



Indonesian Dental Association

Journal of Indonesian Dental Association

<http://jurnal.pdgi.or.id/index.php/jida>
ISSN: 2621-6183 (Print); ISSN: 2621-6175 (Online)



Research Article

Comparison of Facial Aesthetics Perception in Preclinical and Clinical Students of the Faculty of Dentistry, Lambung Mangkurat University

Qantya Auliana Alifa Rahma^{1§}, Fajar Kusuma Dwi Kurniawan², Renie Kumala Dewi³, Galuh Dwinta Sari⁴, Tri Nurrahman⁵

¹ Undergraduate Student, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia

² Department of Orthodontics, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia

³ Department of Pediatric Dentistry, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin, Indonesia

⁴ Department of Psychology, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin

⁵ Department of Oral Surgery, Faculty of Dentistry, Lambung Mangkurat University, Banjarmasin

Received date: July 26, 2023. Accepted date: October 15, 2023. Published date: December 29, 2023.

KEYWORDS

perception;
facial aesthetics;
facial symmetry;
facial profile;
vertical proportion;
dentistry student

ABSTRACT

Introduction: Facial aesthetics consist of facial symmetry, soft tissue profile, and vertical proportions of the face. Perception is subjective which means different things for each person. Aesthetic perception in dental students is very important because later in the future they will act as dentists and must understand about functional and aesthetics in the oral and facial cavities, and must be able to meet the needs and expectations of patients. **Objective:** To compare the perception of facial aesthetics with preclinical and clinical students of the Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This study used analytical observational method with cross sectional approach. The sample size was calculated using an unpaired numerical comparative analytical formula, obtained by 128 respondents using the simple random sampling technique. Research respondents were given questionnaires totaling 15 photos, namely 5 photos of facial symmetry, 5 soft tissue profile photos, and 5 photos of vertical proportions of faces. The research questionnaire has been tested for validity and reliability. **Results:** The results of the Mann Whitney Test obtained an overall significance of 0.047 ($p < 0.05$), facial symmetry 0.039 ($p < 0.05$), soft tissue profile 0.385 ($p > 0.05$), and vertical proportion of the face 0.612 ($p > 0.05$). **Conclusion:** In three components of the assessment, there are differences in perception in facial symmetry, and there are no differences in perception in soft tissue profiles and facial vertical proportions. Overall, there are differences in the perception of facial aesthetics between preclinical students and clinical students of the Faculty of Dentistry, Lambung Mangkurat University.

[§] Corresponding Author

E-mail address: qantyaaulianaar@gmail.com (Rahma QAA)

DOI: [10.32793/jida.v6i2.1064](https://doi.org/10.32793/jida.v6i2.1064)

Copyright: ©2023 Rahma QAA, Kurniawan FGD, Dewi RK, Sari GD, Nurrahman T. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium provided the original author and sources are credited.

INTRODUCTION

Aesthetics is something related to beauty.¹ Aesthetics in the field of dentistry aims to create aesthetics and appeal, improve the patient's image, and make the patient satisfied with the results of treatment.² Facial aesthetics in orthodontics identify the lower third of the face from the bottom of the nose to the chin. Facial aesthetics based on the Scoring system of the perception of overall, facial symmetry, facial profile and facial vertical proportions consist of facial symmetry, soft tissue profile, and vertical proportions of the face.³

Aesthetics is subjective, which means that everyone has their own way of perceiving themselves and their appearance.^{4,5} Perception is a person's perspective on something through the five senses.² Aesthetic perception of the face is the way a person judges facial appearance and can differ from individual to individual due to many factors including gender, age, family, friends, marital status, culture, socio-economy, occupation, environment, and also education level.^{4,6} As one of the factors that have a role, education is a factor that influences perception that the higher the education, the more knowledge a person has.⁷ Knowledge of basic aesthetic concepts in dentistry learned by dental students can help with the understanding of facial aesthetic perception.⁸

The implementation of dental education in universities is divided into two phases, namely preclinic or dental undergraduate programs and clinics or dental professional programs. Preclinical students are students who are undergoing education in dentistry with theory-based learning and clinical students who have completed preclinical education and get the opportunity to interact directly with patients.^{9,10}

