# Variations in the Facial Dimensions and Face Types among the Students of A Medical College

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## ABSTRACT

**Introduction:** Facial dimensions and the face types are the most variable factors in human community. These dimensions have practical implications for the anthropologist, forensic experts, anatomists and surgeons. The present study is aimed to determine the facial dimensions and face types among the medical and nursing students.

**Methods:** A cross-sectional study was done among medical and nursing students of Devdaha Medical College and Devdaha College of Science and Technology from January 2017 to February 2018. There were 155 students of which 72 were males and 83 females. Facial height and width were measured and facial index was calculated. The collected data was entered and analyzed in SPSS 21 and differences in measurements among males and females were calculated.

**Results:** The mean facial height among the total population was 10.83 ± 0.74 cm and facial width was 12.39 ± 0.67 cm with the mean facial index of 87.44 ± 4.82. The most prevalent was the mesoprosopic face (n= 59, 38.06%) followed by leptoprosopic (n=43, 27.74%). The least prevalent face type was hyperleptoprosopic (n= 7, 4.52%) which was observed only in male individuals.

**Conclusions:** The present study depicts higher values of facial height, width and facial indexfor males when compared to the females. The present finding is based upon the indices and classification obtained from developed nation. Further studies with local data would help develop indices and classification for Nepalese population.

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**Keywords:** *anthropometry; facial height; facial index; facial width.*

## INTRODUCTION

Every individual is unique in their facial characters. These charactersvary with different ethnic groups, body form and proportions.[1] Anthropometric analysis is a non-invasive quantitative method employed to determine the measurements of the different body parts in either living or dead for scientific purposes.[2] It has been used for the sex determination, estimation of height and other medico-legal purposes by anthropologists and forensic scientists.[3] At birth the development of face is completed by 40% followed by 65% within next 7 years and growth in the bizygomatic width by 15% within 10 years.[4] Shape of face depends on many factors like gender, ethnicity, socio-economic, nutritional, genetic factors and climate.[5-7] Facial index has been categorized as hypereuroprosopic, europrosopic, mesoprosopic, leptoprosopic and hyperleptoprosopic on the basis of percentage values of facial breadths and lengths.[8] This study is aimed to determine the variations in facial morphometry amongst the medical students.

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## METHODS

A cross-sectional study was done among the students of Devdaha Medical College and Devdaha College of Science and Technology from January 2017 to February 2018. The ethical approval was taken from ethical committee of Devdaha Medical College and Research Institute prior to the study. There were 155 students who participated in the study including 72 males and 83 females. The participants were informed about the study protocols and personal identifier was removed before the data collection. The study participants were asked to sit in a relaxed state looking forward straight. Anthropometric measurements were obtained by using Vernier callipers. The variables were recorded as age, sex, facial height and facial width.

The facial height was measured in centimetres (cm) from the nasion (the point in the nose crossed by the mid-sagittal plane and naso-frontal sutures) to the gnathion (the lowest point of mandible where the mid-sagittal plane intersects the lower margin of lower jaw). Facial width was measured in cm between the right and left zygion (the lateral most point on the zygomatic arch). Facial index was calculated by using the formula, Facial index (FI) = (Facial width /Facial height) x 100. It was again categorized into five different face shapes by using the Banister's classification. The five face types

are hypereuroprosopic (very broad face, FI = <80), europrosopic (broad face, FI = 80-85), mesoprosopic (round face, FI = 85-90) leptoprosopic (long face, FI = 90-95) and hyperleptoprosopic (very long face, FI = >95). The collected data was then entered and analyzed by using SPSS 21. The descriptive analysis was performed for frequency, mean and standard deviation (SD). Student's t-test was employed to compare the means between the facial width and facial height within the study participants. The inclusion criteria were: a) those participants who had no craniofacial asymmetry; b) those who had no history of orthodontic treatment; c) those who had no history of facial bone fracture and d) those who consented for the study. The exclusion criteria were: a) those having craniofacial asymmetry; b) those having history of facial trauma and fracture; c) those participants who had undergone orthodontic treatment and d) those participants who did not consent to participate.

## RESULTS

The present study comprised of 155 medical and nursing students of which 72 (46.45%) were males and 83 (53.55%) females respectively. The mean value of both facial height and facial width were slightly higher in male participants (Table 1).

| Table 1. Mean and SD of facial height and facial width among medical students. | | | | | |
|---|---|---|---|---|---|
| Sex | Total (n) | Facial height (cm) Mean ± SD | Range of facial height (cm) | Facial width (cm) Mean ± SD | Range of facial width (cm) |
| Male | 72 | 11.31 ± 0.47 | 10.10-13.00 | 12.69 ± 0.64 | 11.2-15.1 |
| Female | 83 | 10.41 ± 0.68 | 9.30-12.60 | 12.14 ± 0.60 | 11.1-13.7 |
| Total | 155 | 10.83 ± 0.74 | 9.30-13.00 | 12.39 ± 0.67 | 11.1-15.1 |

