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Original Research Article

Soft tissue photographic norms for central India subjects- A pilot study

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ABSTRACT

Aim & Objective: To determine the soft tissue angular photogrammetric standards in Central Indian topics.

Materials and Methods: 40 central Indian participants, 20 males and 20 females, ranging in age from 18 to 25, were examined in this study using lateral profile photographs. Standardized profile pictures were obtained between the focal lengths of 55 and 200 mm with a camera Canon 1500D macro lens.

Result: The data were analysed using SPSS 20.0, a statistical software for social sciences. Using the Kolmogorov-Smirnov test to determine the probability distribution of the data, it was determined that the data were not normally distributed (p value.05).

Conclusion: The present study used photogrammetric analysis to develop soft tissue face measures that will help orthodontists undertake more quantitative analysis and reach informed conclusions. By using this photogrammetric approach, the collected mean values may be compared to records of persons who had the same characteristics. There were statistically significant variations in Central India for a few key parameters.

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1. Introduction

An appealing and balanced face is one of the main objectives of orthodontic diagnostic and treatment planning.¹ The age of cephalometric dominance, in which the profile as seen on a lateral cephalogram was primarily used to define beauty, endured for a long time.²

The new paradigm, however, is soft tissue-based diagnostic and treatment planning. Despite a paradigm shift toward soft tissue-based diagnosis and treatment planning as well as result evaluation, there have been relatively few studies on photographs despite the fact that lateral cephalograms are not taken as required records during the pre-treatment stage, post-treatment stage, and retention phase of orthodontic treatment.³

This soft tissue envelope is based on foundation of hard tissue skeletal component which is reflected on profile images typically the hard tissue (skeletal) can be measured on lateral and frontal cephalogram. However, several soft tissue measurements can be done directly on profile images as well.⁴

As a result, a photograph-based cephalometric study may be useful for planning orthodontic treatment, especially in situations when a cephalometric radiograph is expressly avoided. To analyse soft tissue cephalometric characteristics in participants from Central India is what we thus propose as the goal of our study.^{5–8}

2. Materials and Methods

The lateral profile photos (n = 40) of central Indian participants meeting the inclusion criteria are analysed in this study. After getting their permission, standardised subject profile photos were obtained, then manually

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analysed. Standardized profile pictures were shot for the records using camera Canon 1500D and a 55-200mm macro lens.

The tripod is used to position the camera correctly vertically based on the height of the participants. The camera's focal length was 5.6 mm, the shutter speed was 100, and the separation between the operator and subject was 8 feet. Two umbrella flashes and an illuminated white backdrop are employed for excellent lighting and shadow-free pictures. (Figure 1A-C)

Following angular were measured on soft tissue photographs–

1. $N'-Trg'-Sn'$
2. $N'-Trg'-Me'$
3. $SN'-Trg'-Me'$
4. $Trg'-Me'-Mp'$

2.1. Inclusion criteria

1. Good quality profile pictures.
2. No obvious skeletal asymmetries.
3. Evenly spaced upper and lower arches.
4. No previous history of orthodontic treatment.
5. Age range: 18 to 25 years.

2.2. Exclusion criteria

1. Antero-posterior or vertical dysplasia that is syndromic and severe.
2. Any facial injuries or surgery.
3. Lip and palate deformities.

2.3. Statically analysis

Data filled in excel sheet. The data were analysed using SPSS 20.0, a statistical software for social sciences. Using Kolmogorov-Smirnov test to determine the probability distribution of the data.

3. Results

The excel page was filled out with the data. The data were analysed using the statistical software for social sciences (SPSS) 20.0 version. Using Kolmogorov-Smirnov test to determine the probability distribution of the data, it was determined that the data were not normally distributed (p value.05). It was done using descriptive statistics. The Spearman's correlation coefficient was used to evaluate the correlation between the variables. Statistical significance was determined by the p value of less than.05. The 95% confidence level was used.

Table 1 shows the mean (SD) and median (inter-quartile range) of the $N'-Trg'-Sn'$, $N'-Trg'-Me'$, $SN'-Trg'-Me'$, and $N'-Trg'-Mp'$ angles. These angles are only faintly



Fig. 1: A: Adobe photoshop, B: Photographic setup; C: Camera canon EOS 1500; D: Angles were measured on soft.

connected with one another, and the association that was discovered was statistically insignificant.

