Original Paper

Nutritional Status, Food Consumption Pattern and Lifestyle Practices Of Bowen University Students, Iwo

Rachael Ramotu Fakunle[1], Victoria Adeniyi[1], Ayomide Miracle Ademola[2]*

1) Nutrition and Dietetics Department, Bowen University, Iwo, Osun State, Nigeria
2) Food Science and Technology Department, Enugu State University of Science and Technology, Enugu State, Nigeria
*) corresponding author: ademolaayomide121@gmail.com

Abstract —**Young adults are vulnerable to obesity, especially as they transition into university life and become responsible for their food consumption and lifestyles. This study assessed the nutritional status, food consumption pattern and lifestyle practices of undergraduates studying at Bowen University, Iwo. A cross-sectional study involving 235 undergraduates was conducted at Bowen university, Iwo. The respondents were assessed with the use of pretested questionnaire to collect data on sociodemographic characteristics, socioeconomic characteristics, body weight, height, body mass index (BMI), food consumption pattern with the use food frequency questionnaire and lifestyle practices. The collected data were analysed with the use of SPSS. The study showed that more than half (63.5%) of the respondents were between the ages of 17-20 years, 57.5% had normal body weight, 5.5% were slightly obese, 12.3% were underweight, and 24.7% were overweight. Cereals, notably, rice was consumed by 33.2% of the respondents on a daily basis and was also the major cereals consumed. This study showed that 22.6% of the respondents engage in physical activities more than three times a week, 23.4% less than three times a week and 63.8% do not engage in any physical activity except school and domestic activities. About 15% of the respondents took alcohol and those who smoked cigarette (4.3%) are far less than those who do not smoke. Most undergraduates have normal body weight, and most of them have low smoking, alcohol drinking and physical activity engagement.**

Keywords: **Body Mass Index, Cross-sectional, Undergraduates, Weight**

I. INTRODUCTION

Nutrition is the ingestion of food, considered in relation to the body's dietary needs and implies an adequate, well-balanced diet combined with regular physical activity [1]. The nutritional status, food consumption pattern, and lifestyle practices of undergraduates have gained increasing attention in recent years due to the growing concerns about the impact of poor nutrition on health [2]. Undergraduates are a particularly vulnerable population to poor nutrition due to their busy schedules, limited resources, and high-stress levels. Poor nutrition can lead to a range of health problems, including obesity, type 2 diabetes, cardiovascular disease, and certain types of cancer [3]. Therefore, understanding the nutritional status, food consumption pattern, and lifestyle practices of undergraduates is crucial for improving their health and well-being.

The nutritional status can be assessed by measuring body mass index (BMI), waist circumference, and body fat percentage. Studies have shown that many undergraduates have poor nutritional status, as evidenced by high rates of overweight and obesity [4]. The food consumption pattern of undergraduates is influenced by various factors, including cultural beliefs, peer pressure, and availability of food. Youths and young adults often have poor eating habits, such as skipping breakfast, consuming high amounts of energy-dense foods, and low intake of fruits and vegetables [5]. The lifestyle practices of undergraduates can also impact their nutritional status and food consumption pattern. Many adolescent engage in unhealthy lifestyle practices, such as smoking, excessive alcohol consumption, and physical inactivity [6].

The nutritional status, food consumption pattern, and lifestyle practices of undergraduates have significant implications for their health and well-being. Therefore, it is important to study the nutritional status, food consumption pattern, and lifestyle practices of undergraduates, in order to develop effective interventions that promote healthy eating habits and lifestyle practices.

II. METHODOLOGY

A. Study Area

The study was carried out at Bowen University, Iwo, Osun state.

B. Brief Description of The Study Area

The Nigerian Baptist Convention owns and runs the private, Christian, Baptist university known as Bowen University in Nigeria. In the former 1,300-acre (6 km2) site of the Baptist College, a school for teacher preparation on a hill outside the city, Bowen University is based in Iwo, Osun State, Nigeria. Iwo LGA is 245 square kilometers in size and has average temperatures of 27 degrees centigrade. The LGA has an average humidity of 69 percent and has a Tropical Savannah climate. It is estimated that Iwo receives 1700 mm of precipitation overall per year.

C. Study Design

The study design used was cross-sectional descriptive survey.

D. Population of Study

The study included undergraduate students, which comprised of male and female of Bowen University, Iwo Osun State.