The range of facial index was higher in males with the mean (89.33 ± 5.02) when compared to females (85.80 ± 4.00). The facial index values among male and female participants were statistically significant (Table 2).

| Table 2. Mean and SD of facial index among medical students. (n = 155) | | | |
|---|---|---|---|
| Sex | Facial index range | Facial index Mean ± SD | P -value |
| Male | 75.18-100.00 | 89.33 ± 5.02 | <0.001 |
| Female | 77.69-92.68 | 85.80 ± 4.00 | <0.001 |
| Combined | 75.18-100.00 | 87.44 ± 4.82 | <0.001 |

Face types were categorized as hypereuroprosopic, europrosopic, mesoprosopic, leptoprosopic and hyperleptoprosopic as per FI value (Table 3).



**Figure 1. Distribution of face types among the studied population.**
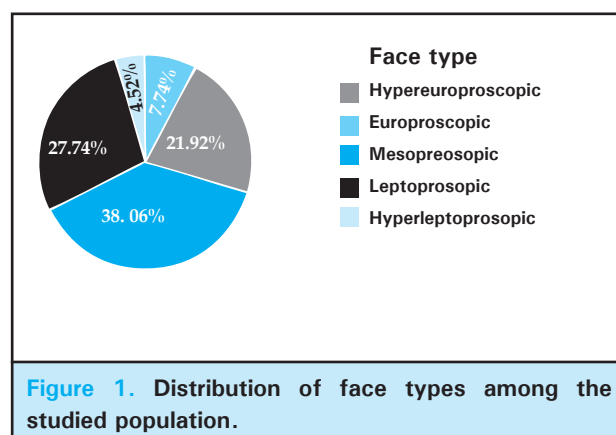
**Table 3.** Distribution of face type among study population. (n = 155)

| Face types | Facial Index (FI) | Male n (%) | | Female n (%) | | Total n (%) | |
|---|---|---|---|---|---|---|---|
| Hypereuroprosopic | <80 | 6 | 8.33 | 6 | 7.22 | 12 | 7.74 |
| Europrosopic | 80-85 | 5 | 6.94 | 29 | 34.94 | 34 | 21.94 |
| Mesoprosopic | 85-90 | 21 | 29.17 | 38 | 45.79 | 59 | 38.06 |
| Leptoprosopic | 90-95 | 33 | 45.84 | 10 | 12.05 | 43 | 27.74 |
| Hyperleptoprosopic | >95 | 7 | 9.72 | 0 | 0 | 7 | 4.52 |
| Total | | 72 | 46.45 | 83 | 53.55 | 155 | 100 |

In males, leptoprosopic faces were prevalent (n = 33, 45.84%) whereas mesoprosopic face were dominant in the females (n = 38, 45.79%). The prevalent face type in both the gender was mesoprosopic (n = 59, 38.06%) and least prevalent was hyperleptoprosopic (n = 7, 4.52%). Europrosopic face type was the least prevalent face in males (n = 5, 6.94%) whereas hyperleptoprosopic face type was rare in females.

## DISCUSSION

Facial dimensions and facial index varies with gender and ethnic groups.[9-12] The mean facial height of Nepalese male and female from the present study were lower than the measurements obtained from Sri Lanka (12.56 ± 0.93cm in male and 12.00 ± 0.64cm in female respectively).[13] In contrast, Nepalese population had wider face when compared to Sri Lankan population (12.00 ± 0.64cm in male and 10.99 ± 0.77 cm in females respectively).[13] However, measurement of mean facial height and width of both Nepalese males and females were very close to Malaya population.[8] When the facial index is compared with Sri Lankan and Serbian population, Nepalese population had lower values.[13,14] Studies conducted in Central Serbia and Sri Lanka reported the hypereuroprosopic face as the least dominant face types which is in contrast with the findings of the present study.[13,14] Our study revealed narrow faced females were rare and it is believed that hyperleptoprosopic (narrow face) males are regarded as more attractive by females.[15] It might be due to the fact that men with wider faces are more aggressive, dominant and status seeking.[16] Infidelity is also linked to wider faced males with higher FI.[17-]

[19] The person with higher FI is supposed to be more aggressive, uncooperative and intolerant than those with lower FI.[16,20] The facial index is used as a tool for orthodontic treatment.[21] The facial index is also related to masculinity. There is an association of facial index to testosterone level.[22] From the forensic point of view, the facial indices can be used as an instrument of dentification.[23] The more prevalent face type of the given population can be used to construct the facial features of exhumed skull. Although the study has met its aim, further studies are sought in different ethnic and age groups in different regions of the country to generalize the findings as the national statistics of the facial dimensions and face type.

## CONCLUSIONS

The present study depicts higher values of facial height, width and facial index for males when compared to the females. The present finding is based upon the indices and classification obtained from developed nation. Further studies with local data would help develop indices and classification for Nepalese population.

## ACKNOWLEDGEMENTS

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