IPS Journal of Nutrition and Food Science
IPS J Nutr Food Sci, 4(3): 504-511 (2025)
DOI: https://doi.org/10.54117/ijnfs.v4i3.113

Food Security and Anthropometric Status of Undergraduates at Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

Okudu, H. O.[1*], Okoli, J. N.[2], Chiwenite, M. C.[1], Adeoye-Agomoh, Q. C.[1] and Ebie, C. V.[1]

[1]Department of Human Nutrition and Dietetics, Michael Okpara University of Agriculture Umudike.
[2]Department of Human Nutrition and Dietetics Nnamdi Azikiwe University, Nigeria.

*Corresponding Author: okudu.helen@mouau.edu.ng

Abstract

Background: Food insecurity among students is a critical issue that often goes unnoticed because students hide such problems due to shame. This study was designed to investigate the food security status and anthropometric status among students of Michael Okpara University of Agriculture Umudike, Abia State, Nigeria.

Methodology: A cross-sectional study was conducted on 432 students at the Michael Okpara University of Agriculture Umudike. The students were selected using simple random sampling. Students information were collected using a questionnaire. Food security and anthropometric status were assessed using standard methods. The data was analyzed using SPSS. Correlation was used to assess relationships between socio-economic characteristics and food security status.

Results: The result revealed that 35.4% of respondents were highly food-secured, 48.4% were marginally food-secured, 10.2% were low food insecure, and 4.9% had deficient food security. 11.3% were underweight, 72.9% were of normal weight, 17.8% were overweight, and 3.9% were in the obese. The waist-hip ratio, showed that 97.5% of the students were normal, while 2.5% were at risk. The study also revealed significant correlations between the respondents' body mass index, their monthly income, monthly expenditure, and their sex. Furthermore, there was a significant correlation between monthly income and skipping meals ($p<0.05$).

Keywords: *Food, food security, anthropometric status, nutritional status, dietary practices, students.*

Article History
Received: 29 May 2025
Accepted: 08 Jul 2025
Published: 18 Jul 2025

Scan QR code to view•

How to cite this paper: Okudu, H. O., Okoli, J. N., Chiwenite, M. C., Adeoye-Agomoh, Q. C., & Ebie, C. V. (2025). Food Security and Anthropometric Status of Undergraduates at Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria. *IPS Journal of Nutrition and Food Science*, *4*(3), 504–511. https://doi.org/10.54117/ijnfs.v4i3.113.

1. Introduction

The goal of food security initiative is to ensure social and political stability, which is essential for the country's economic growth and defense (1). Food can have an impact on society, the nation, and state life. The rights to food, which form the cornerstone of human rights, are crucial to food security (2). Food is a necessity for life, and article 25 of the Universal Declaration of Human Rights from 1948 first established the right to proper nutrition (3). Food security is more than a necessity for well-being; it is a human right that affects global safety, economic strength, security and sustainability (4, 5).

The Food and Agriculture Organization of the United Nations (FAO) gave a clear definition of "food security at five different levels (individual, household, national, region and global) as "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for active and healthy life" (6,7). Heady and Ecker reported that there are about 250 definitions and 450 indicators of food security (8,6,9). Food stability refers to the time-bound element of food availability, access, and usage. Food sufficiency focuses on the availability and acceptable quantities of food of appropriate quality. Physical and economic access focuses on individuals' access to sufficient food. (10). These key variables have been widely accepted as the four major dimensions of food security (8,10,11). On the other hand, food insecurity may be referred to as the absence of one or more of these components (11).

Food insecurity among students is a critical issue and it is hard to be noticed because most of the students try to hide such problems and are ashamed to talk about these kinds of issues (12). Since the majority of students rely on food procurement, food accessibility is impacted, which causes food insecurity

among students and encourages the adoption of unhealthy dietary patterns (13). A significant portion of a student's income is consumed by the high costs associated with nutrition, disease management, and treatment. The burden of these chronic diseases is also as a result of lifestyle and dietary factors (14).

University students often become food insecure because they lack the nutrition knowledge, earning potential, budgeting abilities, and resources necessary to prepare healthful meals (15). These shortcomings usually lead to high rate of weight gain, weight loss and poor eating behaviors. According to World Health Organization, about 80% of health issues, like cardiovascular diseases, overweight, obesity, diabetes and cancer are frequently detected and found to have significant influence on human health status. Food security is influenced by factors at the institutional level, such as the collegiate environment's inadequate meal plans, campus eateries, and housing's inclusion of kitchen facilities (16, 17,18).

