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# Anthropometric Comparison of Nasal Parameters between Male and Female Yoruba Students

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**ABSTRACT**:
Nasal index (NI) is a useful anthropometric parameter in forensic Medicine and Reconstructive Surgery. It is also useful in classification of race and sex of individuals of unknown identity. Such anatomical documentation is absent among the Yoruba students in the Department of Anatomy, OlabisiOnabanjo University, Sagamu, South-West, Nigeria. The study was carried out on 140 Anatomy students, male (n= 58) and female (n= 82) aged between 18-24 years (mean of 21.21) after necessary consents and ethical approval were obtained. With the aid of sliding caliper, Nasal breadths and heights were measured to the last 0. 01 cm. Nasal index (NI) was calculated as the ratio of nasal breadth and nasal height, and data were analyzed statistically. The Nasal heights ranged from 3.10cm to 8.00cm in these students with a mean ± SD of 5.46 ± 0.9. The breadths ranged from 1.90cm to 6.90cm with mean ± SD of 3.94 ± 0.7. The NI was observed to have mean ± SD 73.27 ± 13.64 % and classified as Mesorrhine in both male and female students. The mean ± SD NI was however observed to be 72.77 ± 12.25% in males while it was 73.62 ± 14.61 females and classified as Mesorrhine (medium size noses) in both sexes. This provides baseline data, valuable in Nasal Anthropometry for Clinical practice, Reconstructive Surgery, and Forensic Anatomy.

**Key words:** Nasal index, Nasal Anthropometry, Mesorrhine, Forensic Anatomy.

## INTRODUCTION

For analysis and classification of fossil remains including living population, external measurements from human body and upon the skeleton has been found useful.[1] Nasal Anthropometry has been reported to be an important tool used in Reconstructive Surgery, genetic counseling and Forensic investigation.[2]

The Nasal index (NI) is very useful in anatomical anthropology and it is recognized in Nasal surgical and medical management. Different studies have indicated its racial and ethnic differences and it has been found out to be related to regional and climatic differences. In view of the fact that the Nasal assessment is the first step a surgeon takes before performing Rhinoplasty to change the shape of the nose which is at present a very important branch of cosmetology, the various forms of nasal types must be considered especially among the Yoruba students.

Nasal index has however, been classified into five categories[3].

1. Hyperleptorrhine: < 54.9% (Long Narrow Nose)
2. Leptorrhine: 55.0 - 69.9% (Moderately Narrow Nose)
3. Mesorrhine: 70.0 - 84.9% (Moderate or Medium Nose)
4. Platyrrhine: 85.0 - 99.9% (Moderately Wide Nose)
5. Hyperplatyrrhine: >100% (Very Wide Nose)

This information is of importance in Anthropological studies, Forensic Medicine, Rhinoplasty Surgery and Reconstructive surgeries of the face and nose. The nose is a pyramidal structure located in the midline of the face and attached to the facial skeleton. It has a root that is continuous with the forehead and which opens into its internal surface, separated by nasal septum[4]. Final nasal variations depend on the skin and soft tissue covering the dorsum of the nose, this affect its final nasal contour and profile after nasal augmentation[5].

In the literature, values of nasal index are scares in Africa, most especially (Yoruba anthropometry among Yoruba students had not been documented especially in Olabisi Onabanjo University, hence the need to generate a baseline data in this regard prompted this investigation) among the Yoruba tribe in Nigeria. Hence, the aim of this study is to provide data for documentation on the Yoruba tribe, which could be of utmost importance in anthropological studies and clinical practices.

## MATERIALS AND METHODS

The study was conducted among the students with Yoruba ancestry of about two generations in both parents in the Department of Anatomy, Faculty of Basic

Medical Sciences, Obafemi Awolowo College of Health Sciences, Olabisi Onabanjo University, Sagamu, Ogun State, Nigeria. A total number of 140 (n=58 males and n=82 females) students were randomly selected for the study; aged between 18-24 years, mean age 21.21. The necessary consents and ethical approval were duly obtained from the students and those who had trauma or surgery of the face and nose were excluded from the study. Students with history of Yoruba ancestry of about two generations of both parents were included in the study.

The students were put in comfortable position before various measurements were taken. Nasal breadths (maximum breadth of the nose) and heights (the height of the nose) were measured with the aid of sliding caliper to the nearest 0.01cm. Nasal height is the distance between nasion (ns) and subnasale (sn). The nasal breadth is the distances between right and left alae of the Nose. These were measured in centimetres (cm) with the help of sliding caliper (all measurements were taken with students in comfortable position, sitting in a chair and head in anatomical position[6].

