

Nutritional Knowledge, Anthropometric Status, and the Rate of Fast Food Consumption Among Undergraduate in Michael Okpara University of Agriculture, Umudike, Abia State

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Abstract

Background

Nutrition knowledge is an important factor in promoting healthier eating habits and consequently maintaining an appropriate body weight, thus preventing overweight and obesity. Poor eating habits and lack of nutrition knowledge are important public health issues that have serious health implications.

Objectives

This study assessed the nutritional knowledge, anthropometric status and food consumption among undergraduate students of Michael Okpara University of Agriculture Umudike, Abia State, Nigeria.

Methodology:

A cross-sectional research design was adopted for the study. Multi-stage sampling techniques were used to select 430 respondents from eight colleges in the school. Data was collected from the respondents with the use of a well-structured questionnaire. Ten (10) knowledge questions were adapted from Priya and Sinha (2020) and it was scored and graded overall as poor, average and good nutritional knowledge depending on the overall score. Dietary information was collected using a food frequency questionnaire. BMI and waist-hip ratio were determined from anthropometric assessment. The data collected was analyzed using Statistical Package Service Software (SPSS) version 23.0.

Results

The result showed the respondents' mean age to be 23.70 ± 1.91 . Findings of the study also showed that less than half (46.3%) of the respondents had average nutritional knowledge and 30.0% and 23.7% had poor and good nutritional knowledge, respectively. The result showed that 48.1% of the respondents had normal BMI, while 37.4% and 10.3% were overweight and obese, respectively whereas 4.2% remaining were underweight. Food consumption data showed that 19.8% of the respondents consumed rice daily, and 21.2% consumed garri daily. The result also showed that 20.2% of the respondents consumed instant noodles daily and some (12.1% and 9.5%) of the respondents consumed pizza and shawarma daily. The result showed that there is a significant relationship between fast food consumption and nutritional knowledge of the respondents.

Conclusion

The findings of the study showed that many of the respondents had poor nutritional knowledge, and poor nutritional status and unhealthy food intake.

INTRODUCTION

Adequate and appropriate nutrition knowledge is critical in order to eat a healthy diet. Unfortunately, there are a myriad of different opinions on what comprises a healthy diet, which can be confusing to people. Having appropriate education on nutrition will oftentimes help improve the students' nutritional status (Trabucco et al., 2013).

Healthy eating practices encourage optimal health, growth, and intellectual development as well as the prevention of diseases, whereas unhealthy eating habits can lead to malnutrition (Allom and Mullun, 2013). Studies in both developed and developing countries have identified some poor dietary practices namely; skipping breakfast, increased intake of high calorie snack, eating outside the home, consumption of soft drinks among adolescents and low consumption of fruits, vegetables and use of supplements (Sarkar et al., 2015; Ahmed et al., 2023). Young people are typically more likely to establish poor eating habits. University students' diets tend to be unhealthy, with a high intake of fast food, sweets, and beverages with added sugar. They also tend to skip meals, especially breakfast, and consume less fruit and vegetables, milk, fish, and other healthy options (Tatter, 2018). The challenging eating practices like skipping of meals (especially breakfast) which can lead to higher levels of snacking among undergraduates due to time restrictions and the development of dietary habits and food preferences over time, particularly during adolescence, affect nutrient and energy consumption (Afolabi et al., 2013).

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 influence their dietary patterns (Dubick et al., 2016). The diminished social support brought on by lengthy emotional and physical separation from their family and friends, the impacts of which may threaten regular eating patterns adds to this problem (Roselawati et al., 2017). Once enrolled, students are responsible for managing their own households and using their income to pay for both educational and non-educational expenses (Blagg et al., 2017). Undoubtedly, the majority of university students are young people who have recently completed their secondary education, making their first experience of living independently a difficult task (Ramlee et al., 2019).

Fast foods are the food that involve easy and quick preparation then, becoming a quick meal or take away meal which can be obtained from restaurants and snack bars (Daradkeh et al., 2018). Fast food is becoming increasingly popular among all age groups. As the demand increases the fast food industry takes the opportunity to increase the number of outlets. Although the increased number of fast food outlets results in good economic sources, the disadvantages to human health outweighed the benefits. Increases in fast food outlets are associated with higher body mass index (Dornelles, 2019). Fast foods do contain high calorie content, sugar, salt and fat which can increase the risk of developing diseases like obesity, diabetes, hypertension, cardiovascular disease (CVD) and many more (Ipatenco, 2018).

Their food preferences are highly related to the common factors like convenience, cheaper and so on. Especially among adolescents and young adult, these two groups are more likely to consume the fast food compared with older people (Alfaris et al., 2015). Hence, it will result in high intake of fast food

which can affect their health status. It can be further supported by Benajiba (2016) which stated that university students are the most frequent group that consumes fast food among adults.

With the increasing trend of non-communicable diseases, a steady rise in the share of processed foods has been seen. In the last half century food processing has evolved greatly as a consequence of the industrialization and globalization of food systems (Moubarac et al., 2017). The prevalence of overweight and obesity has risen continuously during the last century, particularly in low-income countries as well as in low-income groups in high-income countries in both adults and children (WHO, 2014).

Despite having knowledge of the adverse health effects of fast food consumption, many individuals continue to consume it, highlighting the gap between nutrition knowledge and actual dietary behaviour. This suggests that knowledge alone is insufficient to promote healthy eating unless it is translated into practice, a finding also reported by El-Gilany et al. (2016), who emphasized the importance of applying nutrition knowledge in everyday food choices.

MATERIALS AND METHODS

Study design

The research design used for the study was cross sectional study design.

Population of the study

The population of the study consists of undergraduate's students of Michael Okpara University of Agriculture, Umudike, Abia State. According to University Rank enrollment range, MOUUA student's population size ranged between 10,000-14,999 from all the Departments in the school.

Sampling and Sampling Techniques

The study used a multi-staged sampling method to select the participants. Michael Okpara University of Agriculture, Umudike, Abia State undergraduate students were purposively selected then eight (8) colleges (CAFST, CEET, COED, CNREM, COLNAS, COLPAS, COLMAS, CAERSE) were randomly selected systematically out of the eleven (11) colleges that make up the study area. In the second stage, two (2) departments each from the 8 selected colleges were selected using simple random sampling techniques by balloting without replacement. In the third stage, twenty-seven (27) students were also randomly selected from each of the selected department, thus the sample size was 430 with 10% attrition rate and was determined using Yamane (1967) sample size calculation model.

Ethical declarations

Informed Consent/ Ethical Approval

Permission was obtained from the Deans and Heads of Department of the selected colleges and departments and participants. Also, informed consent to participate was obtained from respondents before data collection. 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 and adhered to the principles of the Declaration of Helsinki. Ethical approval was obtained from Federal Medical Center, Umuahia with ethical number: FMC/QEH/G.596/Vol.10/514.

DATA COLLECTION

Questionnaire Administration

Data were collected using a well-structured questionnaire developed for the purpose of the study. The questionnaires consist of the following sections: Socio-demographic data, socio-economic data, nutritional knowledge, food frequency questionnaires, and anthropometric measurements.

Socio-demographic data collected includes information on sex, age, gender, level, department, college, residence religion, and ethnicity of the participants.

Nutritional knowledge questions on various food groups, their sources and function adapted from (Priya and Sinha, 2020) were used to ascertain the level of respondent's nutritional knowledge. It consisted of a set of fifteen (15) questions which were asked to understand the respondent's nutrition knowledge. Ten (10) points was awarded for each correct responses of the nutritional knowledge-based question, while no point was awarded for incorrect response which was adapted from a standard nutrition knowledge questionnaire by Priya and Sinha (2020).

Maximum score that is obtainable is 60.0% above.

- Scores between 0-39.9% – poor
- 59.9% – average
- Above 60 – excellent

Priya and Sinha (2020).

