



## Anthropometric analysis between Naso-aural Inclination and Their Correlation in Bangladeshi Buddhist Rakhain Ethnic Females

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### Abstract

**Background:** Naso-aural Inclination most prominent structure of the face, influencing facial appearance and profile. **Objective:** The aim of the study was to describe anthropometric analysis between naso-aural inclination and their correlation in Bangladeshi Buddhist Rakhain Ethnic females. **Methodology:** This cross-sectional observational study was carried out in the Department of Anatomy, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh from January 2011 to December 2011 for a period of one (01) year. Adult healthy Bangladeshi Buddhist Rakhain females in the age group of 18 to 30 years were included as study population. Standard of normative facial anthropometric values related to nose inclination and ear inclination were measured. **Result:** A total number of 100 adult healthy Bangladeshi Buddhist Rakhain females were recruited for this study. The mean nose inclination was  $29.85 \pm 5.59$  degree and ear inclination left was  $11.93 \pm 3.44$  degree. **Conclusion:** In conclusion the standard of normative facial anthropometric values related to nose inclination is significantly greater than ear inclination among the Bangladeshi Buddhist Rakhain females. [*Journal of National Institute of Neurosciences Bangladesh, July 2023;9(2):132-135*]

**Keywords:** Anthropometric analysis; naso-aural inclination; Bangladeshi; Buddhist; Rakhain ethnic females

### Introduction

Anthropometry is the science that deals with the measurement of size, weight and proportion of the human body. This was adopted by medical scientists to estimate body size for over a hundred year's back<sup>1</sup>. Anthropometric analysis aims to provide the most reliable comparison of body forms by using specific landmarks determined in respect of anatomical prominences. It is now easier to discuss the differences between ethnic and racial groups, and to compare individual variations in both sexes<sup>2</sup>.

Anthropometric measurements of the nose is one of the most visible organs on the face and its appearance contributes enormously to facial aesthetics<sup>3-4</sup>. Clinicians, scientists and artists have always studied the human face and nose: the anatomical bases of communication and environment interaction; the phenotype for personal identification; and the key characteristics that depict the health state of an individual, have all been considered

from both qualitative and quantitative points of view<sup>5</sup>. Additionally, nasal dimensions are used to provide guidelines for treatment planning. The proportions of the so-called ideal nasal shape and the operations designed to achieve these have been the subject of numerous papers. The right size, shape, and proportions of a nose help to make a person beautiful or handsome, because it is at the center of the face<sup>6</sup>. Knowledge of the unique shape, anatomy and dimensions of the nose would be very useful for surgeons undertaking repair and reconstruction of the nose<sup>7</sup>.

Anthropometric methods and surgical practice have now merged to treat congenital or posttraumatic facial disfigurements in various racial or ethnic groups successfully<sup>2</sup>. Nasoplasty surgeons require access to facial data based on accurate anthropometric measurements to perform optimum correction<sup>2</sup>. The anthropometric information is also important for nutritionist and beauticians for estimation of caloric

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requirements from frame size and somatotype of females. Therefore, an attempt had been taken in the present study to make anthropometric analysis between naso-aural inclination and their correlation in Bangladeshi Buddhist Rakhain Ethnic females.

### Methodology

**Study Settings and Population:** This cross-sectional observational study was carried out in the Department of Anatomy at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh from January 2011 to December 2011 for a period of one (01) year. Participants of the study were adult healthy Bangladeshi Buddhist Rakhain ethnic females who were in the age group of 18 to 30 years. Data analysis was carried out in the Department of Anatomy at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka. The following exclusion criteria were used to screen out the ineligible participants through history taking and physical examinations like mixed ethnic origin, congenital craniofacial anomaly, major craniofacial trauma, orthodontic treatment or craniofacial reconstructive surgery, malocclusion, common genetic, endocrine or neurological disorders, craniofacial diseases and abnormalities, growth related disorders and history of facial trauma/reconstruction surgery were excluded from the study. During landmark marking, the participant was asked to sit relaxed on a chair and the head was kept in the normal head position. This position was suitable for correct identification of facial features<sup>8</sup>. All the measurements were taken twice

to avoid measurement error. With the help of a sliding calliper, the measurements were taken in millimetres. The landmarks used for taking different physical measurements have been described by Kolar and Salter<sup>9</sup>. For measuring the inclinations, the participant's head was adjusted using an angle finder in such a way that the Frankfort plane lay horizontal.

**Procedure of Measuring Nasal Bridge Inclination (Figure IA):** Keeping the participant's head at the fixed position described above, the short edge of the angle finder was placed on the nasal bridge and reading was taken from the dial in degrees. If the needle was in front of the 0 mark, the inclination was taken as negative; if it was behind the 0 mark, the value was taken as positive. Usually this inclination is always positive.

**Procedure of measuring ear Inclination (Figure IB):** Keeping the participant's head at the fixed position, the long edge of the angle finder was placed against the long axis of the ear, beginning with the lower edge of the ear and rotating the angle finder until the upper end was at the upper tip of the ear. The reading on the dial was subtracted from 90 degrees to determine the inclination. If the needle was posterior to the 90-degree mark, the inclination was taken as negative; if anterior, it was taken as positive<sup>10</sup>.

**Statistical Analysis:** The data were statistically analyzed by Statistical Package for Social Science (SPSS version 17.0) to determine the range, the mean and standard deviation and any significant correlation between the nose inclination and ear inclination.

