

# Dietary Pattern and Nutritional Status of Undergraduates in Adeyemi Federal University of Education, Ondo State, Nigeria.

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DOI: <https://doi.org/10.51244/IJRSI.2024.1110056>

Received: 12 October 2024; Accepted: 22 October 2024; Published: 20 November 2024

## ABSTRACT

The study examines the dietary pattern and nutritional status of undergraduates in Adeyemi Federal University of Education, Ondo. The purpose of the study is to assess the nutritional status, physical activity level, dietary pattern and factors associated with dietary pattern of undergraduates. The research study adopted descriptive survey research design. Data were collected using questionnaire. Findings reveal that the nutritional status of students varies, indicating 17.9% to be underweight, 48.9% had normal weight, 24.3% were overweight while 8.9% were obese. The study revealed that 80.3% of the students skip meal which is mostly Lunch. Other findings are factors such as availability, social media, stress, peer influence, family background/cultural beliefs and convenience that influence students' dietary pattern and thus their nutritional status. It was recommended that school management should organize enlightenment program on appropriate dietary practice, students should engage in regular recreational and physical activities.

**Keywords:** Dietary Pattern, Meal skipping, Nutritional Status, Undergraduates

## INTRODUCTION

A healthy diet is a pillar of well-being throughout the lifespan. It promotes the achievement of supporting normal growth, development and healthy body weight, reduces chronic diseases risk and promotes overall health and wellbeing. A dietary pattern to support optimal nutrition and health should be based on biological and medical needs as well as preference of the individual (Alaba & Adewumi, 2017). Consuming a healthy diet throughout the life-course helps to prevent malnutrition in all its forms as well as a range of non-communicable diseases (NCDs) and conditions. Fruit, vegetables, legumes, nuts and whole grains, fats and sugar. A healthy diet helps to protect against malnutrition in all its forms, as well as non-communicable diseases (NCDs), including such as diabetes, heart disease, stroke and cancer (WHO, 2020). Healthy dietary practices start early in life – breastfeeding fosters healthy growth and improves cognitive development, and may have longer term health benefits such as reducing the risk of becoming overweight or obese and developing NCDs later in life (WHO, 2020). Dietary pattern is defined as the overall combination of the whole diet in terms of nutrients derived from foods and drinks, which are consumed in a recurring manner. United State Department of Agriculture (USDA, 2014) defined dietary patterns as the quantities, proportions, variety or combination of different foods, drinks and nutrients in diets and the frequency with which they are habitually consumed. This could be healthy and unhealthy depending on the kind of food consumed and how it is being consumed. The quality of diet consumed reflects dietary patterns in total that are associated with better health and reduced incidence risk for chronic diseases. According to Tucker (2020) many diseases including obesity, diabetes and cardiovascular diseases are largely preventable with healthy lifestyles, such as consumption of diets high in fruits, vegetables, whole grains, nuts, seeds, omega 3-fatty acids low-fat dairy, low in refined grains, are protective against the aforementioned diseases.

Adequate nutrient intake is not only critical for the normal growth and developmental processes but is also

important to optimize the health, physical fitness and performance and is considered as an important element of any physical fitness program (Alissa, et al, 2015). Moreover, nutrition is very vital for the optimal growth, development, general well-being and function of human. Inadequate nutrition however, can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduce productivity (Berthoud, 2017). A healthy human diet entails preparation of quality food and good storage system that preserve nutrients in the food from oxidation or leaching out and thereby reducing the risk of food borne illnesses (Iloabanafor, 2017). In 2005, the World Health Organization measured that 1.6 billion people were overweight and 400 million were obese. It estimates that by the year 2015, 2.3 billion people will be overweight and 700 million will be obese (Ekwebene, et al, 2020).

The dietary intake among undergraduates in developing countries including Nigeria is of concern as most traditional diets (predominantly cereal and tuber based) while consumption of fresh fruits, vegetables, and foods low in fat are gradually being replaced with more Westernized diets which lack diversity and are high in calorie-rich processed foods (Ochola and Masibo, 2014). Undergraduates spend most of their time in school coupled with the autonomy to make food choices while in school making them vulnerable to sub-optimal dietary habits. Dietary habit analysis has emerged as a useful epidemiological approach to assessing the overall diet and its relation with disease conditions. In Nigeria today, the dietary pattern of undergraduates is influenced by so many factors including poverty, educational environment, cultural practices, etc. students from resource-constrained households have limited access to healthy foods and health care services, which put them at higher risk of sub-optimal nutrition and dietary intake (Nikoi and Anthamatten, 2014).

