Prevalence of Overweight and Obesity among Adolescents in Secondary Schools in Abia State, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author PEE designed the manuscript, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author ONO designed the manuscript, conducts literature research and analyses of the result. Both authors read and approved the manuscript.

Original Research Article

ABSTRACT

Aims: The study determined the prevalence of overweight and obesity among adolescents in secondary schools in Abia State, Nigeria.
Study Design: A cross-sectional school based survey was conducted among adolescents of Aba South L.G.A to determine the prevalence of overweight and obesity.
Sample: A probability proportional to size was used to select 600 participants, aged 10-19 years from 10 schools. Place and duration of the study: Aba South LGA, study done between September and October, 2012.
Methodology: Their weight, height, waist, hip, body mass index and triceps skinfold were assessed. Overweight and obesity was defined using IOTF, CDC and NHANES III cutoff points. Waist-Hip Ratio (WHR) was compared with the WHO standards. Data was analysed using descriptive statistics. Chi-square analysis was used to test the categorical variables at $P<0.05$.

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Results: The prevalence of overweight seems high in both genders (3.0% and 6.7% in males and females respectively) (p=0.005) while obesity prevalence was low (1.0% and 2.5% in males and females respectively) (0.085). More female adolescents (1.2%) than males (0.3%) were classified as obese when triceps skinfold was used as a measure of obesity. About 36.0% of the adolescents were at high health risk when WHR was used as measure of classification.
Conclusion: Based on the findings, it was concluded that there is need for individualized dietary education among adolescents in secondary schools in Nigeria.

1. INTRODUCTION

Overweight and obesity is an escalating health problem in both developed and developing countries. The International Obesity Task Force (IOTF) report showed that one in ten children worldwide is overweight; a total of 155 million children and adolescents are overweight and around 30–45 million are classified as obese [1]. The main contributing forces in the increasing prevalence of overweight and obesity are believed to be increasing urbanization and the globalization of food markets [1]. With rising incomes and urbanizing populations, physical activity levels tend to decline and diets increasingly shift to include foods higher in saturated fats and sugars [2]. The problem of overweight and obesity is confined not only to adults but also being reported among the children and adolescents of developed as well as developing countries [2]. Since, adolescence is a period of transition from childhood to adulthood; It assumed critical position in the life cycle of human beings, characterized by an exceptionally rapid rate of growth [3]. The prevalence of overweight and obesity among children and adolescents has increased significantly in the developed countries during the past two decades and similar trends are being observed even in the developing world [3]. Overweight and obesity are risk factors for many health problems, regardless of a person's age. Children and adolescents who are overweight and obese, however, face a greater risk of health problems— including type 2 diabetes mellitus, high blood pressure, high blood lipids, asthma, sleep apnoea, orthopaedic problems and psychosocial problems—than their normal weight peers [4]. There is an urgent need to investigate the magnitude of this problem in developing countries such as Nigeria, and to implement prevention strategies as early as childhood by involving families, schools and the whole community.

Aba South LGA is a multiethnic and multicultural society with people from all walks of life. Most of the people are civil servants and they have limited land space for farming activities. The people mostly eat outside their homes because of the nature of their work while school children depend mostly on snacks. This propelled the researcher to assess the prevalence of overweight and obesity among their adolescents. This study determines the prevalence of overweight and obesity among adolescents in secondary schools in Abia State, Nigeria.

2. MATERIALS AND METHODS

2.1 Survey Area

The survey was carried out in secondary schools in Aba South Local Government Area of Abia State, Nigeria.

2.2 Study Design

The study was a cross sectional survey.

2.3 Study Population/Sample Unit

A total number of 600 secondary school student adolescents were selected. The study population consisted of secondary school students of 10-19 years of age selected from 61 registered secondary schools (27 public and 34 private secondary schools) in Aba South L.G.A of Abia State, Nigeria.

2.3.1 Sampling technique

There were 27 public and 34 private secondary schools in Aba South L.G.A. The names of the private and public schools were written in different pieces of papers and folded into two containers (one for private schools while the other for public schools. Ten secondary schools (5 public and 5 private secondary schools) were systematic randomly selected by balloting

without replacement. The sample was selected using a multi-stage cluster random sampling technique. The first stage was identifying and determining the numerical strength of children aged 10-19 years in each of the schools. The distribution of these pupils by age and sex was obtained from class registers. The second stage involved calculating by simple proportion 10 % of the children (10-19 years) in the sample size to obtain the study sample per school. This was done according to their ages and sexes. The third stage was the actual selection of the respondents according to their ages and sexes in their different classes. This was done using simple random sampling technique by balloting without replacement.

