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# Knowledge and Attitude Towards Dietary Risk Factors and Prevalence of Obesity Among Newly Admitted Undergraduates of Osun State University, Nigeria

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**Abstract.** The epidemic of overweight and obesity poses a global challenge to chronic disease prevention, driven by increased consumption of energy-dense, fatty foods and a rise in physical inactivity due to sedentary lifestyles. Westernisation, urbanisation, and eroding traditional values contribute to this issue, leading to childhood obesity persisting into adulthood and triggering various diseases. Middle and low-income countries face a double disease burden, grappling with infectious and non-communicable diseases due to escalating obesity rates. This study assessed the knowledge and attitudes towards dietary risk factors and the prevalence of obesity among newly admitted undergraduates at Osun State University, Nigeria. The findings revealed a relatively low prevalence of obesity (4.7%) among the studied population, with encouraging knowledge about obesity among the students. Socio-demographic factors such as family standard of living and parents' were found to influence obesity among undergraduates. However, limited community exercise facilities, poverty, and poor nutritional education contribute to poor dietary habits. Further efforts are needed to address obesity in this population and its potential impact on health and the economy. Stakeholders should support childhood obesity prevention interventions, including marketing and advertising restrictions on unhealthy foods and beverages adolescents consume.

The research employed a descriptive cross-sectional study design, sampling 320 participants from three university campuses through a multistage sampling method. Data collection was facilitated through a semi-structured questionnaire administered to themselves. The data was analysed using univariate, bivariate, and multivariate approaches.

The 320 respondents were 47.8% male and 52.2% female; a more significant percentage were 15-19 years old. 8 out of 10 respondents had good knowledge, and the attitude of the respondents was significantly associated with their age and religion, such that the respondents between 15-19 years of age and the Muslims were more likely to have good knowledge than their counterparts.

Family standard of living (father and mother occupational status) was the socio-demographic factor influencing obesity among Osun State University undergraduate students. Adequate intervention is required to enable adolescents and their parents/guardians to understand the health-related problems they are prone to by being obese. Concerned

stakeholders should support childhood obesity prevention interventions such as marketing and advertising restrictions on unhealthy foods and fizzy drinks adolescents consume.

**Keywords:** obesity prevalence; health awareness; undergraduates; dietary knowledge; dietary risk factors.

## INTRODUCTION

Obesity, once thought to affect high-income nations primarily, is now experiencing a significant increase in low and middle-income countries, especially within urban areas. Meanwhile, these countries continue to grapple with a dual burden of health issues: infectious diseases and undernutrition. Obesity contributes significantly to chronic non-communicable illnesses like cardiovascular disease and specific cancers. Obesity is increasing among urban adults and preschool children in Nigeria, reflecting the ongoing global surge in various communities. This phenomenon can be attributed to a lack of accessible community facilities promoting regular exercise, socioeconomic challenges, limited nutritional education, risky dietary habits, and sedentary lifestyles. Worldwide, each year witnesses reports of more than 300 million cases of adult obesity and over 1.1 billion instances of adult overweight [1]. The trajectory of obesity has shown a tendency to reach its highest point since the 1960s, making individuals more susceptible to conditions like hypertension, diabetes, cancers, and various other cardiovascular-related health challenges [2]. Obesity occurs in young adults, older adults, and children [3]. The global rise in overweight and obesity poses a significant obstacle to preventing chronic diseases. This is driven by the growing consumption of calorie-dense foods high in fat, coupled with a surge in physical inactivity due to the increasingly sedentary nature of numerous occupations, mechanised transportation, and the growing trend of urbanisation.

Obesity represents a persistent health condition, and the link between obesity and factors such as income and educational attainment is intricate, varying according to gender and racial/non-Hispanic background [4]. According to [5], the prevalence of obesity, adjusted for age, indicated that college graduates exhibited a lower occurrence (27.8%) in comparison to those with partial college education (40.6%) and individuals who had completed high school or had lower levels of education (40.0%). The trends did not remain uniform among all subgroups defined by sex and racial/hispanic origin. As the Centers for

Disease Control and Prevention reported, the collective obesity prevalence stands at 42.8% among adults beyond 60 years, 44.8% for middle-aged adults aged 40 to 59, and 40% for younger adults aged between 20 to 39 years [6]. Remarkably, out of the total annual expenditure of \$3.3 trillion on healthcare for chronic ailments, obesity alone contributes a significant share of \$1.4 trillion. The primary reason for obesity and overweight is an inequity between the calories ingested and those expended. The rising prevalence of obesity in adolescents has become a significant public health issue due to its associated health complications.

