

STUDY OF NASAL PARAMETERS AND NOSE TYPES AMONG UNIVERSITY STUDENTS IN MALAY POPULATION

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Abstract

Human nose can be found in many shapes and sizes. Racial, ethnic and environmental influences can result in different appearances of the nose. Nasal parameters such as nasal height, nasal width and nasal index were investigated in the Malay population, using convenient sampling methods. Study sample consisted of 80 young Malay adults (40 males, 40 females) aged 19-30 years. The mean \pm SD values of nasal height of Malay male and female were 52.2 ± 5.3 and 50.4 ± 9.7 respectively. The mean \pm SD values of nasal width of Malay male and female were 39.7 ± 3.0 and 36.7 ± 3.2 respectively. Mean nasal indices in male and female were 76.66 and 74.55 respectively. The predominant nose type in Malay was found to be of mesorrhine type (medium nose) in both male (67.5%) and female (70%). These findings were comparable with studies done in other Asian races such as Malaysian Indian, Chinese and other Indians. The findings of this study may contribute to satisfactory outcomes in cosmetic and reconstructive rhinoplastic surgery, anthropology, and forensic medicine in the Malay population.

Key words: *nasal height, nasal width, nasal index, Malay population.*

INTRODUCTION

Human nose can be found in many shapes and sizes. Racial, ethnic and environmental influences can result in different appearances of the nose [1]. The shape of the nose can be determined by climate condition (Last, 1981). Narrow noses are favoured in cold and dry climates while broader noses in warm and moist weather, as a consequence of natural selection in human evolution (Hall and Hall, 1995). Nasal index is very useful in anthropology in distinguishing racial and ethnic differences (Franciscus and Long, 2001; Porter and Olson 2003; Aung, 2000). It also exhibits sexual differences (Zhang, 1990) and it has become a useful tool in Forensic Science (Xu *et al.*, 2001). The facial and nasal dimensions are among the most

important cephalometric parameters that describe human morphology [2].

Sharma and Sharma, 2012^[3] classified the nose types based on the nasal index values as - Hyperleptorrhine or very narrow or fine nose (<54.9), Leptorrhine or narrow or fine nose (55.0 - 69.9), Mesorrhine or medium nose (70.0 - 84.9), Platyrrhine or broad nose (85.0 - 99.9) and Hyperplatyrrhine or very broad nose (100.00).

Several studies reported the nasal indices of Caucasian populations as leptorrhine type and a few reported on African and Nigerian populations as platyrrhine type. Risely (1915) reported the nasal indices of Indo-Aryan and Sudroid populations (Indian Negroids) as 66.9 - 79.6 and 73.1 - 95.1 respectively^[4].

As there was scarcity of information on nasal index in Malay population, this study was aimed at identifying the mean values of nasal parameters and the frequencies and percentages of nose types in different sexes of the Malay population.

MATERIAL AND METHODS

The study sample was selected using the convenient sampling method. It consisted of 80 university students (40 males and 40 females) from UniKL RCMP, Ipoh. The age of the subjects ranged from 19 to 30 years. Subjects who had no trauma or no surgery of the face or nose and no history of cleft lip or cleft palate were included in the study. Nasal height and width were measured as shown in figures 1 and 2.

Nasal index

$$= [\text{nasal width}/\text{nasal height}] \times 100$$

The data obtained was subjected to statistical analysis. Basic descriptive statistics and independent sample t-test were conducted using SPSS (Statistical Package for Social Sciences) version 17. The 'p' value of less than 0.05 was considered as statistically significant.

