

# Study of nasal index of population of Gujarat an anthropometric study

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## Abstract

**Background:** Anthropometric analysis in clinical practice play very important role in distinguishing various racial and ethnic feature and their preservation. Human nose differs in anatomy and morphology among racial groups. The racial and ethnic morphometric differences in nose exist in the world population. This has been the subject investigation for many scientists. The size, shape and proportion of nose are very valuable for cosmetic and plastic surgeons under taking repair and reconstruction of the nose. Soft tissue Software photo anthropometric study has been conducted with For Gujarat population. Average Nasal index for male was 80 and female was 76 with significant difference between two sex ( $p < 0.01$ ). Nasal index of the Gujarati male and female has been compared with other races.

**Key words:** Nasion, Subnasale, Alar width, Nasal Index, Reconstructive Surgery Gujarat.

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## INTRODUCTION

It is well established fact that single standard of facial aesthetics is not appropriate for to diverse race and ethnic groups. Facial characters are largely influenced by factors such as race, ethnic groups, age, sex, culture. Facial proportions and their geometry has been subject of investigation from ancient times (Florine, Vegter *et al.*, 2000).<sup>1</sup> Greek canon of beauty were highly influenced by anatomic scholars since renaissance period and many of it with some modification are still embraced as the basic foundation of aesthetic facial analysis by plastic and reconstructive surgeons (Florine, Vegter *et al.*, 2000).<sup>1</sup> It's a well known fact that morphological features of different race and ethnic groups does not appear

randomly but are distributed in geographic cluster. Ethnicity is a variable that affects craniofacial dimension (Rajakshmi, C.H. *et al.* 2001).<sup>2</sup> Nasal Index is very useful in distinguishing racial and ethnic difference (Franciscus R.G. *et al.* 1991).<sup>3</sup> With the development of digital technology human face and its various characters have become an identity criteria for individual. Human anthropometry is well developed branch with lot of research work going world around. nasal index is one such parameter which has been studied in the Gujarat with diverse population has no such data. Nasal Index is an ethnic sensitive parameter by which the individuals can be classify in to various type of noses. Migration of large number of people from Gujarat to world over makes it necessary to have a base line data for plastic surgeon and reconstructive surgeon. Unknown identity of individual is also identifying using such data in various fields like forensic medicine, cybercrime and reconstructive surgery.

## MATERIAL AND METHODS

A total number of 760 subjects form Gujarat were studied. All subjects belong to Gujarat region with their forefather belonging to Gujarat and there is no intercaste marriage in their family. Subjects were healthy individual without any known craniofacial deformity.

After the ethical clearance of institute ethical committee, the study was started. All subjects were between 18-25 years of age. Out of which 379 were males and 381 were females. Subjects were selected randomly from various a region of Gujrat. Frontal Photograph was taken in Frankfort's plane with subjects in standing position. Photographs were taken with 10 mega pixel camera and subjected to soft tissue anthropometric software system designed in MATLAB Version 7. Photographs were analysed by one observer to prevent inter observer error. All soft tissue landmarks were reproduced on the photograph using software. The analysed data were taken on Microsoft excel file. All collected data were summarized using SPSS version 10

**SOFT TISSUE LANDMARKS**

1. **Nasion (n)** - The deepest depression at the root of the nose typically corresponds to the nasofrontal suture.
2. **Subnasale (sn)** - Junction between lower borders of nasal septum and cutaneous portion of the upper lip in the midline.
3. **Alare (al)** - The most lateral point on the nasal ala on right and left side.

**MEASUREMENTS CALCULATED**

**Length of Nose-** It is distance between Nasion (n) and Subnasale (sn).

**Width of Nose-** It is distance between Ala.

**NASAL INDEX-** Width of Nose / Length of Nose X 100

**RESULTS**

Gujarat population had mean nasal index of 78.0 Average Nasal index of Male was 80.0 and Female had 76.0. From above result it is obvious that Gujarati Male had higher Nasal Index than Gujarati Female. Type of Nose was Mesorrhine in both males and females. Both males and females had significant difference in their nasal index (P<0.01). Present study revealed that racial as well sexual difference in nose type and nasal index is present in male and female as well in different racial group.

