

# Anthropometric studies of nasal parameters of Qazvin residents, Iran

## Abstract

**Background:** Nasal parameters are important in anthropology to distinguish race, sex and ethnic of people groups and are useful to identify unknown person. The aim of this study was to determine the anthropometric characteristics of Nose in residents of Qazvin, Iran.

**Materials and methods:** A cross-sectional survey was performed on 300 adults from Qazvin; they were 18 to 55years-old. There were 160 males and 140 females with a male/female ratio of 1.2:1. This group was randomly selected. Without gender prejudices their nasal parameters, nasal height, tip protrusion and alar thickness, were measured using a sliding caliper.

**Results:** The mean nasal width/height (Nasal index -NI) was 90.7 in males and 88.2 in females. Males had a higher NI compared to females ( $p < 0.03$ ). The most common type of nasal variability is type A (70.5%), Platyrrhine nose, Type B (26.7%) especially in females (mesorrhine) and Type C (leptorrhine) (2.8%).

**Conclusion:** There is a significant correlation between sex of an individual and type of nose. Platyrrhine nose, among males and mesorrhine among females were more common, only 2.8% being leptorrhine. The nasal indices in males were higher than in females.

**Keywords:** anthropology, nasal index, qazvin residents

Volume 1 Issue 1 - 2015

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**Received:** June 08, 2015 | **Published:** July 21, 2015

**Abbreviations:** NI, nasal index; NW, nose width; NH, nose height

## Introduction

Anthropometry is a branch of science that measures linear and angular dimensions of the body in living human. Anthropometric Findings, dimensions of the face and skull, allow researchers to use it in diagnosis, classification and treatment of craniofacial disorders through orthographic surgery or facial plastic surgery.<sup>1-3</sup> According to the findings of anthropological studies, we can discuss about the differences of health and nutritional status and also, economic and social wealth in different races.<sup>4</sup> Nose is located in the middle part of the face, which is the most notable element and is considered as one of the best clues to the origin of the race. The shape of nose including the tilt, tip and septum varies in races, tribes and geographic areas.<sup>5</sup> Thus, according to the appearance of the nose, the demand is increasing for rhinoplasty surgery.<sup>6</sup>

Topographical study of nose, which is performed before surgical operation to change the shape and size of the nose, is important for rhinoplasty surgery. So knowing the details of the nose for any particular ethnic group, enables surgeons to offer patients to have a better cosmetic result.<sup>7</sup> Characteristics and differences of nose among various ethnic groups have been studied.<sup>8</sup> Variables that can affect the shape of the nose include race, tribe and environmental climate. Nasal index in various races show its relevance to climate, such that narrow nose is observed in cold and dry weather, while flat or wide nose, could be seen in moist and warm areas which is the result of natural selection in human evolution.<sup>9,10</sup> Nasal index (NI) is

an important anthropometric parameter, which helps to identify and identify race and gender of an unknown individual.<sup>11</sup> Several studies have been conducted in accordance with the nasal index and classified nose to three types' platyrrhine, mesorrhine and leptorrhine which are determined as following: if the nasal index is less than 70, Nose is leptorrhine; if more than 85, platyrrhine (flat nose) and if it is between 70 and 85, it is called mesorrhine.<sup>12,13</sup> Based on the importance of knowing the characteristics of nose in each region, current study has been performed to identify the anthropometric properties of Qazvin population.

## Materials and methods

This study is a cross-sectional study on 300 (160 men and 140 women) adult individuals, living in Qazvin (Iran). This group was randomly selected. The age range was 18 to 55years. In this study, the subjects had no history of trauma or physical deformities. The populations selected for this study were living in the area over a century. The study was approved by the Ethics Committee of Qazvin University of Medical Sciences. Type of nose, bridge of nose, tip of the nose and nostrils cases were examined in this study. Furthermore, nose width (NW) and nose height (NH) were measured and NI was calculated in the whole group based on following definitions:

- Nose height (NH): from soft tissue nasion to subnasale.
- Nose width (NW): from right to left nasal alae.
- Nasal index (NI): the ratio of nose width to nose height $\times 100$ .
- Nose Shape: Leptorrhine ( $NI < 70$ ), platyrrhine ( $NI > 85$ ) and mesorrhine ( $70 \leq NI \leq 85$ )

Data were collected and statistical analysis was done using descriptive statistics and independent sample t-test, using SPSS 16 software.  $P \leq 0.05$  was considered significant, statistically. Each measurement was taken three times and the calculation with accuracy of 1mm was considered.

## Results and discussion

The present study consisted of 300 subjects, 160 males' and 140 females. The age range was 18 to 55years. The mean age was 32 for female and 34-36 for male.

