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STATURE OF NIGERIAN FEMALE ADOLESCENTS

With a note on Menarche

BY

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ABSTRACT

A cross-sectional study was carried out between May and October 1990 on 1156 Igbo school girls aged 9 to 18 years. By systematic random sampling, these girls were selected from primary and secondary schools in Enugu, Nigeria. Their mean heights ranged from 131.3 +/- 0.1 to 165.8 +/- 0.1 cm while the mean weight ranged from 25.6 +/- 4.1 to 56.0 +/- 7.4 kg. When stratified into socioeconomic class (SEC), the upper class showed higher values of mean height of 134.1 +/- 0.1 to 169.80 +/- 0.5 cm and a mean weight of 27.2 +/- 4.3 kg to 38.4 +/- 10.4 (p<0.05). The mean menarcheal age was 13.24 +/- 1.27 year while it was 12.8 +/- 1.1 yr for the upper class Igbo school girls. These differences between the general population studied and the upper SEC of the same population were statistically significant. When compared with the figures from a similar study done in 1961 by Tanner and O'Keefe on upper class Igbo school girls, the 1961 figures were found to be lower than all corresponding values in this study. This study therefore shows a significant general statural improvement among Nigerian Igbo girls since the last study in 1961, particularly when the upper class groups are compared in the two different years. Comparing with London girls and thereafter, these 1990 figures were remarkable.

The implications are highlighted.

KEYWORDS: Igbo school girls

Adolescent stature

Menarche
INTRODUCTION

Physique and sexual maturation vie with and interact with cognitive skills and emotional expressiveness in contributing to the social identity of the adolescent. Worldwide, earlier physical and sexual maturation of the adolescents have been reported. Tanner and Ito however clearly reported the importance of adequate nutrition in development. Socioeconomic class (SEC) stratification therefore puts this in the correct perspective. By 1961, this information was scarce in non-European groups which included Nigeria. Tanner and O’Keeffe therefore carried out a study on the heights and weights as well as the age at menarche of upper class Nigerian Igbo school girls, providing mean values for these parameters, apparently as a baseline for future comparison. The present cross-sectional study reports a follow-up on this important arm of the social identity of the adolescent i.e. their physical size/stature and state of sexual maturation (represented by menarche). This was compared with the findings in the British school girls then and at the time of this study.
AIMS/OBJECTIVES

1. To provide a reference point for young female Igbo adolescents of the time.
2. To investigate the relative stature of the Nigerian Igbo female Adolescents with their British counterparts using heights and weights.
3. To highlight the implications of the stature of the Nigerian Igbo female adolescents.

SUBJECT AND METHOD

A total of 1156 primary and secondary school girls in Enugu in Southeastern Nigeria, aged between 9 and 18 were randomly selected between May and October 1990. At the time of the study, Enugu was the capital of the area previously known as Anambra State where the Igbo race was well represented. Anambra State then included the present Enugu, Anambra, Imo, Ebonyi and Abia states of Nigeria. The various sections of Enugu capital territory were well represented in subject selection. Multi-stage sampling method, using the systematic random sampling method was employed to select the primary and secondary schools as well as to select the subjects from a constructed frame. The details and objectives of the study were explained to the school authorities for transmission to the school girls through whom permission from their parents or guardians was received.

The girls were questioned for their ages which were confirmed by the ages in the school register – a prerequisite for admission into
any school in the state. The ages of the girls were recorded to the nearest 6 months (1st July to the 30th June the following year). Where any discrepancy could not be convincingly resolved, such a subject was excluded from the study. Also excluded from the study were those with known or suspected chronic illnesses like Sickle Cell Disease and those not willing to participate. They were also questioned for SEC using a modification of the method employed by Olusanya, Okepa and Ejimokhai. This method scored the father’s occupation/income and his educational attainment as well as the mother’s educational attainment. Finally, the girls were questioned for their ages at menarche.

The heights and weights of the selected school girls were then measured using a standard stadiometer and a standard weighing scale by only one person so as to guard against inter-observer error. The girls were bare-footed and in very light clothing. The mean height and mean weight for each age were calculated from where the range of the means was established.

The information obtained from the present study was compared with the 1961 findings, plotted graphically and then superimposed on the British standard chart which the 1961 study was compared with. The superimposition was to create a picturesque base for the comparison of this study with that of the 1961 study. The pre-menarcheal ages of 9-14 yrs included were to demonstrate the effect of SEC on both the pre- and the post-menarcheal adolescents and not to miss the early maturities.
RESULTS

This study has shown that the range for mean height for 9 - 18-year-old Lhbo school girls is 131.3 \pm 0.1 cm to 165.3 \pm 0.1 cm. These mean heights increased progressively at every age from 9 to 18 years for the general population of 1156 school girls. When stratified into socio-economic classes (SEC), the upper SEC demonstrated a range of mean heights from 134.1 \pm 0.1 cm to 169.8 \pm 0.5 cm. This again increased progressively at every age but peaked at 17 years with a slight drop at 18 years. For the mean weight, the range is 25.6 \pm 4.1 kg to 56.0 \pm 7.4 kg for the general population of Lhbo school girls under study. For the upper socio-economic class, the range of mean weight is 17.1 \pm 1.09 kg to 35.1 \pm 10.1 kg. These again show progressive increase at each age, both mean weights peaked at 17 years, however, dropping slightly at age 18. Tables I and II shows this information which provides the reference point. Even the age of menarche reduced from (4.0 \pm 0.01 year in 1961 to 13.24 \pm 1.27 years in 1990), and further to 12.77 \pm 1.8 yr among the 1990 upper class Lhbo school girls.

