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Obesity Indices and Academic Performance of Medical Students of Igbo Extraction at College of Medicine, University of Nigeria

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Abstract: The study aimed at determining the prevalence of obesity amongst medical students of Igbos of Nigeria and its effect on their academic performance. One hundred and ninety-five (195) third-year medical students (122 males and 73 females) participated in the study. The students' standing height and weight were measured using stadiometer with functional weighing scale. The BMI was calculated from weight and height. The waist and hip circumferences were measured with non stretchable tape at the midway between the iliac crest and the sub-costal margin, and the widest part of the buttocks respectively. The academic performance was based on the results of their second MB, BS professional examination. Descriptive analysis was done and associations between academic performance and the variables were determined using student's t-test, Chi-square tests, and Spearman's correlation. The mean values of BMI, hip and waist circumferences of the students were 23.2±2.5, 88.1±5.8 and 74.2±5.4 in males and 24.1±4.0, 92.2±8.5 and 72.0±8.5 in females respectively. The height, weight and waist circumference were significantly higher in males than females ($p< 0.001$), whereas the BMI and hip circumference were higher in females. Both genders were predominantly of normal BMI, and the prevalence of obesity was 1.6% in male and 5.5% females. There was no significant correlation between the indices of obesity and academic performance of the students. In conclusion, the prevalence of overweight/obesity is low, and there was no significant association between the indices of obesity with academic performance.

Key words: Obesity Indices · Academic Performance · Igbos of Nigeria

INTRODUCTION

Overweight and obesity are said to be related to some factors such as; genetic composition of individuals, socioeconomic status, sedentary life style, feeding habits, culture and gender [1]. Objective discussions of the problems of obesity, overweight and underweight are possible with the categorization of body mass index [2]. Thus, body mass index has been useful in the determination of how much an individual's body weight deviates from ideal for his/her height, and this can be used to predict the general wellbeing and health of the individual.

Aside from being a risk factor for cardiovascular diseases, Diabetic mellitus and other health conditions, overweight and obesity were said to be related to decreased cognitive ability and memory functions [3, 4] by leading to mental and emotional problems, such as anxiety and depression [5] social and psychological consequences [6] which may lead to poor academic performance amongst obese students. It was stated that reduced physical activity due to obesity may decrease oxygen flow to the brain, decrease brain neurotransmitters and decrease brain-derived neurotrophins that support neuronal differentiation and survival in the developing brain, thus reducing academic performance [7].

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Medical profession is prestigious in our society and most of our medical students are from families of average and above average socioeconomic status. Due to the high academic demand on these students, the life style of many of them can be described as "Triangular", from class room to refectory, refectory to sleep and back to class room. At times, they tend to sacrifice some sleeping time and indulge in fast food intake with little or no consideration for physical exercise, all in an attempt to meet up with the ever growing academic demand of medical college. Thus the students may be deemed as being at risk of overweight and obesity.

It was noted that, overweight and obesity are associated with negative changes in structures of the brain and increases the risk of Alzheimer's disease [8]. As academic performance is positively associated with cognitive abilities and memory functions, and having shown that obesity is negatively associated with cognitive and memory functions, overweight/obesity might negatively affect the students' academic performance [9]. Jaswal and Jaswal [10] showed that negative correlation existed between obesity and academic performance amongst adolescents. They noted that normal weight adolescents had better academic performance than their obese counterparts.

On the other hand, some authors [11-15] found no significant association between obesity and academic performance. Atare and Nkangude [16] studied body mass index and academic performance in physical and health education students of University of Uyo and conclude that overweight/obesity has no impact on their academic performance.

The aims of the study were to determine the prevalence of overweight/obesity amongst the medical students of Igbo extraction in University of Nigeria and its effect on their academic performance.

MATERIALS AND METHODS

The study was a descriptive survey and it was conducted in the Anatomy Department at the College of Medicine in the University of Nigeria, Enugu Campus. It involved 195 medical students of Igbo extraction in Southeast Nigeria. Their academic performance was based on the results of their second MB, BS professional examination.

Anthropometry: The following anthropometric parameters were measured. Measurements were performed in 3 trials and the average of the trials was recorded.

Weight: The weight was measured using weighing scale with zero adjustment. The subjects wore minimal clothing without shoes. The weight was recorded to the nearest 0.1kg.

Height: The standing height was measured to the nearest 0.1cm using a stadiometer with a ruler detachable head piece as a pointer. The subject stood erect with the head in the frankfurk plane, arms hanging at the sides and they were bare footed.

Body Mass Index: Was calculated from height and weight as;

$$BMI = \frac{Wt(kg)}{Ht(m^2)}$$

Waist Circumference: Was measured to the nearest 0.1 cm with non stretchable tape at the midway between the iliac crest and the sub-costal margin.

Hip Circumference: This was measured to the nearest 0.1 cm with non stretchable tape at the widest part of the buttocks.

Ethics: Approval of the study protocol was obtained from the College of Medicine Research Ethics committee, University of Nigeria, Enugu Campus.

Informed Consent: The informed consent was obtained from all the participants.