**Table 1: Nasal Index of Gujarat population**

Populations	Average Nasal Index
Gujarati Male	80.00
Gujarati Female	76.00

**Table 2: Comparison of nasal index of different population**

Population	Authors	Male	Female
Dangi	Priyanka singh <i>et al.</i> (2006)	76	76
Onges	Pandey (2006)	87	90
Ahirwars	Singh and Purkait (2006)	81	82
Dangis	Singh and Purkait(2006,2008)	76	76

Andoni	Oladipo et (2006)	79	83
Okrika	Oladipo et(2009)	86	86
North Indian	Agarwal (2016)	67	60
Western Utter Pradesh	Sudhakar <i>et al.</i> (2016)	75	72
South Indian	Radha <i>et al.</i> (2019)	67	64
Jammu and Kashmir	Nusrat <i>et al.</i> (2019)	72	65
Gujrati	Present study	80	76

**DISCUSSION**

Nasal index is an request of facial triad its and internationally accepted parameter for racial origin<sup>32</sup>. Rhinoplasty and reconstructive surgery use nasal index as an important parameter in repare and reconstruction as well as medical management<sup>34-36</sup> Nasal index is one of the clinical anthropometric parameter recognized in nasal surgical and medical management. Nasal index of Dangi males and female was 76.5 (Priyanka, Singh. *et al.* 2006)<sup>4</sup> which was lesser than Gujarati male (80.0) and female (76. 0). Nasal index of Ahirwars (Priyanka, Singh. *et al.* 2006)<sup>4</sup> male was 81.0 were as for female it was 82.4 which is higher than Gujarat male (80.00 and female (76.0). These findings suggest that Gujarati female had nasal index similar to Dangi females were as in Ahirwars females it was higher.<sup>4</sup> In a study of nasal index in jammu and Kashmir Nusrat *et al.*<sup>50</sup> had found the nasal index of female was 65 and 72 for male of Kashmir with with predominant type of nose was leptorrhine ( ) Such difference should be subjected to further investigation because of its relevance to forensic science. Nasal index of Igbo male was 95.9 and female was 90.8(Oladipo *et al.* 2007)<sup>5</sup> which is higher than Gujarat population. Nasal index of Yorubas male was 90.0 and female was 88.1 (Oladipo *et al.* 2007)<sup>5</sup> whereas Ijaws male show nasal index of 98.6(Oladipo *et al.* 2007)<sup>5</sup> and in female nasal index was 94.2(Oladipo *et al.* 2007).<sup>5</sup> All groups show higher nasal index than Gujarat population. Nasal index was found to be 73 in an study of population of Western Uttar Pradesh by Sudhakar *et al.* which is lower than the present study In another study on south Indian population done by Radha *et al.*<sup>20</sup> nasal index of male was 67 and female was 64 with predominance of leptorrhine type of nose The nose is one of the best clues to racial origin. Nasal index is very useful anthropometric parameter in nasal surgery and medical managements (Hansen and Mygine, 2002).<sup>6</sup> Nasal Index is related to regional and climatic difference (Farkas *et al.* (1986).<sup>7</sup> Most Caucasian are Leptorrhine having long and narrow nose with nasal index of 69.9 or less.<sup>6</sup> A successful outcome in rhinoplasty requires through and accurate preoperative planning and this can be made only possible if one has an objective in mind.

## CONCLUSION

Nose is an aesthetic as well as anatomical landmark in racial identification feature. face and consider as symbol of beauty and honour. Change in Nasal index is highly influence by type of race, condition of weather. The result of present study will be useful for planning of corrective and reconstructive plastic surgery of the nose. Since each racial group and ethnic population has their own nasal character and anatomical structure the mean nasal values should be correctly understood in each ethnic group to preserve race specific character since the definition of aesthetic is different in various racial groups.

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