### Types of nose

Four types of nose-convex, concave, straight and curved (eagle) in males and females were examined. As shown in Table 1, in male population, 27 cases (16.8%) were convex, 11cases (6.8 %) were concave, 102 cases (63.7%) were straight and 20 cases (12.5%) were curved. In female population, 35 (25%) cases were convex, 21(6.8 %) cases were concave, 74 (52.8%) cases were straight and 10 (7.1%) cases were curved.

### Bridge of the nose

Three shapes of nasal bridge were detected in males and females: convex, concave and straight. As shown in Table 1, these results were

reported directly in male population, 24 (15%) cases were convex, 70 (43.7%) cases were concave, and 68 (42.5%) cases were straight. The most common type of nasal bridge in male population was concave, while the convex type was the least common. The 13 (9.3%) convex cases, 70 (50%) concave cases, and 57(40.7%) straight cases in female's population were reported. Nasal bridges in most females were concave, whereas convex forms were the least common (Table 1).

### Shape of nose tip

Three forms of nose tip were detected: horizontal, upward and downward. As shown in Table 1, 151 (94.3%) horizontal nose tips were observed in male population, the number of upward and downward nose tips were 5 (3.1%) and 4 (2.5%), respectively. In the female population horizontal, upward and downward nose tips were 73(52.1%), 56 (40%), and 3 (7.8%), respectively (Table 1).

### Shape of nostril

Three shapes of nostril -anteroposterior, transverse and oblique- were studied. As shown in Table 1, 1.57 (35.6%) anteroposterior, 16 (10%) transverse and 87 (54.3%) oblique cases were reported in male population. 80 (57.1%) anteroposterior, 32 (22.8%) transverse and 28 (20%) oblique cases were reported in female population (Table 1).

**Table 1** Nasal morphological distribution of males and females in the Qazvin residents, Iran

		Males		Females	
		Frequency	%	Frequency	%
Nose Type	Convex	27	16.8	35	25
	Concave	11	6.8	21	15
	Straight	102	63.7	74	52.8
	Curved (eagle shape)	20	12.5	10	7.1
Bridge of Nose	Straight	68	42.5	57	40.7
	Concave	24	15	13	9.3
	Concave	70	43.7	70	50
Tip of Nose	Horizontal	151	94.3	73	52.1
	Upward	5	3.1	56	40
	Downward	4	2.5	11	7.8
Nostril	Anteroposterior	57	35.6	80	57.1
	Transverse	16	10	32	22.8
	Oblique	87	54.3	28	20
Shape	Leptorrhine	138	86.25	138	98.5
	Mesorrhine	9	23.75	2	1.5
	Platyrrhine	0	0	0	0

## Shape of nose

Three forms of nose, leptorrhine, mesorrhine and platyrrhine were studied. As shown in Table 1, 138 (86.25%) leptorrhine and nine (23.75%) mesorrhine cases in male population were reported. 138 (98.5%) leptorrhine and two (1.5%) mesorrhine were reported in female population and there was no platyrrhine nose (Table 1).

## Width, height and nasal index

Width, height and nasal index in males and females were studied. Table 2 shows the mean, median, minimal and maximal width, height and the nasal index in males and females. According to this table, the mean nose width in men was more than women: 3.8±0.23cm versus 3.38±0.22cm, which was a significant difference (p=0.001). The mean nose height in men and women were 6.06±0.29 m and 5.68±0.28cm, respectively. This difference was significant (p=0.001, Table 2).

The mean nasal index in men was 62.54±5.78, while in women was 59.61±4.78. There was a significant difference in the mean nasal index (p=0.0001, Table 2). It was shown in previous studies that nasal index is affected by gender.<sup>14,15</sup> Race, tribe and climate are considered to be important factors in shape of nose. For instance, narrower noses are seen in cold and dry weather, while<sup>16</sup> wider nose is seen in warm and wet weather which is the result of natural selection in human evolution.<sup>9,10,16</sup> Nasal parameters can be widely used in nasal surgery, and medical management.<sup>14</sup> According to the height, width and nasal index, three types of nose are defined: platyrrhine, mesorrhine and leptorrhine. Nichani studied nasal indices in four different groups of European, African, Australian, and German and came to the conclusion that racial differences influenced the nasal parameters. In this study, nasal morphology (width, height and nasal index) in the population of Qazvin (Iran) has been studied.<sup>17</sup> This value was higher in comparison to the same value in Canadian, northern Italian, Turkish, Jingpo population of China, Nigeria Isokos