E. Inclusion Criteria

Eligible respondents for this study were all full time Undergraduate students of Bowen University who have agreed to participate in the study and signed the consent form.

F. Exclusion Criteria

Excluded from the study were undergraduates that were pregnant (female) and students on medication with known chronic diseases.

G. Sample Size Determination

The sample size was determined using Yamane's formula.

$$n = Z^2 * \frac{(p)(q)}{(0.05)^2}$$

Where:

Z is confidence interval at 95% (1.96)

P is the prevalence 18.2% - Prevalence of Overweight among students (Yun et al. 2018)

Q is 1-P

e is level of precision

$$n = 1.96^2 * \frac{(0.182)(1-0.182)}{(0.05)^2}$$

n = 229

However, the sample size was increased to 235.

H. Sampling Technique

Multistage Sampling Technique was used for this study.
Firstly, four (4) colleges were selected randomly from the seven (7) colleges in the school, using simple random sampling technique.
Secondly, five (5) departments each were selected from the selected colleges using simple random sampling technique, giving a total of 20 departments
Lastly, 235 students that meet the selection criteria were randomly selected from the 20 departments.

I. Data Collection

A semi-structured, self-administered questionnaire was used to gather socio-demographic and socio-economic data. Every respondent completed a questionnaire each. The first section of the questionnaire consists of questions on the respondent's demographic data (age, educational attainment, gender, etc.), as well as socioeconomic data (income, education, employment etc.). Food consumption patterns were evaluated using food frequency questionnaire. The food frequency was based on the main food groups (nine). The mechanical bathroom scale was zeroed before the respondent stood on it to guarantee accurate measurements of body weight. The respondents were instructed to take out any "heavy" objects from their pockets, such as keys and wallets, as well as any bulky pieces of clothing or accessories (big jackets, shoes, woolen jerseys etc.). On the scales, they were instructed to remain motionless and to look straight ahead. Before the measurement was recorded, the needle and digital screen were given time to settle. The body weight was calculated to the closest 0.5 kg in kilograms [7]. The respondents were asked to taken off their shoes before the height measurement was taken. They were instructed to take a position facing the front of the room with their backs to the wall. They were positioned so that the backs of their feet, calves, lower back, and heads are on the wall. They stood just below the measuring tool that dropped down. In order to take the measurement, the measuring tool was lowered until it gently rested on the respondent's skull. They were measured in meters, with a precision of 0.5 centimeters. [7]. Weight in kilograms divided by height in meters squared yields the BMI (body mass index). It is categorized as underweight if it is less than 18.5 kg/m^2, normal if it is between 18.5 and 24.99 kg/m^2, overweight if it is between 25 and 29.9 kg/m^2, obese if it is above 30 kg/m^2 [7].

J. Pilot Survey

At Ajayi Crowther University in Oyo State, 30 undergraduates were given questionnaires as pretest. The decision to select undergraduates from Ajayi Crowther University was made in light of the parallels between the traits of the undergraduate respondents from Bowen University and those of the Ajayi Crowther University respondents.

K. Ethical Consideration

Ethical approval was sought for through a letter of introduction to the school authority through the directorate of student Affairs.

L. Informed Consent

All respondents provided informed consent before to the data collection process. Written on the questionnaire, the informed consent also contained a verbal description of the study's goals, its confidentiality, and the respondents' right to refuse participation.

M. Statistical Analysis

Statistical Product of the Social Sciences (SPSS) software was used to evaluate the data after it had been entered into an Excel spreadsheet. Where applicable, data were displayed using

frequencies and percentages for categorical variables, mean values and standard deviation for continuous variables.

III. RESULTS

A. Sociodemographic and socio-economic characteristics of the respondents

More than half (63.5%) of the respondents were between the ages of 17-20 years, while less than half (36.5%) were between the ages of 21 and above. Majority (81.3%) of the respondents who participated in this survey were female while the males were 18.7%. Almost all respondents (98.7%) were Christians, while 0.9% practiced Islam and 0.4% indicated other religion. Assessing the ethnicity of the respondents shows that almost three-quarter 73.6% were Yoruba, followed by Igbo 16.6%, while Hausa students were only 2.6%, followed by the other ethnic groups. The study further showed that 34.5% of the respondents receive between ₦31000 and ₦40000 monthly followed by 31.9% who receive between ₦21000 and ₦30000 monthly, 22.1% receive more than ₦40000 in a month, meanwhile 11.5% of the respondents receive less than ₦20000 a month. It was observed that majority (94%) of the fathers had tertiary education, similarly most (92.3%) of the mothers in this study had tertiary education.