The anthropometric assessment (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). BMI was classified as follows:

ClassificationBMI (kg/m²)

- Under-weight < 18.5
- Normal weight 18.5 – 24.9
- Over weight 25.0-30.0
- Obesity 30 and above

(WHO, 2012)

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. WHR was classified as follows;

WHR

Female Male

- Low risk — <0.8 Low risk <0.9
- Moderate risk — $0.8-0.85$ Moderate risk — $0.9-0.95$
- High risk — >0.85 High risk — >0.95

(WHO, 2012)

Data Analysis

BMI and WHR were derived from the weight and height, waist circumference and hip circumference data of the respondents. 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 obtained was analyzed using SPSS (Statistical Package for the Social Sciences) version 23.0. Descriptive statistics such as mean, standard deviation, frequency and percentage was used to summarize the data from socio-economic, demographic, awareness and nutritional knowledge, fast foods consumption, BMI and WHR. Chi-square was used to determine the relationship between nutritional knowledge and fast food consumption. A P-value of less than 0.05 was accepted as statistically significance.

RESULTS

Table 1 shows the socio-economic and demographic characteristics of respondents which shows that more than half (64.2%) of the respondents were within the ages of 20–24 years, 31.2% of respondents were within the ages of 25–29 years while few (4.7%) of the respondents were within the ages of 16–20 years. More than half (55.1%) of respondents were female while 44.9% were male. Results also showed that majority (97.7%) of respondents were Christian while few (2.3%) of respondents were Muslim and Traditionalist.

Majority (96.5%) of respondents were single and few (3.5%) of them were married which is associated to the study population. More than half (60.9%) of respondents have a household size of 4–6 persons, 15.1% of respondents have a household size of 1–3 persons while few (2.1%) of the respondents have

household size of more than 10 persons. Majority (89.8%) of respondents that participated in the study were Igbos while few (4.9 and 5.3%) of the respondents were Hausa and Yoruba which can be linked to the study area because it's Igbo tribe geo-political zone.

Furthermore, 12.5% of respondents each were undergraduates from CNREM, COLPAS, COLMAS, COED, COLNAS, CAFST, CEET and CAERSE colleges, respectively. Many (79.5%) of them were students of 300–500 level while 20.5% remaining were students of 100 and 200 level, respectively. More than half (57.4%) of respondents reside off campus and some (37.9% and 4.7%) remaining resides at new and old hostel respectively. Less than half (30.7%) of respondents received monthly upkeep above 15, 000, 39.8% of respondents received between 5, 000 – 10, 000 monthly upkeep while 9.1% of the respondents received less than 5, 000 monthly upkeep.

Table 1
Socio-economic and demographic characteristics of the respondents

Variable	Frequency (F)	Percentage (%)	Mean $\pm$ SD
Age group			
19–20 years	20	4.7	
20–24 years	276	64.2	
25–29 years	134	31.2	
Total	430	100.0	23.70 $\pm$ 1.91
Sex			
Male	193	44.9	
Female	237	55.1	
Total	430	100.0	
Religion			
Christianity	420	97.7	
Muslim	6	1.4	
Africa Tradition	4	0.9	
Total	430	100.0	
Marital Status			
Single	415	96.5	
Married	15	3.5	
Total	430	100.0	
Family household size			
1–3 persons	65	15.1	
4–6 persons	262	60.9	
7–9 persons	94	21.9	
10 persons above	9	2.1	
Total	430	100.0	
Ethnicity			
Igbo	386	89.8	

Variable	Frequency (F)	Percentage (%)	Mean $\pm$ SD
Age group			
Hausa	21	4.9	
Yoruba	23	5.3	
Total	430	100.0	
College			
Cafst	54	12.5	
Colmas	54	12.5	
Coed	54	12.5	
Cnrem	54	12.5	
Colnas	54	12.5	
Colpas	54	12.5	
Ceet	54	12.5	
Caerse	54	12.5	
Total	430	100.0	
Level			
100	49	11.4	
200	39	9.1	
300	95	22.1	
400	210	48.8	
500	37	8.6	
Total	430	100.0	
Residence			
Old hostel	20	4.7	
New hostel	163	37.9	
Off campus	247	57.4	
Total	430	100.0	
Monthly upkeep			
Less than 5, 000	39	9.1	

Variable	Frequency (F)	Percentage (%)	Mean $\pm$ SD
Age group			
5, 000 – 10, 000	171	39.8	
11, 000 – 15, 000	88	20.5	
Above 15, 000	132	30.7	
Total	430	100.0	

Table 2 presents the nutritional of undergraduates about fast food consumption. The study findings revealed that more than half (56.5%) of respondents gave an incorrect response while 43.5% of them gave correct response towards meaning to fast foods. On the statement “fast food are nutrient dense foods” more than half (62.3%) of respondents gave correct response while 37.7% of respondents gave an incorrect response towards the statements. More than half (56.0%) of respondents gave correct response while 44.0% gave an incorrect response towards the statement “fast food are good sources of micronutrients”.

Many (77.0%) of respondents gave correct response and 23.0% gave an incorrect response towards the statement that fast food is high in fat, calorie and sugar contents. More than half (71.9%) of respondents gave correct response and few (28.1%) of respondents gave an incorrect response towards the statement fast food consumption results in gaining weight. More than half (67.9%) of respondents gave an incorrect response about fast food being a predisposing factor to non-communicable diseases while 32.1% gave a correct response. On the statements “constituents of fast food and fast food is one of the causes of cancer” more than half (59.3% and 55.1%) of respondents gave a correct response towards the aforementioned statements.

Majority (90.9%) of respondents gave an incorrect response about the statement that diabetes mellitus is caused by excessive intake fast food and soft drink while few (9.1%) remaining gave correct response towards the statement. On the statement “servings of fruits and vegetables ideal daily to achieve optimum health” more than half (82.3%) of respondents gave an incorrect response such as 3 servings a day which disagree to the recommendation of WHO to be 5 servings per day.

Many (83.3%) of respondents gave an incorrect response towards method of cooking green leafy vegetables so as to retain its nutrients therein while few (17.0) of respondents gave correct response towards the statement. More than half (78.4%, 71.9% and 75.1%) of the respondents gave correct responses towards the statements “examples of food that are good sources of pro-vitamin, function of vitamin C and A rich foods while 21.6%, 28.1% and 24.9% remaining respondents gave an incorrect response towards the statements respectively.

Table 2
Nutritional knowledge of undergraduates about fast food consumption

S/N	Nutritional knowledge profile of undergraduates	Correct response F %	Incorrect response F %
1.	Meaning of fast food	187 43.5	243 56.5
2.	Fast food are nutrient dense foods	268 62.3	162 37.7
3.	Fast food are good sources of micronutrient	241 56.0	189 44.0
4.	Fast food is high in fat, calorie and sugar contents	331 77.0	99 23.0
5.	Fast food consumption results in gaining of weight	309 71.9	121 28.1
6.	Fast food is predisposing factor to NCDS	138 32.1	292 67.9
7.	Constituents of fast food	255 59.3	175 40.7
8.	Fast food is one of the causes of cancer	237 55.1	193 44.9
9.	Diabetes mellitus is caused by excessive intake of fast food and soft drinks	39 9.1	391 90.9
10.	Type of fat most important for people to cut down due to its implication on health	208 48.4	222 51.6
11.	Servings of fruits and vegetables ideal daily to achieve optimum health	76 17.7	354 82.3
12.	Best method for cooking green leafy vegetables	73 17.0	357 83.3
13.	Examples of food that are good source of pro-vitamin A	337 78.4	93 21.6
14.	Function of vitamin C rich foods	309 71.9	121 28.1
15.	Function of vitamin A rich foods	323 75.1	107 24.9

Figure 1 below denotes the graphical representation overall nutritional knowledge of undergraduates. The figure showed that higher percentage of respondents had an average knowledge about food and nutrient consumption, food sources and functions while 30.0% of respondents had poor knowledge whereas 23.7% remaining had good knowledge.

