

LIFESTYLE AND ANTHROPOMETRIC ASSESSMENT OF IN-SCHOOL ADOLESCENTS IN RURAL AND URBAN COMMUNITIES OF NSUKKA LOCAL GOVERNMENT AREA, ENUGU STATE, NIGERIA

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ABSTRACT

Background: Adolescence is marked by considerable existential conflicts as well as exposure and vulnerability to substance abuse. Poor lifestyle behaviour of adolescents today constitute risk factor for future adult's health status. The study assessed the anthropometric status and lifestyle behaviour of in-school adolescents of rural and urban communities in Nsukka local government area, Enugu state.

Methods: A cross sectional study of 375 in-school adolescents randomly selected from urban and rural secondary schools in Nsukka local government area was done using a multistage sampling technique. Structured and validated questionnaire were administered to the subjects to elicit information on the socio-demographic, socio-economic and lifestyle behavior characteristics. Anthropometric assessment was carried out using standard methods and the data obtained was categorized using World Health Organization Z- scores standard. Data obtained from the questionnaire was analysed using IBM SPSS Statistics version 21. Descriptive statistics was used to describe the data and inferential statistics (t-test and chi-square) was used to compare associations. Significance level was set at $p < 0.05$.

Results: More than half (69.3%) of the respondents were females, 48.5% of the respondents were in the middle adolescence (14 -16 years). The prevalence rates of underweight and obesity among the adolescents in the urban areas are 26.9% and 0.8% respectively while in the rural areas they are 22.1% and 1.2% respectively. Proportion that participated in exercise were 85.7% and 80.8% in the rural and urban areas respectively but more of those in the urban areas took part in vigorous intensity exercises (65.4%). Smoking pattern showed that 0.8% and 1.2% in the urban and rural areas indulged in cigarette smoking and only rural adolescents admitted to the smoking of Indian hemp (3.7%). Alcohol intake was also significantly higher in the rural adolescents (31.4%) when compared to their urban counterparts (12.3%). There exists significant difference ($p=0.000$) for alcohol intake between the urban and rural adolescents, frequency of physical activity between the rural and urban adolescents, education level of sponsors in both rural and urban areas. There also exists a significance difference ($p=0.003$) for the duration of physical activities.

Conclusion: This study revealed prevalence of double burden of malnutrition (overweight/obesity and underweight), poor lifestyle behavior among adolescents in urban and rural secondary schools in Nsukka.

Keywords: *Lifestyle, Anthropometry Assessment, Adolescents*

INTRODUCTION

Adolescence is marked by considerable existential conflicts as well as exposure and vulnerability to unhealthy lifestyles, leading to a variety of social and public health problems which could pose an age long problem to the future health, productivity and national development if appropriate measures are not taken (1). The state of nutrition of an individual is said to be good (optimum) if there is no evidence of malnutrition whether open or latent (2). Adolescent age is an opportunity to nurture the lifestyle habits necessary for a healthy productive life in adulthood and also a time to reverse the current trend towards obesity and cardiovascular diseases (3). Adolescence is characterized by a strong tendency to experiment with risk behavior as the desire for novelty and a greater quest for experiment are much in adolescence than in later life (4).

According to World Health Organization (WHO) estimates, 60% of deaths globally are due to non-communicable diseases associated with unhealthy diet and physical inactivity, with 79% of these deaths occurring in developing countries (5). Urbanization has also been linked to exposure to junk foods, also sedentary lifestyles are also contributory factors to excessive weight gain (6). Overweight and obese youths are at a five times greater risk of obesity in early adulthood compared with children at the same age and with normal weight (7). Obese and overweight adolescents may suffer from a range of health problems including musculoskeletal difficulties, breathing problems, asthma, obstructive sleep apnea, pre-diabetes (disturbed blood glucose levels), poorer mental health, stigmatization, low self-esteem (8) and have higher risk of morbidity, disability and premature mortality in adulthood (9).

Lifestyle (a mode of living adopted by an individual, a group, a nation or a commonwealth of nations) is influenced by economic, political, cultural and religious factors, demography and technological advancements (10). Poor lifestyle-habits have been the bane of the society as most adolescents adopt unhealthy lifestyles like substance use, excessive physical activity which are of vigorous intensities. Substances abused by these adolescents include tobacco and its products, Indian hemp, alcohol, opioids, cannabinoids, volatile solvents, hallucinogens, sedatives, cocaine, other stimulants and psychoactive substances (11).

