

Anthropometric Study Of The Facial And Nasal Length Of Adult Igbo Ethnic Group In Nigeria

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Abstract

Cephalometric techniques have been used by numerous researchers to produce standard mean values for skeletal, dental, and soft tissue structures. This has become useful in the classification of different populations.

In the present study, 600 adult Igbo subjects (18-69yrs) comprising 300 males and 300 females were measured for facial height (FH) and nasal height (NH).

The result obtained showed that on the average, the Facial Height (FH) of adult Igbo males was found to be $12.55 \text{ cm} \pm 2.11 \text{ cm}$ while that of Adult Igbo females was found to be $11.19 \text{ cm} \pm 1.92 \text{ cm}$. Furthermore, the Nasal Height (NH) for adult Igbo males was found to be $4.87 \text{ cm} \pm 0.84 \text{ cm}$ and $4.40 \text{ cm} \pm 0.76$ for Adult Igbo Females.

Statistical analysis of mean and Standard Deviation indicates sexual dimorphism, with significantly higher value ($p \leq 0.05$) of all parameters in males compared to females.

The result of this study will be of importance in functional orthodontics, clinical practice and forensic medicine.

INTRODUCTION

Studies on craniofacial relations and variations in man have long been used to differentiate various racial groups in physical anthropology. Morphological features of different races and ethnic groups are not randomly distributed but appear in geographic clusters ¹.

Cephalometric techniques have been used by numerous researchers to produce standard values for skeletal, dental, and soft tissue structures for different ethnic groups ^{2,3} as well as in forensic medicine ⁴. It has also been shown that skeletal and dental development changes throughout adulthood ⁵ and that stature and sex can be determined using lateral cephalometric ⁶.

It is well established that a single standard of facial esthetics is not appropriate for application to diverse racial and ethnic groups ^{7,8,9}. Therefore, researches on craniofacial study of different ethnic groups are on going with the intention to establish ethnic specific anthropometric data for populations with different ethnic background ¹⁰.

Cephalometric standards for Iranians ¹¹, Saudis ¹²,

Jordanians ¹³ and Egyptians ^{14,15} have been established.

Values of the nasal height, breadth and index of African tribes from various geographical regions and ethnicity are not as readily available as figures from other parts of the world. However, Akpa et al, ¹⁶ did a study on morphometric study of the nasal parameters in Nigerian Igbos and found out that the Igbos have a platyrrhine type of nose. Oladipo et al ¹⁷, showed that the mean nasal index of Igbos was 94.1 ± 0.39 and also observed sexual dimorphism in all the ethnic groups studied with males having significant ($p < 0.05$) higher nasal index.

This present study was carried out to document and provide a baseline data of Facial and Nasal height amongst adult Igbos between 18-69 years. This would be useful in clinical practice, forensic and anthropological studies.

MATERIALS AND METHODS

A cross-sectional study was carried out using a total of 600 Igbo subjects aged between 18 to 69 years. Three hundred (300) were males while three hundred (300) were females. Subjects were purely of Igbo ethnic origin by both parents

and grand parents and were selected at random from South-Eastern part of Nigeria. All the participants were healthy and without symptoms and signs of craniomandibular anomalies. Their consent was sought.

Facial Height (FH) was measured from the Nasion to the Menton of the Mandible while the Nasal Height (NH) was measured from the Nasion to the Nasospinale. These measurements were done with the aid of a Sliding Caliper. All measurements were taken using standard anthropometric procedure with the subject sitting in a chair in a relaxed condition and head in the anatomical position. The data was subjected to statistical analysis of mean and standard deviation of mean.

RESULTS

The values of the morphological measurements for Facial and Nasal height are shown in table 1,2,3,4 while the mean and standard deviation are shown in table 5.