Table 3 indicates the anthropometric status of respondents. The study revealed that less than half (48.5%) of respondents for both males and females had normal weight. 37.4% of respondents were overweight while few (10.3% and 4.2%) were obese and underweight according to the WHO body mass index recommendation. The females had a higher risk of being overweight (21.1%) than the males (16.3%).

The result also revealed that more than half (73.1%) of the males and females were at lower risk of developing central obesity which is reflected in their waist circumference. While a lesser percentage of respondents (27.4%) had higher risk of developing central obesity which could be attributed to their lifestyle. More than half (59.1%) of respondents for male and female had a lower risk of developing health issues as shown by their waist-hip ratio status which measure the level of fat deposit on the waist and hip circumference of the body while 27.4% and 13.4% of respondents had a moderate and higher risk of developing health issues as shown by their waist-hip ratio.

Table 3
Anthropometric status of the respondents according to sex.

Variable	Male	Female	Total
	F %	F %	F %
Body Mass Index Status (BMI)			
Underweight (< 18.5 Kg/m ²)	0 0.0	18 4.2	18 4.2
Normal (18.5-24.99 Kg/m ²)	100 23.2	107 24.8	207 48.1
Overweight (25.0-29.9 Kg/m ²)	70 16.3	91 21.1	161 37.4
Obesity (30.0 Kg/m ² and above)	23 5.3	21 5.0	44 10.3
Total	193 44.8	237 55.2	430 100.0
Waist Circumference (WC)			
Not at risk	182 42.3	132 30.6	314 73.1
Increased risk	11 2.5	105 24.4	116 26.9
Total	193 44.8	237 55.2	430 100.0
Waist-Hip Ratio Status (WHR)			
High Risk	6 1.4	52 12.0	58 13.4
Moderate Risk	28 6.5	90 20.9	118 27.4
Low risk	159 36.9	95 22.3	254 59.1
Total	193 44.8	237 55.2	430 100.0

Figure 2 denotes the graphical representation of anthropometry characteristics among the respondents. The result shows that 48.1% of the respondents were normal, 37.4% were overweight and 10.3% were obese, respectively. The result also shows that more than half (73.1%) of the respondent is not at risk due to their waist circumference measurements while 59.1% were at low risk developing health issues based on their waist-hip ratio.

Table 4 revealed the food consumption pattern among the respondents. The finding outcome shows that 36.7% of respondents consumed bread 2–3 times in a week, 19.8% consumed bread once in a week. Less than half (44.0%) of respondents rarely consumed corn and 68.8% consumed rice 2–3 times in a week, this can be attributed to the fact that rice is one of the staple foods in Nigeria that is easily assessable by all. 42.6% of respondents consumed beans 2–3 times in a week and 34.5% consume garri 2–3 times in a week. The findings also shows that 30.2% of respondents consume fufu and yam 2–3 times in a week while 52.8% of respondents rarely consumed sweet potatoes. More than half (64.0% and 65.3%) of respondents consumed palm oil and vegetable oil 2–3 times in a week which can be linked to the fact that it's one of the major ingredients in cooking food. Less than half (35.6%) of respondents consumed fish 2–3 times in a week, 28.1% consumed beef 2–3 times in a week.

More than half (53.5%) of respondents rarely consumed snail. Thirty-eight (38.4%) of respondents consumed whole milk daily while 34.0% and 30.0% of respondents consumed ice-cream and yoghurt 2–3 times in a week. More than half (55.1%) and 43.5% of respondents rarely consumed cabbage and carrot, respectively. The study also showed that 24.2% of respondents consume lettuce once in a week, 8.4% of the respondents consumed tomatoes daily. Less than half (44.0%) of respondents consume onions daily. Some (20.2%) of respondents consume instant noodles daily, 15.6% consume soft drink daily, 9.5% consume cakes daily. Some (12.1% and 9.5%) of respondents consume pizza and sharwama daily. 50.5% of respondents rarely consume lettuce, 52.1% of respondents rarely consume garden egg while 24.2% consumed it once a week. Less than half (37.0%) of respondents consumed tomatoes 2–3 times in a week while 44.0% consumed onions daily, this result of good consumption of tomatoes and onions among the students can be linked to the fact that onion and tomatoes are most required in the preparation of many dishes. 32.6% of respondents consumed bitter leaf once a week.

Furthermore, the results also revealed that 33.3%, 27.9%, 26.3%, and 40.9% of respondents consumed water leaf 2–3 times in a week, apple 2–3 times in a week, watermelon once a week and rarely consume orange which can be leads to the respondent's food choice or like and accessibility. Few (25.3%) of respondents consumed of the banana daily, 27.9% of the respondents consumed pawpaw 2–3 times in a week. More than half (77.7%) of the respondents rarely consume avocado.

Table 4
Food consumption pattern among the respondents

Foods	Daily		Once a week		2–3 times a week		Rarely		Total	
	F %		F %		F %		F %		F %	
Bread	64	14.9	85	19.8	158	36.7	123	28.6	430	100.0
Corn	0	0.0	119	27.7	122	28.4	189	44.0	430	100.0
Pap	0	0.0	65	15.1	186	43.3	179	41.6	430	100.0
Rice	85	19.8	17	4.0	296	68.8	32	7.4	430	100.0
Beans	20	4.7	117	27.2	183	42.6	110	25.6	430	100.0
Soya beans	8	1.9	128	29.8	77	17.9	217	50.4	430	100.0
Garri	91	21.2	119	27.7	152	35.3	68	15.8	430	100.0
Fufu	0	0.0	138	32.1	130	30.2	162	37.7	430	100.0
Yam	0	0.0	147	34.2	130	30.2	153	35.6	430	100.0
Sweet potatoes	0	0.0	65	15.1	112	26.0	253	58.8	430	100.0
Groundnut	22	5.1	56	13.0	176	40.9	176	40.9	430	100.0
Coconut	0	0.0	52	12.1	76	17.7	302	70.2	430	100.0
Palm oil	71	16.5	20	4.7	275	64.0	64	14.9	430	100.0
Vegetable oil	59	13.7	66	15.3	281	65.3	24	5.6	430	100.0
Fish	110	25.6	86	20.0	153	35.6	81	18.8	430	100.0
Bush meat	92	21.4	101	23.5	51	11.9	186	43.3	430	100.0
Beef	92	21.4	56	13.0	121	28.1	161	37.4	430	100.0
Snail	75	17.4	25	5.8	47	10.9	283	65.8	430	100.0
Whole milk	165	38.4	8	1.9	106	24.7	151	35.1	430	100.0
Skimmed milk	42	9.8	69	16.0	92	21.4	227	52.8	430	100.0
Ice-cream	59	13.7	86	20.0	146	34.0	139	32.3	430	100.0
Yoghurt	61	14.2	95	22.1	129	30.0	145	33.7	430	100.0
Cabbage	39	9.1	99	23.0	105	24.4	187	43.5	430	100.0
Carrot	39	9.1	95	22.1	59	13.7	237	55.1	430	100.0
Lettuce	0	0.0	104	24.2	48	11.2	278	64.7	430	100.0
Garden egg	0	0.0	104	24.2	102	23.7	224	52.1	430	100.0