Nutrition is a salient means through which the indicators for good health can be achieved. This is because proper nutrition promotes a good nutritional status thus satisfies the requirement for good physical health. The nutritional status of an individual is usually as a result of multiple factors that interact with each other at different levels. The consumption of adequate amount of food both in terms of quantity and quality is one of the key determinants, which has a significant impact on the nutritional status. Inappropriate nutrition status can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, reduce productivity and in chronic cases, diseases such as cardiovascular diseases, diabetes and bone diseases which may seriously impact the health status of the undergraduate now and in their adulthood, this study is been carried out.

## Research Problem

Inadequate/inappropriate dietary pattern can lead to reduced immunity, increased susceptibility to diseases, impaired physical and mental development as well as reduced productivity. Unhealthy diets among undergraduates may cause disease deficiency related diseases such as scurvy, blindness, anaemia, or excessive health threatening nutrition conditions such as obesity and metabolic syndrome and common chronic systemic diseases which include cardiovascular diseases, diabetes and bone diseases which may seriously affect the health of the undergraduates if adequate care is not taken. Hence, the main purpose of the study is to investigate dietary pattern and nutritional status of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State. Specifically, this study:

1. identified nutritional status of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State.
2. examined the physical activity level of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State,
3. documented the nutritional knowledge of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State.
4. evaluated the dietary pattern of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State.
5. investigated the factors associated with dietary pattern of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State.

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## METHODOLOGY

### Research Design

The descriptive survey research design was used for this study. The use of this research design is considered appropriate because of its merit, which suit a study of this nature. Survey design is the one in which a group of items were studied by collecting, analyzing and interpreting data from a few people considered to be representative of the study population. The design was adopted because it is concerned with describing and interpreting opinion, ideas and fact as expressed by respondents.

### Area of the Study

The study was carried out in Ondo West Local Government Area of Ondo State. Ondo West Local Government is one of the 18 Local Government Areas in Ondo State. There are three tertiary institutions in Ondo town. They Adeyemi Federal University of Education, Ondo, University of Medical Science, Ondo and Wesley University of Science and Technology, Ondo.

### Population of the Study

The population of the study consists of all students in Adeyemi Federal University of Education (AFUED), Ondo, Ondo State. The total number of undergraduate/students is 11,136 (AFUED Management Information System, 2023).

### Sample and Sampling Techniques

The sample size of the study is two hundred and twenty-three (223). This value was arrived at by calculating 2% of the total population. Proportionate sampling technique was used to select respondents from each of the faculty.

### Instrument for Data Collection

A 4-Likert-Scale structure questionnaire consisting of items meant to elicit information from the respondents was used for this study. The research work adopted 4-Likert Scale because it makes it possible for respondents to indicate their responses according to the degree of acceptance or rejection of the stated statements. Four Likert-Sacle options denoting Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD) were used as the rating scale. The questionnaire was titled "Dietary Pattern and Nutritional Status of Undergraduate in Adeyemi Federal University of Education, Ondo Town (DPNSUAFUED)". The research instrument comprised of six sections, A, B, C, D, E, and F. the demographic section A, while section B, C, D, E, and F contained answers on nutritional status, nutritional knowledge, dietary pattern, and physical activity level factors associated with dietary pattern and nutritional status of undergraduates in Adeyemi Federal University of Education, Ondo.

### Validation of Instrument

The self developed research questionnaires which were based on research specific objectives of the study were used in the questionnaire to elicit information from the respondents. It was validated by the project supervisor and two (2) other experts in the Department of Home Economics, Adeyemi Federal University of Education, Ondo. Their observations, suggestions and comments were used to refine the final copy of the instrument.

### Reliability of Instrument

Twenty (20) copies of the instrument were administered to tertiary institution students who are outside the study area. After two (2) weeks, another set of the same questionnaire items was given to the same set of respondents. The first and second item was correlated using Crombach Alpha reliability technique which yielded a coefficient of 0.64.

## Method of Data Collection

Two hundred and twenty-three (223) copies of the questionnaire was produced and administered to undergraduates in Adeyemi Federal University of Education, Ondo and collected back immediately to avoid loss in transit.