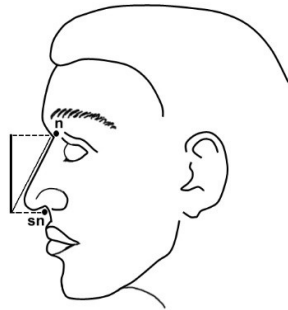


Figure 1

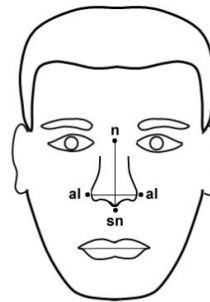


Figure 2

Nasal height was measured as the distance from the nasion (n) to the subnasale (sn). Nasion is the midpoint of the naso-frontal suture at the root of the nose. Subnasale (sn) is the lowest point on the nasal septum, where it joins the upper lip.

Nasal width was measured as a straight distance and at right angle to the nasal height, from ala to ala (al-al). Alare (al) is the most lateral point of the nasal aperture.

A 12-inch fast display calliper: Tresna, series: EC05 (ID: 111-103-20g) was used to measure the nasal parameters. Measurements of all subjects were done by one observer to prevent inter-observer variation. On the basis of the mentioned measurements, the nasal index was calculated as:

RESULTS

Nasal parameters in Malay population were shown in tables 1-4.

Table 1. Nasal height and nasal width in male and female Malay population.

Landmark	Mean value \pm SD	95% CI	p value
Male-nose height (n-sn)	52.2 \pm 5.3	50.47 – 53.88	0.304
Female-nose height (n-sn)	50.4 \pm 9.7	47.25 – 53.46	
Combined Nose height	51.3 \pm 7.8	49.5 – 53.0	
Male-nose width (al-al)	39.7 \pm 3.0	38.7 – 40.6	< 0.001
Female-nose width (al-al)	36.7 \pm 3.2	35.7 – 37.8	
Combined nose width	38.2 \pm 3.4	37.4 – 39.0	
Male nasal index	76.7 \pm 9.1	73.8 – 79.6	0.350
Female nasal index	74.6 \pm 10.9	71.1 – 78.0	
Combined nasal index	75.6 \pm 10.0	73.4 – 77.9	

Table 1 showed nasal height and nasal width in male and female of the Malay population. In Malay population the nasal width was found to be significantly higher in male than in female ($p < 0.05$).

Table 2. Frequency and percentage of nose types found in Malay male according to the classification of nasal indices.

Types of nose in male	Nasal Index	Frequency	Percentage
Hyperleptorrhine (very fine nose)	<54.9	0.0	0.0
Leptorrhine (fine nose)	55.0-69.9	8.0	20.0
Mesorrhine (medium nose)	70.0-84.9	27.0	67.5
Platyrrhine (broad nose)	85.0-99.9	4.0	10.0
Hyperplatyrrhine (very broad nose)	>100	1.0	2.5

Table 2 showed the frequency and percentage of nose types found in Malay male according to the classification of nasal indices. In Malay male, mesorrhine type of nose was found in 67% and leptorrhine type of nose was found in 20% of the Malay population. The other types were found in the ranges between 0 to 10%.

Table 3. Frequency and percentage of nose types found in Malay female according to the classification of nasal indices.

Types of nose in female	Nasal Index	Frequency	Percentage
Hyperleptorrhine (very fine nose)	<54.9	10	2.5
Leptorrhine (fine nose)	55.0-69.9	7	17.5
Mesorrhine (medium nose)	70.0-84.9	28	70.0
Platyrrhine (broad nose)	85.0-99.9	3	7.5
Hyperplatyrrhine (very broad nose)	>100	1	2.5

Table 3 showed the frequency and percentage of nose types found in Malay female according to the classification of nasal indices.

Table 4. Types of nose found in male, female and combined Malay populations.

Types of nose	Male n (%)	Female n (%)	Combined n (%)
Hyperleptorrhine (very fine nose)	0 (0)	1 (2.5)	1 (1.25)
Leptorrhine (fine nose)	8 (20)	7 (17.5)	15 (18.75)
Mesorrhine (medium nose)	27 (67.5)	28 (70)	55 (68.75)
Platyrrhine (broad nose)	4 (10)	3 (7.5)	7 (8.75)
Hyperplatyrrhine (very broad nose)	1 (2.5)	1 (2.5)	2 (2.5)

Table 4 showed the types of nose found in male, female and combined Malay population. In Malay female, mesorrhine type of nose was found in 70% and leptorrhine type was found in 17.5% of the Malay population. The other types ranged between 2.5% to 7.5%. The prevalence of mesorrhine type among males (67.5%) and females (70%) in our study were not significantly different ($p>0.05$).

