



ANTHROPOMETRIC STUDY OF INTERALAR WIDTH AND MOUTH WIDTH MEASUREMENTS AMONG NIGERIANS OF DELTA STATE EXTRACTION

Ubulu Lucky Uche^{*1,2}, Adunfe Oluwatobi Oluseun¹, Nwachuku, Mike Ibeabuchi¹, Babatunde, Lewis Bamidele¹, James Onah Ikpa^{1,3}

¹Department of Anatomy, College of Medicine, University of Lagos. Lagos State, Nigeria.

²Department of Anatomy, Faculty of Basic Medical Sciences Delta State University (Delsu), Abraka-Nigeria.

³Department of Anatomy, Faculty of Basic Medical Sciences Cross River University of Technology (Crutech), Calabar – Nigeria.

***Corresponding Author: Uche Ubulu Lucky**

Department of Anatomy College of Medicine University of Lagos, Lagos State, Nigeria.

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ABSTRACT

Facial measurements can be used in estimating sex age and ethnic or racial variations within a given population. However, these measurements could be affected by nutritional, biological and climatic factors. Application of these measurements play pivotal roles in forensic medicine, plastic surgery, orthodontics and identification. This study set out to study the anthropometric differences in Interalar and Mouth width among Nigerians of delta state extraction. The study involved 200 subjects (100males and 100 females) selected from a randomised Delta state population between the ages of 18-30 years who must have satisfied the measurement criteria and given full consent. Measurement of Mouth width and Interalar width was taken with a digital vernier calliper. The values of measured parameters (Interalar width and Mouth width) were measured and calculated. The Interalar width of both males and females had a mean value of 42.39 ± 4.18 and 37.31 ± 4.75 respectively with p- value of 0.09 which was not statistically significant at $p < 0.05$. The Mouth width for both males and females has a mean of 58.91 ± 7.26 and 47.42 ± 6.10 respectively with p- value of 0.04, which was considered statistically significant at $p < 0.05$. Interalar width and Mouth width was higher in males than females and it is believed that the result from this present study may provide very useful baseline data which may be of importance in reconstructive surgery and forensic study.

1.0 INTRODUCTION

Since early twentieth century, Case (1921)^[1] tried to establish features responsible for facial beauty. These include prominent chin with mild mento-labial furrow, lower lips slightly posterior to the upper lips, in balance with the cheek, nose and lips seal competence. Facial features are influenced by biological factors such as gender, ethnicity, economic and social factors.

Facial anthropometry is important for determination of various face shape as well as identification in palaeoanthropology and forensic medicine.^[2] The human face is used for expression, appearance, and identity it is also a distinguishing feature from person to person. The definition of an attractive face is subject to factors such as personality, culture, age, ethnic background The face is the most important and observable component of our appearance which provide our social recognitions.^[3,4] Several factors such as sex, ancestry, diets, climatic influence, and other biological factors are determinants of growth and development.^[3,5,6] The standard proportion for the human head can help place facial features and their orientation as such circumference of the head can

be used to determine the growth rate of children and as an indicator of normal brain development.^[6]

2.0 MATERIALS AND METHODS

2.1 Study Design

This research work is quantitative descriptive design, comprising of 200 subjects (100males and 100 females) selected from a randomised Delta state population between the ages of 18-30 years.

2.1.1 Measurement Criteria

Subjects were allowed to participate in this study, if they met the following criteria.

- Subjects must be indigenes of Delta state by both parents.
- Subjects must have no deformity of the nose, Mouth and face.
- Subjects must be free of any neurodegenerative disease that might affect the face.
- Subjects were between the ages 18-30 years.
- Only subjects who consent to participation in the study will be allowed to

2.1.2 Informed Consent

Informed consent forms were given to all participants while they were briefed on how the research work will go a long way to benefit them and the society at large then, asked to willingly sign the consent form, so as to make sure their participation was voluntary.

2.1.3 Measurement Of The Interalar Width

The subjects were seated comfortably on a chair in a relaxed and upright position, with the head resting firmly against the head rest. The Interalar width was determined by using the external width of the nose at the widest point. The distance between the digital vernier caliper

was taken without the application of pressure by bringing the recording parts of caliper just in contact with the outer surface of the nose. While measuring, subjects were asked to stop breathing momentarily to avoid change in the shape of the nose.^[7,8]

2.1.4 Measurement of The Mouth Width

To measure the Mouth width, each subject was asked to look straight in front and adopt a relaxed nature of facial expression to prevent distortion of the lip. A Vernier calliper was used to measure the width of the Mouth by placing the digital calliper on the lip of the Mouth at the widest points of the Mouth.^[7,8,9]

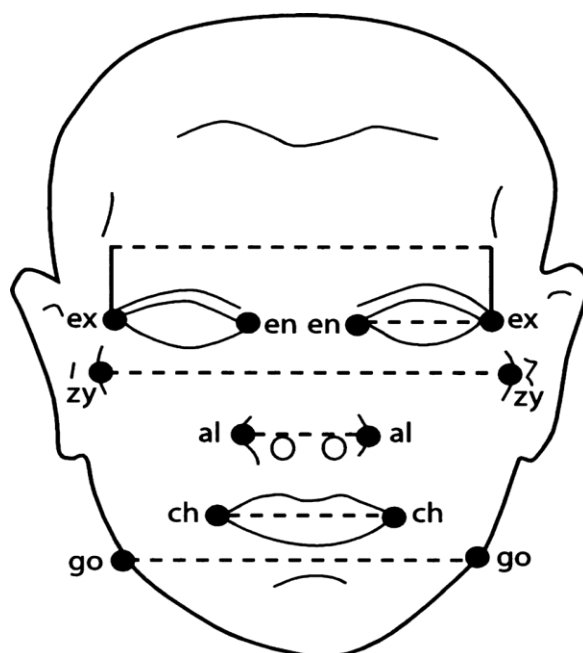


Figure 1: Showing various Facial dimensions “ch” represents Mouth width, “al” represents Interalar width. Adapted from Leslie *et al.*, (2005).^[10]

2.1.5 DATA ANALYSIS

The data obtained from this study was subjected to statistical analysis using descriptive statistics and Independent Sample T-test with the aid of Statistical Package for Social Sciences (SPSS) version 20.0 to ascertain if there was statistically significant differences between the males and females with regards to the interalar width of the nose and the Mouth width. P-values less than 0.05 ($p < 0.05$) was considered statistically significant.

