

Analysis of Nasolabial & Nasofacial Angles between Bengali & Manipuri Adult Males of Bangladesh: A Photo-Anthropometric Study

Pathan MAK^{1*}, Paul P², Akhter N³, Choudhury S⁴, Das A⁵ & Hasan A⁶

ABSTRACT

Background: Photo anthropometry is the scientific procedure that comprise using photographs to deal with the study of different proportion of body parts and completed measures that differ broadly among racial groups. This study was done to found the photo-anthropometric difference by measuring nasolabial and nasofacial angles of external nose between Bengali and Manipuri adult male of Bangladesh.

Materials and methods: This cross-sectional analytic study was conducted in the Department of Anatomy, Sylhet MAG Osmani Medical College, Sylhet from January 2022 to December 2022. Fifty (50) Bengali and fifty (50) Manipuri adult males ranging from 25 to 59 years age group were selected through convenient sampling. Photo-anthropometric methods were used for collecting data from Sylhet region. Values of the study were expressed as mean \pm standard deviation. Two samples mean "Z" test was used to compare the results between groups. **Results:** Between the two ethnic groups Bengali and Manipuri, the angular dimensions of external nose, nasolabial angle ($P \leq 0.05$) was significantly higher in Manipuri adult males. On the other hand, the nasofacial angle ($P \leq 0.05$) was significantly higher in Bengali adult males. **Conclusion:** The result of the present study will play an important role in Anatomy, Plastic Surgery, Forensic Medicine, Genetics and Anthropology for identifications, adopting corrective surgical procedures, preparing nasal models for different ethnicity group.

Key words: External nose; Nasolabial angle; Nasofacial angle; Photo-anthropometry.

1. Md. Azmal Khan Pathan, Assistant Professor of Anatomy, Brahmanbaria Medical College, Brahmanbaria.
2. Pankaj Paul, Professor of Anatomy, Sylhet MAG Osmani Medical College, Sylhet.
3. Najnin Akhter, Associate Professor & Head of Anatomy, Brahmanbaria Medical College, Brahmanbaria.
4. Sudipta Choudhury, Associate Professor of Anatomy, Sylhet MAG Osmani Medical College, Sylhet.
5. Anamika Das, Assistant Professor of Anatomy, Sylhet MAG Osmani Medical College, Sylhet.
6. Abul Hasan, Assistant Professor of Anatomy, Gazi Medical College, Khulna.

Address of correspondence: Dr. Md. Azmal Khan Pathan, Assistant Professor of Anatomy, Brahmanbaria Medical College, Brahmanbaria. Email: azmalkhan866@gmail.com

Introduction

The term 'anthropometry' derived from the Greek word Anthropos: A man and Metron: Collective measurement synonymized as

measurement of the man. Anthropometry is gold standard technique that trades with the study of body proportion and absolute dimensions that differ widely among racial

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groups.¹ The term nasal anthropometry deals with size, shape and proportion of the human nose across different populations.² Nasal parameters are also important for evaluation and diagnosis of craniofacial deformities.³ Nasal parameters are considered as one of the most important variables to racial and ethnic origin among the different parameters of cephalometry.¹ Anthropometry based on photographs is called photo-anthropometry which is a new field developing in Bangladesh.

The midline of the mid face features included the pyramidal-shaped structure-the external nose.⁴ The nose dimensions a person varies considering size, shape, and proportion of face occupied by it. Nose offers a visual cue about their personality, ethnicity and other racial identity.⁵ External nose shapes differ significantly between individuals. The external nose's morphometry offers a baseline for expressing racial and ethnic distinctions. The external nose is one of the anatomical structure that provide a look to an persons face.⁶ The knowledge of the nasal anthropometry is essential for the rhino plastic surgeon accurate preoperative planning.¹ Photo-Anthropometry is easy to use and is relatively noninvasive and cheap.

As a result, photo-anthropometry of the craniofacial region can be used to get various angular and linear measurements of the nose.⁷ The shape of the external nose and its relationship with the face are quite different among races in both anatomically and morphologically. Kinds of nasal surgery are performed recently on the basis of nasal anthropometry for aesthetic refinement and reconstruction in patients of different nationalities.⁸ Though Bangladesh is a relatively small country, people of different ethnic groups live here and these different groups have differences in their physical characteristics. The Manipuri community is one of the major tribe in Bangladesh. The people from the Manipuri tribe have different physical characteristics from those of the Bengali population⁹. So the prime objective of the study to established the Photo-anthropometry of external nose between Bengali and Manipuri adult males of Bangladesh.