The mean height and mean weight of 9 - 18-year-old school girls in this study as well as that of the earlier study of Lhbo school girls which studied 12 - 18-year-old school girls who were in the upper class, are represented on Tables I and II. Also included are the mean height and mean weight of the upper class school girls in this study. Table III shows the range of mean height and mean weight for
the 12 - 18-year olds in 1961 (who were all in the upper class), and the present 1990 upper class girls and the general population studied in 1990.

Figures 1 and 2 show these tabulated values graphically and compares them with a graph obtained for London girls of the same period as shown by Tanner and Whitehouse in the British Standard Chart.

These show that the Nigerian Igbo school girls of 1961 were lighter and shorter than the British school girls. The present 1990 study shows a closer approximation to the London girls in the British Standard Chart than the earlier 1961 study. The 1961 values are, on the average, at the 20th centile while the 1990 ones fall along an average of the 75th centile. However, before the age at menarche, the 1961 Igbo school girls fell close to the 50th centile line while the 1990 values fell close to the 90th centile line. Nevertheless, Table IV shows that irrespective of the age, at the same height, the 1961 Igbo school girls weighed more than the corresponding London girls and the girls in the present study. The tallest Igbo school girls in the present study (1990) are found to be the lightest, falling along the 25th centile of the weights of the British Standard Chart and menarche 18 years. There is no corresponding height in the earlier, 1961 study.

ANALYSIS

The statistical package employed for test of significance is the Z-Test

The Standard Normal Deviate (SND).
This study has shown that the range for mean height for 9-18 year old Ijebu school girls is 134.4 ± 0.1cm to 168.8 ± 0.5cm. These mean heights increased progressively at every age from 9 to 18 years for the general population of 1156 school girls. When stratified into socio-economic classes (SEC), the upper SEC demonstrated a range of mean heights from 134.1 ± 0.1cm to 169.8 ± 0.5cm. This again increased progressively at every age but peaked at 17 years with a slight drop at 18 years. For the mean weight, the range is 23.6 ± 4.1kg to 56.0 ± 7.4kg for the general population of Ijebu school girls under study. For the upper socio-economic class, the range of mean weights is 27.2 ± 4.4kg to 58.4 ± 10.1kg. These again show progressive increase at each age, both mean weights peaked at 17 years, however, dropping slightly at age 18. Tables I and II shows this information which provides the reference point. Even the age of menarche reduced from 14.92 ± 0.01 year in 1961 to 13.24 ± 1.27 years in 1990.

These findings agree that improved socio-economic class of a girl positively influences her stature, height and weight and age at sexual maturation (age at menarche).

It therefore suggests that there is an improvement in the general SEC of the Ijebus from the wake of the Nigerian independence which was in 1960 to 1990. This is because Tables I, II and III demonstrate appreciable increase in stature from the 1961 upper class school girls to the general population in 1990. The further increase in the upper
class school girls in the present study suggests that there is still more potential for improvement in stature among the corresponding Igbo girls. Comparative analyses of the various mean heights, mean weights, as well as the range of values, tell the story. Janes and Mackenzie had already made the point that Southern Nigerian children have the same growth potentials as the Black Americans who are known to be very big sized adults. Already values for girls in this study are higher than values for British girls of corresponding ages of 16 - 19 years studied in 1986. With the secular trend which makes the younger generation mature sexually earlier and grow bigger than their parents, a future comparative study is expected to improve on the values got in the 1990 study.

Interestingly, the 1961 Nigerian Igbo school girls are found to be heavier, weight for height than their British counterparts and girls in the present study, calculating with Pavereal Index which is $\frac{Ht}{Wt}$ (kg). The earlier study presented essentially mean morphs while the 1990 girls tend towards ecomorphs. This ecomorphic somatotype approximates that of the British girls and so this calls for further studies.

CONCLUSION

There is a continued appreciation of the growth in stature of the Nigerian Igbo adolescents as seen in the school girls, most probably due to an improvement in the SEC as at 1990. They also show potential for further increase in physical size. This becomes important in sports medicine especially with basket ball and similar games. With
improved environment and socioeconomic class and of course discipline, many more Igbo girls (and by extrapolation, boys), will most likely excel in those situations that require improved stature as is already being seen among those Igbos in the U.S.A.

RECOMMENDATION

There is need to do follow-up studies of the stature of the Igbo girls periodically until this stabilizes as a target standard for Nigerian girls. The time is ripe for this now.

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