Above measurements were used to calculate Nasal index based on the following formula[7] given below:
Nasal index = Nasal breadth X 100 (in percentage)
Nasal height

The data were entered into Microsoft Excel and analyzed using student's T-test and P-value (0.05) as a level of significance.

**RESULTS**

The results from this study showed that, the mean nasal height for male Yoruba students (5.72 ± 0.88) was significantly higher than values (5.28 ± 0.88) for females Yoruba students. (Fig.1). Likewise, the mean nasal breadth for male Yoruba students (4.11± 0.65) was significantly higher than values (3.83 ± 0.72) for females Yoruba students (Figure 1).

The mean nasal index showed sexual dimorphism with the values for female Yoruba students (73.62 ± 14.61) was not significantly higher than the values in male Yoruba students (72.77+/-12.25) (Figure 2).

The mean, standard deviation, range and P-values of nasal parameters of the male and female Yoruba students are represented in Table 1.

The percentage frequency distribution of the nose types represented showed the prevalence of the mesorrhine nose type among both males (41.38%) and females (37.8%) Yoruba students of Anatomy Department of Olabisi Onabanjo University.

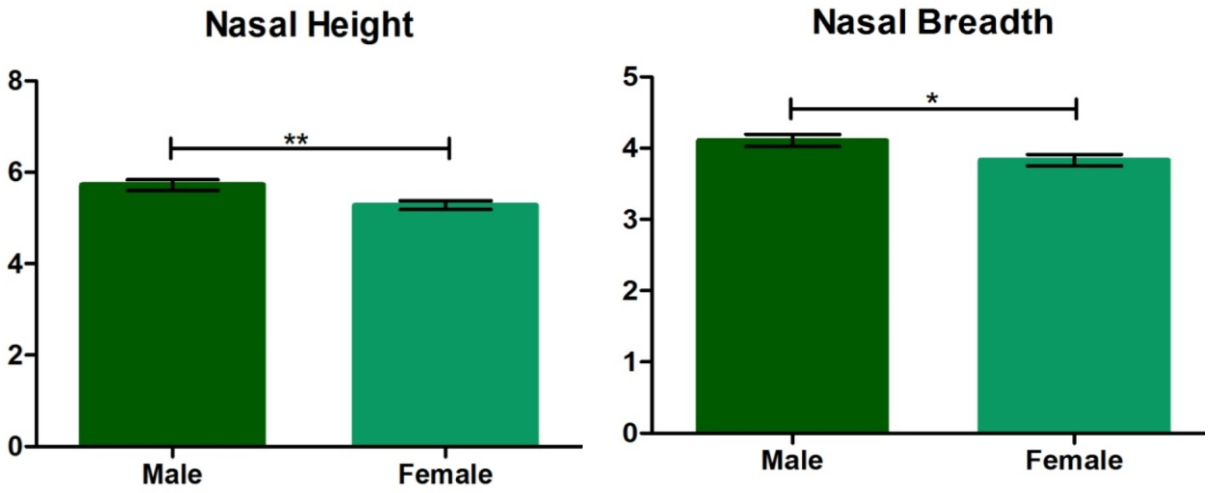


**Figure 1:** The mean nasal height and breadth values among male and female Yoruba students.
* $P \leq 0.05$
** $P \leq 0.01$

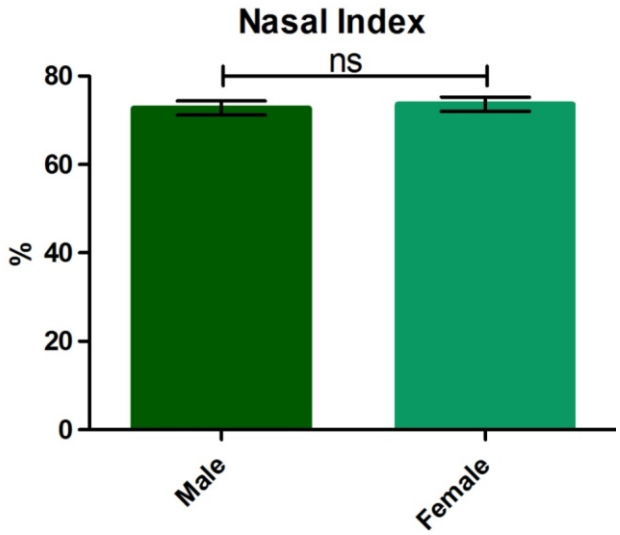


**Figure 2:** The mean nasal index values among male and female Yoruba students.
ns - P > 0.05 (no significance)

**Table 1:** The descriptive statistics of Nasal Anthropometry in Yoruba students of Anatomy Department, OOU, Sagamu, Nigeria.