Figure 1

Table 1: Facial Height (Adult Igbo Male)

S/N	AGE GROUP (YEARS)	N	FACIAL HEIGHT(F.H) (CM)
1	18-20	50	11.84
2	21-23	65	12.12
3	24-26	52	12.09
4	27-29	40	12.31
5	30-32	24	12.90
6	33-35	16	12.18
7	36-38	10	12.54
8	39-41	12	11.86
9	42 AND ABOVE	31	13.00

Figure 2

Table 2: Facial Height (Adult Igbo Female)

S/N	AGE GROUP (YEARS)	N	FACIAL HEIGHT(F.H) (CM)
1	18-20	68	10.90
2	21-23	72	11.22
3	24-26	30	11.25
4	27-29	24	11.47
5	30-32	20	11.50
6	33-35	15	11.14
7	36-38	29	11.11
8	39-41	12	11.16
9	42 AND ABOVE	30	11.35

Figure 3

Table 3: Nasal Height (Adult Igbo Male)

S/N	AGE GROUP (YEARS)	N	NASAL HEIGHT(N.H) (CM)
1	18-20	50	4.78
2	21-23	65	4.73
3	24-26	52	4.84
4	27-29	40	4.97
5	30-32	24	5.11
6	33-35	16	4.85
7	36-38	10	4.80
8	39-41	12	4.69
9	42 AND ABOVE	31	5.19

Figure 4

Table 4: Nasal Height (Adult Igbo Female)

S/N	AGE GROUP (YEARS)	N	NASAL HEIGHT(N.H) (CM)
1	18-20	68	4.24
2	21-23	72	4.39
3	24-26	30	4.37
4	27-29	24	4.66
5	30-32	20	4.57
6	33-35	15	4.26
7	36-38	29	4.50
8	39-41	12	4.43
9	42 AND ABOVE	30	4.46

Figure 5

Table 5: Mean and Standard deviation (SD) of Nasal and Facial Height of Adult Igbo.

Parameters	n	Facial Height		Nasal Height	
		Male	Female	Male	Female
Mean	300	12.25	11.19	4.87	4.40
S.D	300	2.11	1.92	0.84	0.74

p<0.05, SD = standard deviation, n = number of subjects.

With respect to Facial Height, the values for adult Igbo males increased from the 18-to-20 years of age group to the 21-to-23 years of age group (Table 1) but the Facial Height decreased by 0.03 cm between the 21-to-23 years of age group to 24-to-26 years of age group (Table 1). This decrease in Facial Height could not be immediately accounted for. There was also a gradual increase from the 24-to-26 years of age group to the 30-to-32 years of age group which is followed by another decrease of 0.72cm from the 30-to-32 years of age group to the 33-to-35 years of age group. The figure of facial height increased again at the 36-to-38 years of age group and decreased at the 39-to-41 years of age group and there after increased again at the 42-and-above age group. Although, this could not be accounted for, it could be attributed to sample size. The highest value for adult Igbo males Facial Height was noted at the 42-and-above years of age group while the least value was noted at the 18-to-20 years of age group. The mean Facial Height of adult Igbo male was observed to be 12.25 cm (Table 5).

In contrast, adult female Igbos showed a consistent increase in Facial Height from the 18-to-20 years of age group to the 30-to-32 years of age group (Table 2).The value decreased at the 33-to-35 years of age group by 0.36 cm and thereafter increased to 11.35 cm at the 42-years-of age group and above. The highest value for the facial height of adult Igbo females was observed in 30-to-32 years of age group and the least value in the 18-to-20 years of age group. The average value of the adult Igbo female Facial Height (FH) was 11.19 cm (Table 5).

Furthermore, the Nasal Height of adult Igbo male (Table 3)

decreased from the 18-to-20 years of age group to 21-to-23 years of age group by 0.05 cm. It there after showed gradual increase from the 21-to-23 years of age group to 30-to-32 years of age group .It then decreased in the 33-to-35 and 39-to-41 years of age group before increasing to 5.19cm in the 42-and-above years of age group.

The highest value for adult male Igbo Nasal Height was observed in the 42-and-above years age group while the lowest was observed in the 21-to-23 years of age group. The mean value for Nasal Height for Adult Igbo was 4.87 cm. (Table 5)

Also, the Nasal Height of adult Igbo females (Table 4) increased from 4.24 cm at the 18-to-20 years of age group to 4.57cm at the 30-to-32 years of age group (Table 4). Between the 30-to-32 years of age group and the 33-to-35 years of age group, there was a decrease in Nasal Height by 0.31 cm. Another increase was observed in the 36-to-38 years of age group, decrease in the 39-to-41 age group and then another increase in the 42-and-above age group.