Indeed, it has been posited that food insecure students endorse increased rates of depression and anxiety, decreased ability to concentrate, and low-grade point averages compared to their counterparts (19). University students experience psychological stress due to several factors, such as having an irregular lifestyle, school events and gatherings, academic burden, and preparing to search for a job which influences their dietary patterns (20). Despite the possible negative effects of food insecurity on students' academic performance in colleges and universities, the issue has not yet garnered much attention in the academic literature as University students are overlooked as a nutritionally at-risk population (16, 21, 22). Food insecured students tend to perform poorly academically (20).

This study aims to assess the food security status, dietary practices, and nutritional status of students at Michael Okpara University of Agriculture, Umudike

2. Materials and Methods

Study Design

This study adopted a cross-sectional and comparative design involving both male and female undergraduate students at Michael Okpara University of Agriculture, Umudike, Abia State.

Study Population

The study population consists of all the students in Michael Okpara University of Agriculture, Umudike, Abia State. According to MOUAU Annex library, MOUAU consist of 11 colleges and 22508 students

Sampling and Sample Technique

Undergraduates in Michael Okpara University of Agriculture Umudike, Abia State were purposively selected then six (6) colleges (CAFST, COLPAS, COED, COLMAS, COLNAS, CEET) were randomly selected out of the eleven (11) colleges that make up the study area. In the second stage, two (2) departments each from the 6 selected colleges were randomly selected. In the third stage thirty (36) students were also randomly selected from each of the selected department, thus the sample size was 432.

Informed Consent

Permission on behalf of the students was obtained from the Heads of Department. The purpose of the study was carefully explained to subjects in the school and those who agreed to be investigated were selected for detailed study.

Data Collection

Data was collected using validated and pretested questionnaires. The U.S Adult Food Security Survey Module was used to assess food security status of respondents which followed a brief overview of how-to code responses and assess household food security status based on the Adult Food Security Scale. Responses of "yes," "often," "sometimes," "almost every month," and "some months but not every month" were coded as affirmative. The sum of affirmative responses to the 10 questions in the Adult Food Security Scale was the household's raw score on the scale. Food security status was assigned as follows:

- Raw score zero—High food security among adults
- Raw score 1-2—Marginal food security among adults
- Raw score 3-5—Low food security among adults
- Raw score 6-10—Very low food security among adults

(U.S. Adult Food Security Survey Module, 2012)

The anthropometric measurement (height, weight of the respondent) was obtained using heightometer and bathroom scale respectively. Weight and height were used to calculate their body mass index (BMI). The body circumference such as waist and hip circumference were also measured using non-stretchable measuring tape. Waist and hip circumference were also used to calculate waist-hip ratio.

Data Analysis

Data from the weight and height, waist circumference and hip circumference of the respondents was used to derive the BMI and WHR. BMI was calculated as weight on kilograms, divided by height in meter square (kg/m^2) and WHR was calculated by dividing the waist circumference by the hip circumference

Statistical Analysis

Data were analyzed using SPSS (Statistical Package for the Social Sciences). Descriptive statistics such as means, standard deviations, frequencies, and percentages were used to summarize the data. Correlation analysis was conducted to examine the relationships between food security status and socio-economic variables.

3. Results

Socioeconomic Characteristics of Respondents

Table 1 displays the socioeconomic characteristics of the students. The study found that 60.6% of the students were aged 20-24 years, 23.1% were aged 15-19, 10.2% were aged 25-29 years, and 6% were aged 30-34 years. The lowest proportion of respondents (4.5%) belonged to the ≥28 age group. The majority of the respondents were males (69.7%), and the rest were females (30.3%). The data also revealed that 89.8% of

the respondents belonged to the Igbo tribe, followed by the Yoruba tribe with 10.2%. Less than half (46.8%) of the respondents were in the 200 level, 28.9% in the 300 level, 12.5% in the 400 level, and 11.8% in the 100 level. More than half (58.6%) of the respondents had a monthly income less than N30,000, 37.3% had a monthly income between N31,000-N50,000, 2.3% had a monthly income between N71,000-N100,000, while 1.9% had a monthly income between N51,000-N70,000. Concerning monthly expenditure, 45.1% spent less than N30,000 monthly, 44.9% spent between N31,000-N50,000, and 6.3% spent between N71,000-N100,000. However, 3.7% spent between N51,000-N70,000 monthly. The study revealed that 91% of the respondents' families consisted of 4-6 members, 7.9% of the respondents' families consisted of 1-3 members, and 1.2% of the respondents' families consisted of 7-10 members.