## Methods of Data Analysis

The responses to the questionnaire item were collated and analysed using mean ( $\bar{x}$ ), and standard deviations. The mean of the questionnaire item was used and interpret based on the statistical real limits of the numbers as follows: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, Strongly Disagree (SD) = 1. A cut-off point was determined the accepted and rejected items. The cut-off point was obtained by totaling the normal value divided by the number of nominal value  $\frac{4+3+2+1}{4} = \frac{10}{4} = 2.50$ . Any item with the mean of 2.5 and above was taken as agree while any one with mean below 2.50 was taken as disagreed. All statistical analysis was carried out using Statistical Package for Social Sciences (SPSS) version 23 for statistical analysis.

## RESULTS AND DISCUSSION

### Results

**Research Objective 1:** Nutritional status of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State?

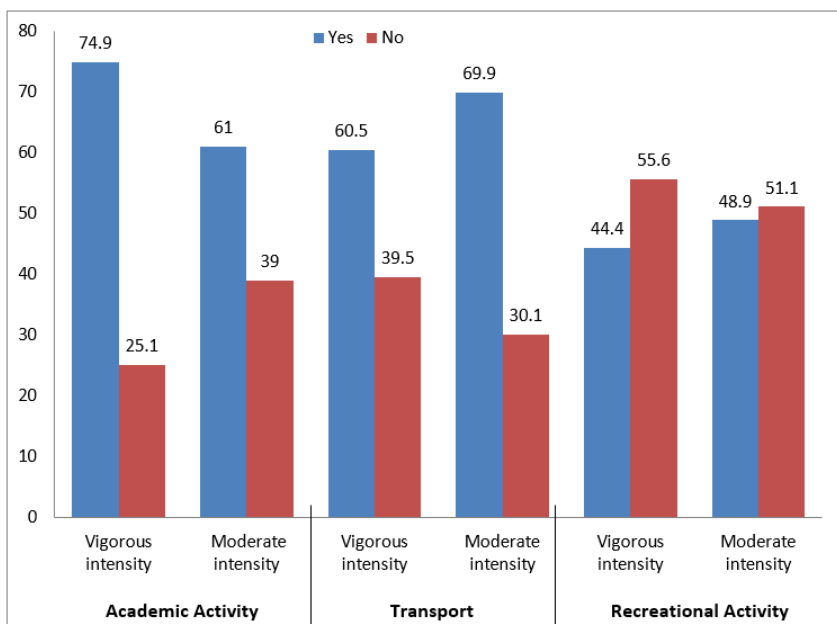
Table 1: Nutritional Status of Undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State

Range	Less than 18.5 kg/m <sup>2</sup>	18.5 to 24.9 kg/m <sup>2</sup>	25.0 to 29.9 kg/m <sup>2</sup>	30.0 or above kg/m <sup>2</sup>
BMI	40 (17.9%)	109 (48.9%)	54 (24.3%)	20 (8.9%)

Data obtained from respondents revealed that, 48.9% of the students were in healthy status, 17.9% of the students were underweight, 24.3% were overweight, 8.9% of students have BMI more than 30 kg/m<sup>2</sup> which means obese.

**Research Objective 2:** Physical activity level of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State?

### Engagement in Physical Activity by Specific domain and the intensity level



Of the total study participants, 40.1% reported no physical activity that lasted for at least 10-min continuously in any of the three physical activity domains. Whereas, 59.9% reported doing physical activity for at least 10-min continuously, 61.0% reported moderate-intensity physical activity at academic activity, 69.9% reported activity during travel to and from places. These are the common physical activity in the study setting. Vigorous and moderate-intensity leisure-time activities were the least commonly practiced among students.

**Research Objective 3:** Nutritional knowledge of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State?

Table 3: Nutrition knowledge of Undergraduates in Ondo West Local Government Area of Ondo State

SN	Items	$\bar{x}$	SD	Decision
1	Carbohydrates are the primary source of the body’s energy which the central nervous system, the brain and nerve cells rely exclusively on glucose	0.86	0.35	High
2	Carbohydrates spare protein from being burned for energy	0.82	0.38	High
3	Fibres promotes the normal functioning of the intestinal tract and is associated with a reduced risk of diabetes, certain cancers and heart disease	0.86	0.35	High
4	Fats provides insulation, a cushion around critical organs and provide optimum body temperature in cold weather	0.89	0.31	High
5	Proteins are used for building and maintaining body tissues	0.89	0.31	High
6	Yogurt is a good source of protein, calcium, phosphorus, potassium, riboflavin and vitamin B12	0.96	0.19	High
7	Eggs can be replaced with nuts	0.69	0.47	High
8	Vitamins promotes the normal functioning of the immune system of the body	0.82	0.38	High
	<b>Total</b>	<b>0.85</b>	<b>0.34</b>	<b>High</b>

