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Norms of soft tissue cephalometric in the 18–25 age demography in Vietnam

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Abstract

BACKGROUND AND PURPOSE: The soft-tissue layer and facial skeleton influence the harmony and equilibrium of the face. The evaluation of the patient's structural and soft-tissue features is one of the most crucial steps in preparing for the diagnosis and treatment of oral-maxillofacial orthodontics. Clinicians can intervene with the proper treatment at the proper time to achieve the best results by being aware of the traits and variations of soft tissue at various developmental stages and in various races. To obtain a consistent treatment result in terms of function and aesthetically pleasing results, patients, and forecast, the growth that may take place after the orthopedic therapy has concluded.

OBJECTIVE: To examine the soft-tissue features of the oral-maxillofacial area in Vietnamese adults (aged 18–25 years) by evaluating cephalometric radiographs.

MATERIALS AND METHODS: In a cross-sectional descriptive study, 85 students from Can Tho University of Medicine and Pharmacy took part. Students' lateral cephalograms were taken in compliance with the sample requirements.

RESULTS: Men's lip protrusion (4.30 ± 0.71) was higher than women's (3.88 ± 0.97) ($P = 0.024 < .05$) and men's (-4.88 ± 0.93) chin lip groove depth was higher than women's (-4.24 ± 0.93) ($P = 0.002$), both with a P value of .05.

CONCLUSIONS: The study identified a statistically significant difference in the protrusion of the top lip and the depth of the cleft lip between the male and female, demonstrating that the soft-tissue features of Vietnamese students were distinct from those of other races.

Keywords:

Lateral cephalogram, oral maxillofacial region, soft-tissue cephalometric norms, Vietnamese adults

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Introduction

Anthropometric measurements used for face recognition have evolved throughout time. The indications and distinguishing characteristics of the craniofacial system fluctuate together with the body's overall growth. In the realm of general and clinical medicine, it is crucial to assess the hard and soft tissue indices of the head and face to establish a thorough diagnosis and offer a suitable treatment plan, surgery, especially maxillofacial plastic surgery, and maxillofacial surgery.

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The analysis of the patient's soft-tissue anatomy is one of the most crucial steps in dental diagnosis and treatment planning.^[1]

The last 10 years have seen a rise in the importance of cosmetic dentistry. The field of orthodontics recently underwent a paradigm change to place a greater emphasis on aesthetics, with a special emphasis on the soft tissues around the mouth. Different measuring techniques are used by the authors in the globe and in Vietnam to acquire precise indications for morphological and functional therapy interventions in the face and to establish the requirements for a harmonious face. Studying craniofacial traits for various races requires various measuring

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and analytic techniques. In particular, the cephalometric film's parameters are used to help the orthodontist, along with information from other sources including the intraoral or superficial inspection, analysis of the study jaw sample, and the patient's medical, dental, and behavioral histories. Treatment methods include dental work and plastic surgery.^[2]

Previous studies are frequently used to judge how teeth are positioned in relation to other teeth, but their scope is still restricted in terms of sample size and geographic scope. Soft-tissue features are more important to the bone composition. To address this issue, further research on the soft-tissue indices of the face is required and subject selection that takes into account Vietnamese adults' facial aesthetics.

Materials and Methods

Study subjects and study design

Cross sectional descriptive research was used for the study. Can Tho University of Medicine and Pharmacy, Faculty of Odonto Stomatology, March 2021-April 2022. The Ethics Committee in Biological Research (Approval number: 114/HĐĐĐ) approved this study's ethics committee. Study materials include drawings of slanted and straight skulls made by Vietnamese students from Can Tho University of Medicine and Pharmacy, aged 18 to 25 years. The following requirements must be met by sampling criteria: Age between 18 and 25 years, at least 28 permanent teeth, a normal tooth shape free of abnormalities, a Vietnamese household, and consent to participate in the study were the main requirements. Standards for an appearance include a balanced three-level straight face and a flat side view. Intraoral standards: Bite class I first molars and canines, bilaterally symmetrical arches, teeth constantly erupting, teeth not rotated and not spread apart, teeth properly distributed along the bite line, overbite, and overbite within normal limits (2-4 mm). Subjects with conditions that influence the growth of teeth, arches, and faces are excluded, as are people who have had cosmetic surgery or orthodontic treatment and refuse to participate in the study.

As per author Tran Tuan Anh's study (2016),^[3] the data collecting approach uses the estimating formula proportionate to the standard deviation observed on the film at $\delta = 0.84$ (mm) of the measurement A1-Cg. This yields a sample size of 85 cephalometrics films on 85 student samples. All visitors to the Department of Odonto-Stomatology at the Can Tho University of Medicine and Pharmacy complied with the requirements for easy sampling.

Data collection

Cephalometric radiographs were acquired of all research participants with their heads in their normal positions

and their teeth in centric occlusion. Participants also had their mouths impersonated and had photos of their faces taken in the lateral position.