Table 1: Socioeconomic Characteristics of Respondents

Variables	**Frequency (F)**	**Percentage (%)**
Age (years)		
15-19	100	23.1
20-24	262	60.6
25-29	44	10.2
30-34	26	6.0
35-39	-	-
40-45	-	-
Total	**432**	**100**
Gender		
Male	301	69.7
Female	131	30.3
Total	**432**	**100**
Ethnicity		
Yoruba	44	10.2
Igbo	388	89.8
Hausa	-	-
Others	-	-
Total	**432**	**100**
Year of study		
100L	51	11.8
200L	202	46.8
300	125	28.9
400	54	12.5
500	-	-
Others	-	-
Total	**432**	**100**
Monthly Income (N)		
Less than 30,000	**253**	**58.6**
31,000-50,000	**161**	**37.3**
51,000-70,000	**8**	**1.9**
71,000-10,000	**10**	**2.3**
Above 100,000	-	
Total	**432**	**100**
Monthly expenditure (N)		
Less than 30,000	**195**	**45.1**
31,000-50,000	**194**	**44.9**
51,000-70,000	**16**	**3.7**
71,000-100,000	**24**	**6.3**
Above 100,000	-	-
Total	**432**	**100**
Household size		
1-3 persons	**34**	**7.9**
4-6 persons	**393**	**91**
7-10 persons	**5**	**1.2**
Above 11	-	-
Total	**432**	**100**

Food Security Level/Grade of the Students

Table 2 below showed the food insecurity grade of the students. The results revealed that 35.4% of the respondents were highly food secure, 48.4% of the respondents were marginally food secure, 10.2% were low food insecure, and 4.9% had very low food security.

Table 2: Food security level/grade of the students

Food security grade	Scores	F	%	Mean ± SD
High food security	0	153	35.4	1.06 ± 0.04
Marginal food security	1-2	209	48.4	1.16 ± 0.22
Low food security	3-5	44	10.2	1.27± 0.15
Very low food security	6-10	21	4.9	1.32 ± 0.09
Total		**432**	**100**	**1.10 ± 0.16**

Food Security Status of Respondents

Table 3 illustrates the food security status of the respondents. Based on food availability to the respondents in the past 4 weeks, about 49.1% indicated that sometimes food was not enough to eat, 32.4% had enough but not always the kind of food, 10.2% indicated often not enough to eat, while 8.3% had enough of the kind of food to eat. The study revealed that 79.9% of the respondents were worried about running out of food, while 20.1% were often worried. About 54.2% of the respondents indicated that oftentimes food didn't last and no money to get more, while 45.8% indicated sometimes. The study showed that often about 69.9% of the respondents couldn't afford to eat balanced meals, while 20.1% indicated sometimes. However, very few (10%) of the respondents couldn't afford to eat balanced meals. The majority (90.7%) of the respondents cut or skip meals because of not enough money, while a few (9.3%) do not cut or skip meals. More than half (84.5%) of the respondents ate less because they did not have enough money, while 15.5% ate enough. The study revealed that about 59.5% of the respondents in the past 4 weeks were hungry but did not eat because they did not have enough money. It was also revealed that 53% of the respondents lost weight because they did not have enough money for food, while 47% did not lose weight. About 78.5% of the respondents went hungry for a whole day because they did not have enough money for food, while 21.5% did not. In some months, about 63.4% of the respondents were hungry for a whole day because they did not have enough money for food, 28.6% almost every month, and 8% only 1 or 2 months. The study revealed that 50.7% of the respondents almost every month often cut the size of their food because they did not have enough money, while 40% in some months but not every month and 9.3% only 1 or 2 months.

Anthropometric Status of the Respondents

Table 4 illustrates the anthropometric status of the respondents. The results from the Body Mass Index of the respondents revealed that 11.3% were underweight, 72.9% were normal weight, 17.8% of the respondents were overweight, and 3.9% were in obesity grade one. Results from the waist-hip ratio of the respondents revealed that 6.1% of the female respondents are at risk of cardiovascular diseases, while 1% of the males are at risk of cardiovascular diseases.

