# Sexual Dimorphism In Stature Of Adult Northern Nigerians

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## Abstract

The present study investigated sexual dimorphism in stature (height) of a population of northern Nigerians resident in the Ilorin Township. The study population comprised two hundred and fifty (250) young adults; this consisted of 150 males and 100 females, aged 18 -29 years. In each subject, height was measured using the Avery height and weight scale; from the data obtained, absolute and relative sex difference in stature were extrapolated. A value of 5.5% was obtained for relative sex difference in stature of the study population; this indicates that northern Nigerians have the least sexual dimorphism in stature when compared to the values of 5.9% and 5.7% earlier reported for western and eastern Nigerians respectively. The regional variation in sex dimorphism in stature of adult Nigerians, as observed in this study, was possibly due to a combination of nutritional, socio-economic and genetic factors.

**Keywords**: Sexual dimorphism in adult stature Key Words: Sexual dimorphism, stature

## Introduction

Anthropometry has been a major means of studying body proportion, composition and physique, as well the factors affecting these parameters, in a particular population. In any given country, sexual dimorphism in adult stature is a known phenomenon, with the males usually growing taller than the females; Tanner<sup>1</sup> and Tobias<sup>2</sup> suggested that such sexual difference in stature is traceable to certain socio-economic factors to which individuals are exposed during childhood.

Recently a study of sexual dimorphism in stature of adult eastern Nigerians had been reported<sup>3.</sup> However, within a particular country, the importance of regionally and chronologically based anthropometric study of stature and similar parameters had been emphasized. In Hun-

**Correspondence to:** Mr. O.B. Akinola Department of Anatomy University of Ilorin, Nigeria E-mail: woleakinola @ yahoo.com. gary, Bodzar<sup>4</sup> reported that stature decreased from the northwestern to the southeastern parts of the country. Besides, mean adult height was observed to show a positive secular trend over time. The aim of the present study there fore is to study sexual dimorphism in stature of a population of adult northern Nigerians.

#### **Subjects and Method**

The study population consisted of two hundred and fifty (250) Young adults, comprising 150 males and 100 females (aged 18-29 years). These individuals were resident in Ilorin Township and were randomly selected for purpose of the present work: however, those with physical disabilities were not included.

In each subject, height was measured with Avery height and weight meter (Avery, England); measurement was taken with the individual bare footed, the heel, buttock and shoulders being in contact with the vertical plane of the scale. The head was positioned in the Frankfurt plane. All measurements were taken to the nearest 0.1 cm.

From the data collected, the following calculations were done as follows: Absolute sex difference = mean height for males (m) – mean height for females (f)

Relative sex difference =  $\frac{m-f \times 100}{m}$ 

## **Statistical Analysis**

Data obtained for height were also analyzed for statistical significance using the student's t-test.

## Results

Mean height, sex differences and relative sex differences (in height) of the study population are shown in Table 1. Absolute sex differences and relative sex difference ranged from 10.5 - 12.3cm and from 5.8-7.0% respectively. Statistically significant differences occurred between male and female heights in all the age groups considered, with the male being consistently taller (P<0.05)

Mean height, sex differences and relative sex difference (in height) for some European. Asian and Afri-

 Table 1: Mean height (cm), sex difference(cm), relative sex difference(%) in height by age.

Age (years)	Male			Female		Sex diff		Rel Sex Diff
	No	Mean Height (cm)	S.D	N0	Mean Height (cm)	S.D	m-f	<u>M-f x 100</u> m
18-19	21	172.8	8.2	29	162.7	6.8	10.1	5.8
20-24	99	174.0	6.2	51	163.5	6.0	10.5	6.0
25-29	30	174.7	6.3	19	162.4	5.9	12.3	7.0
All(18-19)	150	173.8	6.9	100	164.3	6.4	9.5	5.5