Foods	Daily		Once a week		2–3 times a week		Rarely		Total	
	F %		F %		F %		F %		F %	
Cucumber	4	0.9	132	30.7	106	24.7	188	43.7	430	100.0
Tomatoes	36	8.4	115	26.7	159	37.0	120	27.9	430	100.0
Onions	189	44.0	105	24.4	85	19.8	51	11.8	430	100.0
Okra	119	27.7	108	25.1	84	19.5	119	27.7	430	100.0
Bitter leaf	20	4.7	140	32.6	67	15.6	203	48.1	430	100.0
Water leaf	39	9.1	36	8.4	143	33.3	212	49.3	430	100.0
Apple	24	5.6	64	14.9	120	27.9	222	51.6	430	100.0
Water melon	76	17.7	113	26.3	77	17.9	164	38.1	430	100.0
Orange	114	26.5	8	1.9	116	27.0	192	44.6	430	100.0
Banana	109	25.3	100	23.3	115	26.7	106	24.7	430	100.0
Pawpaw	83	19.3	100	23.3	120	27.9	127	29.5	430	100.0
Avocado	8	1.9	80	18.6	8	1.9	334	77.7	430	100.0
Pineapple	95	22.1	44	10.2	80	18.6	211	49.1	430	100.0
Mango	20	4.7	81	18.8	26	6.0	303	70.5	430	100.0
Instant noodles	87	20.2	63	14.7	138	32.1	142	33.0	430	100.0
Soft drink	67	15.6	166	38.6	75	17.4	122	28.3	430	100.0
Packaged bread	29	6.7	86	20.0	218	50.7	97	22.6	430	100.0
Cakes	41	9.5	90	20.9	105	24.4	194	45.1	430	100.0
Sausage	32	7.4	105	24.4	133	30.9	160	37.2	430	100.0
Pizza	52	12.1	25	5.8	164	38.1	189	43.9	430	100.0
Sharwama	41	9.5	16	3.7	65	15.1	308	71.6	430	100.0
Hot dogs	33	7.7	45	10.5	20	4.7	332	77.3	430	100.0
Hamburger	16	3.7	45	10.5	88	20.5	281	65.3	430	100.0

Figure 3 illustrates the pattern of food consumption among respondents across different food groups. The results showed that 27.8% of respondents consumed fast food, 24.1% consumed fruits and vegetables. This suggests that although a considerable proportion of students consume healthy foods such as fruits and vegetables, there is also a strong preference for convenient and readily available fast foods.

Regarding spices and condiments consumption, 10.9% of respondents consumed spices and condiments, 9.9% consumed beverages and drinks, and cereals and legumes (9.4%) occurred at moderate levels among the respondents. Lower consumption frequencies were observed for roots and tubers (4.9%), nuts (4.4%), fish and meat products (3.5%), and dairy products (3.5%). The least consumed food group was fats and oils (1.6%), indicating minimal direct consumption of these items compared with other food categories.

Table 5 shows the relationship between nutritional knowledge and fast food consumption of respondents. The result shows that there is a significant ($P < 0.05$) relationship between nutritional knowledge and consumption of instant noodles, pizza and sharwama among the respondents with X^2 value of (56.94, 26.51 and 22.46) and P-value of (0.000, 0.001 and 0.013), respectively. This result implies that nutritional knowledge possess by the respondents determine their soft drink, pizza and sharwama consumption as more than half of the respondents consumed them rarely and never.

Table 5
Relationship between nutritional knowledge and fast food consumption of the respondents

Fast food consumed	Knowledge Grade			Total	Df	χ ²	P-value
	Poor	Average	Good	F %			
	F %	F %	F %				
Instant noodles							
Daily	23 5.3	40 9.3	24 5.6	87 20.2	8	56.94	0.000*
Once in a week	38 8.8	13 3.0	12 2.8	63 14.7			
2–3 times in a week	25 5.8	85 19.8	28 6.5	138 32.1			
Rarely	43 10.0	54 12.6	29 6.7	126 29.3			
Never	0 0.0	7 1.6	9 2.1	16 3.7			
Total	129 30.0	199 46.3	102 23.7	430 100.0			
Soft drink							
Daily	14 3.3	34 7.9	19 4.4	67 15.6	8	9.75	0.283 ^{ns}
Once in a week	50 11.6	76 17.7	40 9.3	166 38.6			
2–3 times in a week	25 5.8	36 8.4	14 3.3	75 17.4			
Rarely	40 9.3	49 11.4	29 6.7	118 27.4			
Never	0 0.0	4 0.9	0 0.0	4 0.9			
Total	129 30.0	199 46.3	102 23.7	430 100.0			
Cakes							
Daily	11 2.6	18 4.2	12 2.8	41 9.5	8	9.09	0.335 ^{ns}
Once in a week	32 7.4	34 7.9	24 5.6	90 20.9			
2–3 times in a week	33 7.7	53 12.3	19 4.4	105 24.4			
Rarely	40 9.3	76 17.7	42 9.8	158 36.7			
Never	13 3.0	18 4.2	5 1.2	36 8.4			
Total	129 30.0	199 46.3	102 23.7	430 100.0			
Pizza							
Daily	10 2.3	26 6.0	16 3.7	52 12.1	8	26.51	0.001*
Once in a week	5 1.2	12 2.8	8 1.9	25 5.8			

Fast food consumed	Knowledge Grade			Total	Df	χ ²	P-value
	Poor	Average	Good	F %			
	F %	F %	F %				
Instant noodles							
2–3 times in a week	38 8.8	81 18.8	45 10.5	164 38.1			
Rarely	44 10.2	55 12.8	28 6.5	127 29.5			
Never	32 7.4	25 5.8	5 1.2	62 14.4			
Total	129 30.0	199 43.6	102 23.7	430 100.0			
Sharwama							
Daily	11 2.6	18 4.2	12 2.8	41 9.5	8	22.46	0.013*
Once in a week	6 1.4	10 2.3	0 0.0	16 3.7			
2–3 times in a week	8 1.9	35 8.1	22 5.1	65 15.1			
Rarely	88 20.5	108 25.1	60 14.0	256 59.5			
Never	16 3.7	28 6.5	8 1.9	52 12.1			
Total	129 30.0	199 43.6	102 23.7	430 100.0			

ns = Not significant, *Significant

Discussion

This study presents evidence on the nutritional knowledge, anthropometric status, and rate of fast-food consumption among undergraduates at Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria. The study revealed that more than of the respondents were within the ages of 20–24 years. This age distribution is expected because most undergraduate students in Nigerian universities fall within the young adult age group. The finding is consistent with the report of World Health Statistics 2024, which recognizes young adults aged 20–24 years as a major proportion of the university population in many low- and middle-income countries. This study is in line with the study by Okudu et al. (2025), which states that the highest proportion was seen to be in the 20–24-year age group, and the study by Ukonu et al. (2024), who reported that most respondents in their study on household food security and dietary diversity in south-eastern Nigeria were young adults, reflecting the demographic characteristics of the study population. The proportion of female respondents (55.1%) exceeds that of the male. Similar findings were reported by Oderinde et al. (2023), who observed a slightly higher proportion of female respondents in household food security studies in southwestern Nigeria. Conversely, studies conducted

in northern Nigeria have reported a predominance of male respondents, largely because household surveys often recruit household heads, who are predominantly male (Kehinde & Favour, 2020).

The Igbo tribe has the highest proportion and is mainly Christian. This is also in line with the study conducted by Oguizu and Alozie (2018), where the majority of their study population were Igbos and the majority were Christians. This finding reflects the religious composition of south-eastern Nigeria, where Christianity is the predominant religion. Similar observations have also been reported among university students in south-eastern Nigeria by Ukonu et al. (2024). Therefore, the religious distribution observed in this study is largely attributable to the geographical location of the study rather than any association with food security. This was expected, as the study was carried out in the Eastern part of Nigeria, which can be linked to the study area because it's an Igbo tribe geopolitical zone that was also mainly Christian. From this study, less than half of respondents received monthly upkeep above N15,000; The relatively low monthly allowance received by many respondents suggests potential financial constraints that may limit their ability to purchase adequate and nutritious food. This finding agrees with recent Nigerian studies showing that limited income remains one of the strongest determinants of food insecurity and poor dietary diversity among students and households (Obayelu et al., 2021; Quinton et al., 2024). The recent increase in food prices and inflation in Nigeria has further reduced the purchasing power of households and students, thereby increasing their vulnerability to food insecurity and poor dietary quality. monthly upkeep, which can be linked to their respective source of income. The amount received by the students as upkeep will determine their purchasing power and affordability of their needs on campus. The very high proportion of single students in this study closely matches other student studies where unmarried respondents dominate, like Mukoru et al.'s 2023 study, which stated that nine out of ten participants had never married, the majority were full-time students, and holiday jobs were noted in less than a third overall out of 393 respondents, and Tay et al.'s 2024 study, which indicated that the majority of the participants were female and single. Similar findings have also been reported among university students in Nigeria, where the majority of respondents were unmarried because they were still pursuing their education (Obayelu et al., 2021). Marital status has been associated with food security in community-based studies; however, among university students, being single is a common demographic characteristic and may not independently influence food security.

