for social sciences (SPSS v 21.0, IBM). Descriptive statistics like frequencies and percentage for categorical data, Mean & SD for numerical data have been depicted.

Normality of numerical data (all indices) was checked using Shapiro-Wilk test & was found that the data followed a normal curve; hence parametric tests have been used for comparisons.

Inter group comparison (>2 groups) was done using oneway ANOVA followed by pairwise comparison using post hoc test for comparison of perception of nasolabial angle type between three study groups. Inter group comparison between three types of nasolabial angle types by each study participant group was done using One-way Anova F test followed by Tukey's post hoc test.

For all the statistical tests, p<0.05 was considered to be statistically significant.

Results

The cross - sectional studies selected compared orthodontists, dentists and layman regarding perception of Nasolabial angle through photographs, to assess whether orthodontists are more critical and accurate in assessing Nasolabial angle than dentist and layman, and also dentists are assessing Nasolabial angle than layman.

Table 1: Overall comparison of perception of each nasolabial type subject (acute, average, obtuse angle) between orthodontist, dentist, layman respectively using One-way Anova F test followed by Tukey's post hoc test for pairwise comparison.

Nasolabial	Orthodontist	Dentist	Layman Mean	p value	Ortho vs	Ortho vs	Dentist vs
angle	Mean (SD)	Mean (SD)	(SD)	^(overall)	Dentist#	Layman#	Layman#
A1	1.50(0.56)	0.8(0.3)	0.47(0.12)	p<0.001**	p<0.05*	p<0.001**	p<0.001**
A1	1.54(0.42)	1.0(0.24)	0.49(0.21)	p<0.001**	p<0.05*	p<0.001**	p<0.001**
A1	1.48(0.62)	0.9(0.2)	0.36(0.15)	p<0.001**	p<0.05*	p<0.001**	p<0.001**
A2	4.3(0.61)	3.0(1.3)	2.6(0.9)	p<0.001**	P<0.05*	p<0.001**	p=0.368(NS)
A2	4.6(0.5)	3.3(0.7)	3.0(1.2)	p<0.001**	p<0.05*	p<0.001**	p =

							0.471(NS)
A2	4.3(0.28)	3.3(0.9)	2.8(1.1)	p<0.001**	p<0.05*	p<0.001**	p=0.595(NS)
A3	2.8(1.1)	2.5(0.7)	0.82(0.21)	p<0.001**	p=0.137 (NS)	p<0.001**	p<0.001**
A3	2.7(0.8)	2.4(0.8)	0.77(0.18)	p<0.001**	P=0.094 (NS)	p<0.001**	p<0.001**
A3	3.0(0.7)	2.6(1.1)	0.96(0.26)	p<0.001**	p<0.05*	p<0.001**	p<0.001**

p>0.05-no significant difference (NS) *p<0.05-significant **p<0.001-highly significant

^p value(overall) calculated using One-way nova F test

#p value (individual pairwise) calculated using Tukey's post hoc test.

Graph 1:



Table 2: Overall comparison of perception between nasolabial angles type (acute, average, obtuse angle) in each study groups i.e., orthodontist, dentist, layman respectively using One-way Anova F test followed by Tukey's post hoc test for pairwise comparison.

Nasolabial angle type	Orthodontist Mean (SD)	Dentist Mean (SD)	Layman Mean (SD)	
Acute	1.17 (0.48)	0.9 (0.27)	0.44 (0.16)	
Average	Average 4.4 (0.39)		2.8 (0.95)	
Obtuse	Obtuse 2.83 (0.92)		0.85 (0.22)	
One-way Anova 'F' test value	F = 8.12	F = 12.8	F = 13.6	
p value^	p value^ p <0.001**		p <0.001**	
Acute Vs Average#	Acute Vs p <0.001** Average#		p <0.001**	
Acute Vs Obtuse#	Acute Vs p < 0.001** Obtuse#		p<0.05*	
Average Vs Obtuse#	Average Vs p<0.05* Obtuse#		p<0.05*	





In this study the Average Nasolabial Angle perception score by orthodontist was higher, as compared to obtuse and acute Nasolabial angle.