DISCUSSION

The mean nasal height and nasal width in males were 52.2 ± 5.3 and 39.7 ± 3.0 respectively while those of the females were 50.4 ± 9.7 and 36.7 ± 3.2 respectively. Although the mean values of nasal parameters of male subjects were higher than those of female subjects only the mean value of nasal width was found to be significantly higher in the male than in the female ($p < 0.001$).

The mean values of nasal parameters in the study done by Ngeow et al (2009) on Malay population and Malaysian Indian population^[4] were similar to our findings.

The morphological classification of the nose represented in our study as indicated in Table 4 showed the prevalence of mesorrhine nose type (with a nasal index of 70.0 - 84.9) in both male (67.5 %) and female (70 %) of young Malay adults. The second most common type was leptorrhine (with a nasal index of 55.0 - 69.9) which was also found in 20% of male and 17.5 % of female. The other types ranged between 0% to 10%.

According to Ngeow et al^[4] the nose type in Malaysian Indian population was also mesorrhine or medium type. Also a study on the shape of nose of the Jingpo people in China by Li et al (2000) stated that the type of the nasal index is middle or mesorrhine with a value of 70.0 to 84.9^[5]. This showed that the predominant nose type in Asia is mesorrhine (medium type) and the similarity may be due to the fact that these people are sharing the same climate and geographical area. In the Albanian population the predominant nose type is leptorrhine (fine nose) based on the mean nasal index of 67.07 and 63.87 for males and females respectively^[5].

The nasal index has been studied by several authors; these studies indicated racial and ethnic differences in nasal index among different populations. Most Caucasians are leptorrhine having long and narrow nose with

the nasal index of 69.9 or less or they could be mesorrhine with an index between 70.0 and 84.9. On the other hand, according to Khrisnan and Kumar (2007), Negroids as well as Australoid tribes are platyrrhine (broad nose) with a nasal index of 85 or more^[7]. In the present study the mean nasal index of Malay male and female were 76.7 ± 9.1 and 74.6 ± 10.9 respectively under the category of mesorrhine (medium nose) type. The nose is one of the best clues to racial origin (Madison, 2004). The nasal index is very useful in anthropology and it is one of the clinical anthropometric parameters recognized in nasal surgical treatment (Hansen and Mygind, 2002; Zankl, 2002). Nasal index is related to regional and climatic differences (Last, 1981). Various studies had indicated racial, ethnic and gender differences in nasal index among different populations^[7,8].

The nose plays a role in both warming and moistening of the inspired air. As such, in colder and drier climates, the length of the nasal passage is increased and the base is narrowed, thus increasing the surface area and the period of time over which the inspired air is warmed and moistened^[1]. For this reason it was thought that the shape of the nose in different ethnic groups had been adapted to the climate and environment to which they were being exposed. When conducting large population studies, the rhinologists may find the anthropometric measurements of nasal height, nasal width and nasal index to be a more relevant discriminator and is a better basis for assessment of normal nasal patency in nasofacial surgery^[9]

CONCLUSION

The mean nasal index of Malay population was identified. The predominant nose type of Malay population falls within the mesorrhine nose (medium nose) type which was similar to findings of the previous studies done in the

Asian population. The nasal width was found to be significantly higher in the male than in the female ($p > 0.05$). The findings of this study may contribute to satisfactory outcomes in cosmetic and reconstructive rhinoplastic surgery, designing of face masks, anthropology, and forensic medicine (especially in identifying the remains of the body) in the Malay population.

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