Household size was predominantly 4–6 persons. This finding is consistent with the average household size reported in the 2023–24 Nigeria Demographic and Health Survey, which indicates that Nigerian households commonly comprise four to six members. Larger household sizes have been associated with increased household food insecurity because available resources are shared among more household members, thereby reducing food availability per capita. Similar observations were reported by Obayelu et al. (2021) and Yohannes et al. (2023), who found household size to be a significant predictor of food insecurity in Nigeria and Ethiopia, respectively.

An equal number of respondents were selected from each college, indicating that the sampling procedure ensured adequate representation across the eight colleges. Such proportional representation minimizes selection bias and enhances the generalizability of the findings within the university. Nearly

half of the respondents were in 400 level. The higher representation of senior students may reflect greater willingness to participate or higher availability during data collection. Senior students often experience increased academic workload and financial responsibilities, which may influence their dietary practices and food security status. Similar observations have been reported among undergraduate populations in Nigeria, where higher-level students demonstrated greater vulnerability to food insecurity because of increased living expenses and reduced financial support (Obayelu et al., 2021).

More than half of the respondents lived off-campus. The predominance of off-campus residence may be attributable to limited on-campus accommodation. Off-campus residence has been associated with differences in food purchasing behaviors, dietary diversity, and food security because students are often responsible for preparing or purchasing their own meals and may incur higher living expenses. Ukonu et al. (2024) similarly observed that residence influenced household food security and dietary diversity among Nigerian households.

Regarding the knowledge of nutrient compositions of fast foods, many respondents recognized that fast food is high in fat, calories, and sugar and can cause weight gain, but far fewer linked it to non-communicable diseases, diabetes from excessive intake of soft drinks, or correct fruit and vegetable recommendations. This study findings fit recent evidence showing students often know the immediate harms of fast food but still miss broader diet-quality and chronic-disease concepts, which reported nine out of ten participants were aware that fast food was unhealthy and seventy-three % of students believed that Western fast food is high in calories, indicating that fast-food consumption is prevalent among physically active college students, and despite recognizing the high calorie content of Western fast and ultra-processed food, many students have limited nutritional knowledge (Pratheepkumar et al., 2024; Hu and Yan, 2026).

The body mass index of the respondents revealed that 4.2% were underweight, 48.1% were of normal weight, 37.4% of the respondents were overweight, and 10.3% were in obesity grade one. The prevalence of obesity among students is higher than the 3.9% reported by Okudu et al., (2025). The prevalence of obesity among the male and female respondents in this study was 5.3% and 5.0%, respectively. This is in line with the study that reported that a lower 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 (Amole et al., 2011; Olatunbosun et al., 2011). The higher prevalence of obesity compared with that reported by Okudu et al. (2025) may reflect changing dietary patterns, increased consumption of energy-dense ultra-processed foods, reduced physical activity, and other lifestyle factors common in university settings. These findings underscore the need for campus-based interventions that promote healthy eating, regular physical activity, and weight management. The study outcome shows that the female respondents had more central adiposity by waist circumference and WHR. This should be of concern because studies have reportedly shown that there is a significant association between frequent fast food consumption patterns and overweight, obesity, and poorer anthropometric characteristics, this finding did not align with other studies that reported no significant relationship between frequent fast food intake and nutritional status. Higher consumption of energy-

dense foods may increase health risks such as weight gain in university students (Saha et al., 2021). Similarly, Agbo et al. (2025) reported that healthy weight and low WHR were found among respondents who consumed fewer fast foods compared with respondents who were overweight/obese and also had high WHR. But Sabrina et al. (2024) studies reported that there was no significant relationship between frequent intake of fast foods and nutritional status with a p-value = 0.379.

The findings shows that there was no relationship between the level of balanced nutrition knowledge and nutritional status with a p-value = 0.384. The variation in the prevalence of BMI, WC, and WHR found in this study may be due to the differences in the sample size and environmental factors. 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. 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 (Fadupin et al., 2015; Okudu et al., 2018).

The respondents' food consumption pattern reflected a mixed diet characterized by regular intake of staple foods such as rice, garri, beans, fish, onions, okra, bananas, and oranges, alongside frequent consumption of processed and convenience foods, including instant noodles, soft drinks, pizza, sausages, cakes, and packaged bread. This finding is consistent with previous studies among university students, which reported that fast foods, sugar-sweetened beverages, packaged foods, and convenience meals constitute a significant part of students' diets (Oladimeji et al., 2018; Pratheepkumar et al., 2023). Despite this dietary pattern, the respondents demonstrated good nutrition knowledge regarding the role of fruits and vegetables as sources of provitamin A and the functions of vitamins A and C. This finding agrees with the study by Rakhshanderou et al. (2017), which reported that most respondents had adequate knowledge of the nutritional importance of fruits, vegetables, vitamins, and minerals.

On the statement "servings of fruits and vegetables ideal daily to achieve optimum health," more than half of the respondents gave an incorrect response, such as 3 servings a day, which disagrees with the recommendation of WHO to be 5 servings per day. This result disagrees with the findings of Victoria (2019), whereby 47.0% and 55.0% of the respondents gave the correct answer about the servings of fruits and vegetables per day. The majority of the respondents gave an incorrect response towards the method of cooking green leafy vegetables so as to retain their nutrients therein, while a few of the respondents gave a correct response towards the statement. This result is in line with the report of Bastias et al. (2017), whereby the majority of the respondents gave wrong answers about the best method of cooking vegetables. Misconceptions regarding the World Health Organization's recommendation of at least five servings of fruits and vegetables per day may contribute to inadequate fruit and vegetable consumption, thereby reducing the intake of essential vitamins, minerals, dietary fibre, and phytochemicals that protect against non-communicable diseases. Similarly, inadequate knowledge of nutrient-preserving cooking methods for green leafy vegetables may result in cooking practices that lead to significant nutrient losses, particularly of heat-sensitive and water-soluble vitamins such as vitamin C and folate. The inference drawn from the food frequency consumption graph indicated

that the respondents consumed more of the staple foods found within their reach from household stores and markets.

It was observed that there was a significant relationship between nutritional knowledge and instant noodle, pizza, and shawarma consumption but no significant association with soft drinks or cakes. Studies reported this partial association: some studies found knowledge scores to have a significant relation with intake patterns, while others showed that taste, peer influence, convenience, and social eating often have more influence than nutritional knowledge. This was consistent with the study of Tay (2024) which reported a significant association between knowledge score and attitude score about fast food and intake pattern ($p < 0.001$ and $p = 0.008$, respectively). While Pratheepkumar et al. (2023) and Khan and Jha's studies reported that the main reasons for fast food consumption were the influence of friends and social eating with friends, which was predominant in the context, with group dining being the primary fast-food motivation by less than half of the participants. This suggests that nutritional knowledge influences some food choices, but not all food choices can be influenced by nutritional knowledge. Comprehensive interventions addressing social and environmental factors, beyond traditional knowledge-based education, are needed to promote healthy behavioral patterns among present and future healthcare providers (Khan and Jha, 2026).

This study findings suggest that undergraduate students tend to favor convenient and processed food choices, particularly fast foods, while nutrient-rich food groups such as protein-rich foods (fish/meat and dairy products) are consumed less frequently. This dietary pattern may predispose students to nutritional imbalances and potential health risks if sustained over time.