The results of the study showed that Average Nasolabial Angle perception score by orthodontist had highest mean (4.4), followed by Obtuse Nasolabial Angle perception by orthodontist (2.83), and followed by Acute Nasolabial Angle perception by Orthodontist (1.17). The perception of nasolabial angle by orthodontist also statistically highly significant as One-way Anova F test value 8.12 and p value is less than 0.001*

The results of the study showed that the Average Nasolabial Angle perception score by Dentist had the highest mean (3.2), followed by Obtuse Nasolabial Angle perception score by Dentist (2.5), followed by Acute Nasolabial Angle perception score by Dentist (0.9). The perception of nasolabial angle by Dentist also

σ

Page L

statistically highly significant as One-way Anova F test value 12.8 and p value is less than 0.001*

The results of the study showed that Average Nasolabial Angle perception score by Layman highest mean (2.8), followed by Obtuse Nasolabial Angle perception score by Layman (0.85), followed by Acute Nasolabial Angle perception score by Layman (0.44). The perception of nasolabial angle by orthodontists is also statistically significant as One-way Anova F test value 13.6 and p value is less than 0.05.

The results of the study showed that the Nasolabial Angle perception score by Orthodontist had the highest mean, followed by Nasolabial Angle perception score by Dentist, and followed by Nasolabial Angle perception score by Layman in all the groups.

It was found that the Nasolabial angle perception score by the orthodontist had maximum whereas for the Nasolabial Angle perception score by Layman had minimum for all the groups.

The highest score was demonstrated by Orthodontists, which were Average Nasolabial Angle perception (4.4). The lowest score was demonstrated by Layman, which was Acute Nasolabial Angle perception (0.44).

Overall study states that the Nasolabial Angle perception score by orthodontist > Nasolabial Angle perception score by Dentist > Nasolabial Angle perception score by Layman.

Discussion

• The discussion of facial Esthetic standards is increasingly common in society and consequently in dentistry. We have used photos for the assessment of facial attractiveness, even though they are visual assessments of Esthetic perception of the face.

• Orthodontists play a very important role in creating new smiles. It is essential to understand the quest for better appearance among the new generation. An attractive and well-balanced smile influences the perception of the individual's nasolabial angle appearance.

• When upper lip position is fixed, the profile is considerably attractive because the angle of nasal tip is not changed or altered, when nasal tip rotation angle is Fixed, profiles with a retro lined upper lip are considered significantly attractive by the laypersons.

• Therefore, during an orthodontic treatment, appropriate retraction of the incisors is done to improve soft tissue profile attractiveness.

• Nasolabial angle (NLA) formed by lower base of the nose and by the upper lip the H- line –tangent to the most salient point of the chin and upper lip and H angle formed by the intersection of the H-line with the Na-Pog line and used to measure the prominence of the upper lip in relation to the facial profile.

NLA in class 1 malocclusion

In class I patients were treated with extractions of the first four or second premolars, and in patients with bimaxillary protrusion treated with extractions of all four first premolars. Al Murtadha et al. recorded a retraction in the position of the upper and lower lips and the consequent increase in the NLA with an average difference of 4.92° after the orthodontic treatment of these patients who had extractions. The authors explained that the retraction of the lips, and therefore an increase of the NLA, is due to the retraction of the upper and lower anterior teeth as they move backwards to occupy the extraction spaces. On the other hand, there is no change in the NLA in those cases with extractive orthodontics where the procedure is aimed at the resolution of dentoalveolar crowding or a camouflage of mild skeletal malocclusions.

NLA Treatment of Class III Malocclusion

The Xu et al. reported a statistically significant decrease in the NLA values of 5.629° in patients treated with protocols that included a protraction of the maxilla. They also reported changes in the position of the upper and lower lip. Conversely, Celikoglu et al. reported no statistically significant difference between two groups of patients treated with a "mini maxillary protraction" and with rapid palatal expansion plus face mask. The slight increase in NLA values recorded in patients treated with "mini maxillary protractor" was certainly due to the dental and skeletal effects on the upper jaw, resulting in a better support to the upper lip, which was more advanced.