Perceptions of facial aesthetics vary at different levels of education and depend on the type of education undertaken.¹¹ According to Dong et al, facial aesthetics' perception of facial symmetry, namely chin asymmetry between orthodontists, dentists, and laypeople, results from significant differences in perception with orthodontic results are more sensitive to changes in chin asymmetry.¹² According to Fitri et al, facial aesthetics' perception of the vertical proportion of the face of the Deutro Malay race in dentists and laypeople obtained significant perceptual differences with dentists being more critical in determining the vertical proportion of the aesthetic lower third of the face.¹¹ According to Alhammadi et al regarding the perception of facial aesthetics from ordinary people, dental assistants, general dentists, and dental specialists at Jazan University, Saudi Arabia, significant differences in perception with general dentists are higher and have better perception.³

This study aims to analyse the comparison of facial aesthetics perception in preclinical and clinical students of the Faculty of Dentistry, Lambung Mangkurat University

MATERIALS AND METHODS

This research began with the preparation of a research permit and ethical clearance issued by the Faculty of Dentistry, Lambung Mangkurat University No. 050/KEPKG-FKGULM/EC/II/2023. This study was an analytical observational study with a cross sectional design. The population in this study was preclinical and clinical students of the Faculty of Dentistry, Lambung Mangkurat University. The calculation of the number of samples using an unpaired numerical comparative analytical formula obtained 128 samples consisting of 64 preclinical students and 64 clinical students. Sampling is carried out using simple random sampling techniques based on inclusion and exclusion criteria.

The inclusion criteria in this study are active students of the Faculty of Dentistry, Lambung Mangkurat University aged 18-25 years, have studied dentofacial growth and development, and are willing to become research respondents. The exclusion criteria of this study were students who had not received lectures on dentofacial and uncooperative students.

The assessment of facial aesthetic perception was measured using a questionnaire containing 3 questions on the components of facial aesthetics with each question labelled with the title "Choose the most aesthetic image?". The question consists of 15 photos consisting of: 5 photos of facial symmetry, 5 soft tissue profile photos, and 5 photos of vertical proportions of faces modified using Adobe Photoshop CC 2020 photo manipulation software where each component consists of 1 standard photo and 4 modified photos adjusted to the scoring index with a VAS scale (visual analogue scale) by assigning a value of 1 to 5 to each photo, where 5 is the standard photo, and 1 is the least aesthetic photo (Figure 1-3).

The results of the questionnaire measurement will be calculated on average facial aesthetics perception and categorized as follows: 13 >12 = very aesthetic; 10-12 = aesthetic; 9-10 = quite aesthetic; 7-8 = not aesthetic; and 3-6 = very unaesthetic.

Statistical Analysis

The research questionnaire was tested for validity and reliability using the Pearson product moment correlation test and the Pearson and Cronbach's Alpha correlation.

The data were analysed using SPSS (statistical package for social science) software version 24 (IBM, Armonk, NY). Starting with the normality test with Kolmogorov-Smirnov, the results of the data were not normally distributed, so a non-parametric test of the Mann-Whitney test was carried out.



Figure 1. Facial symmetry Manipulation (A) the mid-sagittal plane coincident with soft tissue pogonion point of the chin; (B) 2 mm shift of soft tissue pogonion to the left; (C) 4 mm shift of soft tissue pogonion to the left; (D) 6 mm shift of soft tissue pogonion to the left; (E) 8 mm shift of soft tissue pogonion to the left



Figure 2. Facial soft tissue profile Manipulation (A) severely reduced lower anterior facial height (short face); (B) slightly reduced lower anterior facial height; (C) average vertical facial proportion; (D) slightly increased lower anterior facial height; (E) severely increased lower anterior facial height (long face)



Figure 3. Vertical proportions manipulation (A) straight facial profile (Class I); (B) slightly convex facial soft tissue profile (mild Class II); (C) moderately convex facial soft tissue profile (moderate Class II); (D) severely convex facial soft tissue profile (severe Class II); (E) concave facial soft tissue profile (Class III)

RESULTS

The characteristics of respondents to the study of facial aesthetics perception in preclinical and clinical students of the Faculty of Dentistry, Lambung Mangkurat University can be seen in Table 1.