Furthermore, a negative self-perception of body image has historically been linked with obesity and could potentially impact individuals' psychological and social well-being, particularly adolescents. Adopting Western lifestyles, urbanisation, the erosion of traditional values, the transition of childhood obesity into adulthood, and the association of obesity with various diseases collectively contribute to the growing concern around this issue. The complexity of obesity's underlying mechanisms is extensive and varies depending on the factors contributing to weight gain. Enhancing our comprehension of these elements is crucial for developing more targeted health policies. Consequently, this study seeks to evaluate the awareness and attitudes of college students towards dietary factors linked to obesity risk and ascertain the prevalence of obesity within this student population.

## MATERIALS AND METHODS

*Study Design.* This cross-sectional study with a descriptive approach was conducted in February 2021 among university students in tertiary institutions in Osun state, which is situated in the southwest region of Nigeria.

*Sample size determination.* The sample size was determined using Leslie Fischer's formula for a single proportion (for populations greater than 10,000). The sample size was estimated at 265.6 based on a prevalence rate 22.7a before the study. The sample size was rounded to 320 to

account for potential attrition and non-responses and facilitate comprehensive cross-tabulation and multivariate analysis.

*Study Population and Sampling Technique.* A multistage sampling method was employed to select the study sample. Initially, three campuses were chosen out of the six through a random selection process involving balloting. In the subsequent stage, two departments were selected randomly from each chosen campus, resulting in six departments within the study region.

*Research Instrument.* The survey instrument was subjected to a pretest at a government-run university in Aiyeye and underwent validation. The questionnaire was structured into three sections. Section A centred on the sociodemographic information of the respondents, while Section B assessed their understanding of dietary factors. Section C delved into their attitudes towards obesity. Following training sessions conducted by the lead author, the authors administered the questionnaire. The participants were provided with an explanation of the study's objectives, after which they completed the semi-structured questionnaire through self-administration.

*Ethical Consideration.* Approval was requested and received from the Health Research and Ethics Committee at the College of Health Sciences, Osun State University. Additionally, consent was acquired from the Heads of the chosen departments. Confidentiality of both data and participants' identities was guaranteed and upheld throughout the research.

*Data management.* The collected data underwent analysis, and the findings were displayed through pertinent frequency distribution tables and charts. Chi-square and logistic regression analyses were conducted, with a confidence level of 95%, and significance was determined by a p-value < 0.05. Only variables demonstrating importance were included in the regression models.

*Measures.* In this research, individuals responding with 'yes' to the question 'Have you heard of obesity?' were considered to possess knowledge and an attitude regarding dietary risk factors associated with obesity. Correct answers to knowledge and attitude inquiries were awarded a score of 1, whereas incorrect answers received a score of 0, resulting in 16 questions. A score of 8 or higher, representing 50%, indicated good knowledge. For attitude, the maximum score was 6, categorised into 'Negative attitude' for scores

0-3 and 'Positive attitude' for scores 4-6 toward obesity risk factors.

## RESULTS AND DISCUSSION

Table 1 shows the sociodemographic characteristics of respondents. The proportion of female respondents was slightly higher (52.2 %) than the male (47.8 %). The mean age was recorded as 16.6±0.64 years. Among the participants, 54.7% fell within the age bracket of 15 to 19 years.

Table 1 – Sociodemographic characteristics of respondents (N=320)

Variable		Frequency	%
Sex	Male	153	47.8
	Female	137	52.2
Age-group	15-19	175	54.7
	20-24	130	40.6
	25-29	10	3.1
	>30	5	1.6
Religion	Christian	238	74.4
	Islamic	74	23.1
	Traditional	8	2.5
Ethnicity	Yoruba	291	90.9
	Others (Ibo, Hausa)	29	9.1
Fathers' occupation	Trading	95	29.7
	Artisans	41	12.8
	Professionals	141	44.1
	Others	43	13.4
Mothers' occupation	Trading	141	44.1
	Artisans	44	13.8
	Professionals	121	37.8
	Others	14	4.4
Marital status	Single	306	95.6
	Married	13	4.1
	Separated	1	0.3

Figure 1 shows that out of 320 respondents, 81.3% have good knowledge, while 18.8% have a poor understanding of obesity.