NLA after Rapid Palatal Expansion

Torun is the only author who dealt with the effects of rapid palatal expansion, reporting a slight and not statistically significant decrease in NLA values.

NLA Treatment of Class II Malocclusion

Regarding the variations in the NLA as recorded in studies concerning class II malocclusions, there were no statistically significant differences when patients were treated with functional orthodontic, orthopaedic devices or with brackets. Xuan et al. reported a correlation between changes in the NLA and the posterior occlusal plane in patients with class II malocclusion. Hour far et al. recorded a greater increase in the NLA in patients treated with Herbst (118.64°) compared to patients treated with removable appliances for mandibular advancement (114.78°). Villanova et al. did not find significant variations in NLA values in their study comparing the effects of different devices (Distal Jet and Jones Jig respectively) used for the treatment of class II malocclusion, with a control group of untreated patients.

Conclusion

• Facial aesthetics is one of the main goals of orthodontics treatment. This study is a simplified method for assessing facial aesthetics; it focuses mainly on the outline of the profile.

• In short, significant divergence is found regarding the perception of orthodontists, dentists and layman on facial nasolabial angle.

• Orthodontists are more critical and accurate at assessing nasolabial angle than dentists and laymen. Also, dentists assess the nasolabial angle more accurately than laymen.

• Overall study states that the Nasolabial Angle perception score by orthodontist > Nasolabial Angle perception score by Dentist > Nasolabial Angle perception score by Layman.

• The perception of nasolabial angle by orthodontist and Dentist is also statistically highly significant and layman also statistically significant.

• Based on these standard deviations, the ideal nasolabial angle would be 93.4 to 98.5 degree for men and 95.5 to 100.1 degree for women.

• Although variations in NLA were found in patients undergoing rapid palatal expansion, orthographic surgery and correction of class II and III malocclusions by non-extractive protocols, these results were not statistically significant. However, a statistically significant change in NLA values occurred in patients

• With a class I and extractive treatments the first or second four premolars,

• With a class II and maxillary protrusion,

- With maxillary protrusion, except in cases of severe crowding where the extraction spaces are not used for retraction of the anterior sector,
- Undergoing non-surgical rhinoplasty with a hyaluronic acid filler.

Page.

References

1. Nandini S, Prashanth CS, Somiah SK, Reddy SR. An evaluation of nasolabial angle and the relative inclinations of the nose and upper lip. J Contemp Dent Pract. 2011 Jun 1;12(3):152-7.

2. Barbosa PB, Matos FD, Ceri Cato GO, Rosário HD, Pith on MM, Paranhos LR. Perception of laypersons and dentists regarding Esthetic facial changes: a systematic review. Biosci. j. (Online). 2016:1128-37.

3. Marchiori GE, Sodré LO, da Cunha TC, Torres FC, Rosário HD, Paranhos LR. Pleasantness of facial profile and its correlation with soft tissue cephalometric parameters: Perception of orthodontists and lay people. European Journal of Dentistry. 2015 Jul;9(03):352-5.

4. Quinzi V, Paskay LC, D'Andrea N, Albania, Monaco A, Saccomanno S. Evaluation of the nasolabial angle in orthodontic diagnosis: a systematic review. Applied Sciences. 2021 Mar 12;11(6):2531.

5. Bar S, Misra J, Bhanu C. The Influence Of Nasolabial Angle-Shift On Soft And Hard Tissue Display On Smile.

6. Lo FD, Hunter WS. Changes in nasolabial angle related to maxillary incisor retraction. American journal of orthodontics. 1982 Nov 1; 82 (5):384-91.

7. Sohaila K, Nawaz E, Durrani OK, Akram D, Imtiaz A, Iqbal A, Bhatti WA, Bashir U. Comparison of perceptions of laypersons, dentists and orthodontists to altered smile aesthetics. Pakistan Orthodontic Journal. 2015;7(2):76-82.

8. Barbosa PB, Matos FD, Ceri Cato GO, Rosário HD, Pith on MM, Paranhos LR. Perception of laypersons and dentists regarding Esthetic facial changes: a systematic review. Biosci. j. (Online). 2016:1128-37.