Young people have greater problems with regards to alcohol intake; moreover, early initiation in alcohol use is one of the most important predictors of future health, socio-cultural and economic problems (12). Alcohol is the world's third largest risk factor for disease, it contributes to 4% of the global burden of disease and is estimated that about 2.5 million deaths each year are directly attributable to alcohol, with 9% of the deaths in the 15 to 29 year age group being alcohol related (12). Studies have shown that regular physical activity provides more health benefits than sporadic and high intensity workouts (13). Furthermore, the vulnerability of adolescents which could be attributed to their increased nutritional needs, eating patterns, lifestyles and high susceptibility to environmental influences (14) prompted this study. Hence the study assessed the anthropometric and lifestyle behavior of in-school adolescents in Nsukka local government area, Enugu state.

METHODOLOGY

Research design

Cross sectional survey was adopted for this study.

Study population

The study involved male and female adolescents aged 10 - 19 years in government secondary schools of rural and urban communities in Nsukka local government area, Enugu state.

Sample size and sampling procedure

Multistage sampling procedure was first used as government established secondary schools in Nsukka local government area were stratified into rural and urban schools. There are 22 rural and 8 urban secondary schools in Nsukka, thirty percent each of the schools was chosen for this study.

$$\frac{30 \times 22}{100} = 6.6 \approx 7 \text{ rural schools}$$

$$\frac{30 \times 8}{100} = 2.4 \approx 2 \text{ urban schools}$$

A total of nine schools; seven rural and two urban were selected by balloting without replacement. In each school, the class registers for the different classes was used to obtain the total number of students in each

class that fell within the expected age range (10-19 years), and a random sampling technique by balloting without replacement was used to select study participants from the nine secondary schools for life style assessment and anthropometrics.

Data collection

Preliminary visit

Nsukka Local Government Post Primary School Management Board was visited with an identification letter obtained from the Head of Department, Department of Home Science, Nutrition and Dietetics to obtain the total number of government secondary schools in the area. The principals of the selected schools were also visited to obtain permission to carry out the study before eventually entering into the field.

Ethical consideration and informed consent.

Consent to participate in the study was obtained from the respondents by giving them a consent form after a detailed explanation of the study protocol was given to them. Only subjects who consented were recruited for the study.

Questionnaire

Structured and validated questionnaire was used to elicit information. The questionnaire made use of self-administered and interviewer administered methods. Information on the lifestyle behavior assessment of the adolescents was elicited using the questionnaire.

Anthropometric assessment

Height measurement

All anthropometric data were collected following standard norms set up by WHO (15) as a height meter graduated in centimetres was used for height measurement, and respondents' height were taken with their shoes removed; both feet parallel to each other and with the heels, buttocks, shoulders and back of head touching the height meter. The head were kept comfortably erect, with the lower body of the orbit in the same horizontal plane as the auditory meatus. Height measurement was read to the nearest 0.1m after converting from centimetre to metre.

Weight measurement

This was taken using Hanson's bathroom weighing scale, graduated in kilograms with a capacity of 120kg. With no shoes and with minimal clothing, the respondents were made to stand at the centre of the platform of the weighing scale without touching or leaning on anything. With head held erect and arms hanging by the sides, readings were taken to the nearest 0.1kg (16).

Body mass index

Body Mass Index (BMI) is an international standard that is defined as the weight in kilograms divided by the square of the height in meters (kg/m^2) (16). The BMI of these adolescents was classified using the BMI

for age Z-scores obtained from (15). The classification of BMI for age of the respondents was categorized into underweight, normal, overweight and obesity respectively.

Data and statistical analysis

The data obtained was coded and analyzed using IBM SPSS Statistics version 21.0. Descriptive result was presented as frequency, percent, mean and standard deviation. Inferential analysis was performed with Pearson’s correlation chi-square and significant level

was set at $p < 0.05$. Independent sample t-test for equality of mean was used to test the significant difference at the confidence level of 95%.

RESULTS

Table 1 shows the socio-demographic information of the respondents. About 69.3% of the respondents were females while 30.7% were males. Majority of the respondents were in the age range of 14 -16 years and in senior secondary school one (SSS1).

Table 1: Socio-Demographic Information of the Respondents.