3.0 RESULT

3.1 Descriptive Statistics

A total of 200 subjects were taken for the study, which comprises of 100 males and 100 females (Table 1). The minimum and maximum values of age for male subjects were 18.00 and 29.00 respectively with a mean value of 22.63 ± 2.95 while the minimum and maximum values of age for female were 18.00 and 26.00 respectively with a mean value of 22.24 ± 1.98 (Table 3). For females, the Interalar width has a minimum and maximum value of

23.30 and 49.91 respectively with the mean value of 37.31 ± 4.76 , the Mouth width has a minimum and maximum value of 34.75 and 64.75 respectively with the mean value of 47.42 ± 6.10 while for the male, the Interalar width has a minimum and maximum value of 30.16 and 50.76 respectively with the mean value 42.39 ± 4.18 and Mouth width has a minimum and maximum value of 44.66 and 72.43 respectively, with the mean value of 58.91 ± 7.26 (Table 3).

Table 1: Frequency distribution of study sample in relation to gender.

Gender	Frequency	Percent
Female	100	50
Male	100	50
Total	200	100

Table 2: Descriptive statistics of age of study subjects.

Sex	N	Minimum	Maximum	Mean	Std. dev.
Female	100	18.00	26.00	22.24	1.98
Male	100	18.00	29.00	22.63	2.95

Table 3: Descriptive statistics of parameters measured with regard to gender.

Sex	Parameters	N	Min.	Max.	Mean	Std.dev.
Female	Interalar width (mm)	100	23.30	49.91	37.31	4.67
	Mouth width (mm)	100	34.75	64.75	47.42	6.10
Male	Interalar width (mm)	100	30.16	50.76	42.39	4.18
	Mouth width (mm)	100	44.66	72.43	58.91	7.26

3.2 GENDER DIFFERENCES IN MEASURED PARAMETERS

The value for parameters (Interalar width and Mouth width) were measured and calculated. The Interalar width of both males and females has a mean value of

42.39±4.18 and 37.31±4.75 respectively with p- value of 0.09 which was not statistically significant at $p < 0.05$.

The Mouth width for both males and females has a mean of 60.91±7.26 and 47.42±6.10 respectively with p- value of 0.04, which was also not statistically significant at $p < 0.05$.

Table 4: Independent sample Test of parameters measured between males and females.

Parameters	Gender	Mean±std. dev.	T	DF	p-value	Sig
Interalar Width	Male	42.39±4.18	8.01	194.7	0.09	Not significant
	female	37.31±4.75				
Mouth width	Male	60.91±7.26	12.1	198.0	0.04	significant
	female	47.42±6.10				

4.0 DISCUSSION AND CONCLUSION

Facial measurement through anthropometric study shows wide variations between different ethnic groups among male and females.^[7,9] In this present study, males have both wider Mouth width and wider Interalar width when compared to females, with p values of 0.09 and 0.04 respectively, of which Interalar width was not statistically significant at $p < 0.05$ while Mouth width ($p < 0.05$) was statistically significant. Generally, males are seen to have wider Mouth and nose than females. This is similar to the findings of Dharap *et al.*, 2013^[11] who reported that mean inter-alar width of the nose (IAW) was 35.06mm (37.14mm in males and 33.21mm in females) and the mean of the Mouth width was 50.66mm (52.85mm in males and 48.63mm in females). The difference between these two facial measurements was statistically significant ($p < 0.001$). Also in the study among the Gujarati population by Prasanth & Patel, (2011)^[12] it was reported that mean inter-alar width of males was 38.18±2.71mm with the range of 34.16±2.54mm with a range of 30.09 - 38.42. The difference in mean inter-alar width of males and female was greater than the value reported by Hoffman *et al.*, in (1988)^[13] but less than the value of the present study. This may be due to ethnic variation. The greater inter-alar width seen in this present study reveals the influence of male having larger size of Jaws and Teeth compare to female.^[11,12,13]

The proportions between Mouth width and inter-alar width depend on facial type. Studies have shown^[6,7,11] that the widest Mouth dimensions are found among the Europeans while the narrowest dimensions are found

among the North American and Indians in both genders. This may be due to ethnic variation.^[4]

The results here showed that inter-alar width and Mouth width were both higher in males than females. This variation in size may be due to genetic or ethnic variation.^[13] There is statistical gender difference ($p < 0.05$) in the mouth width measurement which could be important in forensic situations.

4.1 CONCLUSION

In conclusion, the analysis showed that Interalar width and Mouth width was higher in males than females and it is believed that the result from this present study may provide very useful baseline data which may be of importance in reconstructive surgery and forensic study.

The study will be of great importance in the field of aesthetics, medicine, dentistry, anthropology and forensic sciences. This study should be subjected to further investigation among different ethnic groups in Nigeria and more parameters of the face should be measured in order to know the variations in dimension of these facial landmarks.

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