B. Anthropometric measurements of the respondents

The mean weight was 62.5 ± 11.02kg, the mean height was 1.65 ± 0.9 and a mean body mass index (BMI) of 23.12 ± 4.20kg/m^3 was recorded among the study participants. In terms of the body mass index category, more than half 135 (57.5%) had normal body weight, 13 respondents (5.5%) were slightly obese, 29 respondents (12.3%) were underweight, and 58 respondents (24.7%) were overweight.

C. Food Consumption Pattern of the respondents

Boiled rice was consumed by 33.2% of the respondents on a daily basis and was also the major cereals consumed. Agidi was the least consumed cereals with only 6.8% of the study respondents eating it 1-2 times a week, while bread was consumed daily by 6.4% of the respondents. Also, spaghetti was consumed by 11.9% of the respondents on a daily basis, while just a few respondents (2.6%) ate Indomie at least once a day.

For foods from roots and tuber, boiled yam was the most consumed food daily with 4.7% of the study respondents consuming it per day, while garri was not eaten at all on a daily basis by the respondents, also Porridge, potato and pounded yam were rarely eaten per day by the respondents with only 0.9%, 1.7% and 3.4% respectively.

Beans is a legume that was consumed the least (2.1%) on a daily basis by the respondents, while Moi Moi was the consumed legume with 8.5% of the respondents eating it daily, followed by akara (2.6%) daily.

Pepper, tomatoes and onions were the most consumed vegetables on a daily basis by the students with 26.8% and 26.4%, 27.2% respectively, while Okra and Orange were the least (0.9%) consumed fruits and vegetables consumed daily.

Milk and milk products were consumed by 27.2% of the students more than 2 times a day, while Eggs were consumed by 22.6% the respondents of the study at least once a day.

TABLE I. SOCIODEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

Variables	Frequency	Percentage
Age (years)		
17-20	150	63.5
21 and above	85	36.5
Gender		
Male	44	18.7
Female	191	81.3
Religion		
Christianity	232	98.7
Islam	2	0.9
Others	1	0.4
Ethnicity		
Yoruba	173	73.6
Igbo	39	16.6
Hausa	6	2.6
Others	17	7.2
Monthly Allowance		
<20000	27	11.5
21000-30000	75	31.9
31000-40000	81	34.5
>40000	52	22.1
Educational level of Fathers		
Primary education	1	0.4
secondary education	13	5.5
tertiary education	221	94
Educational level of Mothers		
Primary education	4	1.7
secondary education	14	6
tertiary education	217	92.3

TABLE II. ANTHROPOMETRIC MEASUREMENTS OF THE RESPONDENTS

Variables	mean ± SD
Weight (kg)	62.5 ± 11.02
Height (m)	1.65 ± 0.9
BMI (kg/m^3)	23.12 ± 4.20

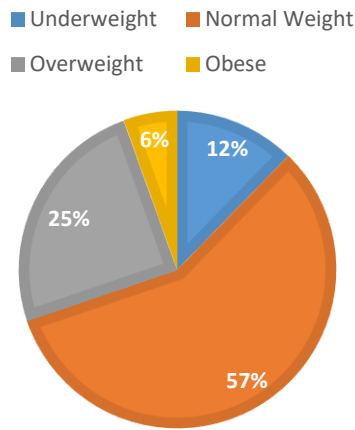Underweight Normal Weight Overweight Obese

12% 57% 25% 6%

Fig. 1. Body Mass Index of The Respondents

D. Food Consumption Pattern of the respondents

Boiled rice was consumed by 33.2% of the respondents on a daily basis and was also the major cereals consumed. Agidi was the least consumed cereals with only 6.8% of the study respondents eating it 1-2 times a week, while bread was consumed daily by 6.4% of the respondents. Also, spaghetti was consumed by 11.9% of the respondents on a daily basis, while just a few respondents (2.6%) ate Indomie at least once a day.

For foods from roots and tuber, boiled yam was the most consumed food daily with 4.7% of the study respondents consuming it per day, while garri was not eaten at all on a daily basis by the respondents, also Porridge, potato and pounded yam were rarely eaten per day by the respondents with only 0.9%, 1.7% and 3.4% respectively.