Parameter	Frequency	Percent
Sex		
Male	115	30.7
Female	260	69.3
Total	375	100.0
Age		
10-13yrs	70	18.7
14-16yrs	182	48.5
17-19yrs	123	32.8
Total	375	100.0
Class		
JSS 1	74	19.7
JSS 2	66	17.6
JSS 3	28	7.5
SSS 1	146	38.9
SSS 2	61	16.3
Total	375	100

Table 2 shows the BMI characteristics of the respondents. The mean \pm standard deviations for height, weight for urban adolescents are 1.60 ± 0.71 , and 49.10 ± 8.11 while for rural adolescents it was 1.61 ± 0.107 and 50.266 ± 8.37 . The result showed that the prevalence of underweight and obesity among the adolescents in the urban areas were 26.9% and 0.8%

while in the rural areas they were 22.1% and 1.2%. Most (71.6%) of the adolescents in the urban areas had normal BMI for age. The study showed that 21.5% of the adolescents whose parents earn below twenty thousand (₦10,000 – ₦20,000) were underweight, 74.7% were normal, 1.5% were overweight while 2.2% were obese.

Table 2a: Comparison of the mean anthropometric parameters between rural and urban respondents

Parameter	Sector	N	Mean	Std. Deviation	t- value	p-value
Height	Urban	130	1.6054	0.07157	-0.553	0.004
	Rural	245	1.6112	0.10716		
Weight	Urban	130	49.1019	8.11367	-1.295	
	Rural	245	50.2663	8.37772		

Table 2b: Prevalence of overweight/obesity and underweight among the adolescents

BMI Class	Urban F (%)	Rural F (%)	Total F (%)
Under weight	35 (26.9)	54 (22.1)	89 (23.7)
Normal	93 (71.6)	185 (49.3)	278 (75.4)
Overweight	1 (.8)	3 (1.2)	4 (1.1)
Obesity	1 (.8)	3 (1.2)	4 (1.1)
Total	130 (100)	245 (100)	375 (100)

Table 2c: Cross-tabulation of BMI class with the monthly income of sponsors

Monthly income of sponsor (₦)	Under weight	Normal	Over weight	Obesity	Total	t-value
10,000 to 20,000	29 (21.5)	101 (74.7)	2 (1.5)	3 (2.2)	135 (100)	61.154
21,000 to 30,000	11(21.1)	40 (76.9)	0 (0)	1 (1.9)	52 (100)	
31,000 to 40,000	16 (29.6)	37 (68.5)	1 (1.9)	0 (0)	54 (100)	
41,000 to 50,000	7 (26.9)	19 (73.1)	0 (0)	0 (0)	108 (100)	
51,000 and above	26 (24.1)	81 (52.8)	1 (.9)	0 (0)	108 (100)	
Total	89 (23.7)	278 (74.2)	4 (1.1)	4 (1.1)	375 (100)	

Table 3 shows the socio-economic characteristics of the respondent's sponsors. Also, 9.3% of mothers in the rural areas had no formal education, while 1.1% of mothers in urban areas had no formal education.

Parents (38%) in the rural areas earned a low income of ₦10,000 to ₦20,000 while 32.3% of their urban counterparts earned same.

Table 3: Cross-tabulation of Socio economic characteristics with geographical location of the adolescents

Parameter	Urban F (%)	Rural F (%)	Total F (%)	Chi square Value	p-value
Education level of mother					
No-formal education	4 (1.1)	35 (9.3)	39 (10.4)	57.922 ^a	0
Primary education	21(5.6)	75 (20.0)	96 (25.6)		
Secondary education	53 (14.1)	111 (29.6)	164 (43.7)		
Post-secondary education	52 (13.9)	24 (6.4)	76 (20.3)		
Total	130 (34.7)	245 (65.3)	375 (100)		
Education level of father					
No formal education	6 (1.6)	35 (9.3)	41 (10.9)	23.321 ^a	0
Primary education	23 (6.1)	63 (16.8)	86 (22.9)		
Secondary education	50 (13.3)	99 (26.4)	149 (39.7)		
Post-secondary education	51 (13.6)	48 (12.8)	99 (26.4)		
Total	130(34.7)	245 (65.3)	375 (100)		
Monthly income of sponsor					
10,000 to 20,000	42 (11.2)	93 (24.8)	135 (36.0)	4.981 ^a	0.289
21,000 to 30,000	15 (4.0)	37 (9.9)	52 (13.9)		
31,000 to 40,000	23 (6.1)	31 (8.3)	54 (14.4)		
41,000 to 50,000	7 (1.9)	19 (5.1)	26 (6.9)		
51,000 and above	43 (11.5)	65 (17.3)	108 (28.8)		
Total	130 (34.7)	245 (65.3)	375 (100)		

Table 4 shows the physical activity patterns and duration of these adolescents. Most adolescents dwelling in the rural areas were physically active as

shown by a value of 85.7% as against 80.8% in the urban areas. Furthermore, 65.4% of rural adolescents indulge in physical activities of vigorous intensity.