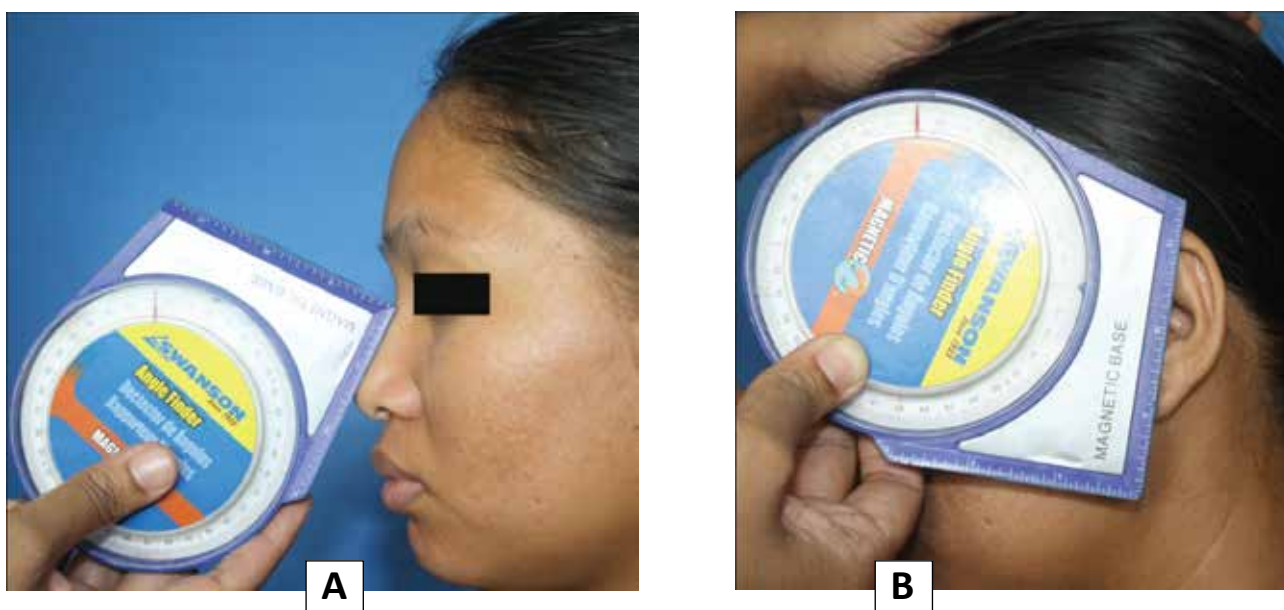


Figure I: Procedures of Measuring the nose inclination (A) and Ear Inclination (B) in a Participant using an Angle Finder

## Results

A total number of 100 female participants were recruited for this study. The nose inclination was  $29.85 \pm 5.59$  degree and ear inclination-left was  $11.93 \pm 3.44$  degree. The differences were statistically significant ( $p=0.000$ ) (Table 1).

Table 1: Values of the Variables Related to Naso-Aural Inclination in the Adult Healthy Bangladeshi Buddhist Rakhain Females\*

Variable	Value (Degree)		P value
	Range	Mean ( $\pm$ SD)	
Nose inclination	19.00-45.00	29.85 ( $\pm$ 5.59)	0.000
Ear inclination -left	6.00-21.00	11.93 ( $\pm$ 3.44)	

\*N (no. of participants)=100 females; †From paired t test;  $p \leq 0.05$  was considered as significant; S=Significant

## Discussion

Characterized the different races and ethnic groups the nasal profile and nasal morphology play very important role. The function of Nasal index is to classify the various types of nose. It is very useful in anthropology as it is one of the clinical anthropometric parameter recognized in nasal surgery and medical management<sup>11</sup>. The nasal index has been found to modify between childhood, adolescence and young adulthood and after young adulthood into the sixth decade of life<sup>12</sup>. Nasal index also can differ due to regional and climatic differences<sup>13</sup>.

This study shows nose inclination was  $29.85 \pm 5.59$  degree and ear inclination left was  $11.93 \pm 3.44$  degree. It observed that nose inclination was higher than ear inclination which was statistically significant ( $P < 0.05$ ). It is evident that the Rakhain females showed mean values of nose inclination similar to the Japanese, Indian, Bulgarian, Czech, German and Slovak females. By comparisons with other populations mentioned, no visible trend could be noted. The Mongoloid population (Japanese) had similar means while the Negroid population had lower (L) means. Porter, along with Farkas, evaluated the differences between continental Asian, Asian American, and North American Caucasian faces in 2002. The most significant differences between these two groups were that the Asian group had significantly smaller mouth width, greater Inter-canthal distance, shorter eye fissures length, and much wider noses. Farkas et al<sup>12</sup> have presented and discussed the findings of 14 anthropometric measurements in peoples of Europe all Caucasoid, Middle East, Asia and of African origin

some of which have been discussed above and tested their differences statistically with North American white people.

## Conclusion

In conclusion, the standard of naso-aural inclination anthropometric values related to nose inclination higher is significantly greater than ear inclination among the Bangladeshi Buddhist Rakhain females. The findings of this study may help to establish the naso-aural inclination in Bangladeshi Buddhist Rakhain females which will be helpful for treatment planning. Furthermore, study needs standardizing a Bangladeshi Buddhist female Rakhain database of nasal variables. Discussions comparing these data with corresponding data from other populations may also be useful as well as proper use in surgery.

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## Conflict of interest

We declare that we have no conflict of interest.

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None

## Contribution to authors

Hossain S, Iqbal M, Yeasmin F were involved in protocol preparation, data & sample collection and literature search and manuscript writing. Sultana R, Begum F were involved in sample preparation and testing. All the authors have involved from protocol preparation up to manuscript writing & revision.

## Data Availability

Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

## Ethics Approval and Consent to Participate

Ethical approval for the study was obtained from the Institutional Review Board. As this was a prospective study the written informed consent was obtained from all study participants. All methods were performed in accordance with the relevant guidelines and regulations.

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