Data Analysis: The data were analyzed using statistical package for the social sciences (SPSS) version 20. Descriptive analysis was used to determine the frequency, percentage and mean of the parameters. Associations between academic performance and the obesity indices were determined using student's t-test, Chi-square tests and Pearson's correlation.

RESULTS

As shown in Table 1, the means of BMI, Hip and waist circumferences of the students were 23.2±2.5, 88.1±5.8 and 74.2±5.4 in males and 24.1±4.0, 92.2±8.5 and 72.0±8.5 in females respectively. The height, weight and waist circumference were significantly higher in males than females ($p< 0.001$), whereas the BMI and hip circumference were higher in females.

Table 1: Obesity indices of the students by gender (n=195)

Obesity indices	Male M±SD	Female M±SD	P-Value
Weight (cm)	69.4±9.0	63.9±11.0	0.001
Height (cm)	172.8±7.3	162.9±5.5	0.001
Waist circumference (cm)	74.2±5.4	72.0±8.5	0.001
Hip circumference (cm)	88.1±5.8	92.2±8.5	0.001
BMI	23.2±2.5	24.1±4.0	0.047

Table 2: Categories of BMI of the students by gender (n=195)

	Underweight	Normal weight	Overweight	Obese	Total
Male No.(%)	0(0)	98(80.3)	22(18.1)	2(1.6)	122(100)
Female No.(%)	0(0)	51(69.9)	18(24.6)	4(5.5)	73(100)

Underweight - < 18
Normal weight - 18-24
Overweight - 25-29.9
Obese - ≥ 30

Table 3: Pearson's correlation coefficient of academic performance with obesity indices

	Wt	Ht	WC	Hip C	BMI	AP
AP	-0.102	-0.015	-0.135	-0.059	-0.103	1

Wt - Weight, Ht - Height, WC - Waist circumference, Hip C - Hip circumference, BMI - Body mass index, AP - Academic performance

Table 4: Academic performance of the students by categories of BMI and gender

	Underweight	Normal weight	Overweight	Obese	P -Value
Male					
Score - M±SD	---	52±10	46±14	51±12	0.361
No.(%)	0 (0)	98 (80.3)	22 (18.1)	2 (1.6)	
Female					
Score - M±SD	---	50±10	47±9	46±15	0.354
No.(%)	0 (0)	51(69.9)	18 (24.6)	4 (5.5)	

Table 2 shows that the students were predominantly of normal BMI, males (80.3%) and females (69.9%). The prevalence of overweight in male and female students was 18.1 and 24.6% respectively, whereas the prevalence of obesity was 1.6% in males and 5.5% in females.

Table 3 shows that there was no significant correlation between academic performance and indices of obesity.

As shown in Table 4, there was no significant difference in the academic performance of the students amongst the four categories of body mass index in both gender.

DISCUSSION

The students' academic performance is vital in assuring the production of good graduates who will become leaders that may be responsible for the nation's economic development [17]. Thus, attention to the factors affecting students' academic performance cannot be over emphasized. Researchers have studied some of the factors in various centers of learning [18]. Hence, we aimed at determining the prevalence of overweight/obesity amongst the medical students of Igbo indigenes at University of Nigeria and its effect on their academic performance.

The mean values of body mass index of the students were within the normal limit in both gender. The female students had significantly higher mean body mass index than their male counterparts ($P < 0.05$). The categorization of body mass index into underweight, normal weight, overweight, and obese showed that both the male and female students were predominantly of normal weight, with 1.6 and 5.5% obese respectively. The prevalence of obesity in this study is less than what was obtained in United State and South Korea where 33.8% and 31.3% of their young adults were obese [19].

Comparison of the academic performance of the students with the different categories of body mass index showed no significant difference. The Pearson's correlation coefficient also showed that body mass index did not correlate significantly with academic

performances of the students. This implied that irrespective of the weight of the students, they can still achieve optimal academic performance provided that other learning conditions and materials are adequately provided. Thus, we can state that in our region, there is no basis for attributing poor academic performances with overweight/obesity profiles of the individuals. Our findings corroborate those of Kaestner and Grossman [11], Abdelalim *et al*. [12], Baxter *et al*. [13] and Atare and Nkangude [16] who reported that there was no significant relationship between body mass index and obesity with academic performance. Kaestner and Grossman [11] noted that body mass index and obesity have no significant effects on academic performance. Baxter *et al*. [13] also found no significant relationships between academic performance and body mass index percentile in African-American children.

On the contrary, some researchers revealed that high body mass index or obesity have negative effect on academic performance [20-25]. It was also showed that the obesity can reasonably be associated with students performance at the university [26].

Other studied indices of obesity were waist and hip circumferences. The former was higher in males while the later was higher in females ($P< 0.001$). Like the body mass index, the waist and hip circumferences did not correlate significantly with academic performance of the students.

CONCLUSIONS

The prevalence of overweight/obesity is low amongst our students. The mean body mass index was higher in females than in males and there was no significant association between the body mass index and other indices of obesity with academic performance.

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