

**ORIGINAL RESEARCH**

# Anthropometric study of facial index in the medical students of Doda, Jammu and Kashmir

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Received: 16 February, 2023

Accepted: 22 March, 2023

## ABSTRACT

**Introduction:** Anthropometric studies are scientific studies which are important in forensic medicine and archeology to differentiate a true race from the local mixing of races. The identification of an individual's race is an essential component in forensic identification and reconstructive surgery. The shape of the face has always been an interesting topic for anatomists, anthropologists, plastic surgeons, and artists. **Materials and methods:** The present study aims at measuring the craniofacial parameters in the medical students of Doda, Jammu and Kashmir. The study was conducted on 200 medical students (100 males and 100 females), aged 16-27 years. The parameters measured were morphological facial height and facial width. A standard vernier caliper was used for measuring the parameters. **Result:** The average facial height in males and females observed in the study was  $124.18 \pm 4.61$  and  $113.41 \pm 5.79$ . The average facial width was  $106.41 \pm 8.08$  and  $91.41 \pm 5.72$  in males and females respectively. The total facial index was found out to be  $126.26 \pm 8.80$  and  $116.71 \pm 7.28$  in males and females respectively. **Conclusion:** The dominant phenotype in the studied population was hyperleptoprosopic. The obtained data can be useful in forensic studies, genetic research for identifying the races, anthropological research and in clinical practice.

**Key words:** Anthropometry, facial height, facial breadth, facial index, facial phenotype.

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## INTRODUCTION

Anthropometric studies are scientific methods and techniques for displaying different measurement and observation on the human being as well as skeleton (1). The study has always been important in forensic medicine and archeology in order to identify a true race from the local mixing of races (2). The evaluation of individuals undergoing a cosmetic or reconstructive operation of the face begins with a facial examination. Facial height and width (bizygomatic distance), which determine the overall face index, are the most significant facial dimensions (3-5). Craniofacial measurements varies from person to person which may be due to several influencing factors such as age, sex, ethnicity, nutrition, genetic and environmental conditions (6-8). Forensic identification and

reconstructive surgery both depend on being able to identify a person's race (9).

## MATERIALS AND METHODS

The study was conducted on 200 medical students in a normal healthy state of aged 16-27 years at the Department of anatomy, Government Medical College, Doda, Jammu and Kashmir after taking proper consent from students. The study was approved by the institutional ethics committee.

The characteristics of the face were measured using an electronic digital vernier calliper.

The following parameters were measured in millimetres on each subject:

Total face height was measured using a digital slide calliper from the glabella (g) to the gnathion (gn).

Total facial width was calculated as the angular separation between the right and left zygomatics (zy).

- (Facial height/Facial width) 100 is the formula for the facial/prosopic index (PI).

All of the measurements were made in the open air and were done three times. Measurements were made with a 1 mm allowable error and the mean value of the measurements was taken for further investigation.

The values of Facial Index (FI) were used to determine the incidence of certain facial types according to Martin-Saller's scale. Based on the Facial Index (FI), the facial phenotype was classified as:

**Table1: All the statistical analyses were done by using SPSS 17.0 version.**

| Facial (Prosopic) Type | Range Of Facial (prosopic) Index (FI) % |
|------------------------|---|
| Hypereuryprosopic      | (FI < 78.9) %                           |
| Euryprosopic           | (79.0 - 83.9) %                         |
| Mesoprosopic           | (84.0 – 87.9) %                         |
| Leptoprosopic          | (88.0 – 92.9) %                         |
| Hyperleptoprosopic     | (FI ≥ 93.0) %                           |

**Table2: Facial index parameters in medical students of Doda, Jammu and Kashmir**

| Parameters                | Male          | Female        | Total         | P-value |
|---------------------------|---------------|---------------|---------------|---------|
| Facial height (mean ± sd) | 124.18± 4.61  | 113.41± 5.79  | 119.79± 6.82  | <0.0001 |
| Facial width              | 106.41± 8.08  | 91.41± 5.72   | 98.91 ± 10.26 | <0.0001 |
| Totalfacial index         | 126.26 ± 8.80 | 116.71 ± 7.28 | 121.11 ± 9.34 | <0.0001 |

## RESULT

The results obtained in this research provides important information concerning the facial parameters in the medical students of Doda city, Jammu and Kashmir. The average mean values of the morphological facial height in males was found out to be 124.18± 4.61 and 113.41± 5.79 in females. The average mean values for the width of the face were found out to be 106.41± 8.08 and 91.41 ± 5.72 in females. The total facial index in males was 126.26 ± 8.80 and 116.71 ± 7.28 in females. It has been found that males in the medical college Doda city have significantly higher values of morphological facial height, the facial breadth and total facial index as compared with the female students. (P<0.0001). Here, the dominant type of face phenotype on the basis of the data collected from the students was found out to be hyperleptoprosopic.

## DISCUSSION

The mean average height and width obtained in a study conducted in the population of Andhra Pradesh was found out to be 124.94 ± 3.85 in males and 113.53 ± 4.56 which was similar to our results.

The mean value of the total facial index of both genders in our study (121.11) was higher than those obtained in a study conducted among adult Hungarians in Vojvodina (Serbia) in which the mean total facial index was 87.9, and the phenotype of highest incidence was mesoprosopic (Pavlica et al., 2004). In our research, the most common facial phenotype on the basis of facial index was hyperleptoprosopic.

Morphological facial height values obtained in our study (124.18± 4.61 in males and 113.41± 5.79 in females) were lower than the values obtained in the anthropometric research in the population of northeastern part of Nigeria (141.15 mm ± 7.5 in

males and 141.29 mm ± 7.6 in females) (Maina et al., 2011).

The observed values in our study were also less as compared to the population of Sri Lanka (140.2 mm ± 10.3 in males and 138.8 mm ± 12.9 in females) (Gohiya et al., 2010; Ilayperuma, 2011).

The mean morphological facial height in males observed in our study (124.18± 4.61) was higher than the value obtained in a survey conducted among West Africans (108.4 mm) (Herskovits, 1937), values obtained in our study (109.61mm ± 5.98, males and 101.34 mm ± 6.79, females) were lower than the values obtained in the population of northeastern part of Nigeria (141.15 mm ± 7.5, males and 141.29 mm ± mm ± 10.3, males and 138.8 mm ± 12.9, females)

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