



## Anthropometric Study of the Canthal Parameters among the Hausa and Yoruba Ethnic Groups in Nigeria

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### ABSTRACT

Canthal measures, which differ between and among individuals, are crucial tools for anthropologists of the skull and face, surgical reconstructive specialists and clinical geneticists. The purpose of this study is to determine how canthal measurements differ between members of two distinct ethnic groups in Nigeria. Between the ages of 18 and 45, residents of the Nigerian cities of Akure and Owo who were Hausa and Yoruba were included in the study's sample. The ICD and OCD, or the inner and outer canthal distances, were both represented in millimeters. Canthal Index (CI) was calculated using the standard formula. The independent sample t-test was utilized to statistically examine the data. p-value of 0.05 were used in statistics to determine significance. The findings showed that Outer Canthal Distance (OCD) was sexually dimorphic in the Yoruba ethnic group, with men having a significantly higher mean value and Hausa males having a higher insignificant mean value than Hausa females. Males had slightly higher mean ICDs than females in both ethnic groupings. There was no statistically significant difference between the OCD and ICD scores of Yoruba males and females compared to Hausa males and females despite Yoruba males and females having higher mean values. While Hausa males had greater insignificant CI values than Hausa females, Yoruba females had higher insignificant CI values overall. Yoruba and Hausa respondents' mean CI differences were statistically different.

**Keywords:** Anthropometric, Canthal distance, Inner Canthal Distance (ICD), Outer Canthal Distance (OCD)

### INTRODUCTION

Scientists have always been fascinated by the physical variability of humans. Anthropologists have long been interested in the study of variations in various physical characteristics within and between populations. According to Golalipour *et al.*, ecological, biological, regional, racial, gender, and age factors have an impact on the dimensions

of the human body [1]. On age, gender, and racial groups in certain geographic areas, anthropological studies have been done. In order to meet aesthetic criteria, it is important to measure the soft tissues of the face [2]. However, precise measurements are also needed for the estimation of a number of systemic syndromes, craniofacial abnormalities, and surgical treatments for post-traumatic telocanthus [3-5].

For the diagnosis of disease and therapies for craniofacial anomalies, normal canthal levels can be used as a guide. Thus, the anatomic structures that are present affect the aesthetic outcomes of clinical therapy. Physical measures and evaluations of children's growth and development from various ethnic groups within a country are becoming more and more popular as a highly desired instrument for assessing the health status of children in communities [6]. In Nigeria, there haven't been many studies on canthal measures. For instance, 468 male and 408 female Nigerian children between the ages of 3 and 18 were tested by Saheeb *et al.* to determine their typical values for medial and lateral canthal distances [7]. The canthal indices of the Ijaw and Igbo tribes were compared by Oladipo *et al.*, When the results for Nigerians and Caucasians were compared, the mean medial canthal distance in male Nigerians was somewhat higher than in male Caucasian individuals, and the difference was statistically significant [8].

### MATERIALS AND METHODS

Subjects who were Yoruba and Hausa who were living in Akure and Owo, Nigeria, between the ages of 18 and 45, made up the study's population. 359 subjects in all, including 160 Hausa (100 boys and 60 females) and 199 Yoruba (97 males and 102 females), were used in the study. The subjects were informed of the procedure. The digital sliding vernier caliper was used for data collection. Each subject was instructed to sit at ease on a chair in the Frankfurt plan [9]. The independent sample t-test was utilized to statistically examine the data. p-value of 0.05 were used in statistics to determine significance. The study's findings were presented in tables.

### RESULTS

Males in both ethnic groups had greater mean OCD and ICD scores than females. According to Tables 1 and II, Yoruba males and females had mean OCD measurements of 4.84 mm and 4.67 mm, respectively, with a statistically significant sexual difference. In contrast, Hausa males and females had mean OCD measurements of 35.25 mm and 34.11 mm, respectively, with a statistically insignificant difference. Yoruba males and females had a mean ICD of 9.74 2.97 and 9.20 2.78, respectively, while Hausa males and females had a mean ICD of 98 3.85 and 62 3.55, respectively, with no discernible sexual dimorphism (Table 1 and Table 2).

**Table 1 Independent sample T-test for sexual dimorphism in the Hausa ethnic group's inner and outer canthal distances**

Ethnicity	Variables	Sex	N	Mean	T	p-value
Hausa	ICD	Males	100	98.21	1.97	0.05
		Females	60	62.85		
	OCD	Males	100	35.25	1.2	0.234
		Females	60	34.11		

**Table 2 Independent sample T-test for sexual dimorphism in the Yoruba ethnic group's inner and outer canthal distances**

Ethnicity	Variables	Sex	N	Mean	T	p-value
Yoruba	ICD	Males	97	9.74	1.75	0.062
		Females	102	9.2		
	OCD	Males	97	4.84	1.45	0.146
		Females	102	4.67		

## DISCUSSION

The OCD and ICD values found in this research were greater than the values found in Ikwere school children by Oladipo *et al.*, which may be attributable to genetic or environmental variations between the two study groups [10]. The higher mean values obtained in males in OCD and ICD than females are in line with previous studies in Ijaw, Urhobo and Itsekiri proving that males have higher average values in physical characteristic than females, but disagree with the work of Blessing *et al.* who reported higher mean values in females than males which may be attributed to environmental or age differences between their study and present study [11-13]. Additionally, the difference between the mean values for men and women was significant ( $p < 0.05$ ). However, the age gaps and other environmental variables between the two study groups may be to blame for the discrepancy between the findings of our investigation and their own study. Oladipo *et al.* reported that there was a non-significant sexual difference in CI of both ethnic groups among Igbo and Ijaw people in the southern region of Nigeria [7]. Oladipo *et al.* found that the canthal index of Urhobo females was significantly higher than that of Itsekiri females, and that the canthal index of Itsekiri males was significantly higher than that of Urhobo males, showing that even though ethnic groups live in the same environment, canthal index varies among them [12].

Oladipo *et al.* found that the canthal index of Urhobo females was significantly higher than that of Itsekiri females, and that the canthal index of Itsekiri males was significantly higher than that of Urhobo males, showing that even though ethnic groups live in the same environment, canthal index varies among them. According to studies by Oladipo *et al.*, there is a considerable difference between Yoruba males and Hausa males, and Yoruba females and Hausa females [12].

## CONCLUSION

The study's ethnic groups' canthal indices were noticeably different, showing that their genetic make-up and places of origin varied. The study also discovered sexual dimorphism, but exclusively in Yoruba OCD. The results of this study thus provide information on canthal distances and indices of Yoruba and Hausa subjects in Akure and Owo metropolis, which may be useful to forensic scientists, plastic surgeons, researchers, anatomists, and the general public. They may also serve as a framework for estimating the canthal distances and index of Nigerian subjects in the future.

## DECLARATIONS

### Source of Fund

Nil

**Conflict of Interest**

The authors declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

**Authors' contribution**

All authors read and contributed to the manuscript.

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