Relationship between socio-economic characteristics and anthropometric status of the respondents

Table 7 illustrates the relationship between socio-economic characteristics and the dietary practices of the respondents. The results revealed a significant relationship ($p<0.05$) between monthly income and skipping meals. The study also shows a significant relationship between monthly expenditure and skipping meals. Additionally, the study revealed a negative relationship between monthly expenditure and food availability. There was also a significant relationship ($p<0.05$) between skipping meals and food availability and concerns about food scarcity

Table 3: Food Security Status of Respondents

Variables	Frequency (F)	Percentage (%)
Food available to you in the past 4 week		
Enough of the kind of food I want to eat	36	8.3
Enough but not always the kind of food	140	32.4
Sometimes not enough to eat	212	49.1
Often not enough to eat	44	10.2
Total	**432**	**100**
Worried of running out of food		
Often	87	20.1
Sometimes	345	79.9
Never	-	-
Total	**432**	**100**
Food didn't last and no money to get more		
Often	234	54.2
Sometimes	198	45.8
Never	-	-
Total	**432**	**100**
Couldn't afford to eat balance meal		
Often	302	69.9
Sometimes	87	20.1
Never	43	10
Total	**432**	**100**
Cut or skip meal because no enough money		
Yes	392	90.7
No	40	9.3
Total	**432**	**100**
Eating less because no enough money		
Yes	365	84.5
No	67	15.5
Total	**432**	**100**
Hungry but did not eat because no enough money		
Yes	257	59.5
No	175	40.5
Total	**432**	**100**
Loss weight because no enough money for food		
Yes	229	53
No	203	47
Total	**432**	**100**
Hungry for a whole day because no enough money for food		
Yes	339	78.5
No	93	21.5
Total	**432**	**100**
How often		
Almost every month	97	28.6
Some months but not every month	215	63.4
Only 1 or 2 months	27	8
Total	**339**	**100**
How often you cut the size of your food		
Almost every month	219	50.7
Some months but not every month	173	40
Only 1 or 2 months	40	9.3
Total	**432**	**100**
Skipping meals		
Yes	388	89.9
No	44	10.2
Total	**432**	**100**

Table 4: Anthropometric Status of the Respondents

Body mass index (kg/m^2)	**Male**		**Female**		**Total**	
	F	**%**	**F**	**%**	**F**	**%**
Underweight	32	10.6	17	13	49	11.3
Normal weight	234	77.7	81	61.8	315	72.9
Overweight	29	9.6	22	16.8	51	11.8
Obesity class I	6	2	11	8.4	17	3.9
Obesity class II	0	0.0	0	0.0	0	0.0
Obesity class III	0	0.0	0	0.0	**0**	0.0
Total	**301**	**100**	**131**	**100**	**432**	**100**
Waist Hip Ratio						
Normal	298	99	123	93.9	421	97.5
At risk	3	1	8	6.1	11	2.5
Total	**301**	**100**	**131**	**100**	**432**	**100**

.**Table 5:** Relationship between socio-demographic/economic characteristics and anthropometric status of the respondents

Variables	**Age**	**Monthly income**	**Monthly expenditure**	**Skip meal**	**Food availability**	**Worried of no food**
Age	1					
Monthly income	0.051	1				
Monthly expenditure	0.012	0.533	1			
Skip meal	-0.011	**0.165****	**0.203****	1		
Food availability	**0.076**	**-0.067**	**-0.117***	**-0.248****	1	
Worried of no food	0.034	0.055	0.082	**0.169****	0.061	1

4. Discussion

This study provides insight into the food security, dietary habits, and nutritional status of students at Michael Okpara University of Agriculture Umudike, Abia State Nigeria. This study revealed that 60.6% of the students were aged 20-24 years. The study is in contrast to a similar study by Kingsley and Vivian which states that the highest proportion (41.0%) was seen to be in the 19–21year age group (22). The Igbo tribe having the highest population of 89.8% was expected as the study was carried out in the Eastern part of Nigeria which is dominated by the Igbos who were mainly Christians. This is also in line with the study conducted by Oguizu and Alozie where the majority (88%) of their study population were Igbos and the majority (79.5%) were Christians (23). Low monthly income observed among the students in this study was in line with a similar study by De Onis et al. which revealed that 24% of the participants in their study had low-income levels (24).