| | Nasal Breadth (cm) | | Nasal Length (cm) | | Nasal Index (NI) % | |
|---|---|---|---|---|---|---|
| | Female | Male | Female | Male | Female | Male |
| Mean | 3.83 | 4.11 | 5.28 | 5.72 | 73.62 | 72.77 |
| ± S.D[1] | 0.72 | 0.65 | 0.88 | 0.88 | 14.61 | 12.25 |
| Range:Min[2]-Max[3] | 1.9 - 6.5 | 2.6 - 6.9 | 3.1 - 6.8 | 4.2 - 8 | 29.23 - 130.0 | 50.0 - 95.83 |
| p-value (< 0.05) | 0.0210* | | 0.0039** | | 0.7182 | |

[1]Standard deviation
[2]Minimum
[3]Maximum
* P ≤ 0.05
** P ≤ 0.01

**Table 2:** Percentage distribution of Nasal types in female (n=82) and male (n=58) Yoruba students of Anatomy Department, OOU.

| Nasal Types | Female | Male | Both Genders | |
|---|---|---|---|---|
| | Frequency | Frequency | Frequency | (%) |
| Hyperleptorrhine (very long) | 05 (6.10) | 03 (5.17) | 08 (5.72) | |
| Leptorrhine (long) | 30 (36.59) | 20 (34.48) | 50 (35.71) | |
| Mesorrhine (moderate) | 31 (37.80) | 24 (41.38) | 55 (39.29) | |
| Platyrrhine (broad) | 15 (18.29) | 11 (18.97) | 26 (18.57) | |
| Hyperplatyrrhine (very broad ) | 1 (1.22) | 0 | 1 (0.71) | |

## DISCUSSION

The NI is very useful in Anatomical Anthropology and it is recognized in Nasal Surgical and Medical management[8]. The difference may be due to factors such as genetic, nutrition, hormonal and other related factors[9].

This study showed results that have significantly high values for nasal height and nasal breadth among male Yoruba students compared to the female Yoruba students (P<0.05) (Table 1). Also, there is no significant sexual variation in the nasal index between the male and female Yoruba students with the females having higher values than the males (P=0.7182**).** This study established that the predominant nose type is mesorrhine based on the mean NI of 72.77± 12.25 and 73.62 ± 14.61% for male and female respectively. So, there is no significant difference in the Nasal index of between males and females of Yoruba tribe in South Western Nigeria.

Various studies have indicated racial and ethnic differences in Nasal index among different population. Among Egyptian population, the study of nasal index showed significantly lower nasal index values among the male (71.46) and female (64.56) and the prevalence of mesorrhine and leptorrhine nose types among the male and female Egyptians respectively[10].

In Nigeria, Oladipo *et al.,*[11] reported a Platyrrhine kind of nose among the Igbo, Ijaw and Yoruba ethnic groups in Southern Nigeria with males having significantly higher nasal index than females (p <0.05). Likewise, in the Andoni and Okrika tribes of Rivers State, the male subjects also have significantly higher values than their female subjects. The Andoni tribe was prevalently mesorrhine while the Okrika tribe was prevalently platyrrhine[2].

Among the females of Ikwerre tribe, there was a prevalence of platyrrhine (93.17 ± 0.51) while the males of the tribe had prevalently mesorrhine nose type (84.81 ± 0.51). [1] Among the male and female Omoku indigenes, platyrrhine nose type was also the most prevalent[12].

Study among Indian population revealed 50% Mesorrhine, then Leptorrhine in 29.54% and Platyrhinae in 20.45% of the subjects[13].

## CONCLUSION

The predominant nose type in this study is Mesorrhine based on the mean NI of 72.77±12.25 and 73.62 ±14.61 for male and female respectively. The NI of female is not significantly higher than that of the male. This study provides a baseline data of NI, to serve as anthropometric tool in differentiating ethnic groups, Forensic medicine, reconstructive surgery and rhinoplasty. Hence, it should be subjected to further investigation because of its relevance to forensic science and clinical Anthropometry.

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**CONFLICT OF INTEREST** – None

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