Based on Table 2, it was found that the categorization of facial aesthetics perception in preclinical students with very aesthetic category = 38 (59.375%), aesthetic category = 22 (34.375%), quite aesthetic category = 4 (6.25%), unaesthetic category = 0 (0%), and very unaesthetic category = 0 (0%), while in clinical students with very aesthetic category = 44 (68.75%), aesthetic category = 17 (25.56%), quite aesthetic category = 3

(4.69%) unaesthetic category = 0 (0%), and very unaesthetic category = 0 (0%).

Table 1. Characteristics of Research Respondent Data

Characteristic	N(%)	
	Pre-clinic	Clinic
Gender		
Man	21 (32,81)	15 (23,44)
Woman	43 (67,19)	49 (76,56)
Entry Year		
2016	0 (0)	30 (46,48)
2017	0 (0)	34 (53,12)
2018	0 (0)	0 (0)
2019	22 (34,38)	0 (0)
2020	21 (32,81)	0 (0)
2021	21 (32,81)	0(0)
Age		
19	10 (15,62)	0 (0)
20	14 (21,88)	0 (0)
21	30 (46,88)	0 (0)
22	9 (14,06)	1 (1,56)
23	1 (1,56)	17 (26,57)
24	0 (0)	27 (42,18)
25	0 (0)	19 (29,69)
Total	64 (100)	64 (100)

Table 2. Distribution of Facial Aesthetic Perception Categorization Results

Category Perception	Pre-clinic		Clinic	
	N	%	N	%
Very aesthetic	38	59,375%	44	68,75%
Aesthetic	22	34,375%	17	26,56%
Quite aesthetic	4	6,25%	3	4,69%
Not aesthetic	0	0%	0	0%
Very Unaesthetic	0	0%	0	0%
Total	64	100	64	100

Table 3. Mean Distribution of Facial Aesthetics Perception

Facial Aesthetics	Mean ± SD		.sig
	Preclinic	Clinic	
Overall	12.69 ± 1.661	13.23 ± 1.530	0,047*
Facial Symmetry	4.11 ± 0.893	4.22 ± 0.752	0,039*
Facial profile	4.23 ± 0.938	4.11 ± 0.729	0,385
Vertical Proportion	4.34 ± 1.158	4.41 ± 1.178	0,612

*) p < 0,05

To prove the research hypothesis, namely there are differences in the perception of facial aesthetics in preclinical and clinical students of the Faculty of Dentistry, University of Lambung Mangkurat, researchers conducted the Mann Whitney test to analyze differences in perception of facial aesthetics because the results of the data normality test were not normally distributed using SPSS. The results of the Mann Whitney analysis test can be seen in Table 3.

Based on Table 3 of statistical analysis results using the SPSS version 24 application with the Mann Whitney Test, the mean results and significance of facial aesthetics perception were obtained. In the table, the significance of overall facial aesthetics 0.047 and facial symmetry 0.039 can be seen value ($P < 0.05$), meaning that there is a difference in average perception in preclinical students and Faculty of Dentistry, Lambung Mangkurat University dental clinics. The significance value of the soft tissue profile of 0.385 and the vertical proportion of the face of 0.612 visible values ($P = 0.05$) mean that there is no difference in the average perception of facial aesthetics between preclinical and clinical students Faculty of Dentistry, Lambung Mangkurat University.

DISCUSSION

Perception is a person's perspective on something through the five senses.² The process of perception begins with the sensation that the object causes a stimulus that hits the senses. Stimuli received by the senses will be forwarded by sensory nerves to the brain. Then in the brain it is processed so that a person is aware of what is seen, heard, or touched.¹⁴ This process is influenced by consciousness, memory, thought, and language involving individual interpretations of certain objects, although coming from the same object, individuals can perceive different ones.¹⁵

Perception of facial aesthetics is the way a person judges facial appearance and can differ from individual to individual due to many factors including gender, age, family, friends, marital status, culture, socio-economy, occupation, environment, and also education level.^{4,9} Aesthetic Perception of the face has an important role when a person decides to do orthodontic treatment.¹⁵ The perception of facial aesthetics is important for dental students in assessing and planning orthodontic treatments for patients in the future.¹⁶

The results of categorizing the perception of facial aesthetics in Table 2 show that the perception of preclinical and clinical students shows the most in the aesthetic and very aesthetic categories, this is because dental students have learned about the theory of

dentofacial growth related to facial aesthetics.¹⁷ The results of this study are in line with a study reported by Alhammadi et al 2018 in which more than two-thirds of dental students at Jazan University, Saudi Arabia were able to experience facial aesthetics according to facial aesthetics indicators.⁶