Half (54.2%) of the respondents indicated that oftentimes food didn't last and no money to get more while 45.8% indicated sometimes. The study showed that often about 69.9% of the respondents couldn't afford to eat balanced meals. Shaker and Macdonald circumstances provided the basis for categories that can be described as barriers to achieving food security which are; food prices/cost of food, limited time to prepare food, housing cost, transportation cost, limited knowledge and skills to prepare food, physical accessibility to food, limited facilities and equipment to prepare food, limited/no income, poor nutrition knowledge, poor financial management skills, food thefts in residence, university food environment, variety of tuition and fees/academic expenses, lack of financial support from families, the limitations in working while going to school, living off campus with roommates, student loan debt, nutrition transition, transitions, and unexpected life circumstances, inability to increase financial support, inconsistent food availability, family responsibility, ever-rising living expenses. However, very few (10%) of the respondents couldn't afford to eat balanced meals (26). The majority (90.7%) of the respondents cut or skip meals because of not enough money while a few (9.3%) do not cut or skip meals. More than half (84.5%) of the respondents ate less because not have enough money while 15.5% ate enough. The study revealed that about 59.5% of the respondents in the past 4 weeks were hungry but did not eat because they did not have enough money. Entz et al. reported that many other factors impact the food security levels for students in particular (27). However, there are few studies currently on these contributing factors that include: limited food preparation knowledge and skills, limited time for preparing food, and limited facilities to prepare food. Students often face many time constraints due to many commitments, including studying, working, exercising, and socializing, leaving limited time for grocery shopping and cooking. The two most frequently used coping strategies are to purchase cheap, processed food and to attend on-campus or community functions where there is free food.

It was observed that 35.4% of the respondents were highly food secure, 48.4% of the respondents were marginal food secure, 10.2% were Low food insecure and 4.9% had very low food security. Olauson et al. and Entz et al. found that students often employ unconventional coping mechanisms to deal with food insecurity, such as asking friends and family for food, delaying paying bills, eliminating services such as phones or televisions, or cutting down on purchasing food when textbooks and tuition are due (28,27). Students rely on a variety of different income sources to make ends meet while attending post-secondary school, such as jobs, scholarships, savings, and loans. Entz et al. found that food-insecure students reported the high cost of food as the most significant barrier to accessing food, followed by tuition fees, housing

costs, and inadequate financial support from student loans or grants (27).

The Body mass index of the respondents revealed that 11.3% were underweight, 72.9% were normal weight, 17.8% of the respondents were overweight and 3.9% were in obesity grade one. The prevalence of obesity among students is low compared to the 49.3% and 54.8% reported by Odenigbo et al. and Adienbo et al. respectively (29,30). The prevalence of obesity among the male and female respondents in this study was 2% and 8.4% respectively. In the study conducted by Fadupin et al. 25.0% of the males were overweight while 2.1% of them had obesity grade two. Among the females in Fadupin et al. study, 39.8% were overweight, 20.4% had obesity grade one, 4.3% and 5.4% had obesity grade 2 respectively (33). A low level of overweight and obesity was observed among females than males in this study, which agrees with the earlier reports that obesity was strongly correlated with female gender in Nigeria (31,32).

The waist-hip ratio of the students in this study was contrary to the study conducted by Fadupin et al. where 39.7% of the students had a normal waist-hip ratio and 23.3% of them were at risk (33). High levels of both BMI and WHR (abdominal obesity) are good predictors for non-communicable, nutrition-related chronic diseases and also risk factors for increased morbidity and mortality among the adult population (33,34). Some of the students (6.1%) in this study had abdominal obesity which is an indication of accumulation of fat in the upper region of the body, thus predisposing them to several health risks of chronic diseases, and also increasing their risk of mortality (33,34).

Conclusion

A cross-sectional study was carried out among 432 respondents of the Michael Okpara University of Agriculture Umudike, Abia State who were studying at different years and courses. Some of them were residents in hostels, off-campus and some were from homes. The socio-economic and demographic status, dietary practices, food security status, and nutritional status among university students were explored in this study. From this study, more than half of the respondents were moderately food insecure. Lack of money to buy food and time to prepare the food due to lectures was a major concern. The anthropometric status of the respondents revealed that some of the respondents were overweight while a few of them were obese. The prevalence of overweight was higher among the female respondents than the male respondents in this study. Meanwhile, some of the female and male respondents were at risk of cardiovascular diseases. Results revealed that there was a significant relationship between sex, monthly income, monthly expenditure, and body mass index of the respondents.