Figure 2 shows that 76.9% have good knowledge of obesity risk factors, while 23.1% have poor knowledge of obesity risk factors.

Table 2 shows the respondent's attitude towards obesity. It offers that one-third (52.6%) have never checked their BMI and two third (63.7%) agree they exercise regularly, while one-third (55%) agree obese people should not be stigmatised.

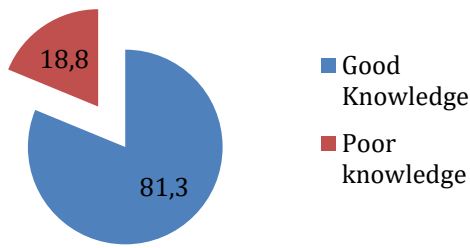


Figure 1 – Overall respondents' general knowledge of Obesity

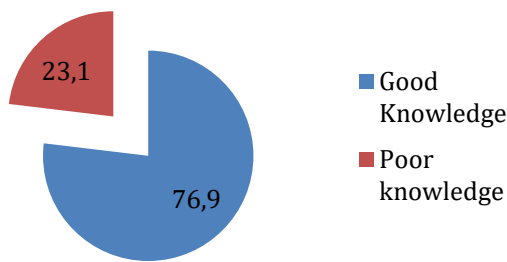


Figure 2 – Overall respondents' knowledge of risk factors of obesity

Table 2 – Respondents attitude towards obesity

Variables		Frequency	%
Have you ever checked your BMI	Yes	119	47.4
	No	132	52.6
Do you exercise regularly?	Yes	160	63.7
	No	91	36.3
Obese people should not be stigmatised.	Yes	138	55
	No	113	45
Would you like to reduce eating junk?	Yes	193	76.9
	No	58	23.1
Checking of BMI is unnecessary.	Yes	68	27.1
	No	183	72.9
There is no risk in taking an alcoholic drink.	Yes	48	19.1
	No	203	80.9

However, a high percentage (80.9%) perceived there are risks in taking alcohol and the majority (72.9%) perceived checking of BMI is necessary. In conclusion, the majority (76.9%) agree they would love to reduce eating junk, and most of our respondents (75.3%) agree they eat fruits and vegetables regularly.

Figure 3 shows that 68% of the respondents have a positive attitude towards obesity, while 32% have a negative attitude towards obesity.

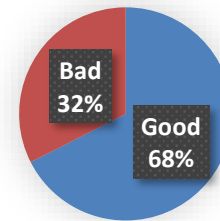


Figure 3 – Respondents Overall Attitude towards Obesity

Table 3 shows an association between respondents' knowledge of obesity and some selected variables. It shows that respondents' age, religion and those who can give a correct definition of obesity were significantly associated with knowledge with a p-value < 0.005 while other variables were not statistically significant.

Table 4 shows an association between respondent's attitudes towards obesity and some selected variable. Only the respondent's age was statistically significant, with the philosophy at p-value <0.05.

Table 5 shows the predictors of respondent's knowledge of obesity using binary logistic regression. None of the tested variables were statistically significant at the logistic level with p-value >0.05.

Table 6 shows the predictors of respondent's knowledge of obesity using binary logistic regression. None of the tested variables were statistically significant at the logistic level with p-value >0.05.

Table 3 – Association between respondents' knowledge of obesity and some selected demographic data

Variables	Good knowledge	Poor knowledge	X <sup>2</sup>	df	P-value
Age Groups, years					
15-19	144/82.3	31/17.7	9.272	3	*0.046
20-24	104/80.8	26/20.0			
25-29	8/80.0	2/20.0			
30 and above	4/80.0	1/20.0			