The highest value of nasal height for adult Igbo was observed at 30-to32 years of age group while the lowest value was observed at 18-to-20 years of age group. The mean Nasal Height for adult Igbo females was 4.40 cm (table 5)

Observation from our results indicated that adult Igbo males had higher values than adult Igbo females. The highest value for Facial Height was observed in the 42-and-above years of age group for males. Also, the highest value for Facial Height was observed in the 30-to-32 years of age group in adult female Igbo this was however followed by a decline in value. The mean values of Nasal Height computed in the present subjects were lesser in females than in males for all age groups. This is indicative of a sexual dimorphic pattern in the ethnic group studied (table 5). The observed differences were statistically significant ($p < 0.05$). When compared to the female group, the highest Nasal Height value for males was observed for age group 27-to-29-years of age.

DISCUSSION

The overall results are summarized and briefly interpreted in Table 1,2,3,4 and 5.

During maturity and old age, a natural increment in the cartilaginous tissues of the face can be observed, giving people longer and larger nose and ears ¹⁸ . Reference data for

anthropometric characteristics of normal, healthy individuals should be provided in age ranges as wide as possible ¹⁹ . Indeed, the set of data offered by this recent investigation probably covers the largest age range with a considerable number of subjects in each sex and age group.

The results of this study agree with many other studies that compare anthropometric characteristics of male and females. Most of such authors have concluded the presence of sexual dimorphism in their studied sample. One of such study is the work done by Oladipo et al ¹⁷ on the nasal indices among major ethnic group in Nigeria where sexual dimorphism was observed in all the ethnic groups studied with males having significantly higher nasal index than female ($p < 0.05$). Even within a restricted geographical region and historical period, patterns of sexual dimorphism sometimes vary significantly ^{20,21} . Local populations also show sexually dimorphic changes in cranial size and shape over time spans as short as a few decades ^{22,23,24,25} . Our findings also support the fact that Sexual difference is better projected as one attains adulthood ²⁶ .

Our finding is in disagreement with that of Akpa et al ¹⁶ (2003) who reported a nasal height value for Igbos as 6.22 cm as against our mean value of 4.64cm (table 5). A possible explanation for this could be as a result of more subjects older than 30 years in their sample choice.

Figure 6

Table 6: Total Average Mean Facial And Standard Deviation For Facial And Nasal Height Of Adult Igbo

Parameter	n	Facial Height (cm)	Nasal Height (cm)
Mean	600	11.72	4.64
S.D.	600	2.02	0.79

Figure 7

Table 7: Nasal and Facial Height in Different Populations

Source	Group	Facial Height (cm)	Nasal Height (cm)
Niswander et al (1967)	Xavante (Brazilian Indian)	12.57	5.55
Herskovites (1937)	Ashanti (African Negroes)	11.90	5.30
Steggerda (1932)	Dutch (Caucasians)	12.29	5.61
Present Study	Nigerians(west Africa)	11.72	4.64

From previous study (Table 7), the Xavante group from Brazilian-Indian population has an average facial height of 12.57cm and an average Nasal height of 5.55cm ²⁷ .

Herskovites ²⁸ reported an average facial and Nasal Height of 11.90cm and 5.30cm respectively for the Ashanti population of African Negroes while Steggerda ²⁹ , reported the average

facial and nasal height of 12.29 cm and 5.61 cm respectively for Dutch population.

Amongst the four groups in Table 7, the Brazilian Indians of Xavante population presented the highest value for facial height (12.57cm) while adult Igbo of Nigerian population presented the lowest value of 11.72cm. Furthermore, the Dutch population presented the highest figure of 5.61 cm for Nasal height while adult Igbo of Nigeria presented the lowest value of 4.64cm. The total average mean facial height (Table 6) of our present study seems to be closest to the Ashanti population. This could be due to the fact that both populations are of African origin.

Our result shows that normal growth and development of the nose does not stop in early adulthood and that males tend to observe longer period of growth. It could also be deduced from this work that the Nasal and Facial Height of males continues to increase until old age while that of females end at adulthood. This could provide clinicians with an appreciable data base for the analysis of dysmorphic syndrome ³⁰.

The mean Facial Height is 12.25cm and 11.19 cm for male and female respectively and the mean Nasal Height is 4.87 cm and 4.40 cm for male and female respectively.

CONCLUSION

The mean Nasal and Facial Height between adult male and female subjects have been determined and compared. Growth of these parameters continues to old age in males but terminates at adulthood in females. This could be of importance to physical anthropometry, forensic investigations and in clinical practice. Further studies should be conducted on other ethnic groups in Nigeria; this could form a basis for comparison.

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