Recommendation

Based on the findings of this study, it is recommended that:

1. Raise awareness, educate and sensitize leaders and the authorities in the field of nutrition and the entire university community in understanding every aspect related to access, availability, preparation and utilization to meet individual physiological needs.
2. Proper agricultural intervention programs will not only help improve nutritional status, but also help alleviate poverty in the extreme households.
3. Policy issues addressing environmental sustainability and a healthy stimulating environment must also be given priority.
4. Further research should be conducted to better understand the systemic pathways to student poverty and food insecurity.

Author Declaration

All authors contributed equally to the success of the work.

References

1. Meade, B. & Stacey, R. (2013). International food security assessment 2013-2013. Department of agriculture, economic research service. GFA-24, U.S. Retrived from www.usda.gov/publications/gfa24.aspx. pp 1
2. Osborn, D., Cutter, A. & Ullah, F. (2015). Universal sustainable development goals. Understanding the transformational challenge for developed countries, Stakeholder Forum. [https://sustainabledevelopment.un.org/].
3. United Nations. (2013d). The Universal Declaration of Human Rights, accessed 5 January 2014, http://www.un.org/en/documents/udhr/.
4. Faridi, M. & Sulphey, M. (2019). Food security as a prelude to sustainability: a case study in the agricultural sector, its impacts on the Al Kharj community in The Kingdom of Saudi Arabia. Entrepreneurship and Sustainability Issues. 6(2): 1536–1545.
5. Iversen, k. (2021). Food: A Fundamental Human Right. http:// www.fao.org/focus/e/rightfood/right2.htm. Access date November 17, 2021J Nutrition Education Behaviour, 50(6): 564–572.
6. Food and Agriculture Organization (FAO), (1996). Rome Declaration on Food Security and World Food Summit Plan of Action. FAO, Rome.
7. Perez-Escamilla, R., Gubert, M.B., Rogers, B and HromiFiedler, A. (2017a). Food security measurement and governance: Assessment of the usefulness of diverse food insecurity indicators for policy makers. Global Food Security, 14: 96-104. https://doi.org/10.1016/j.gfs.2017.06.003
8. Headey, D. & Ecker, O. (2012). "Improving the measurement of food security". IFPRI Discussion Paper, 01225.
9. Food and Agriculture Organization. (2018). The Food Insecurity Experience Scale. Voices of the Hungry [Online]. FAO. Available at: http://www.fao.org/in-action/voices-of-the-hungry/fies/en/
10. Ike, C.U., Jacobs, P. & Kelly, C. (2015). Towards comprehensive food security measures: Comparing key indicators. Africa Insight, 44(3): 91-111. International Journal Behaviour Nutrition Physical Act, 12,93 doi:10.1186/s12966-015-0257-6.
11. Jones, A. D., Ngure, F. M., Pelto, G. & Young, S. L. (2013). What are we assessing when we measure food security? A Compendium and review of current metrics 1, 2. Advances in Nutrition, 4(5): 481–505 http://doi.org/10.3945/an.113.004119