Conclusion

This study demonstrated that undergraduate students had predominantly average nutritional knowledge, with a considerable proportion exhibiting poor knowledge. Although many respondents were within the normal BMI range, the prevalence of overweight and obesity was substantial, and frequent consumption of fast foods and processed foods was common. Nutritional knowledge was significantly associated with the consumption of selected fast foods, indicating that knowledge influences certain dietary choices. These findings underscore the need for targeted nutrition education and health promotion programmes within universities to improve dietary practices, encourage healthier food choices, and reduce the risk of nutrition-related non-communicable diseases among undergraduate students.

Recommendation

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

1. The findings from this study suggests that nutrition education should be found within the universities curriculum which will help enhance the student's nutritional knowledge.
2. The findings from this study suggests a mini nutrition and dietetics clinics within the university environment which will serve as an avenue of assessing, counselling and educating the students

according to their body nutritional needs.

3. The findings from this study suggests establishment of standard, quality and subsidized canteen within campuses which will help produce healthy and affordable goods foods for the students and help reduce consumption of fast foods.
4. This study is recommended to nutritionist, dietitian and other health personnel to increase nutrition awareness and information among students and other population groups as it will help to reduce the prevalence and incidence of diseases attached to faulty nutrition.
5. This study is also recommended that food industry regulation bodies to control production and sales of fast foods that their contents are detrimental to the health of the populace.

Declarations

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Author Contributions

C.V.E: Conceived and designed conception, methodology, investigation, data curation, writing original draft, manuscript preparation and revision.

E.M.O: Conceived and designed conception, methodology, investigation, data curation, supervision, writing original draft, manuscript preparation and revision.

C.E.O: Conceived and designed conception, methodology, investigation, data curation, writing original draft.

U.B.I: Conceived and designed investigation, resources, supervision manuscript preparation and revision.

All authors reviewed the manuscript

Declaration of Generative AI and AI-Assisted Technologies in Scientific Writing

AI was used to comprise and correct grammatical. CHATGPT and quillbot was used.

Availability of data and materials

The data and materials supporting the findings of this study are available from the corresponding author upon reasonable request.

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The data and materials supporting the findings of this study are available from the corresponding author upon reasonable request.

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References

1. Allom V, Mullun B. Maintaining healthy eating behaviours: experiences and perceptions of young adults. *Nutr Food Sci.* 2013;44:156–67. 10.1108/NFS-06-2-0077.
2. Ahmed KR, Kolbe-Alexander T, Khan A. Efficacy of a school-based education intervention on the consumption of fruits, vegetables and carbonated soft drinks among adolescents. *Public Health Nutr.* 2023;26(12):3112–21. 10.1017/S1368980023002094.
3. Sarkar M, Manna N, Sinha S, Sarkar S, Pradhan U. Eating habits and nutritional status among adolescent school girls: an experience from rural area of West Bengal. *IOSR J Dent Med Sci.* 2015;14(9):54–60.
4. Trabucco G, Nikolic M, Mirkovic BV. Nutritional knowledge and behavior among students practicing sports: comparison between two countries. *Acta Fac Med Naiss.* 2013;30(4):201.
5. Tatter G. Food security on college campus: up to half of the nation's college students go without meals, but there isn't a one-size-fits-all solution. *Usable Knowledge.* 2018. Available from: <https://www.gse.harvard.edu/news/uk/18/11/food-insecurity-college-campuses>. Accessed 6 Dec 2019.
6. Roselawati MY, Wan Azdie MAB, Aflah A, Jamaludin AR, Zalilah MS. Food security status and childhood obesity in Kuantan Pahang. *Int J Allied Health Sci.* 2017;1(2):56–71.
7. Dubick J, Mathews B, Cady C. Hunger on campus: the challenge of food insecurity for college students. *Students Against Hunger.* 2016.
8. Afolabi WAO, Towobola SK, Oguntona CRB, Olayiwola IO. Pattern of fast foods consumption and contribution to nutrient intake of Nigerian university students. *Int J Educ Res.* 2013;1(5).
9. Blagg K, Whitmore-Schanzenbach D, Gundersen C, Ziliak J. Assessing food insecurity on campus. Washington (DC): Urban Institute; 2017.
10. Ramlee IS, Ali A, Zalbahar N, Wahab RA, Jaafar SA. Food insecurity among university students at two selected public universities in Malaysia. *Malays Appl Biol.* 2019;48(1):101–10.
11. Ipatenco S. Shocking fast food facts. *Healthy Eating | SFGate.* 2018. Available from: <https://healthyeating.sfgate.com/shocking-fast-food-1673.html>
12. Daradkeh G, Al-Muhannadi A, Al-Hajr M. Fast food vs healthy food intake and overweight/obesity prevalence among adolescents in the State of Qatar. *J Obes Treat Weight Manag.* 2018;1(1):2.

13. Dornelles A. Impact of multiple food environments on body mass index. PLoS ONE. 2019;14(8):e0219365. 10.1371/journal.pone.0219365.
14. Sabrina A, Khotimah S, Rahayu HK. The correlation between the nutritional condition of undergraduate students at Mulawarman University and the frequency of fast food consumption and balanced nutritional knowledge level. J Kesehatan Pasak Bumi Kalimantan. 2024.
15. Agbo EC, Nnadi IM, Nnadi UP. Anthropometric indices, dietary diversity score and fast food consumption among university workers in Southeast Nigeria: a cross-sectional study. IPS J Nutr Food Sci. 2025.
16. Alfaris NA, Al-Tamimi JZ, Al-Jobair MO, Al-Shwaiyat NM. Trends of fast food consumption among adolescent and young adult Saudi girls living in Riyadh. Food Nutr Res. 2015;59.
17. Benajiba N. Fast food intake among Saudi population: alarming fact. Am J Food Nutr. 2016;6(2):44–8.
18. Moubarac JC, Batal M, Louzada MLC, Martinez Steele E, Monteiro CA. Consumption of ultra-processed foods predicts diet quality in Canada. Appetite. 2017;108:512–20.
19. World Health Organization. Nutrition in adolescence: issues for the health sector. Geneva: World Health Organization; 2014.
20. Oguizu AD, Alozie OC. Prevalence of hypertension among adult traders in selected markets in Awka South Local Government Area, Anambra State, Nigeria. Acta Sci Nutr Health. 2018;3(6):142–9.
21. Okudu HO, Okoli JN, Chiwenite MC, Adeoye-Agomoh QC, Ebie CV. Food security and anthropometric status of undergraduates at Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria. IPS J Nutr Food Sci. 2025;4(3):504–11. 10.54117/ijnfs.v4i3.113.
22. Bastias JM, Balladares P, Acuna S, Quevedo R, Munoz O. Determining the effects of different cooking methods on the nutritional composition of salmon. J Food Agric. 2017;12(1):1–7.
23. Fadupin GT, Adeoye A, Ariyo O. Lifestyle and nutritional status of urban school teachers in Ibadan, Nigeria. Niger J Nutr Sci. 2015;35(1):35–40.
24. Okudu HO, Okolie VU, Chijioke MC. Lifestyle and prevalence of overweight and obesity among secondary school teachers in Uzo-Umahi LGA of Enugu State, Nigeria. Food Sci Nutr Technol. 2018.
25. Amole L, OlaOlorun A, Odeigah L, Adesina S. The prevalence of abdominal obesity and hypertension amongst adults in Ogbomoso, Nigeria. Afr J Prim Health Care Fam Med. 2011;3(1):5.
26. Olatunbosun ST, Kaufman JS, Bella AF. Prevalence of obesity and overweight in urban adult Nigerians. Obes Rev. 2011;12(4):233.
27. Tay YQ, Husin AR, Adnan MBH, Ganesan KSAP, Ahmad FSB. Study on relationship of sociodemographic characteristics, knowledge, attitude and practice on fast food intake among University of Cyberjaya medical students. Int J Multidiscip Res. 2024. Available from: <https://www.ijfmr.com>
28. Saha S, Al Mamun MA, Kabir M. Factors affecting fast food consumption among college students in South Asia: a systematic review. J Am Coll Nutr. 2021. 10.1080/07315724.2021.1946147.

