

Nasofacial Anthropometric Study Among Nupe Ethnic Group, Nigeria.

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ABSTRACT

Anthropometry data of Nasofacial indices dimensions is vital in Nasofacial Surgery, Forensics Medicine and Diagnostic comprehension. This study is aimed at observing the variation of length and width of face and nose among Nupe Ethnic group of Katcha Local Government Area of Niger state. A cross sectional study was done on 400 colleges and secondary school students aged between 12-20years, using appropriate sampling method. The Nasal facial length and width were measured and recorded. The data were analyzed using SPSS/16.0 software. The mean value of Facial index for the male and female Nupe subjects showed 70.2 ± 0.61 and 69.1 ± 0.53 with mean Nasal index of 90.87 ± 0.42 and 90.3 ± 0.584 indicating the dominance of hypereuryprosopic face type and platyrrhine nose type. The difference in Facial and Nasal indices between male and female Nupe subjects was not statistically significant ($p > 0.05$). These measurements in healthy subjects are useful for dysmorphologist in the early identification of some dysmorphic syndromes like cleft lip associated with nose disorders; it will also be relevant in Forensic Medicine, Rhinoplasty Surgery and Physical Anthropology.

Keywords: Anthropometry, Nose, Face, Nupe Tribe, Nigeria

INTRODUCTION

Anthropometry comes from a Greek word "Anthropos" which means human and "metron" which means measure (Khan *et al.*, 2012). According to the WHO, the Anthropometry is an inexpensive and non invasive technique for assessing the size, proportions, and composition of the human body. Nasofacial Anthropometry is a specific component of the anthropometric field that focuses on the facial and nasal region which is also vital for sex determination, Forensics uses, quantifying nasofacial dysmorphology, Facial Surgery and diagnostic reconstruct congenital or post traumatic facial disfigurement successfully (Farcas *et al.*, 2005). The anthropometry of any part of the body varies between individuals among race. The face and nose are important physiognomic features in humans.

Face and nose developed from the frontonasal prominences, nasal prominences, maxillary and mandibular prominences. The final characteristics of the face depend on the changes in the proportion and position of these components (Kurnia, 2006).

The Growth and development in humans are affected by many factors such as geological, biological, geographical, racial, gender, and age factors (Jahanshahi *et al.*, 2008; Kurnia *et al.*, 2012). Cephalometry is an important aspect of physical anthropology in which measurements are useful in Forensic Medicine, Plastic Surgery and Treatment Planning (Heidari *et al.*, 2009; William *et al.*, 1995). The facial and nasal indices are among the most cephalometrics parameters useful in inter-racial classification and intra-racial categorization. The different categories of anatomical faces are;

Hypereuryprosopic (very broad, short face), Euryprosopic (broad, short face),

Mesoprosopic (average face), Leptoprosopic (tall, narrow face)

Hyperleptoprosopic (very tall, narrow face) (William *et al.*, 1995).

The white race have a narrow, long and high nose (Leptorrhine), the blacks have wide and fat nose (platyrrhine) and orientals have medium sized nose in between the first two (mesorrhine) (Jimoh *et al.*, 2011). The nose may be elevated by direct clinical measurement (morphometry) (Mutsvangwa *et al.*, 2011). Variables that determine the shape of the nose include race, tribe, environmental factors, and Clinical condition (Sinnatamby, 2006). With narrow nose being favored in cold and dry climates and broad noses in warmer, moister noses as consequence of natural involved in human evolution.

The different type of anatomical noses include; Hyperleptorrhine (excessively tall and narrow nose), Leptorrhine (tall and narrow), Mesorrhine (medium), Platyrrhine (excessively broad and flat nose) (Kurnia, 2006).

The knowledge of the absolute and the relative variability in the size and shape of the human body is crucial to study human growth, population variation, and medicological identification in forensics as well as in optimization of instrument such as respirators, gas and dust masks, and military helmets (Khan *et al.*, 2012). The standard proportion exists for American, Indians, Malaysians and many other populations but only few exists for Nigerians. Many people had carried out research on nasofacial indices in Igbo, Yoruba and Hausa ethnic group in Nigeria (Adamu, 2010 and Omotoso *et al.*, 2012). Bekwara, Andoni and Okrika ethnic groups of cross river state in Nigeria (Lukpata *et al.*, 2013 and Oladipo *et al.*, 2009). However, very little studies have been carried out, thus a research on Nupe Ethnic group in Nigeria.

MATERIAL AND METHODS

The instrument used for the measurement of nasal index and facial index was sliding vernier caliper, which has two set of arm that is the upper fixed arm and the lower moveable arm.

The sliding vernier caliper also has two reading scales. These are the scale division and the main division.

The sample size comprises of 400 subjects made up of randomly selected children and young adult (300 males and 100 females) of age range 12 – 20 years.

The measurements were taken with subjects sitting on a chair in relaxed mood and upright with head unsupported in an anatomical position.

A 12inch (0.003mm) fast display vernier caliper series ECOS5 (ID: 1111 - 103-20g) was used for the measurement of nasal height, nasal width, facial height and facial width.

Nasal height was measured by placing the upper fixed divider arm of the vernier caliper with accuracy of 0.01cm on the nasion superiorly and the lower arm on the sub nasal inferiorly, and then the readings were taken on the vernier scale and recorded.

Nasal width was measured as the distance between the external surfaces of one alar of the nose to the alar at right angle to the nasal height.