Beans is a legume that was consumed the least (2.1%) on a daily basis by the respondents, while Moi Moi was the consumed legume with 8.5% of the respondents eating it daily, followed by akara (2.6%) daily.

Pepper, tomatoes and onions were the most consumed vegetables on a daily basis by the students with 26.8% and 26.4%, 27.2% respectively, while Okra and Orange were the least (0.9%) consumed fruits and vegetables consumed daily.

Milk and milk products were consumed by 27.2% of the students more than 2 times a day, while Eggs were consumed by 22.6% the respondents of the study at least once a day.

Less than a quarter (14.5%) of the respondents consumed food products that contained palm oil on a daily basis, while 31.1% consumed foods that contained groundnut oil on a daily basis.

Fish was eaten at least once a day and more than two times a day by 11.1% each of the study respondents.

Beverages was consumed by 10.6% more than two times daily while fried foods was eaten at least once a day by 14.9%, suya (5.5%), breadwarma (5.1%) others (7.2%) were eaten at least once a day of the respondents. Few respondents consumed fried foods (12.8%), suya (17%), egg rolls (14.5%), biscuit (23.4%), hot dogs (18.3%). ice cream (21.3%), meat pie

(17.4%), fried rice (9.8%), burger (10.6%), breadwarma (11.1%) consumed 1-2 times per week. Few respondents consumed fried foods (6.8%), suya (8.5%), egg rolls (13.2%), biscuit (14.9%), hot dogs (9.4%). ice cream (8.1%), meat pie (10.6%), fried rice (10.6%), burger (3.4%), breadwarma (4.3%) consumed 3- 4 times per week. Few respondents consumed fried foods (5.1%), suya (4.3%), egg rolls (1.3%), biscuit (10.2%), hot dogs (2.6%). ice cream (3%), meat pie (7.2%), fried rice (13.6%), burger (5.1%), breadwarma (2.6%) consumed 5- 6 times per week. Shortenings was not eaten at all by the students.

TABLE III.   Food Consumption Pattern of the respondents

Types of foods	Never	Once per month	2-3 times per month	1-2 times per week	3-4 times per week	5-6 times per week	Once per day
CEREALS							
Boiled rice	1.7	2.1	2.6	14	18.3	17	33.2
Agidi/Eko	74.5	8.5	6	6.8	2.1	0.9	0.4
Bread	10.2	17	8.5	22.1	15.7	9.8	6.4
Spaghetti	8.9	5.5	12.8	17.9	16.2	14.9	11.9
Indomie	28.5	10.6	14	28.9	10.2	0.9	2.6
ROOTS AND TUBERS							
Boiled Yam	55.3	16.6	7.7	8.1	6	-	4.7
Pounded Yam	38.7	27.2	8.9	11.9	7.2	1.7	3.4
Amala	30.6	18.3	18.7	23.4	3.8	0.9	2.6
Garri	27.7	17.4	11.9	21.3	12.3	2.1	
Porridge	62.1	10.2	12.3	8.5	3	0.4	0.9
Potatoes	3.3	10.2	14.5	21.7	13.6	4.3	1.7
LEGUMES							
Beans	33.6	13.2	17.4	26.8	3.8	2.6	2.1
MoiMoi	30.7	11.1	20.9	17.9	6	1.7	8.5
Akara	50.6	12.3	12.3	11.1	7.7	1.3	2.6
FRUITS AND VEGETABLES							
Orange	35.7	14.9	8.1	24.3	7.2	0.0	0.9
Pineapple	28.5	17.9	7.2	22.1	10.2	3.8	2.1
Water melon	31	20	8.1	19.1	9.8	1.7	2.1
Ewedu	29.4	20.9	16.6	18.7	4.7	2.1	4.3
Okra	50.6	13.2	17	9.8	3	3.4	0.9
Green (shoko, Efo)	39.1	15.3	14.9	21.3	0.9	3.8	2.6
Tomatoes	15.3	8.1	3.4	11.5	3.4	6.8	26.4
Pepper	12.8	5.1	3.8	11.9	3.8	8.9	26.8
Onion	15.3	3.4	2.1	13.2	5.5	8.1	25.1
DAIRY PRODUCTS							
Milk and milk products	15.3	3.4	2.1	13.2	5.5	8.1	25.1
Eggs	13.2	3.8	9.4	15.7	9.8	10.6	22.6
OILS							
Palm oil	18.2	2.6	14.9	21.3	7.2	14	14.5
MEAT AND ITS PRODUCTS							
Meat	8.1	4.7	11.9	10.6	8.5	16.6	15.3
FISH AND ITS PRODUCTS							
Fish	12.7	11.9	10.6	17	14	11.5	11.1