- Step 1: Conduct a preliminary investigation to compile a list of potential study subjects.
- Step 2: Instruction in taking cephalometric film, measuring film, and analyzing pictures.
- Step 3: Perform an intraoral examination to assess the bite in light of the selection criteria.
- Step 4: Take radiographs of the cephalometrics film.
- Step 5: Using the Vistadent OC program, measure the craniofacial measurements and determine the craniofacial indices (soft and bone) [Figure 1].

Statistical analysis

Excel and SPSS 26.0 software were used to record, input, synthesize, and process the data. Put descriptive statistics like percentage, mean, and standard deviation to use. The *t*-test for two independent samples was used to compare data between the two groups of men and women, or compare with other authors, which are examples of inferential statistics. All tests were run with a significance threshold of 5%.

Results and Discussion

The study involved 85 students from Can Tho University of Medicine and Pharmacy with an equal number of men and women; there were 43 men (50.59%) and 42 women (49.1%) in total. The findings were as follows:

Most of the tissue angles and soft-tissue protrusions on the cephalogram, including the indices of Gl - Sn - Pog', N'SnPog', and N'PnPog,' were greater in women than in men in terms of face convexity [Table 1]. This distinction, nevertheless, was not statistically significant ($P > .05$). This outcome is comparable to the research done by Tran Tuan Anh *et al.*^[3] (2016) on commenting on various facial soft-tissue morphological traits of distant skulls in a group of students in Angle's class I. The chin angle features were not different in this investigation but variances were

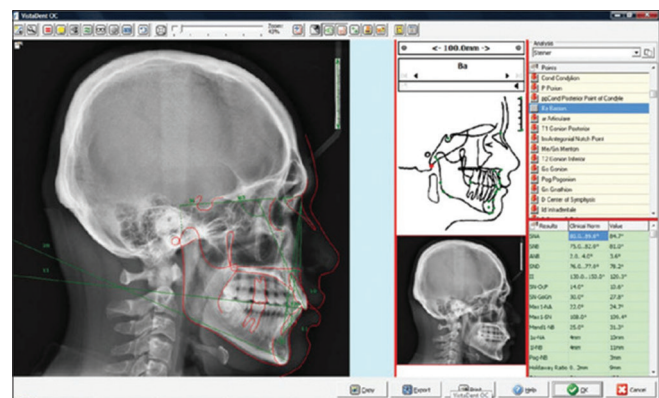


Figure 1: The Vistadent OC program

discovered at the bases of other locations, including the nose, lips, and chin. It was similar to that of Europeans in terms of facial projection and there was no statistically significant difference between men and women.^[4-6] The protrusion is dependent on the location of the N' and Pog' points in addition to the Sn point, thus even if the upper jaw protrudes much, the protrusion may not be as significant if the forehead and chin protrude first.

The findings demonstrate that the upper lip protrusion (Ls-SnPog') has a different value in the soft lip and chin indices compared to the European research by Holdaway in 1983.^[7] The upper lip protrusion was greater in the Vietnamese student group compared to the Caucasian ethnic group. Although not statistically significant, the student group's nasolabial angles are lower than the Caucasian standard value, which also adds to the confirmation of the upper lip protrusion and the big upper lip thickness.^[8] In addition, the lower lip protrusion and lower lip to E-line in our study were different from the criteria used for the Japanese population^[6] and the study conducted by author Jagan Nath Sharma on Nepalese individuals. In contrast to the author Amjad Al Taki's 2019 study on the adult Persian group, our study's average chin thickness was more. The Vietnamese had a chin thickness of 12.40 ± 2.10 , but the Persians had a chin thickness of 13.48 ± 2.51 .^[8] As a result, the Vietnamese had soft-tissue traits that were noticeably distinct from those of other national groups.

In contrast to the characteristics of face convexity, the study demonstrated that men had larger indices of lip and chin characteristics than women, including indexes of Cotg - Sn - Ls, Ls - SnPog', Li - SnPog', Ls - PnPog', Li - PnPog', Si - LiPog', and Pog - Pog'. For instance, the study discovered that male upper lip

protrusion (4.30 ± 0.71 vs. 3.88 ± 0.97) was higher in men than in women, a difference that was statistically significant ($P < .05$) [Table 2]. The study was exactly like the research conducted by Nguyen Thi Thu Phuong in 2013 on a group of Vietnamese undergraduates and Amjad Al Taki in 2009 on a group of Persian adults. In the two investigations, there were differences in men's and women's upper lip protrusion and thickness. Men had an index that was substantially greater than women's ($P < .05$) when comparing the value of upper lip tension between the genders.^[8] Men often had short features and well-developed muscles, while women typically had delicate, soft faces. As a result, it was proper for men to have greater soft-tissue indices than women. However, in both our study and the study of Anh TT,^[3] lower lip protrusion was less than in Europeans, and there was no difference between men and women.