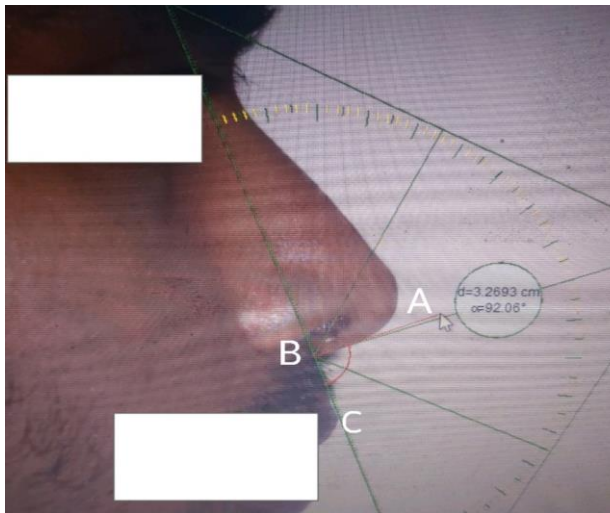
Materials and Methods

This cross-sectional analytic study was done in the Department of Anatomy, Sylhet MAG Osmani Medical College, Sylhet from January 2022 to December 2022 after getting written clearance from the Ethical committee to avoid any medicolegal

questions during collection of digital photograph of face from the subjects. About fifty (50) Bengali and fifty (50) Manipuri adult males (Age 25 to 59 years) were selected by convenient sampling technique. However any congenital facial abnormalities, nasal surgery or trauma subjects are excluded from inclusion criteria. A pre-designed data collection sheet used to collect data. Photo-anthropometric methods were used for collecting data from Sylhet region. Moreover, an informed written consent was taken from the subjects. The ossification of all bones of face is completed by the age of twenty five years was the basis of consideration of selection of sample.¹⁰ For data collection digital camera, computer programmed with MB ruler were used. The procedure of the work was narrated to the participants. With the help of a questionnaire information was collected from all the participants. Age of the participant was filed from birth certificate and/or national identity card. Digital photography of face–lateral view was taken. This procedure was an alternative of manual anthropometry provided that the images was captured in a standardized fashion.¹¹ Participant was guided to follow the instruction that was neutral, relaxed facial

expression and all facial jewelry was expelled from the subject if present. The participants were seated comfortably on a chair looking straight forward.¹¹ The camera was set up on a stand. Lateral facial photographs was taken with a digital camera, using flash mode from a fixed distance (4 feet) using zoom function.¹¹ The participants head was at the same level as the camera for providing a good image of face and also kept the distortion of face to a minimum. The lateral facial photographs was captured at a fixed time between 9 AM and 2 PM to avoid diurnal variations. All the photographic measurements of the subjects was taken by same researcher in a computer programme named Adobe Photoshop.¹¹ The “nose height” was measured from nasion to subnasale by slide caliper before taking lateral facial photograph of each subject. Then the “nose height” of individual photograph was transformed into physically measured value by using the transform option of Adobe Photoshop. Then MB ruler software was used to measure the variables from the photograph.¹² A line drawn from pronasale to subnasale and subnasale to upper lip points for measuring nasolabial angle.¹³ And to get nasofacial angle, a line drawn from pronasale to nasion and nasion

to pogonion. Both angles were identified in a digital lateral photograph of face⁷ Then this angles were measured by using the 'MB Ruler' software and was recorded on data sheet.¹²



Photograph 1. Right lateral view of face with head in standard position showing nasolabial angle (ABC). B-subnasale, A-