OTHERS							
Beverages	26.8	11.1	19.1	15.3	6.4	8.1	2.6
Alcoholic drinks	61.8	8.9	6.8	6.4	4.3	4.7	3
Soft drinks	11.9	14	18.3	17.9	12.8	7.2	6
Snacks	18.7	14.9	11.1	22.6	15.3	4.3	7.7
Pizza	43.4	23.4	7.7	8.9	4.7	0.4	2.6
Cakes, cookies	30.2	24.7	14.9	17.4	4.7	0.4	6.8
Shawarma	36.2	23.8	15.7	11.5	3.8	5.5	2.6
Microwave popcorn	52.8	14.9	12.3	11.5	2.6	1.3	3.4
Shortening	100	-	-	-	-	-	-
Fried food	21.7	14.5	19.6	12.8	6.8	5.1	14.9
Suya	23.8	21.3	18.7	17	8.5	4.3	5.5
Egg rolls	32.3	17.9	14.9	14.5	13.2	1.3	3.8
Biscuits	12.8	21.3	11.1	23.4	14.9	10.2	3.4
Ice cream	28.1	28.5	9.4	21.3	8.1	3	0.4
Meat pie	22.6	24.7	8.5	17.4	10.6	7.2	6
Fried rice	23.8	20.4	14.5	9.8	10.6	13.6	6
Burger	45.5	18.7	15.3	10.6	3.4	5.1	0.4

E. Lifestyle Practices of the respondents

Those who engage in physical activities more than 3 times a week were 22.6% (n=53). While those who engage in physical exercise 30 minutes less than 3x/week were 23.4% (n=55), those who don't engage in any physical activity except school and domestic activities 63.8% (n=150), Also those who took alcohol were less than a quarter 14.4% (n=34), while those who smoked cigarette were 4.3% (n=10), Furthermore those who take nutritional supplement were 60% (n=141) and finally those who were easily stressed were 63% (n=148)

TABLE IV.   LIFESTYLE PRACTICES OF THE RESPONDENTS

Lifestyle practices of respondents	Yes (%)	No (%)
I engage in physical exercise 30 minutes more than 3x/week	53 (22.6)	182 (77.4)
I engage in physical exercise 30 minutes less than 3x/week	55 (23.4)	180 (76.6)
I don't engage in any physical exercise except for school and domestic activities	150 (63.8)	85 (36.1)
I take alcohol	34 (14.5)	201 (85.5)
I smoke cigarette/tobacco products	10 (4.3)	225 (95.7)
I take nutrient supplements (vitamins, mineral, etc.)	141 (60)	94 (40)
I am easily stressed	148 (63)	87 (37)

IV.   DISCUSSION

This study assessed the nutritional status, food consumption pattern and lifestyle practices of 235 Bowen University Students, Iwo, Nigeria. More than half (63.5%) of the respondents were between the ages of 17-20 years, while less than half (36.5%) were between the ages of 21 and above meanwhile most of the students involved in a study carried out by [7] were 21 years and above, with more than half of the students aged between 21 and 24 years (59.7%). While both studies show that most of the students are females, Mogeni and Ouma (2022) reported a near equal representation of 51.39% for females and 48.61% for male while this study observed a wide percentage difference (female; 81.3%). A similar study conducted among students if Lead City University also show that most of the respondents are females (67%) [8]. The participants were majorly Christians (98.7%) and Yoruba (73.6%), this could be due to the fact that Bowen University is a Christian University located in South-Western Nigeria (a Yoruba dominated geographical zone). Reference [8] showed that most (34%) of the respondents receive estimated monthly allowance that range between ₦10,001 and ₦20,000, followed by 22% who receive between ₦20,001 and ₦50.000. This is inconsistent with the findings of this study that showed that 34.5% of the respondents receive between ₦31000 and ₦40000 monthly followed by 31.9% who receive between ₦21000 and ₦30000 a month.