12. Cady, C. (2014). Food insecurity as a student issue. Journal of College and Character, 15(4): 265–272. doi:10.1515/jcc-2014- 0031.
13. Afolabi, W.A.O., Towobola, S.K., Oguntona, C.R.B. & Olayiwola, I.O. (2013). Pattern of fast foods consumption and contribution to nutrient intake of Nigerian university students. International Journal Education and Research, 1 (5).
14. Cruz, S.Y., Fabian, C., Pagán, I., Ríos, J.L, González, A.M. & Betancourt, J. (2013). Physical activity and its associations with sociodemographic characteristics, dietary patterns, and perceived academic stress in students attending college in Puerto Rico. Puerto Rico Health Sciences Journal, 32(1): 12.
15. McArthur, L.H., Ball, L., Danek, A.C. & Holbert, D. (2018). A high prevalence of Food insecurity Among University students in Appalachia reflects a need for educational interventions and policy advocacy. Journal Nutrition Education Behaviour, 50(6): 564–72.
16. Gaines, A.; Robb, C.; Knol, L. & Sickler, S. (2014) Examining the role of financial factors, resources and skills in predicting food security status among college students. International Journal. Consumption Study, 38, 374–384.
17. Mirabitur, E., Peterson, K., Rathz, C., Matlen, S. & Kasper, N. (2016). Predictors of college-student food security and fruit and vegetable intake differ by housing type. Journal America College. Health, 64: 555–564. [CrossRef] [PubMed]
18. Dhillon, J., Diaz Rios, L.K., Aldaz, K.J., De La Cruz, N., Asghar, S.A., Kuse, Q. & Ortiz, R.M (2019). We don't have a lot of healthy options: Food environment perceptions of first-year, minority college students attending a food desert campus. Nutrients, 11: 816.
19. Maroto, M.E., Snelling, A. & Linck, H. (2014). Food Insecurity Among Community College Students: Prevalence and Association with Grade Point Average, Community College. Journal of Research and Practice, 39(6): 515-526. doi:10.1080/10668926.2013.850758.
20. Dubick, J., Mathews, B. & Cady, C. (2016). Hunger on Campus: The Challenge of Food Insecurity for College Students. [studentsagainsthunger.org › wp-content › uploads › 2016/10 › Hunger...]
21. Bakar, W. A. M. A., Ismail, S., Sidek, S. & Abdul, R. (2019). Prevalence and factors affecting food insecurity among university students in Pahang, Malaysia. Malaysian Journal of Nutrition, 25(1): 59–67. https://doi.org/10.31246/mjn-2018-0139
22. Patton-Lopez, M. M., Lopez-Cevallos, D.F., CancelTirado, D.I.& Vazquez, L. (2014). Prevalence and Correlates of Food Insecurity among Students Attending a Midsize Rural University in Oregon. Journal of Nutrition Education and Behavior, 46(3): 209-214.
23. Oguizu, A.D., &Alozie, O.C., (2018) Prevalence of Hypertension among Adult Traders in Some Selected Markets in Awka, Awka - South Local Government Area, Anambra State, Nigeria. Acta Scientific Nutritional Health 3.6(2019): 142-149.
24. De Onis, M., Onyango, A. W., Borghi, E., Siyam, A., Nishida, C. & Siekmann, J. (2003), Development of WHO growth reference for school-aged children and adolescents. Bulletin of the World Health Organization, [Online] Available: http://www.who.int/bulletin /volumes/85/9/07-043497/en/index.html
25. Miller A. (2014). Assessing the factors that influence the food choices of college commuter students.
26. Adesola, K. B., Muhammad-Lawal, A. & Fatoba, I. (2014). Experiential household food insecurity in an urban underserved slum of North India. Food Security. 1(1): 239-250.
27. Entz, M., Slater, J. and Desmarais, A. (2017). Student food insecurity at the University of Manitoba. Canadian Food Studies, 4(1): 139-159.
28. Olauson, C., Engler-Stringer, R., Vatanparast, H. & Hanoski, R. (2018). Student food insecurity: Examining barriers to higher education at the University of Saskatchewan. Journal of Hunger and Environmental Nutrition, 13(1): 19-27.
29. Odenigbo, U.M., Odenigbo, U.C., Oguejio, O.C. & Adogu P.O.U. (2011). Relationship of waist circumference, waits hip ratio and body mass index as predictors of obesity in adult Nigerians. Pakistan Journal of Nutrition, 10(1): 15-18.
30. Adienbo, O.M., Hart, V.O. & Oyeyemi, W.A. (2012). High Prevalence of Obesity among Indigenous Residents of a Nigerian Ethnic Group: The Kalabaris in the Niger Delta Region of South-South Nigeria. Greener Journal of Medical Sciences, 2 (6): 152-156.
31. Amole, L., OlaOlorun, A., Odeigah, L. & Adesina, S. (2011). The prevalence of abdominal obesity and hypertension amongst adults in Ogbomoso, Nigeria. African Journal of Primary Health Care and Family Medicine, 3(1): 5
32. Olatunbosun, S.T., Kaufman, J.S. & Bella, A.F. (2011). Prevalence of obesity and overweight in urban adult Nigerians. Obesity Reviews, 12(4): 233-
33. Fadupin, G.T., Adeoye, A. & Ariyo, O. (2015). Lifestyle and nutritional status of urban school teachers in Ibadan, Nigeria. Nigerian Journal of Nutritional Sciences, 35(1): 35-40.
34. Okudu H.O., Okolie, V.U. & Chijioke, M.C. (2018). Lifestyle and Prevalence of Overweight and Obesity among Secondary School Teachers in Uzo-Umahi LGA of Enugu State, Nigeria. Food Science and Nutrition Technology, ISSN: 2574-2701.

•*Thank you for publishing with us.*