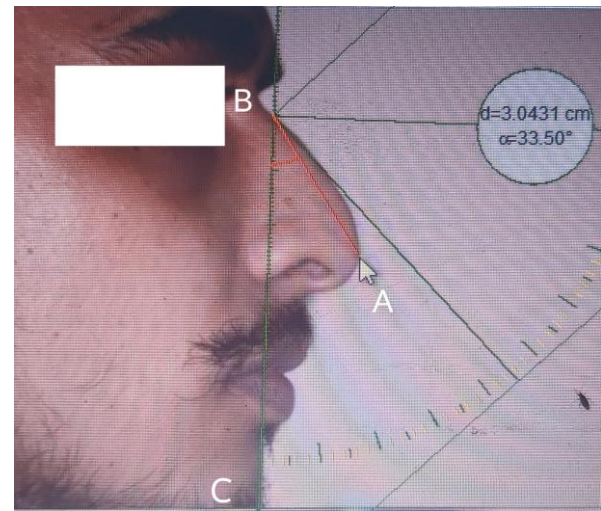
Data analysis

Values of the study were measured as mean \pm standard deviation. Two sample mean "Z" test was used for comparison the results of this two groups.

Results

Nasolabial angle in Bengali adult males, the mean \pm SD of nasolabial angle was $86.68^\circ \pm$

pronasale, (B-C)-line from subnasale to upper lip.



Photograph 2. Right lateral view of face with head in standard position showing nasofacial angle (ABC). (A-B)-line from nasion to pronasale,(B-C)-line from glabella to pogonion, A-pronasale, B-nasion, C – pogonion.

1.56. The nasolabial angle ranged from 83.56° to 90.12° and in Manipuri adult males, the mean \pm SD of nasolabial angle was $95.44^\circ \pm 3.78$. The nasolabial angle ranged from 82.01° to 102.10° . From Table I, it is evident that the mean nasolabial angle was significantly higher ($P < 0.001$) in the Manipuri adult males than in the Bengali adult males (Fig. I).

Table I: Nasolabial angle in Bengali and Manipuri adult male.

Variables	Adult male (N = 100)		P-Value
	Bengali (n = 50)	Manipuri (n = 50)	
Nasolabial angle (°) (Mean ± SD)	86.68 ± 1.56 (83.56 - 90.12)	95.44 ± 3.78 (82.01 - 102.10)	<0.001**

Figure in parentheses indicate range, Comparison between Bengali and Manipuri adult male was done by two sample Z-test. * = Significant at P < 0.05 (2 tailed), ** = Significant at P < 0.01 (2 tailed), N = Total number of sample, n = Sample size, SD = Standard deviation.

Nasofacial angle in Bengali adult males, the mean ± SD of nasofacial was 37.38° ± 3.90.

The nasofacial angle ranged from 29.50° to 44.10°. In Manipuri adult males, the mean ± SD of nasofacial was 35.99° ± 3.07 and the nasofacial angle ranged from 25.08° to 45.80°. From Table II, it is evident that the mean nasofacial angle was significantly (P = 0.040) higher in Bengali adult males than Manipuri adult males (Fig. I).

Table II: Nasofacial angle in Bengali and Manipuri adult male.

Variables	Adult male (N = 100)		P-Value
	Bengali (n = 50)	Manipuri (n = 50)	
Nasofacial angle (°) (Mean ± SD)	37.38 ± 3.90 (29.50 - 44.10)	35.99 ± 3.07 (25.08 - 45.80)	0.05*

Figure in parentheses indicate range, Comparison between Bengali and Manipuri adult male was done by two sample Z-test. * = Significant at P < 0.05 (2 tailed), ** =

Significant at P < 0.01 (2 tailed), N = Total number of sample, n = Sample size, SD = Standard deviation.