29. Mukoru IL, Adebayo O, Oyabambi O, Kanmodi K, Ojo O, Oiwoh S et al. Fast food consumption habits among young people in southwestern Nigeria. *Res J Health Sci*. 2023. Available from: <https://www.ajol.info/index.php/rejhs>
30. Pratheepkumar S, Hamdan L, Khashiev I, Sreedharan J. Practice of fast food consumption among university students and variables associated with the practice. *J Med Health Stud*. 2023;4(5). 10.32996/jmhs.2023.4.5.2.
31. Khan S, Jha P. Nutritional knowledge, dietary behaviors and physical activity among undergraduate medical students: a cross-sectional study. *Int J Community Med Public Health*. 2026. Available from: <https://www.ijcmph.com>
32. Hu H, Yan Y. Analysis of fast-food consumption behavior among physically active male students in a Beijing university. *Int J Phys Act Health*. 2026. Available from: <https://www.sciencepublishinggroup.com/journal/paperinfo?journalid=580>
33. Oladimeji Y, Eze C, Abdulrahman S, Sani A. Determinants of fast food consumption and preferences among undergraduate students of Ahmadu Bello University, Zaria, Nigeria. 2018. Available from: <http://www.ijsrpub.com/uploads/papers/IJSRK/2015/Dec/IJSRK-15-93.pdf>
34. World Health Organization. Body mass index (BMI). Geneva: World Health Organization. 2012. Available from: <https://www.euro.who.int/en/health-topics/disease-prevention/nutrition/ahealthy-lifestyle/body-mass-index>
35. Yamane T. *Statistics: An introductory analysis*. 2nd ed. New York: Harper & Row; 1967.
36. Priya R, Sinha M. Nutritional knowledge and nutritional status amongst university students. *IP J Nutr Metab Health Sci*. 2020;3(1):22–5.
37. World Health Organization. *World health statistics 2024: Monitoring health for the SDGs, sustainable development goals*. Geneva: World Health Organization. 2024. Available from: <https://www.who.int/data/gho/publications/world-health-statistics>
38. National Population Commission (NPC) [Nigeria], ICF. *Nigeria Demographic and Health Survey 2023–24*. Abuja, Nigeria, and Rockville (MD): NPC and ICF. 2024. Available from: <https://www.dhsprogram.com/publications/publication-FR409-DHS-Final-Reports.cfm>
39. Obayelu OA, Akpan EI, Ojo AO. Prevalence and correlates of food insecurity in rural Nigeria: A panel analysis. *Economia Agro-Alimentare*. 2021;23(2):1–25. 10.3280/ecag2-2021oa12344.
40. Oderinde TM, Ilesanmi OS, Afolabi AA. Food insecurity and associated factors among households with under-5 children in slum communities in Ibadan, Nigeria. *BMC Public Health*. 2023;23:1820. 10.1186/s12889-023-16644-3.
41. Quinton J, Jenkins GP, Olasehinde-Williams G. How do household coping strategies evolve with increased food insecurity? An examination of Nigeria's food price shock of 2015–2018. *Food Energy Secur*. 2024;13(5):e70012. 10.1002/fes3.70012.
42. Ukonu IC, Wallace CA, Lowe NM. Household food security and dietary diversity in south-eastern Nigeria. *Matern Child Nutr*. 2024;20(3):e13599. 10.1111/mcn.13599.

43. Yohannes G, Wolka E, Bati T, Yohannes T. Household food insecurity and coping strategies among rural households in Kedida Gamela District, Kembata-Tembaro Zone, Southern Ethiopia: Mixed-methods concurrent triangulation design. BMC Nutr. 2023;9:13. 10.1186/s40795-022-00663-z.

44. Kehinde T, Favour E. Food insecurity and nutrition status of farm households in Northwestern Nigeria. J Food Secur. 2020;8(3):98–104. 10.12691/jfs-8-3-3.