In this study, the results of the perception of overall facial aesthetics were obtained from the sum of the scores of all facial aesthetics components (facial symmetry, soft tissue profile, and vertical proportions of the face) in preclinic and clinical students there were significant differences that could be seen in Table 4, namely obtained a value of 0.047 ($p < 0.05$) and the clinical group showed better results in determining the components of facial aesthetics which matches the indicator. This is because in the preclinical period students are only equipped with theory-based learning.¹⁷ The results of this study are in line with a study reported by Alhammadi 2018, where there were significant differences in face, teeth, and smile perceptions between preclinical and clinical students at Jazan University, Saudi Arabia with the highest perceptions in clinical students.⁶ Clinical-level dental students are better at perceiving aesthetic components of the face aesthetically pleasing and more accurately than preclinical students who tend to be more tolerant of facial aesthetic changes due to clinical learning and training obtained by clinical students.^{6,18}

Facial symmetry is the balance between the left and right faces developed by Leonardo Da Vinci that the face is divided into two parts by an imaginary line that passes through the midpoint of the nose, lips, and chin and the same pupil distance.^{12,19} In this study, the results of facial aesthetics perception (facial symmetry) of preclinic and clinical students found a significant difference of 0.039 ($p < 0.05$) can be seen in Table 3. Facial symmetry that is widely chosen and assessed aesthetically by clinical and preclinical students is when the chin pogonion shifts by 0 mm and 2 mm. The results of this study are in line with a study reported by Alhammadi et al, namely dental students at Jazan University, Saudi Arabia they can feel facial asymmetry of 2-6 mm is an abnormal face. This means that the 2 mm shift can still be aesthetically tolerated by dental students.⁶ Another study by Dong et al reported significant results that chin deviation has a significant influence on facial aesthetics. Facial aesthetics decreases with an increase in the degree of chin deviation with a 4 mm chin deviation begins to be perceived as facial asymmetry.¹² Facial symmetry selected in preclinical students focused more on soft tissue/pogonion, in contrast to clinical students who analysed facial symmetry focusing on the median line of the face located on the lines for the pupil, nose, tip of the philtrum, and midline of the incisor teeth.²⁰

The soft tissue profile is the harmony of the face seen from the soft side measured using an S line drawn from the outermost contour of the chin soft tissue (pog') to the middle of the middle of the S shape formed by the lower edge of the nose (Sn).²¹ In this study, the results of facial aesthetics perception (soft tissue profile) in preclinic and clinical students showed no significant difference, namely 0.385 ($p>0.05$) can be seen in Table 4. Soft tissue profiles that are widely selected and assessed aesthetically by clinical and preclinical students are straight profile (Class I) and slightly convex / concave profile (Class II light). Research according to Aldhorae et al 2019 reported that about 74.48% of dental student respondents considered a slightly convex soft tissue profile rather than a straight profile as an aesthetically sound profile.¹⁸ The results of this study are in line with studies reported by Suphatheerawatir 2019 and Ilyas 2020 which stated that the most aesthetically pleasing profile felt was straight or slightly convex while the unfavourable profile was the concave profile.^{22,23} The results of this study are in line with a study reported by Tufekci et al which states that more accurate profile assessments are made by dental students because they are more aware of aesthetics during their education in dentistry.²⁴ The similarity in the selection of soft tissue profiles in dental students in addition to the theory they obtained during learning is also likely because the Deutro-Malay race has relatively convex facial profile characteristics that ultimately affect respondents' perceptions of aesthetic soft tissue profiles.^{17,25}

