

**Assessment of nose width in western Maharashtra population: A cross-sectional study***Snehal Deulkar<sup>1</sup>, Vinod Shende<sup>2</sup>, Sachin Gathe<sup>2</sup>*

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**Abstract:**

**Introduction:** Facial anthropometry is an important tool in forensic medicine, genetic counseling, reconstructive surgeries and certain manufacturing industries. One of commonest parameter studied is nose width. Hence the present study was carried out to study the nose width in western Maharashtra population. **Material and methods:** The present cross-sectional study was performed on 100 males and 100 females of 18-25 years of age. The study population were the students from the dental, medical and nursing colleges in Mumbai and surrounding region. Subjects were selected according to predefined inclusion and exclusion criteria. The measurements were obtained using sliding vernier calliper, transparent protractor, measuring ruler and stadiometer. Width of nose is measured as the straight distance between the two alae. **Results:** In males, maximum nose width was recorded in interval of 35.1 – 38.0 mm (40%) and minimum nose width in interval of 44.1 – 47.0 mm (2%). In females, maximum nose width was recorded in interval of 32.1 – 35.0 mm (45%) and minimum nose width in interval of 41.1 – 44.0 mm (1%). In total group, 35% had nose width in interval 35.1 – 38.0 mm while 1% had their nose width in interval of 44.1 – 47.0 mm. **Conclusion:** The results of the study provide an important data for forensic investigations, physical anthropometry data base and to guide surgeons in rhinoplasty, nasal reconstructions.

**Key words:** Facial anthropometry, width of nose, Vernier caliper, Western Maharashtra

**Introduction:**

Nose is the most obvious and may be the first fascinating feature of the face. Concerning the nose location, it is present in the central position along the geometrical division of the face. It's a two chambered organ, divided in proportion by a septum, rightly contributing for the overall beauty of human. Racial origin can be commented upon by careful examination of different features of nose. Each race has got specific nasal features whether Caucasian, Africans or Asians. Each race has its own special beauty. Like in Caucasian, the nasal bridge is high, straight and slim with the naso-labial angle of 90 to 100 degrees in the males and up to 120 degrees in the females and having golden triangle tilt at the tip. In Africans, often the bridge height is low with broad tip, short columella and the flared nostrils. While in Asians, the nose seems to lie between Caucasians and Blacks in bridge height, tip width, columella length and alar flare [1,2]. There are wide variations in the nose morphology depending upon age, sex, ethnic group and race.

External environment, climate and socioeconomic status are also seen to play an important role in determining the nasal features, narrower nose being favoured in cold weather and dry climate and broader nose in warmer climate [3,4]. Facial anthropometry has become an invaluable tool in forensic medicine. It is also useful in genetic counselling, reconstructive surgeries. It is a scientific art to reconstruct the face for forensic purpose or in plastic surgery. What it requires is to visualise faces on bony framework of face. One of the important facial anthropometric parameter studied is width of nose. It is one of the first points we notice in face. [5-9]. To achieve this goal, baseline data on facial parameters and indices will be helpful. Thus the present study was carried out to study the nose width in western Maharashtra population.

**Materials and Methods:**

The present cross-sectional study was performed on 100 males and 100 females of 18-25 years of age. The study population were the students from the

dental, medical and nursing colleges in Mumbai and surrounding region. The subjects who were residents of Western Maharashtra region like Mumbai, Thane, Ratnagiri, Raigad and Sindhudurg districts were included for the study. The subjects who have undergone any facial plastic or reconstructive surgery, subjects having history of nasal trauma either acquired through road traffic accidents or any other forms of trauma, subjects having any obvious nasal deformity like congenital or developmental discrepancies were excluded from the study. The study procedure was explained to each participant in detail and written informed consent was obtained prior to the measurements. The study was approved by institutional ethics committee. The measurements were obtained using sliding vernier calliper, transparent protractor, measuring ruler and stadiometer. Before listing the measurements made to determine the various dimensions of the nose, it is necessary to define the landmarks from which such measurements are conventionally made [2,10].