The nasal index was calculated as the ratio of nasal width to the nasal height multiplied by 100 i.e. Nasal index = $\frac{\text{Nasal width}}{\text{Nasal length}} \times 100$ (Oladipo *et al.*, 2009).

As for the face, the facial height was measured by placing the upper fixed arm of the vernier caliper with accuracy on the nasion superiorly and the lower moveable divider on the menton of the mandible and the readings were then read and recorded on the scale vernier caliper.

The facial width was measured as the distance between zygomatic bones (i.e. bizygomatic distance). Therefore, the readings were made on the scale vernier caliper and recorded appropriately.

Table A

Face type Facial index	
Hypereuryprosopic (very broad, short face)	≤78.9
Euryprosopic (broad, short face)	79.0–83.9
Mesoprosopic (normoprosopic: average face)	84.0–87.9
Leptoprosopic (tall, narrow face)	88.0–92.9
Hyperleptoprosopic (very tall, narrow face)	≥93.0
Nose type Nasal index	
Hyperleptorrhine (excessively tall and narrow)	≤54.9
Leptorrhine (tall and narrow)	55.0–69.9
Mesorrhine (medium)	70.0–84.9
Platyrrhine (broad and flat)	85.0–99.9
Hyperplatyrrhine (excessively broad and flat)	≥100.0

The facial index was calculated to be the ratio of the facial height to the facial width multiply by 100 i.e. facial index = $\frac{\text{facial length}}{\text{facial width}} \times 100$ (Romo and Abraham, 2003; Heidar *et al.*, 2004; William *et al.*, 1995). The necessary precaution was noted while using the instrument (Angokoha, 2006).

The data was further analyzed statistically to determine the mean, standard deviation and significance level (P – value.)

ANOVA TEST AND t – test were done for data analysis using SPSS/16.0 software to find the facial and nasal indices mean, and standard deviation for all parameters and P –value.

Inclusion and Exclusion Criteria

Individuals that are truly of Nupe Ethnic origin of both parents and grandparents were randomly selected and included. Subjects with mixed racial parentage were excluded. Individuals with facial trauma, septoplasty, craniofacial abnormalities, and other minor ethnics in Nupe such as Kupa and Gbagi were excluded.

RESULT

Table 1: Mean (\pm SD) of the length and width of face and nose of Nupe tribe aged 12 – 20 years.

Parameters	Mean \pm SD	Minimum	Maximum
AGE	15.73 \pm 2.64	12.00	20.00
NL	274 \pm 0.303	1.90	3.80
NW	248 \pm 0.0.28	1.80	3.70
NI	91 \pm 0.42	0.67	0.85
FL	873 \pm 0.77	7.10	12.80
FW	1252 \pm 0.78	9.60	14.80
FI	69 \pm 0.59	0.56	0.99

The result for age group 15 – 20 years represented in Table 1 showed the overall descriptive of the population.

Table 2: Sexual dimorphism in mean value of the nasal index.

Parameter	Sex	Means	t	P-Value
Nasal index	Male	90.9 \pm 0.653	0.167	0.683
	Female	90.3 \pm 0.584		

Table 2. Shows sexual difference was insignificant for Nasal index (P> 0.05).

Table 3: Sexual dimorphism in mean value of the facial index

Parameter	Sex	Mean \pm SD	t	P-Value
Facial index	Male	70.2 \pm 0.61	0.768	0.381
	Female	69.1 \pm 0.53		

Table 3. Shows sexual difference was insignificant for Facial index (P> 0.05).

DISCUSSION

The different tables above show the result of the study population

Table 1: shows the description of the study population with facial and nasal indices value represented as mean \pm SD (standard deviation), minimum and maximum values of the facial and nasal indices.

Table 2: shows a t- test statistical analyses of facial index by sex of general sample, i.e. sexual dimorphism between male and female with significant level (p>0.05). However, the difference in the facial index is not statistically significant. This implies that both male and female Nupe ethnic group of katcha local government area of Niger state are having the same face type. And this is in contrary with the study of nasofacial indices in Hausa which is unpublished. The study reported that sexual dimorphism exists in Hausa Ethnic group in term of facial index with significant level (p<0.001) (Adamu, 2010).

This study is in accordance to the study of nasofacial indices among children of Southern Nigeria which showed that sexual dimorphism does not exist in term of facial index among children in southern Nigeria with male subjects having a mean facial index of 87.15 \pm 1.70 and mean female having a facial index of 86.25 \pm 1.70 (Omotoso *et al.*, 2012). Table 3: shows a t-test statistically analysis of nasal index by sex of the general sample i.e. sexual dimorphism between male and female with significant level (p>0.05). However, the difference in the facial index is not statistically significant. This indicates also that both male and female Nupe Ethnic group of Katcha Local Government has the same nose type. However, this study is in accordance to the work of Adamu (2010) which shows that sexual dimorphism does not exist in Hausa Ethnic group in term of nasal index. Moreover, this study is in comparable with the study of (Omotoso *et al.*, 2012) which demonstrates that mean nasal index difference between male and female subjects was statistically significant with male and female subjects having mean nasal value of 93.45 \pm 1.66 and 89.62 \pm 1.58 respectively.

CONCLUSION

This study found that the Nupe ethnic group had an overall mean facial index of 70.2 and an overall mean nasal index of 90.87 indicating the prevalence of Hypereuryprosopic face type and platyrrine nose type respectively.

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