Variables	Good knowledge	Poor knowledge	X <sup>2</sup>	df	P-value
College					
Okuku	86/77.5	25/22.5	1.840	2	0.399
Ikire	88/84.6	16/15.4			
Ejigbo	86/81.9	19/18.1			
Gender					
Male	119/77.8	34/22.2	2.320	1	0.128
Female	141/84.4	26/15.6			
Marital Status					
Single	248/81.0	58/19.0	0.336	2	0.845
Married	11/84.6	2/15.4			
Separated	1/100	0			
Ethnicity					
Yoruba	233/80.1	58/19.9	4.005	3	0.261
Ibo	19/95.0	1/5.0			
Hausa	3/75.0	1/25.0			
Others	5/10	0			
Religion					
Christian	194/81.5	44/18.5	7.925	2	*0.038
Islamic	61/82.4	13/17.6			
Traditional	5/62.5	3/37.5			
Fathers Occupation					
Trading	76/80.0	19/20.0	0.625	3	0.885
Artisans	32/78.0	9/22.0			
Professionals	117/83.0	24/17.0			
Others	35/81.4	8/18.6			
If yes, could you give a correct definition					
Excess body weight and fat	139/92.1	12/7.9	56.025	3	*0.000
BMI>30	31/100.0	0			
Big body	7/35.0	13/65.0			
Mothers' occupation					
Trading	112/79.4	29/20.6	3.404	3	0.333
Artisans	34/77.3	10/22.7			
Professionals	104/8.0	17/14.0			
Others	10/71.4	4/28.6			

Notes: \*Statistically significant <0.05.

Table 4 – Association between respondents' attitudes towards obesity and some selected demographic data

Variables	Positive attitude	Negative attitude	X <sup>2</sup>	df	P-value
Age Groups, years					
15-19	97/55.4	78/44.6	9.451	3	*0.048
20-24	79/60.8	51/39.2			
25-29	7/70.0	3/30.0			
30 and above	4/80.0	1/20.0			
Gender					
Male	89/58.2	64/41.8	0.009	1	0.962
Female	98/58.7	69/41.3			
Marital Status					
Single	177/57.8	129/42.2	1.379	2	0.502
Married	9/69.2	4/30.8			
Separated	1/100	0			
Fathers Occupation					
Trading	56/58.9	39/41.1	1.037	3	0.792
Artisans	21/51.2	20/48.8			
Professionals	84/59.6	57/40.4			
Others	26/60.5	17/39.5			
Mothers' occupation					
Trading	82/58.2	59/41.8	0.467	3	0.926

Variables	Positive attitude	Negative attitude	X2	df	P-value
Artisans	24/54.5	20/45.5			
Professionals	73/60.3	48/39.7			
Others	8/57.1	6/42.9			
Have you heard of obesity?					
Yes	145/57.8	106/42.2	0.214	1	0.643
No	42/60.9	27/39.1			

Notes: \*Statistically significant <0.05.

Table 5 – Predictors of respondent's knowledge of obesity using binary logistic regression

Variables	Good knowledge	Poor knowledge	OR(CI)	B	Df	P-value
Age, years						
<25	248/81.3	57/18.7	1.087/0.297 – 3.981	1.016	1	0.899
>25	12/85.7	3/14.3				
Religion						
Christian	194/81.5	44/18.5	0.487/0.141 – 1.679	-0.719	1	0.255
Islamic	61/82.4	13/17.6				
Traditional	5/62.5	3/37.5				
If yes, could you give a correct definition						
Excess body weight and fat	139/92.1	12/7.9	0.622/0.302 – 1.279	0.475	1	0.197
Body Mass Index >30	31/100.0	0/0.0				
Big body	7/35.0	13/65.0				

Table 6 – Predictors of respondent's attitude towards obesity

Variables	Positive attitude	Negative attitude	OR(CI)	B	df	P-value
Age, years						
<25	176/57.7	129/42.3	0.4961/0.1545	0.786	1	0.231
>25	11/73.3	4/26.7				

Obesity is becoming an emerging problem in segments of sub-Saharan African society, while the issue of undernutrition is far from being overstated. Authors [7] documented a swift rise in the occurrence of overweight and obesity in children from developing nations. More than half of the respondents had their ages between 15 to 19 years, with a mean age of 17.8 years. This age range represents the active and productive ages, so their health and well-being are essential. Female respondents were conspicuously more than the male, with 6 out of 10 of the respondents being females. This discovery aligns with the outcome observed by [8]. The cause of this may be the subject of another study. Concerning the knowledge of the respondents about obesity, although nearly four-fifths of the respondents were aware of obesity, almost two-thirds believed they gave the correct definition of obesity, and the majority of them believed that obesity is hereditary in this part of the country. More than 8 out of 10 believe that being obese could lead to health

complications. After scoring and categorising these scores for knowledge, more than four-fifths of the respondents had good knowledge about obesity. This relatively high level of good knowledge about obesity, especially among respondents, is disturbing. This knowledge will not only affect the student's behaviour relating to their nutritional status, but it will also affect what the students imbibe from themselves as touching the issue of obesity. The respondents' attitudes correlated with their age and religious affiliation. Specifically, those aged 15-19 years and those identifying as Muslims were more inclined to possess a favourable understanding than their peers.