2.4 Ethical Approval/Informed Consent

Ethical approval was sought and obtained for this study from the Aba South Local Government Area Education Authority, Abia State. Permission was also sought from local education authority and the principals of the selected schools. The nature, purpose and procedure of the study were explained to the participants in detail. Informed consent was sought from the participants and their parents. The biodata of each participant was taken: This included age (as at last birthday) and sex.

2.5 Data Collection

Questionnaire was designed to provide information on the socio-economic factors and food habit of the respondents. Each subject was subjected to weight, height, waist and hip measurements. Triceps measurement was also taken using skinfold calipers. The weight of each subject was measured using a Salter scale (CMS weights Ltd. London). The subjects were weighed without shoes and in light/minimum clothing. They were asked to stand on the scale with arms on the side and knees erect, one at a time. The measurements were taken to the nearest 0.1kg. Height was measured to nearest 0.1cm using a microtoise height measure. Measurements were taken with subjects bare footed, standing erect with feet parallel and heels put together in line with methods of [5]. Triceps was measured halfway between the acromion process and the olecranon process.

2.6 Determination of Overweight and Obesity

The International Obesity Task Force (IOTF) BMI cutoff points for children was used to define

overweight and obesity. These age- and gender-specific cutoff points were derived from a large international sample with regression techniques, by-passing a line through the adult cutoff points at 19 years. The Waist-hip ratio was calculated and classified according to [6] standards. Waist circumference was classified according to [6] standards. NHANES III cutoff points were used for classification of triceps measurement.

2.7 Data Analysis

Descriptive statistics of frequencies, percentages, mean and standard deviation was used to examine the age- and gender-specific anthropometric indices. Chi-square and independent t-test was also applied to see the differences between the parameters or variables of the genders. Based on the IOTF, CDC and NHANES III cutoff point prevalence of overweight and obesity was calculated. P-value < 0.05 was considered to be statistically significant.

3. RESULTS

Table 1 shows 51.3% of the respondents were females, a greater percentage (51.0%) aged 10-14 years and more than half (57.5%) attended Private secondary schools.

Table 1. Background information of the respondents

	Frequency	Percentage
Sex		
Male	290	48.3
Female	310	51.7
Total	600	100.0
Age-range		
10-14 years	306	51.0
15-19 years	294	49.0
Total	600	100.0
Mean±SD of age=14.56±1.84		
Type of schools		
Public	255	42.5
Private	345	57.5
Total	600	100.0

Table 2 shows that about 38% of the respondents ate every four hourly. Majority of the respondents (82.1%) and (76.2%) consumed vegetables and fruits occasionally respectively.

Table 3 shows that 3% of the respondents were underweight, 9.7% were overweight and 3.5% were obese. More females were overweight and obese than the males.

Fig. 1 shows that 35.7% and 12.8% of the females had moderate and high health risk respectively while 0.7% and 3% of the males had moderate and high health risk respectively

4. DISCUSSION

The study revealed that more females (51.7%) than males (48.3%) participated in the study. A greater percentage of them were within the ages of 10-14 years and more than half of the respondents (57.5%) were from private schools.The reason for more females than males in the population might be because of more enrolment of the females in education in recent times than males. Most males tend to go into business and apprenticeship than the female folks. The background characteristics in this study were comparable to those used in previous studies [7-9]. The mean age of the respondents in this study (14.56±1.84 years) was similar to the findings of [10] where the mean age of their respondents was 14.25±1.25 years.