The study showed that the average weight of the respondents was 62.5 ± 11.02 kg, the mean height was 1.65 ± 0.9 meter and a mean body mass index (BMI) of 23.12 ± 4.20 kg/m^3. A similar study showed that 58.1% of the university students was in the normal weight category, and 18.2% and 10.6% were overweight and obese, respectively with mean height of 1.60 ± 0.084 meter [6]. [9] showed a similar but lesser mean body mass index (20.83kg/m^2). In terms of the body mass index category, more than half (57.5%) had normal body weight, 5.5% were obese, 12.3% were underweight, and 24.7% were overweight. These values are close to the finding of a similar study that showed that 54% were normal and 6% were obese but a far higher value for underweight (40%) (Khan et al., 2015). [10], reported that 7.7% of the university students are underweight, 69.1% are normal, 15.2% are overweight and similarly, 5.2% are obese. A study conducted in Ghana reported that that the students' ranked highest on normal (54%) than overweight (20.4%) and underweight (20.1%). The study further revealed that there were more obese class I (n=109, 4.1%) than obese class II (n=37, 1.4%) students [11].

Cereals, notably, rice was consumed by 33.2% of the respondents on a daily basis and was also the major cereals consumed. Agidi was the least consumed cereals with only 6.8% of the study respondents eating it 1-2 times a week, while bread was consumed daily by 6.4% of the respondents, Also, spaghetti was consumed by 11.9% of the respondents on a daily basis. According to a study conducted by [7], 34% of the students consume cereals less than three times a week while 66% consume cereals at least three times a week.

For foods from roots and tuber, boiled yam was the most consumed food daily with 4.7% of the study respondents consuming it per day, while garri was not eaten at all on a daily basis by the respondents, also Porridge, Potato and pounded yam were rarely eaten per day by the respondents with only 0.9%, 1.7% and 3.4% respectively. In contrast, 54% of the respondents consume roots and tubers at least three times a week [7].

Beans is a legume that was consumed the least (2.1%) on a daily basis by the respondents, while Moi Moi was the consumed legume with 8.5% of the respondents eating it daily, followed by akara (2.6%) daily. [7], showed that 35% of the students consume legumes at least three times a week.

Majority of the students 71.67% have vegetables from time to time in a week [12]. Meanwhile, [7], reported 35% and 51% of the respondents consume vegetables and fruits respectively at least three times a week. [13], reported that 44.9% consume vegetables at least three times a week and 41.3% consume fruits at least three times a week. However, this study showed that pepper, tomatoes and onions were the most consumed vegetables on a daily basis by the students with 26.8% and 26.4%, 27.2% respectively, while Okra and Orange were the least (0.9%) consumed fruits and vegetables consumed daily.

Milk and milk products were consumed by 27.2% of the students more than 2 times a day, while eggs were consumed by 22.6% the respondents of the study at least once a day. [7], showed that 49% and 63% of the students consume milk and eggs less than three times a week respectively.

Less than a quarter (14.5%) of the respondents consumed food products that contained palm oil on a daily basis, while 31.1% consumed foods that contained groundnut oil on a daily basis.

Fish was eaten at least once a day and more than once a day by 11.1% each of the study respondents. Meat is consumed once a day and more than once a day by 15.3% and 24.3% respectively. However, another study revealed that about 37.33% of students have meat every day, and 27.66% have three times a week [12]. In contrast, [7], reported that 34.5% and 58.5% consume fish and meat respectively at least three times a week.

This study showed that 22.6% of the respondents engage in physical activities more than three times a week, 23.4% less than three times a week and 63.8% do not engage in any physical activity except school and domestic activities. A study conducted among students in Saudi Arabia showed that about 50% of the students perform physical activities and exercise sometimes, whereas few students have a habit of performing them on a regular basis [12]. About 15% of the respondents took alcohol and those who smoked cigarette (4.3%) are far less than those who do not smoke. This is consistent with the findings of a similar study by [12] who also reported that the number of students who do not smoke (82.34%) exceeds the percentage of smokers (17.66%).

V. Conclusion

The study showed that the average weight of the respondents was 62.5 ± 11.02 kg, the mean height was 1.65 ± 0.9 meter, a mean body mass index (BMI) of 23.12 ± 4.20 kg/m^3 and more than half had normal body weight. Most of the respondents do not drink alcohol, only 4.3% of the students engage in smoking. The students were also noted to have poor food consumption pattern.