**Table 2**: Heights (cm), sex difference (cm), relative sex

 deference (%) for certain countries

Country	Author	Year	Height (cm)	Sexdiff (cm)	Rel. sex diff (%)
United kingdom	Skinner & Rosenbaun	1985	177.1 163.2	13.9	7.9
Spain	Dela puente et al	1997	175.6 160.7	14.9	8.4
France	Kheruminn & Shreider	1967	174.3 161.4	12.9	7.4
Norway	Bjeike	1971	177.9 165.9	12.0	6.7
Croatia	Prebeg et al	1994	178.4 165.2	13.2	7.3
India	Kaur &Singh	1981	164.1 151.4	12.7	7.7
Japan	Nugaminen & Suzuki	1964	167.2 155.3	11.9	7.1
Korea	Yun et al	1995	170.1 157.9	12.2	7.1
Kenya	Jansen	1984	165.53 155.6	9.9	6.0
South Africa	Setyn et al	1998	168.3 158.3	10.0	5.9
Nigeria (west)	Johnson	1970	168.1 158.2	9.9	5.9
Nigeria (East)	Singh& Obikili	2002	174.9 165.0	9.9	5.7
Nigeria (North)	Present study	2004	173.8 164.3	9.5	5.5

can countries are shown in Table 2.

### Discussion

In the present study, relative difference in stature was 5.5%. Values ranging from 12.0-13.9 had previously been reported for some European countries (table 2); similarly, relative sex difference in stature had been documented as ranging from 11.9-12.7 for certain Asian countries (table 2). However lower values had consistently been reported for African countries; these include 6.0, 5.9 and 5.7 respectively for Kenya, South Africa and Nigeria.

In his anthropometric studies of Hungarian population, Bodzar<sup>4</sup> suggested the need to approach investigation relating to stature on regional and chronological bases for a given country<sup>4</sup>. In Hungary, stature was reported to vary markedly, by region, such that mean stature decreased from the northwest to the southeast; in addition, mean adult height was also observed to show a positive secular trend over time. Thus, the present study of stature in a population of adult northern Nigerians was therefore considered from a regional perspective. Johnson<sup>5</sup> and Obikili and Singh<sup>3</sup> had previously reported values of 5.9% and 5.7% as relative sex difference in stature of western Nigerians (resident in Lagos) and eastern Nigerians (residents in Enugu) respectively<sup>3,,5</sup> .A value of 5.5% was obtained in the present study conducted in Ilorin (north central Nigeria)

From the foregoing, it is obvious that relative sex difference in stature decreased from the western through to the eastern and then to the northern parts of Nigeria. This may indicate poor nutrition among northern Nigerians compared to western and eastern Nigerians. Tobias<sup>2</sup> and Hiernaux<sup>6</sup> had shown that poorly nourished population had lower sex difference in stature compared to better nourished ones. They concluded that this anthropometric parameter might be a good indication of the health status of a population.

The lower relative sex difference in stature presently reported for northern Nigerians may also arise from the reported ability of female children to withstand adverse socio-economic conditions during growth<sup>6</sup>. Kimura and Kitano<sup>7</sup> and Greulich et al<sup>8</sup> had earlier stated that male children exposed to harsh conditions such as malnutrition and war were more adversely affected than the females.

Although the relationship between sex dimorphism in stature and the health status of a population cannot be ignored, Eveleth<sup>9</sup> had indicated that the use of this parameter as an index of the nutritional and health status of a population could be misleading. Certain other factors could therefore contribute to sex differences in stature. Obikili and Singh<sup>3</sup> were of the opinion that genetic factor played a greater role than nutrition in the determination of the magnitude of sexual dimorphism in adult stature; their view was recently corroborated by Le Bloc <sup>10</sup> et al who reported that insulin-like growth factor I (IGF-1) and its receptor are involved in postnatal growth regulation. They concluded that lack IGF-1 or its receptor affect both the stature and weight of a given population.

Thus, the regional variation in sex dimorphism in stature of adult Nigerians, as reported in this study, could be due to a combination of nutritional, socio-economic and genetic factors.

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