**Ala (al) Left and Right** – The classical anthropometric landmark of the nasal wings at the most lateral point of the outer surface.

#### Width of the nose (al to al):

It is measured as the straight distance between the two alae.

#### Statistical analysis:

All the data was collected and tabulated on excel sheet. The values in the study were expressed in terms of mean and standard deviation (SD) by using Microsoft Excel software. The data was a quantitative type of data. The data was analysed by using statistical software named “Graphpad instat, version 3, California, Sandiago”. For comparison between different values in different groups unpaired ‘t’ test was applied. P value < 0.05 was considered to be significant.

#### Results:

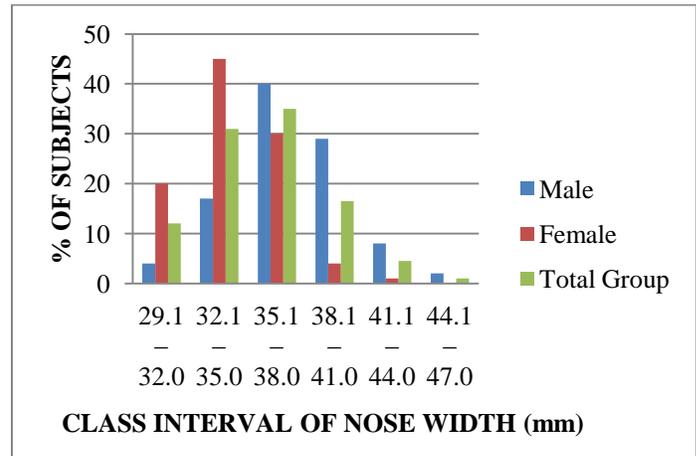
**Table 1:** Nose width measurements in 200 subjects

Class intervals of nose width (mm)	Males		Females		Total group	
	No	%	No.	%	No.	%
29.1 – 32.0	04	04	20	20	24	12
32.1 – 35.0	17	17	45	45	62	31
35.1 – 38.0	40	40	30	30	70	35
38.1 – 41.0	29	29	04	04	33	16.5
41.1 – 44.0	08	08	01	01	09	4.5
44.1 – 47.0	02	02	00	00	02	01

In males, maximum nose width was recorded in interval of 35.1 – 38.0 mm (40%) and minimum

nose width in interval of 44.1 – 47.0 mm (2%). In females, maximum nose width was recorded in interval of 32.1 – 35.0 mm (45%) and minimum nose width in interval of 41.1 – 44.0 mm (1%). In total group, 35% had nose width in interval 35.1 – 38.0 mm while 1% had their nose width in interval of 44.1 – 47.0 mm.

**Graph 1:** Percentage distribution of nose width



#### Discussion:

In the present study, the total group, male group and female group show mean width of the nose ( $\pm$  SD) of  $35.9 \pm 3.0$  mm,  $37.4 \pm 2.9$  mm and  $34.3 \pm 2.3$  mm respectively. The width of the nose shows extremely significant statistical difference ( $p = 0.0001$ ) when the male and female groups are compared.

The values of width of the nose measured by previous researchers and the present study are as follows.

Kurulkar GM and colleagues reported the width of nose as  $35.6 \pm 2.4$  mm  $32.6 \pm 2.5$  mm respectively in 200 adult Bombay populations [11]. Khandekar et al studied lip nose complex in 100 subjects of different age group from western Maharashtra population particularly from Mumbai. They reported that there is a similarity in columellar width between Chinese and Indians. Nasal width is more in Indian males compared to Indian females at all the age groups. Nasal width is found to maximum amongst blacks compared to Indians and Caucasians at all the ages [12].