Table 2 1). $N'-Trg'-Sn'$ & $N'-Trg'-Me'$ are correlated with one another. 2). $SN'-Trg'-Me'$ & $N'-Trg'-Sn'$. Three) $N'-Trg'-Sn'$ & $Trg'-Me'-Mp'$ $N'-Trg'-Me'$ and $SN'-Trg'-Me'$. 5). & $Trg'-Me'-Mp'$ $N'-Trg'-Me'$. 6). $SN'-Trg'-Me'$ and $Trg'-Me'-Mp'$

There was no statistically significant correlation between the different angles

4. Discussion

Different racial and ethnic group have different soft-tissue analysis standards. However, there is lack of data in this field specially for Indian population and we could not find specific data for Central India population. Therefore, standards for central Indian subjects' soft-tissue photographic norms are need of the hour.

Vahid Moshkelgosha et al⁹ study, in an Adolescent Persian Population, found that the male mean and SD for the medium facial third ($N'-Trg'-Me'$) are 27.01 and 2.33, while the value mean and SD are 28.9⁹ and 2.4. Show by our study, which focused on the people of central India.

Angle of the lower third of the face in men is 37.44°, in women it is 35.3°, and in both cases the standard deviation is 2.61°. Angle of inferior facial third ($SN'-Trg'-Me'$) SD

Table 1: Description of different variables.

	N'-Trg'-Sn'	N'-Trg'-Me'	Sn'-Trg'-Me'	Trg'-Me-MP
Mean	30.8°	59.08°	29.7°	27.8°
Std. Deviation	3.5°	4.6°	2.7°	7.8°
Range	25°-38°	53°-70°	25°-35°	15°-55°
Median	30.0°	60.0°	30.0°	28.0°
Inter-quarti lerange	28.0°-34.0°	55.0°-62.50°	28.5°-30.0°	24.0°-30.0°

Table 2: Shows the mean (SD) and median (inter-quartile range) of the N'-Trg'-Sn', N'-Trg'-Me', Sn'-Trg'-Me', and N'-Trg'-Mp' angles. These angles are only faintly connected with one another, and the association that was discovered was statistically insignificant.

Variables	Spearman's correlation coefficient	P value
N'-Trg'-Sn'&N'-Trg'-Me'	.384	>.05(NS)
N'-Trg'-Sn'&Sn'-Trg'-Me'	-.152	>.05(NS)
N'-Trg'-Sn'&Trg'-Me'-MP'	.052	>.05(NS)
N'-Trg'-Me'&Sn'-Trg'-Me'	.306	>.05(NS)
N'-Trg'-Me'&Trg'-Me-MP'	.208	>.05(NS)
Sn'-Trg'-Me'&Trg'-Me'-Mp'	.065	>.05(NS)

2.9, Mean 29.6 was the results of our investigation.

Saravana Pandian K and Sindhuja Krishnan Aravind kumar³ discovered in their study on angular photogrammetric examination of Indian population's soft tissue face profile, the Angle of inferior facial third in males was Mean SD 29.6¹⁰ and the Angle of inferior facial third in females was Mean SD 29.5. The value of Angle of inferior facial third (SN'-Trg'-Me') Mean 29.7, with SD 2.9¹⁰ was found in our study, which was conducted on a population in central India.

Also medial third angle of the face in men the standard deviation is 25.4. Women's typical middle-face angles were 26.6 degrees on average, with a standard variation of 2.4 degrees. In our study, which was done on a population in central India, the angle of the medium facial third (N'-Trgh'-Sn') had a mean of 30.7 and an SD of 3.5.

Yusra A. M. Almansob¹¹ conducted their research on comparison of the soft tissue of the face before orthodontic treatment in Chinese patients having Angle's class I, they reported angle of the middle part of the face with value of 27.6. (N'-Trg'-Sn') and SD of 3.5.¹¹ They reported angle of the lower portion of the face to be SD mean 36.7°.

In our study, N'-Trg'-Me' mean value of 59.08° with SD 4.6°. Trg'-Me'-MP' mean value of 27.8° with SD. 7.8°. which was conducted on a population in central India.

5. Conclusion

1. We found soft tissue photographic norms in central india subjects as following, N'-Trg'-Sn'- mean value of 30.8° with SD 3.5°, N'-Trg'-Me'-M' mean value of 59.08° with SD 4.6°, SN'-Trg'-Me'- mean value of 29.7° with SD 2.7°, Trg'-Me'-Mp'- mean value of 27.8° with SD 7.8°.
2. We also found different values for above mentioned parameters from various international as well as

national population reported previously.

Therefore, this recommended to used soft tissue photographic norms for central India subjects while diagnosis, treatment planning as well as evaluation of results in subjects of central India origin. Further multicentric studies involving larger sample size with gender segregation of subjects will be needed to provide better floating norms for central India subjects.

6. Conflict of Interest

None.

7. Source of Funding

None.

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