Table 2. Frequency of food consumption by the respondents

	Frequency	Percentage
Time intervals of eating		
Every 2 hours	73	12.2
Every 4 hours	225	37.4
Every 6 hours	187	31.2
Every 8 hours	115	19.2
Total	600	100.0
Frequency of vegetable consumption		
Everyday	70	11.7
Occasionally	493	82.1
Never	37	6.2
Total	600	100.0
Frequency of fruits consumption		
Everyday	101	16.8
Occasionally	457	76.2
Never	42	7.0
Total	600	100.0

Table 3. Body mass index of the respondents according to sex defined by IOTF cut-off point

	Underweight freq. (%)	Normal freq. (%)	Overweight freq. (%)	Obese freq. (%)	Total freq. (%)
Male	11(1.8)	255(42.5)	18(3.0)	6(1.0)	290(48.3)
Female	7(1.2)	248(41.3)	40(6.7)	15(2.5)	310(51.7)
Both sexes	18(3.0)	503(83.8)	58(9.7)	21(3.5)	600(100.0)

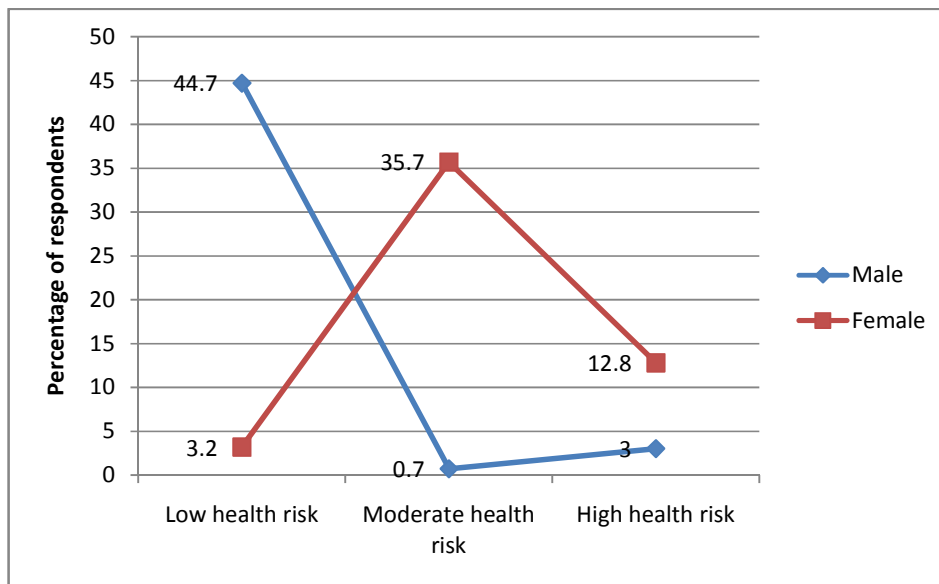*Footnote: Freq. – frequency, % - percentage, X^2 = 12.536, df =3, p= 0.006*

Fig. 1. Sex-specific health risk prevalence of the respondents defined by waist-hip ratio
$X^2 = 4.548$, df= 2, P=0.000

The prevalence of overweight and obesity in this study was 9.7% and 3.5% respectively. This was lower when compared with the prevalence of overweight (15%) and obesity (5%) in Iranian adolescents [11] and Indian adolescents (11.1% for overweight and 14.2% obese) [8]. The possible reasons of higher prevalence of overweight and obesity may be linked to their food habit, westernization and government policies in these countries. However, in this study, there was a significant (P<0.05) higher prevalence of overweight (6.7% and 3.0%) and obesity (2.5% and 1.0%) in females than in males respectively. It can be explained by the fact the male adolescents might be involved in more exercise than their female counterpart. This was lower than the findings of a similar study done at Sagamu by [7] where the prevalence of overweight and obesity in males (8.1% and 1.9% respectively) and females (8.1% and 2.7% respectively) but higher than the findings of similar studies by [12] in Port Harcourt and [13] in Lagos. This might be explained by the time these studies were carried out. Both studies were done earlier. The Waist-Hip Ratio (WHR) of the females (12.8%) had more significantly (P<0.001) high health risk than males (3.0%).The implication of this result is that the females might be more predisposed to non-communicable diseases such as diabetes and hypertension later in life. According to Mueller and Nichols, the fitness experts, WHR helps us track our weight loss progress and also serve as a warning about our estimated health risk for problems related to being overweight such as diabetes, stroke and heart disease [14].

5. CONCLUSION

Consumption of fruits and vegetables among the respondents were quite low. The prevalence of overweight and obesity among adolescents was quite high when compared with the result of other studies in Nigeria and it was higher in late adolescent stage (15-19 years) than early adolescent stage (10-14 years) which might linked to increased frequency of consumption of foods among the group.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history.php?iid=794&id=32&aid=6787