REFERENCES

[1] Uzosike, T. C. J., Okeafor, I., & Mezie-Okoye, M. (2020). Dietary Diversity, Nutritional status and Academic performance of pupils in public primary schools in Port Harcourt Metropolis. Journal of Community Medicine and Primary Health Care, 32(2), 42–56. https://doi.org/10.4314/jcmphc.v32i2.4

[2] Mogeni Brenda Kemunto and Ouma Luke Ondijo (2022) Dietary patterns, behaviours, and their associated factors among university students in coastal Kenya, Cogent Food & Agriculture, 8:1, DOI: 10.1080/23311932.2022.2132873

[3] Scully, T., Ettela, A., LeRoith, D., & Gallagher, E. J. (2021). Obesity, Type 2 Diabetes, and Cancer Risk. Frontiers in oncology, 10, 615375. https://doi.org/10.3389/fonc.2020.615375

[4] Olatona, F. A., Ogide, P. I., Abikoye, E. T., Ilesanmi, O. T., & Nnoaham, K. E. (2023). Dietary diversity and nutritional status of adolescents in Lagos, Nigeria. Journal of family medicine and primary care, 12(8), 1547–1554. https://doi.org/10.4103/jfmpc.jfmpc_1783_22

[5] Rivera Medina, C., Briones Urbano, M., de Jesús Espinosa, A., & Toledo López, Á. (2020). Eating Habits Associated with Nutrition-Related Knowledge among University Students Enrolled in Academic Programs Related to Nutrition and Culinary Arts in Puerto Rico. Nutrients, 12(5), 1408. https://doi.org/10.3390/nu12051408

[6] Yun, T. C., Ahmad, S. R., & Quee, D. K. S. (2018). Dietary Habits and Lifestyle Practices among University Students in Universiti Brunei Darussalam. The Malaysian journal of medical sciences: MJMS, 25(3), 56–66. https://doi.org/10.21315/mjms2018.25.3.6

[7] Omage kingsley and Omuemu Vivian O. (2018). Assessment of dietary pattern and nutritional status of undergraduate students in a private university in southern Nigeria. Journal Food Science and Nutrition. 2018; 6:1890-1897. DOI:10.1002/fsn3.759

[8] Ogundele, A. E., Aleru, E. O., Bodunde, I. O., & Gbenro, O. E. (2023). Drivers of food choice, meal pattern, and lifestyle habits among undergraduate students in Lead City University, Ibadan, Oyo State, Nigeria. World Nutrition, 14(2), 66–78. https://doi.org/10.26596/wn.202314266-78

[9] Khan Binish, Sukhsohale Neelam D, and Khamgaonkar Mohan B. (2015). Nutritional Status and Dietary Pattern of Undergraduate Medical Students of Central India. Scholars Journal of Applied Medical Sciences. 2015; 3(1A):49-52. DOI: 10.36347/sjams.2015.v03i01.012

[10] Sprake, E. F., Russell, J., Cecil, J. E., Cooper, R., Grabowski, P., Pourshahidi, L., & Barker, M. E. (2018). Dietary patterns of university students in the UK: a cross-sectional study. Nutrition Journal, 17(1). https://doi.org/10.1186/s12937-018-0398-y

[11] Oti, J.A., & Eshun, G. (2020) Dietary Habits and Nutritional Status of Undergraduate Students of Winneba Campus of University of Education, Winneba, Ghana. Journal Food Science and Nutrition: JFSN-109.DOI: 10.46715/jfsn2020.10.1000109

[12] Al-shehri, H., Al-Qahtani, A. M., Shaikh, I. A., Hassan, M. A., Alqahtani, N. S., Alqahtani, A. M., & Alabas, M. A. (2017). Assessment of lifestyle and eating habits among undergraduate students in Najran University, Najran, Saudi Arabia. International Journal of Medical Science and Public Health, 6(3), 1. https://doi.org/10.5455/ijmsph.2017.1059801122016

[13] Araujo Gabriela Ferreira dos Anjos, Pereira Alessandra da Silva, Santos Cláudia Roberta Bocca, Rodrigues Maria de Lourdes Carlos Ferreirinha, and Ribas Simone Augusta. (2022). Food practices and nutritional status of university students who use the University Restaurant. Brazilian Journal of Nutrition. 2023;36:e220106. https://doi.org/10.1590/1678-9865202336e220106