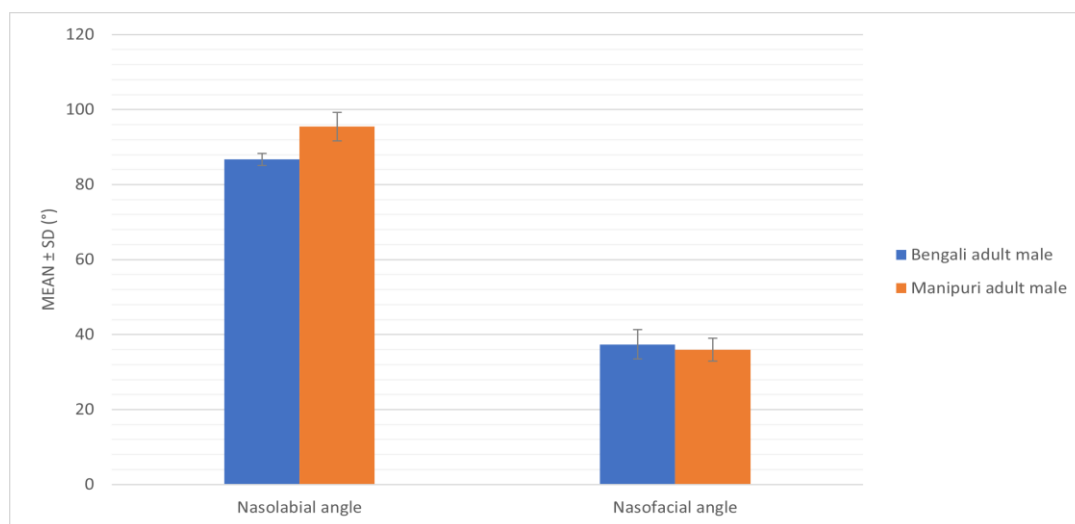


Fig 1: Bar diagram showing nasolabial angle (°) and nasofacial angle (°) in Bengali and Manipuri adult male.

Discussion

Nose is the most protruding part of the face of human. Morphometry of nose is identical and differs from person to person, tribe to tribe and also different in various environmental region. Nasolabial angle and nasofacial angle were measured in this study from digital photograph of face in lateral view. Results of different photographic variables of this study and the photographic variables of other studies of Bangladesh and different countries like India, Nigeria, Iran, Turkey, Nepal, China, Brazil were discussed. In the present study, we have shown that the mean nasolabial angle of Bengali adult was 86.68° and Manipuri adult male was 95.44°. The mean nasofacial angle of this present study was statistically significant and it was greater in Manipuri adult male compared

with Bengali adult male. The mean nasofacial angle of Bengali adult male was 37.38° and Manipuri adult male was 35.99° of this present study. The mean nasofacial angle was statistically significant and it is higher in Bengali adult male compared with Manipuri adult male of this present study. A study on nasolabial angle measurement conducted by Uzan et al. (2005) in adult males of Turkey where the mean nasolabial angle was 90.32^{o15}. Another study by Ferdousi et al. (2013) in Garo people of Bangladesh where mean value of nasolabial angle was 91.28^{o7}. Study on nasolabial angle find that study conducted by Uzan et al. 2005 on Turkish adult male where the mean value of nasolabial angle was greater than Bengali adult male of present study but the mean value of nasolabial angle was lesser

than Manipuri adult male of present study.

In the another study conducted by Ferdousi et al. 2013 on Garo adult male of Bangladesh where the mean value of nasolabial angle was greater than Bengali adult male of present study but the mean value of nasolabial angle was lesser than Manipuri adult male of present study.

We have also observed a study on nasofacial angle measurement by Akter T. 2018 in adult males of medical students of Dhaka city where the mean nasofacial angle was 34.11° .¹² Another study by Ferdousi et al. (2013) in Garo people of Bangladesh⁷ where mean value of nasofacial angle was 40.27° . On observation of study of nasofacial angle find that the study conducted by Ferdousi et al. (2013) in Garo people of Bangladesh where the mean nasofacial angle was found greater value than the Bengali and Manipuri adult male of present study. On the other hand, Akter T., 2018 found the mean value of nasofacial angle was lower in medical students of Dhaka city than the Manipuri and Bengali adult male of present study.

Limitations

i) The sample size was not very large (some study subjects were unable to be cognized and to include as participants for the study

and some of them didn't permit to give facial photographs)

ii) Study subjects were selected from the Sylhet region which may not represent the actual picture of the Bengali and Manipuri adult males of Bangladesh in minimum and
iii) During sorting of study subjects, the assessment of exclusion criteria were based totally on information gathered through verbal enquiry and on visual impression.

Conclusion and Recommendation

Results of this present study showed that nasolabial angle measurements was significantly higher in Manipuri adult males than in Bengali adult males and nasofacial angle measurement was significantly higher in Bengali adult males than Manipuri adult males of Bangladesh. Study subjects should be selected from different region of Bangladesh for further studies and also from different sets of people to represent the actual information of the country. More research is needed to get more precise data on different anthropometric measurements of external nose and use of more sample size to investigate the variations on morphometry of external nose. Research should be done on others tribal population to find out morphological differentiation. Studies can be done on different age groups

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to find out age related changes on anthropometry of nose. There are further scopes for studying variables that were not included in this study.

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Disclosure

All of the authors declared no competing interests.

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