The prevalence of obesity among the studied population was 4.7%, implying 1 out of 10 Osun State University undergraduate students are Obese. The majority of obesity among males was 4.6%, and the female was 4.8%. The prevalence of obesity among the age group 25-29 was 20%, 15-19 was 4.6% and above 20-24 was 3.8%. The

prevalence is moderately low; this shows that obesity among the respondents is minimal. The outcomes presented in this study differ from those of previous research. For instance, authors [9] discovered a prevalence of overweight/obesity at 17.85% among school children in the Wannan Area of China. Another study conducted by [10], also contrasts with our findings, reporting an obesity prevalence of 15.2% among undergraduates (18.7% for males and 11.0% for females) and 11.7% (14.5% for males and 8.2% for females) respectively. The sex prevalence found in the study [10] was contrary to the sex prevalence of our research; male students had a high prevalence in his study, while female students had a higher prevalence in research, but there is a similar prevalence difference between male and female with my findings.

Similarly, authors [11] observed a prevalence of obesity at 17.7% and 13.5% respectively. The obesity rate peaked during the age range of 17–18 years and declined with advancing age, whereas the incidence of overweight increased with age, reaching its highest point at 19–20 and 20–21 years. The findings [11] are similar to our study. They separated overweight and obesity like our own study and found the increase in prevalence with an increase in age and class of study.

Moreover, it was established that obesity among the studied undergraduates is steadily decreasing at all levels. This shows better results for the intensifying efforts of the medical practitioners and all concerned to combat the challenges. It deals with the health of the adolescents, productivity and their development.

Family standard of living was the sociodemographic factor influencing obesity among undergraduate students at Osun State University. Several studies also saw the risk factors found to be significant with obesity. A survey found type of residence was positively associated with overweight/obesity [12]. The high socioeconomic class was significantly associated with a high prevalence of obesity [13]. Research carried out in different environments has recognised multiple factors contributing to adolescent obesity, such as the family's socioeconomic status [14], the size of the family [15], and the occupational status of parents [16]. Those caring for the children might have spoiled them with lousy eating habits or lifestyles. Likewise, the standard of living could also prone the student to exotic foods

and luxuries that will aid the development of obesity.

Frequency of taking fruits and vegetables, mothers encouraging the eating of fruits and vegetables, types of sport engaged in, frequency of engaging in exercise, alcohol consumption and healthy lifestyle were the lifestyles influencing obesity among adolescents. However, adolescents whose mothers always encourage eating fruits and vegetables are less likely to be obese. Numerous studies supported the conclusions of the research; one study highlighted a notable link between the consumption of energy-dense diets and a significant rise in obesity prevalence [13]. In a study among children in Northwest Ethiopia, the odds of obesity were higher among children with high dietary diversity [17].

Overall, the attitude of the respondents towards obesity was good, with about 6 out of 10 having a better view of what can expose them to being obese. However, research in different environments has identified various factors contributing to adolescent obesity, including physical activity [15], dietary habits, and a family history of obesity [18]. It has been established that good nutritional habits will result in healthy living, and if encouraged within the home it will enhance the practice of it. Sports also help a lot in modelling weight and reducing excessive fats in the body.

## CONCLUSIONS

The study concluded that one out of every ten undergraduate students in Osun State University are obese. The result reflects a very low prevalence of obesity among the studied population.

The prevalence of obesity among the studied population was 4.7%. The majority of obesity among males was 4.6%, and the female was 4.8%. The bulk of obesity among the age group 15-19 was 4.6%, and 20-24 was 3.8%

The knowledge about obesity among undergraduate students was encouraging, with about 8 out of 10 students having good knowledge about obesity with respondents' age, religion and those that can give a correct definition of obesity significantly associated their knowledge.

Family standard of living (father and mother occupational status) was the sociodemographic factor influencing obesity among Osun State University undergraduate students.



Frequency of taking fruits and vegetables, mothers encouraging eating of fruits and vegetables, types of sports engaged in, and frequency of engaging in exercise were the lifestyles viewed to

be an exposure to obesity among undergraduates in Osun State University. However, adolescents whose mothers always encourage eating fruits and vegetables are less likely to be obese.

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