The vertical proportion of the face or vertical dimension according to The Glossary of Prosthodontic Terms is the distance between two points or anatomical marks (usually one on the tip of the nose and the other on the chin), one on the immovable part and the other on the moving part.²⁶ The vertical proportions of the face divide the face into five equal parts in the vertical plane and three equal parts in the horizontal plane.²⁷ In this study, the results of facial aesthetics perception (vertical proportions of the face) in preline and clinical students showed no significant difference, namely 0.612 ($P>0.05$) can be seen in Table 4. The vertical proportion of the face that was widely selected and assessed aesthetically by respondents was that the chin length was slightly reduced and normal. The results of this study are in line with a study reported by Alhammadi et al 2018 that the vertical proportions of the face that are considered aesthetic are the proportion of slight chin reduction, normal proportion, and the proportion of slight chin addition.³ This study is also in line with studies reported by Johnston et al and Gautam et al found that the vertical proportion of the normal lower third of the face is considered the most attractive and profiles with an increased proportion of the lower third of the face are

considered to require treatment.^{28,29} The similarity in the selection of vertical proportions of one-third of the face in dental students due to the theory they get at the time of learning is also the possible influence of media such as television, magazines, and the internet that provide aesthetically pleasing facial images every day.^{11,17}

CONCLUSION

Perception of facial aesthetics in three components of the assessment, namely there is a difference in perception of facial symmetry, and there is no difference in perception in soft tissue profile and vertical proportion of the face between preclinical students and clinical students of the Faculty of Dentistry, Lambung Mangkurat University. Overall, there are differences in the perception of facial aesthetics between preclinical students and clinical students of the Faculty of Dentistry, Lambung Mangkurat University.

CONFLICT OF INTEREST

The authors declare that there are no conflict of interest regarding the publication of this paper.

REFERENCES

1. Shamir B Mehta. AestheticDentistry 78 DentalUpdate Patient Assessment: Preparing for a Predictable Aesthetic Outcome. Dent Update. 2015;42(1):78-86.
2. I Gst AA Mutiara Wulandari, Putu Ratna Kusumadewi GAM. Persepsi mahasiswa PSPDG Fakultas Kedokteran Universitas Udayana terhadap senyum dan estetika gigi. Bali Dent J. 2017;1(1):23-28.
3. Alhammadi MS. Perception of facial esthetics by laypersons, dental assistants, general dental practitioners and dental specialists. J Contemp Dent Pract. 2019;20(3):304-310. doi:10.5005/jp-journals-10024-2514
4. Hadi L, Muttaqin Z, Halim S, et al. Persepsi Diri terhadap Estetika Gigi dan Senyum pada Mahasiswa Kedokteran Gigi. Prima J Oral Dent Sci. 2021;4(1):1-8. doi:10.34012/primajods.v4i1.2395
5. Nathania RV, Fanny G, Luthfimaedah MS, et al. Positive Perception of Airlangga University FKG Students on Dental Aesthetics Based on the Semester Being Pursued. Syst Rev Pharm. 2020;11(3):907-911. doi:10.31838/srp.2020.3.135
6. Alhammadi MS, Halboub E, Al-Mashraqi AA, et al. Perception of facial, dental, and smile esthetics by dental students. J Esthet Restor Dent. 2018;30(5):415-426. doi:10.1111/jerd.12405