The prevalence of smoking cigarette and Indian hemp were higher in the rural adolescents (0.8% and 2.4%)

while in urban adolescents they were 0.3% and 0.0% respectively.

Table 4a: Physical activity patterns and duration of the respondents

Parameter	Urban F (%)	Rural F (%)	Total F (%)	Chi- Square	p- value
Do you currently exercise					
Yes	105 (80.8)	210 (85.7)	315 (84)	1.545 ^a	.214
No	25 (19.2)	35 (14.3)	60 (16)		
Total	130 (100)	245 (100)	375 (100)		
Duration of exercise					
Daily	33 (25.4)	102 (41.6)	135 (36)	20.102 ^a	.000
Weekly	43 (33.1)	69 (28.2)	112 (29.9)		
Monthly	43 (33.1)	69 (28.2)	112 (29.9)		
Rarely	7 (5.4)	25 (10.2)	32 (8.5)		
None	22 (16.9)	16 (6.5)	38 (10.1)		
Total	130 (100)	245 (100)	375 (100)		
Length of exercise at a time					
<30mins	68 (52.3)	95 (38.8)	163 (43.5)	17.950 ^a	.003
30-45mins	24 (18.5)	70 (28.6)	94 (25.1)		
46-60mins	4 (3.1)	16 (6.5)	20 (5.3)		
>60mins	6 (4.6)	24 (9.8)	30 (8)		
>90mins	5 (3.8)	17 (6.9)	22 (5.9)		
None	23 (17.7)	23 (9.4)	46 (12.3)		
Total	130 (100)	245 (100)	375 (100)		
Type of exercise					
Light	3 (2.3)	12 (4.9)	15 (4)	9.192 ^a	.027
Moderate	20 (15.4)	59 (24.1)	79 (21.1)		
Vigorous	85 (65.4)	152 (62.0)	237 (63.2)		
None	22 (16.9)	22 (9.0)	44 (11.7)		
Total	130 (100)	245 (100)	375 (100)		

Table 4b: Smoking and alcohol consumption pattern of the respondents

Parameter	Urban F (%)	Rural F (%)	Total F (%)	Chi square	p- value
Do you smoke Cigarette					
Yes	1 (0.8)	3 (1.2)	4 (1.1)		
No	129 (99.2)	242 (98.8)	371 (98.9)		
Total	130 (100)	245 (100)	375 (100)		
Do you smoke Indian hemp					
Yes	0 (0)	9 (3.7)	9 (2.4)	4.893 ^a	0.063
No	130 (100)	236 (96.3)	366 (97.6)		
Do you take Alcohol					
Yes	16 (12.3)	77 (31.4)	93 (24.8)	17.375 ^a	0
No	114 (87.7)	168 (68.2)	282 (75.2)		
Total	130 (100)	245 (100)	375 (100)		
Frequency of alcohol intake					
Daily	1 (0.3)	8 (2.1)	9 (2.4)	12.157 ^a	0.016
Weekly	2 (0.5)	16 (4.3)	18 (4.8)		
Monthly	3 (0.8)	15 (4.0)	18 (4.8)		
Rarely	8 (2.1)	22 (5.9)	30 (8.0)		
Others	116 (30.9)	184 (49.1)	300 (80)		
Total	130 (34.7)	245 (65.3)	375 (100)		
Amount of alcohol consumed per day					
<1 bottle/day	4 (1.1)	40 (10.7)	44 (11.7)	24.138 ^a	0
1 bottle/day	2 (0.5)	19 (5.1)	21 (5.6)		
2-3 bottles/ day	3 (0.8)	9 (2.4)	12 (3.2)		
4 bottles and above/ day	1 (0.3)	3 (0.8)	4 (1.1)		
Others	120 (32)	174 (46.4)	294 (78.4)		
Total	130 (34.7)	245 (65.5)	375 (100)		

Discussion

The study observed that the respondents composed more of the female within the age group of 14 to 19 years (middle to late adolescent stage) and in Senior Secondary School (SSS) classes. Findings from the study revealed low prevalence of overweight and obesity among adolescents in both rural and urban area, but with high prevalence of underweight among them, which is higher among adolescents in the urban compared to rural. The prevalence of overweight and obesity observed among the adolescents in both urban and rural area in this study is lower compared to that reported by the previous study conducted for both rural and urban adolescents in south western Nigeria, the prevalence of overweight and obesity were 11.4% and 5.4% (urban) and 4.0% and 0.4% (rural) (17), and the study on urban dwelling adolescents in the south eastern Nigeria with a prevalence rate of 2.8% and 11.4% for overweight and obesity respectively (18), and also in a comparative study done at Enugu between rural and urban adolescents using BMI percentile categories, 9.8% and 2.8% were the prevalence rates for overweight and obesity for urban area while 5.2% and 1.1% are for rural area (19).