Our study results suggest that the Indian population, particularly western Maharashtra population has difference in width of nose than the subjects examined by various researchers. The difference in nose width measured by previous workers and the present study is because of racial and regional variations. The values for nose width in the

male group of the present study lie in between the values recorded by Farkas LG et al (1986), Hoffman BE et al (1991), Oladipo GS et al (2009), Garandawa HI et al (2009). It shows that the Indian noses are broader than the white or Caucasian noses while the black or Negroid noses are the broadest. The same is observed among the females of different communities and the races [13-17].

### Conclusion

The parameters evaluated in this study are comparable with previous studies and provide an important data for forensic investigations, physical anthropometry data base and to guide surgeons in rhinoplasty, nasal reconstructions.

### Limitations of the study

There is a need to study larger samples to establish ethnic norms from nasal parameters and nasal index for the entire Indian population of different age groups and in both sexes that may not have manifested in this small study.

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### References:

1. Millard DR. A Rhinoplasty Tetralogy: Corrective, secondary, congenital, reconstructive. 1st ed. Boston:Little, Brown and Company; 1996:1-4.
2. Snehal Deulkar, Sachin Gathe, Shabana Borate, Vinod Shende. Morphometric Data of Nose in Western Maharashtra Population: A Cross Sectional Study. IJCMR; 2(3):694-696.
3. Hall RL, Hall DA. Geographic variation of native people along the pacific coast. Human Biology.1995; 67:407-426.
4. Sinnatamby CS. Last's Anatomy: Regional and applied. 12th Ed. Edinburgh: Churchill Livingstone Elsevier; 2011:371-377.
5. Oladipo G. S, Olabiyi, A O, Oremosu A.A, Noronha,C .C. Nasal indices among major ethnic groups in Southern Nigeria. Scientific Research and Essays 2007, 2 (1): 20-22.
6. Krishan K, Kumar R. Determination of stature from cephalo-facial dimensions in a North Indian population. Legal Medicine 2007, 9(3):128-33.
7. Krishan K. Estimation of stature from cephalo-facial anthropometry in north Indian population. Forensic Science International 2008, 181(1-3):52e1-52e6.
8. Olotu J, E, Eroje A, Oladipo G, S, Ezon-ebidor E. Anthropometric study of the facial and nasal length of

adult Igbo ethnic group in Nigeria. The Internet Journal of Biological Anthropology 2009, 2(2).

9. Madison G. The passing of the great race part 1 language and nationality 2004, Chapter 2. Page 2-4.

10. Singh IP, Bhasin MK. A laboratory manual on biological anthropology. 1st ed. Delhi, India: Kamla Raj Enterprises; 1968:16-70.

11. Kurulkar GM, Rajadhyaksha VS. Anthropometric measurements in Bombay: Part 1 Anthropometric study of 200 subjects (100 male and 100 female). Ind Jour Med Res. 1932 July; 20(1):155-261.

12. Khandekar B, Srinivasan S, Mokal N, Thatte MR. Anthropometric analysis of lip-nose complex in Indian population. Indian J Plast Surg. 2005 July-December; 38(2):128-131.

13. Farkas LG, Kolar JC, Munro IR. Geography of the nose: A morphometric study. Aesth Plast Surg. 1986; 10:191-223.

14. Hoffman BE, McConathy DA, Coward M, Saddler L. Relationship between the piriform aperture and interalar nasal widths in adult males. Journal of Forensic Sciences. 1991 July;36(4):1152-1161.

15. Oladipo GS, Fawehinmi HB, Suleiman YA. The study of nasal parameters (nasal height, nasal width, nasal index) amongst the Yorubas of Nigeria. The Internet Journal of Biological Anthropology. 2009 [cited 2010 Dec 13];3(2).

16. Oladipo GS, Udoaka AI, Afolabi EO, Bob-Manuel IF. Nasal parameters of Itsekiris and Urhobos of Nigeria. The Internet Journal of Biological Anthropology. 2009 [cited 2010 Dec 13]; 3(1).

17. Garandawa HI, Nwaorgu OGB, Oluwatosin OM. Morphometric nose parameters in adult Nigerians. The Internet Journal of Otorhinolaryngology. 2009 [cited 2010 Dec 29];10(2).