7. Sanjoto LPTB. Pengaruh Tingkat Pendidikan Terhadap Persepsi Masyarakat Mengenai Pembangunan Kawasan Industri Candi Kelurahan Bambankerep Kecamatan. *Edu Geogr.* 2019;7(2):167-173.
8. Dickie E, Masotti S, Rodrigues-Junior A, Adalberto S. Dental esthetic self-perception of Brazilian dental students. *Rsbo.* 2012;9(4):375-381. <http://www.redalyc.org/articulo.oa?id=153024697004>
9. Makmur H, Adrian N. Perbedaan Persepsi Antara Mahasiswa Pre-Klinik Dan Klinik Terhadap Midline Shifting Pada Gigi Tiruan Lengkap. *J Kedokt Gigi Terpadu.* 2019;1(1):28-34. doi:10.25105/jkgt.v1i1.5148
10. Kemenristek-Dikti. Permenristek-Dikti Nomor 18 Tahun 2018 Tentang Standar Nasional Pendidikan Kedokteran. 2018;(693).
11. Fitri NA, Lipoeto NI, Deswita Y. Difference Between Dentists' and Lay People'S Esthetic Perception in the Variations of Vertical Proportion of Lower Facial Third on Deutero Malay Race. *Andalas Dent J.* 2015;3(2):113-124. doi:10.25077/adj.v3i2.170
12. Dong T, Ye N, Yuan L, Wu S, Xia L, Fang B. Assessing the Influence of Chin Asymmetry on Perceived Facial Esthetics With 3-Dimensional Images. *J Oral Maxillofac Surg.* 2020;78(8):1389-1396. doi:10.1016/j.joms.2020.03.017
13. Azwar S. Metode Penelitian. Pustaka Belajar; 2014.
14. Lia Badriya, Nur Fitriyah KAS. Persepsi Audiens Terhadap Kecantikan Perempuan Oleh Beauty Vlogger Di Youtube (Studi Pada Mahasiswi Ilmu Komunikasi Fisip Unmul). 2018;6(4):357-371.
15. Nurfitriah A, Christnawati C, Alhasyimi AA. Comparison of esthetic smile perceptions among male and female Indonesian dental students relating to the buccal corridors of a smile. *Dent J (Majalah Kedokt Gigi).* 2018;50(3):127. doi:10.20473/j.djmk.v50.i3.p127-130
16. Althagafi N. Esthetic smile perception among dental students at different educational levels. *Clin Cosmet Investig Dent.* 2021;13:163-172. doi:10.2147/CCIDE.S304216
17. Hakim RF, Azizi WD, Hidatullah T, Fakhrurrazi. Persepsi Terhadap Senyum Estetik (Studi Pada Mahasiswi Preklinik Kedokteran Gigi Universitas Syiah Kuala). *Cakradonya Dent J.* 2020;12(1):41-48.
18. Aldhora¹ K, Alqadasi² B, Altawili³ ZM, Assiry⁴ A, Shamalah³ A, Salah addin Al-Haidari⁵. Perception of Dental Students and Laypersons to Altered Dentofacial Aesthetics. 2019;10(1):85-95. doi:10.4103/jispcd.JISPCD
19. Ko EWC, Huang CS, Lin CH, Chen YR. Orthodontic Perspective for Face Asymmetry Correction. *Symmetry (Basel).* 2022;14(9):1-13. doi:10.3390/sym14091822
20. Hidajah N. Median Line Immetry At Centric Occlusion in Fkg Unmas Denpasar. *Interdental J Kedokt Gigi.* 2021;17(1):15-21. doi:10.46862/interdental.v17i1.1260
21. Darwis R, Editiawarni T. <p>Hubungan antara sudut interinsisal terhadap profil jaringan lunak wajah pada foto sefalometri</p><p>Relationship between interincisal angles and facial soft tissue profiles in cephalometric photos</p>. *J Kedokt Gigi Univ Padjadjaran.* 2018;30(1):15. doi:10.24198/jkg.v30i1.17945
22. Suphatheerawatr T, Chamnannidiadha N. Esthetic perception of facial profile contour in patients with different facial profiles. *J World Fed Orthod.* 2019;8(3):112-117. doi:10.1016/j.ejwf.2019.04.002
23. Kausar Ilyasa, Amjad Mahmoodb, Afeef Umar Ziac, Amra Minhasd MS. Evaluation of perception of profile aesthetics by patients. *POJ.* 2020;12(1):42-48.
24. Tufekci E, Jahangiri A, Lindauer SJ. Perception of profile among laypeople, dental students and orthodontic patients. *Angle Orthod.* 2008;78(6):983-987. doi:10.2319/102207-503.1
25. Oktaviona I, Ardani IGAW, Sjafei A. Hubungan tweed triangle dan posisi bibir terhadap garis estetik (Relationship between tweed triangle and the lips position to esthetic line). *Dent J (Majalah Kedokt Gigi).* 2014;47(4):220.
26. Driscoll CF, Freilich MA, Guckes AD, et al. The Glossary of Prosthodontic Terms: Ninth Edition. *J Prosthet Dent.* 2017;117(5):e1-e105.
27. Alrbata RH, Alfaqih AK, Almhidat MR, Al-Tarawneh AM. Thresholds of abnormality perception in facial esthetics among laypersons and dental professionals: Frontal esthetics. *Int J Dent.* 2020;2020. doi:10.1155/2020/8946063
28. Gautam G, Shashikalakumari V, Garg G. Facial attractiveness influenced by lower face vertical proportions and mandibular prominence. *Orthod Waves.* 2013;72(1):30-35.
29. Johnston DJ, Hunt O, Johnston CD, Burden DJ, Stevenson M, Hepper P. The influence of lower face vertical proportion on facial attractiveness. *Eur J Orthod.* 2005;27(4):349-354. doi:10.1093/ejo/cji023