The high prevalence of underweight observed among urban adolescents than the rural adolescents in this study is contrary to the study done in Osun state, which reported that the prevalence of underweight was higher among rural adolescents (22.4%) than in their urban counterparts (16). The high prevalence of underweight observed among the adolescents could be attributed inadequate intake of nutrient to meet the increased nutritional requirements for the growth and development of adolescents due to poor dietary habits, infection and diseases and increased physical activities. Adolescent underweight are linked to high susceptibility to infection and diseases, poor mental development, low productivity due to weakness and fatigue and ultimately death. It is a known fact that overweight and obesity during childhood and adolescent years is becoming an issue of global public health concern (20) and have been associated with obesity in adulthood which is a positive risk factor for non-communicable chronic diseases (NCDs) such as diabetes, cardiovascular diseases and arthritis in adulthood (21).

This study observed poor lifestyle such as smoking, use of indian hemp and drinking of alcohol among adolescents, the poor lifestyle was practiced more

among adolescent in the rural area compared to their urban counterpart. Finding shows that few of adolescents in both urban and rural areas reported that they indulged in cigarette smoking and the smoking of Indian hemp. This findings is low compared to the general prevalence of substance abuse for secondary school students in rural communities of Oyo state of 69.3%, this included alcohol intake, tramadol use, tobacco use and other substances (22). This low prevalence of smoking and use of indian hemp could be attributed to under reporting by the respondents due to fear and confidentiality interest.

The high intake of alcohol among the rural adolescents compared to their urban counterparts was in concordance with the study done on rural and urban adolescents in Germany where the life-time prevalence for alcohol consumption differed significantly between rural (93.7%) and urban areas (86.6% large cities; 89.1% smaller cities) with a higher prevalence in rural areas (23). This high rural prevalence could be likened to the fact that they have fewer alternatives for engaging in interesting leisure activities, hence they resort to alcohol intake. Also, ignorance and custom could also be among the reasons, as some of these substances are used for traditional functions. It is also readily available in rural areas than in urban areas, hence no restriction to consumption by age or gender.

In this study, adolescents in the rural areas were more physically active than the urban adolescents. This finding is in agreement with a previous study done in Brazil where rural area adolescents had a higher participation rate in physical activities than their urban counterparts (37.3% versus 34.5%) (24). This does not conform with the study done in Portugal where urban adolescents had more physical activity pattern which was attributed to the fact that these adolescents were influenced by their parents, availability of facilities for physical activities or maybe physical education lessons at school (24). Regular physical activity provides more health benefits than sporadic and high intensity workouts (13), as it can help prevent many chronic diseases, prevent depression, reduces stress, strengthen muscles, bones, and joints, improve metabolism, increase energy level, increase bone density which help to prevent osteoporosis (25; 26). Physical inactivity levels are on increase and can be attributed to chronic degenerative diseases and mortality rates (27). Several factors have been implicated as the cause of this, such as passive travel to schools, limited access to physical activity facilities, lack of maternal physical activity, time spent on electronic gadgets, low schooling and income levels (24).

Most physical activities of vigorous intensities were carried out by rural dwellers (65.4%). This was in concordance with a study done in Brazil where rural area adolescents had a higher participation rate in physical activities than their urban counterparts (37.3% versus 34.5%) (23). This does not conform with the study done in Portugal where urban adolescents had more physical activity pattern which was attributed to the fact that these adolescents were influenced by their parents, availability of facilities for physical activities or maybe physical education lessons at school (23). Regular physical activity provides more health benefits than sporadic and high intensity workouts (13), as it can help prevent many chronic diseases, prevent depression, reduce stress, strengthen muscles, bones, and joints, improve metabolism, increase energy level, increase bone density which help to prevent osteoporosis (24; 15).

Conclusion

The study established existence of double burden of malnutrition among the adolescents as evidenced by the co-existence of overweight, obesity and underweight in the study population. Other unhealthy lifestyle behaviours and habits like alcohol intake and smoking were also exhibited by the respondents. The study revealed that substance use is a recurring phenomenon, and has spread its tentacles to both rural and urban areas. Indeed, assessing the nutritional status and lifestyle behaviours of adolescents is actually a bench mark towards the attainment of any policy on the age group as it has shown most of their challenges and they also serve as predictors of future health, socio-cultural and economic problems.

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