Male and female upper lip to E-line measurements did not reach statistical significance ($P > .05$). The findings of this author's study, which focused on the Chinese-Malaysian group, differed from those of Kathiravan Purmal^[9] in that they revealed that women had thicker lips than men did in both the protrusion and thickness of the lip profiles of both lips. The study also revealed the difference between the thickness of the chins in men and women, but this finding differed from that of the author's study Amjad Al Taki *et al.* 2009 because the difference was not statistically significant ($P < .05$). Amjad Al Taki and Basciftci both came to identical conclusions on the difference in mean soft-tissue thickness between men and women in the chin area. Turkish men were found to have more prominent chins than Turkish women.^[1,8]

Mentolabial sulcus depth was also observed to differ between men and women in the study; the difference

Table 1: Features of facial convexity angle

Measurements	Description	Gender		Total (n=85)	P
		Male (n=43) Mean±SD	Female (n=42) Mean±SD		
Total convexity except nose (°)	Gl - Sn - Pog'	6,40±5,57	6,52±4,98	6,46±5,26	0.91
Angel of facial convexity (°)	N'SnPog'	166,33±5,43	168,00±4,97	167,15±5,24	0.14
Total convexity with nose (°)	N'PnPog'	135,37±6,48	135,43±4,20	135,40±5,44	0.96

Table 2: Features of the chin and lips

Measurements	Description	Gender		Total (n=85)	P
		Male (n=43) Mean±SD	Male (n=43) Mean±SD		
Nasolabial angles (NLA)	Cotg-Sn-Ls	83,10±10,03	82,26±10,90	82,68±10,41	0.71
Upper lip protrusion	Ls - SnPog'	4,30±0,71	3,88±0,97	4,09±0,8	0.04
Lower lip protrusion	Li - SnPog'	2,12±0,93	2,10±1,05	2,11±0,99	0.85
Upper lip to E-line	Ls - PnPog'	-2,53±0,91	-2,50±0,94	-2,52±0,92	0.85
Lower lip to E-line	Li - PnPog'	-0,95±0,69	-0,95±0,73	-0,95±0,71	0.97
Mentolabial sulcus depth	Si - LiPog'	-4,88±0,93	-4,24±0,93	-4,56±0,98	0.01
Chin thickness	Pog - Pog'	12,74±2,13	12,05±2,04	12,40±2,10	0.20

was statistically significant with a *P* value of .05. The mentolabial sulcus depth of men was larger than that of women (-4.88 ± 0.93 vs. -4.24 ± 0.93). Despite being a minor aspect, this finding which has not before been seen in investigations on the soft-tissue properties of cerebral angiograms in Vietnamese people helps both clinical practitioners and medical professionals and researcher specializing in dental aesthetics and treatment difficulties.

Conclusions

The study's findings, which were reached after interviewing 85 students between the ages of 18 and 25 years, are as follows: The Vietnamese student group has different soft-tissue features from other racial groups. There were no appreciable changes in tissue angles or soft-tissue protrusion between men and women on lateral cephalogram and the characteristics of face convexity mirrored those of other research. In terms of lip and chin traits, the study discovered a statistically significant difference between men and women in terms of upper lip protrusion and mentolabial sulcus depth. Men have a protruding lip that is deeper than that of women, and men also have a deeper lip groove under their chin than women. When determining the diagnosis and course of maxillofacial therapy for Vietnamese patients between the ages of 18 and 25 years, these variations must be taken into account.

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Conflicts of interest

There are no conflicts of interest.

References

1. Hwang HS, Kim WS, McNamara JA Jr. Ethnic differences in the soft tissue profile of Korean and European-American adults with normal occlusions and well-balanced faces. *Angle Orthod* 2002;72:72-80.
2. Kim YH, Kang SJ, Sun H. Cephalometric angular measurements of the mandible using three-dimensional computed tomography scans in Koreans. *Arch Plast Surg* 2016;43:32-7.
3. Anh TT, Dang TV, An NP, Ngoc VT, Phuong NT, Anh LQ. Cephalometric norms for the Vietnamese population. *APOS Trends Orthod* 2016;6:200-4.
4. Johnson EL. The Frankfort-mandibular plane angle and the facial pattern. *Am J Orthod* 1950;36:516-33.
5. Haralabakis B, Spirou V, Kolokithas G. Dentofacial cephalometric analysis in adult Greeks with normal occlusion. *Eur J Orthod* 1983;5:241-3.
6. Sharma JN. Steiner's cephalometric norms for the Nepalese population. *J Orthod* 2011;38:21-31.
7. Holdaway RA. A soft-tissue cephalometric analysis and its use in orthodontic treatment planning. Part I. *Am J Orthod* 1983;84:1-28.
8. Taki AA, Oğuz F, Abuhijleh E. Facial soft tissue values in Persian adults with normal occlusion and well-balanced faces. *Angle Orthod* 2009;79:491-4.
9. Purmal K, Alam M, Zam N. Cephalometric Comparison of skeletal, dental, soft tissue, nose and chin prominence between Malaysian Indian and Malaysian Chinese. *Int Med J* (1994) 2013;20:335-41.