Figures

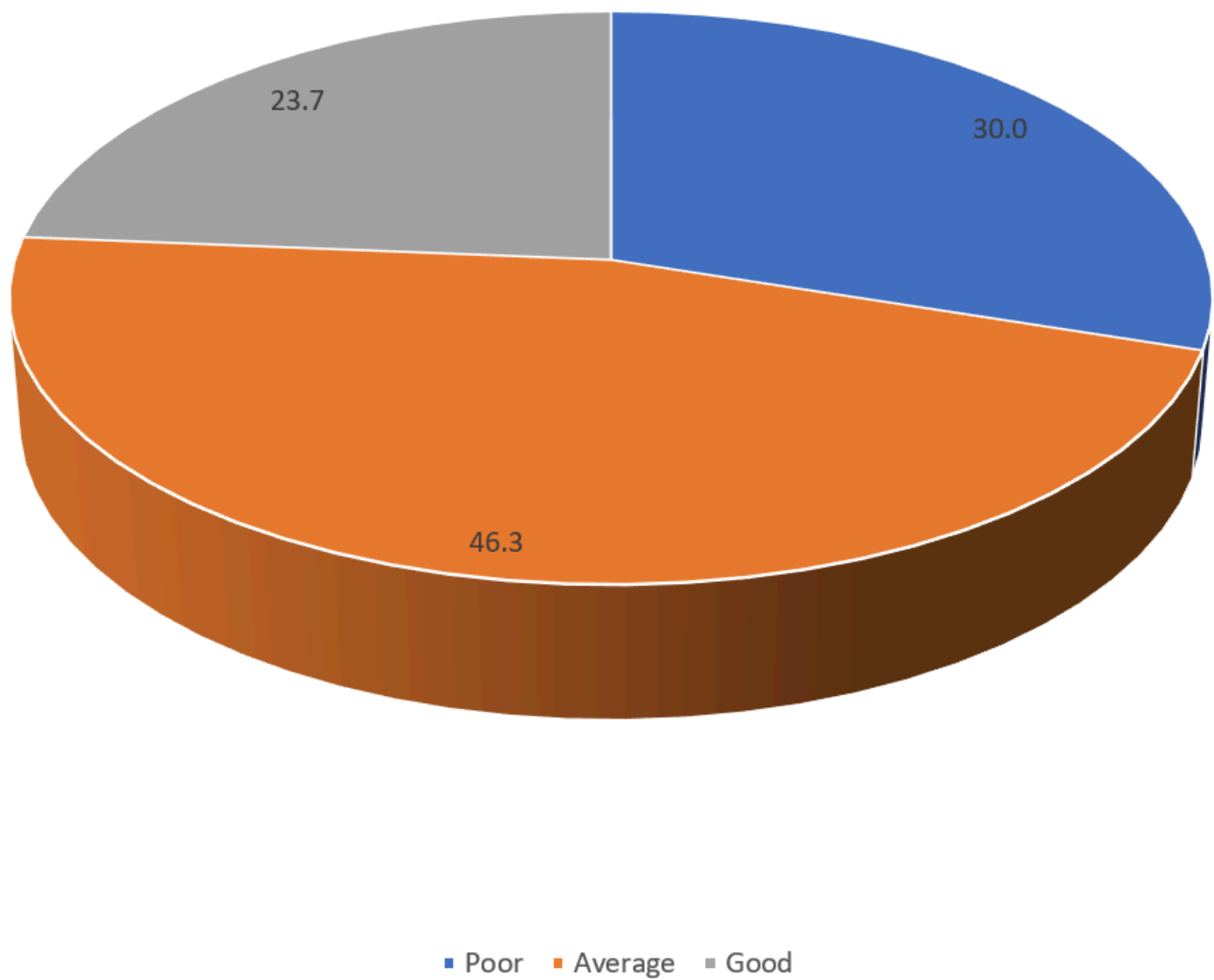


Figure 1

Nutritional knowledge level of the undergraduates

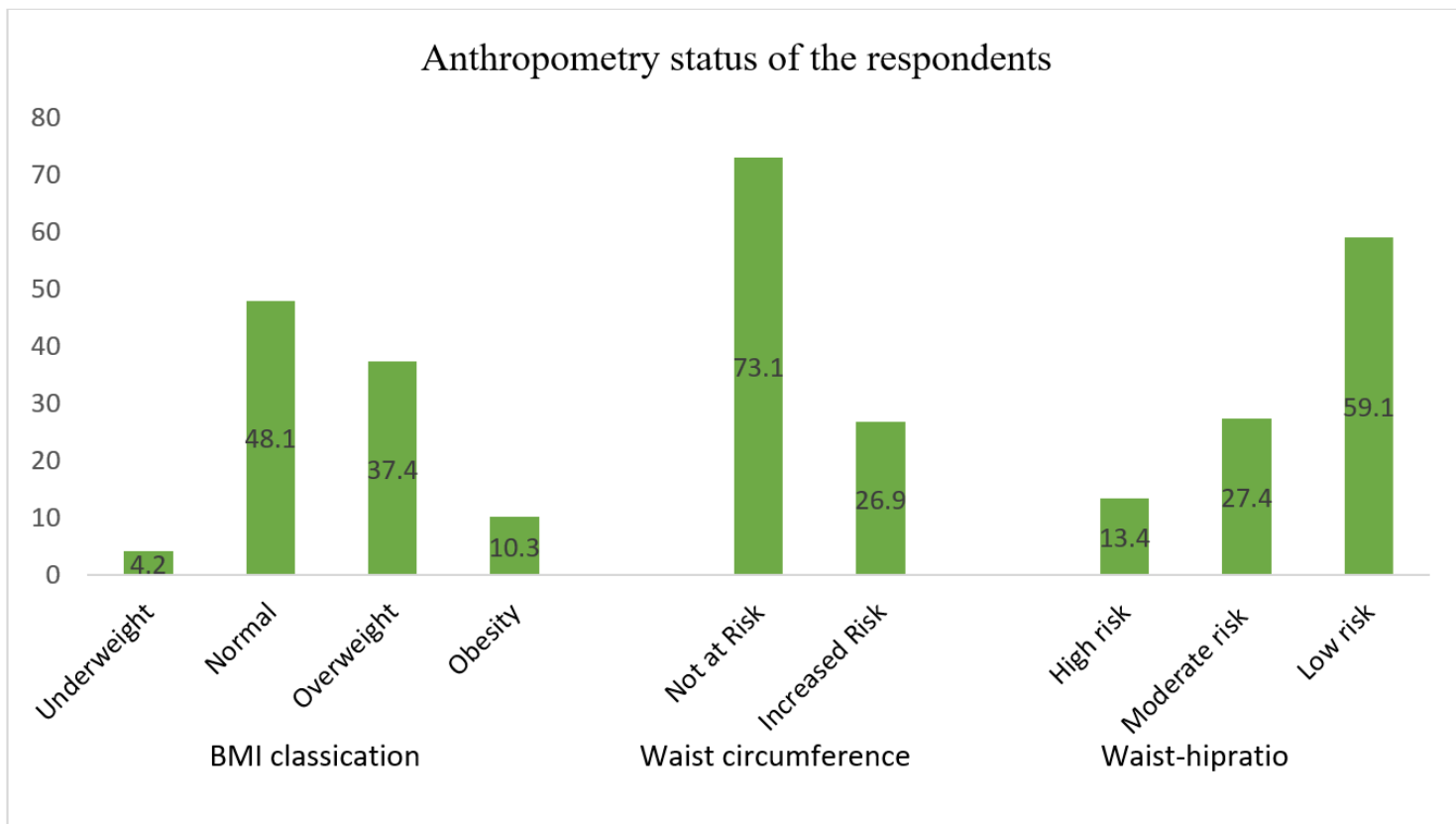


Figure 2

Anthropometry characteristics of the respondents

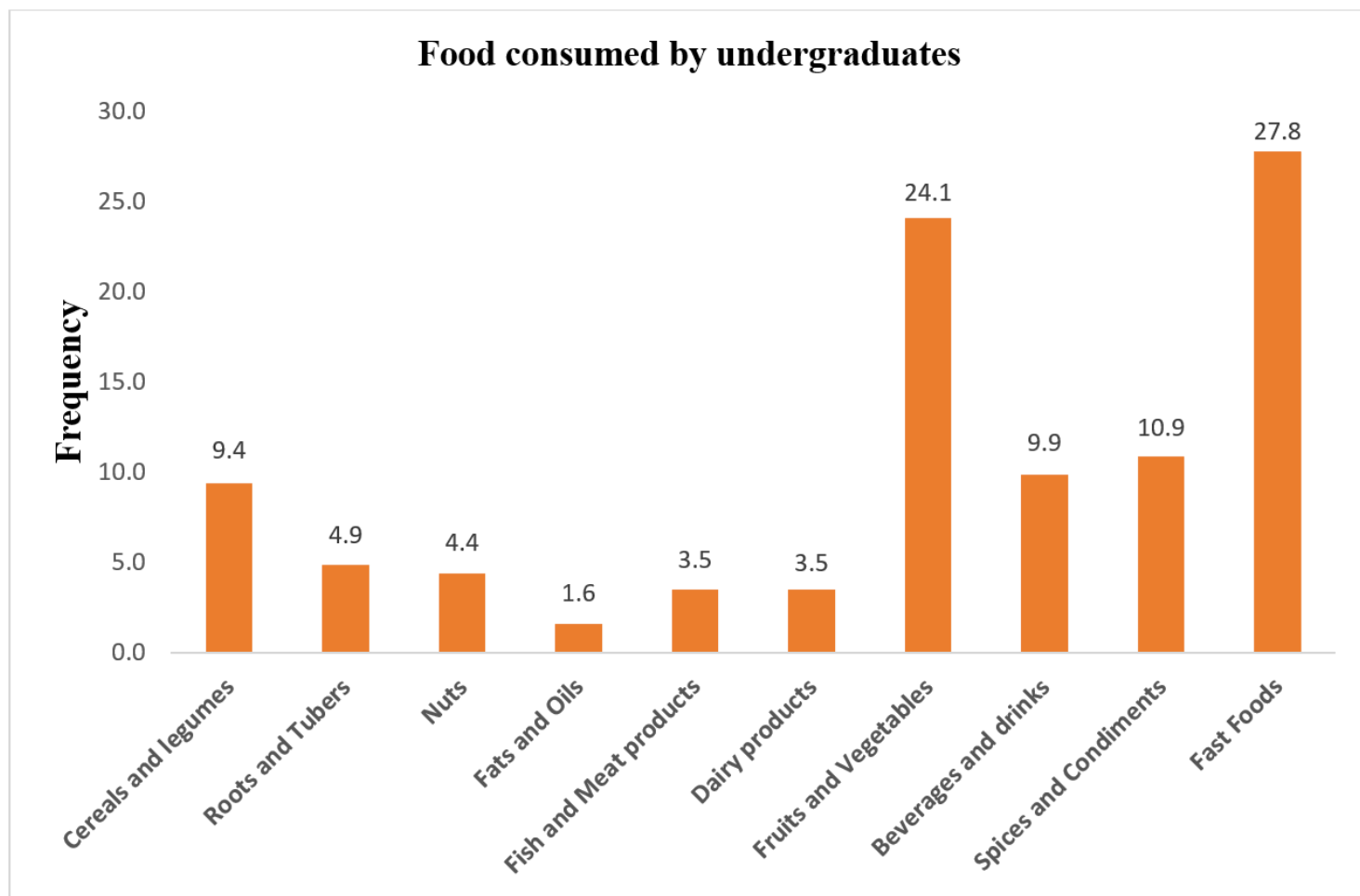


Figure 3

Foods consumed by the respondents

Supplementary Files

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