and Kosovo Albanian.<sup>18-22</sup> Findings showed that the average height of nose in women of Qazvin is higher than Sistani & Baluch et al.<sup>23</sup> In this study, the average width of nose in men was more than women and this difference was significant. The result of present study was similar to Kaushal Brahma et al.,<sup>24</sup> Ngeow et al.<sup>25</sup> Staka et al.,<sup>22</sup> (population of Kosovo-Albania) studies<sup>22</sup> and was also similar to Oladipo et al.<sup>26</sup> Also, Nagle et al.<sup>27</sup> showed that in Latvians population there was no significant difference between nose width of males and females population.<sup>27</sup> The study estimated the average height of nose in men was 6.06±0.29 and in women was 5.68±0.28cm. Height in White women at North Italy was 46.37mm.<sup>18</sup> In Isokos of Nigeria was 4.48cm<sup>21</sup> and in the Kosovo Albanian men and women 55.26 and 52.01mm, respectively.<sup>22</sup> According to the study of Heidari et al.<sup>23</sup> the average height of nose in Sistani women were 46.5mm and in the female population of Bluchestan was 53.0mm which was less than the population of Qazvin.<sup>23</sup> Also in the study of Hormozi and Toosi nasal height was 5.57.<sup>4</sup> It confirms the difference in nose height between different populations and races of the world. It also indicated that due to variations in climate, nasal height is variable in different parts of Iran. The average height of nose in men is more than women. This reflects the differences in sex (Sexual dimorphism). The results of present study are similar to Kaushal et al.,<sup>24</sup> Ngeow et al.,<sup>25</sup> Staka et al.,<sup>22</sup> and also Oladipo et al.<sup>26</sup> Whereas, Nagle et al.<sup>27</sup> reported that there is no significant difference in nose height between male and female population.<sup>27</sup> Some studies have shown that the difference in height could be affected by race and gender. Several studies among different groups of populations have reported variable nasal indices according to racial and ethnic differences, which are summarized in Table 3. Mean nasal index in male was more than female, this difference was significant the same result was shown in the studies of Jimoh et al, Oladipo et al.<sup>28</sup> and Akpa et al.<sup>29</sup> According to the results of current study, most noses in both gender populations were leptorrhine and the minimum number of them was platyrrhine.

**Table 2** Average width, height and nasal index in males and females in Qazvin, Iran

	Sex	Mean ± SD*	Median	Minimum	Maximum	p-value
Nasal Wide	Males	3.8±0.23	3.81	3.4	4.43	0.001
	Females	3.38±0.22	3.41	2.7	3.74	
Nasal Height	Males	6.06±0.29	6.08	5.4	6.61	0.001
	Females	5.68±0.28	5.71	5	6.25	
Nasal Index	Males	62.54±5.78	62.27	39.71	74.2	0.0001
	Females	59.61±4.78	59.88	47.12	68.31	

\*SD, standard deviation

**Table 3** Comparison of nasal index of Qazvin population with other population/ NOTE, NI=nasal index

(Author/year)	Population/Race	Gender	NI
Franciscus, et al. <sup>11</sup>	Sudroid	Male	89.8
	Aryans	Male	83
	Western Europeans	Male	69.9
Nichani, et al. <sup>17</sup>	Bantus	Male	85
	German	Male	71
Singla, et al. <sup>30</sup>	Jat-Sikhs (Punjab)	Male	72
	Banias (Punjab)	Male	79.3
Uzuna, et al. <sup>20</sup>	Turkish	Male	59.4
Pandey <sup>31</sup>	Onges (Andaman Islands)	Male	87.43
		Female	90.07
Hormozi, et al. <sup>6</sup>	Iranian	Female	50.7
Oladipo, et al. <sup>26</sup>	Urhobo	Male	89.63
	Itsekiri	Male	90.74
	Nigerian Yorubas	Male	90.02
		Female	83.58
Oladipo, et al. <sup>28</sup>	Nigerian Igbo	Male	95.8
		Female	90.8
	Nigerian Igbo	Male	98.6
		Female	94.2
Heidari, et al. <sup>23</sup>	Sistani	Male	69.7
	Baluch	Male	59.2
Anibor, et al. <sup>21</sup>	Isoko	Male	92.35
		Female	89.51
Eboh, et al. <sup>32</sup>	Ukwuani	Male	97.47
		Female	98.08
	Brahmins	Male	70.02
		Female	69.89
Kaushal, et al. <sup>24</sup>	Majhabi-Sikhs	Male	76.51
		Female	68.95
	Muslims	Male	67.04
		Female	69.38

## Conclusion

On this basis, it can be concluded that in width, height, and index could be expected to show differences by race and gender. These parameters also showed the proximity of the Qazvin residents to the European races.

## Acknowledgements

Preparation of this paper was supported in part by Qazvin University of medical sciences without any grant.

## Conflict of interest

Author declares that there is no conflict of interest.

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