Keys:  $\bar{x}$  = mean, SD = Standard deviation

Table 3 indicates that the knowledge of the students about nutrition is overall high ( $\bar{x}$  = 0.85). Specifically, they highly know that carbohydrates are the primary source of the body’s energy ( $\bar{x}$  = 0.86), carbohydrates spare protein ( $\bar{x}$  = 0.82), fibres promotes the normal functioning of the intestinal tract ( $\bar{x}$  = 0.86), fats provides insulation, a cushion around critical organs and provide optimum body temperature in cold weather ( $\bar{x}$  = 0.89), proteins are used for building and maintaining body tissues ( $\bar{x}$  = 0.89), yogurt is a good source of protein, calcium, phosphorus, potassium, riboflavin and vitamin B12 ( $\bar{x}$  = 0.96), eggs can be replaced with nuts ( $\bar{x}$  = 0.69), and vitamins promotes the normal functioning of the immune system of the body ( $\bar{x}$  = 0.82).

**Research Objective 4:** Dietary pattern of undergraduates in Adeyemi Federal University of Education, Ondo, Ondo State

Table 4: Frequency and Percentage of Dietary Pattern of Undergraduates in Ondo West Local Government Area of Ondo State

	Frequency	Percent
<b>How often do you eat in a day?</b>		
Once	16	7.2
Twice	84	37.7
Three times	89	39.9
More than three times	34	15.2
Total	223	100.0
<b>Do you skip meals?</b>		
Yes	179	80.3



No	44	19.7
Total	223	100.0
<b>Which meal do you skip?</b>		
Breakfast	72	32.3
Lunch	140	62.8
Dinner	11	4.9
Total	223	100.0
<b>Do you eat in-between meals?</b>		
Yes	154	69.1
No	69	30.9
Total	223	100.0
<b>What time do you eat breakfast?</b>		
Before 11 am	123	55.2
After 11 am	100	44.8
Total	223	100.0

Table 4 indicates that in a day, the 7.2% of the undergraduates eat three once, 37.7% eat two times, 39.9% eat three times and 15.2% eat more than three times. The findings also reveal that most of them skip meals (80.3%), especially lunch (62.8%). A greater proportion of them 69.1%) eat in between meals and 55.2% eat before breakfast 11am.

**Research Objective 5:** Factors associated with dietary pattern among undergraduate in Ondo West Local Government

Table 5: Mean and standard deviation of the respondents on factors associated with dietary pattern among undergraduate

SN	Items	$\bar{X}$	SD	Remarks
1	The availability of healthy food on campus influences the food choice(s) of undergraduates	3.34	0.72	Agreed
2	Access to social media influence the kind of food students consume	2.84	0.90	Agreed
3	Academic stress may affect student’s consumption of adequate diet in schools.	3.55	0.57	Agreed
4	Peer group may influence the food consumption pattern of students	3.00	0.54	Agreed
5	Family background and cultural beliefs have adverse effect on the food choices of students	3.06	0.52	Agreed
6	Undergraduates have preference for convenience foods	3.31	0.56	Agreed
	<b>Total</b>	<b>3.18</b>	<b>0.63</b>	<b>Agreed</b>

Keys:  $\bar{x}$  = mean, SD = Standard deviation

Table 5 reveals the factors associated with dietary pattern of undergraduates. The table revealed that the respondents agreed to the following items: the availability of healthy food on campus influences the food choice(s) of undergraduates ( $\bar{x}$  = 3.34), access to social media influence the kind of food students consume ( $\bar{x}$  = 2.84), academic stress may affect students consumption of adequate diet in schools ( $\bar{x}$  = 3.55), peer group may influence the food consumption pattern of students ( $\bar{x}$  = 3.00), family background and cultural beliefs have adverse effect on the food choices of students ( $\bar{x}$  = 3.06), undergraduates have preference for convenience foods ( $\bar{x}$  = 3.31). Thus, it was affirmed that availability of healthy food, access to social media, academic stress, peer group, family background and cultural beliefs have adverse effect on the food choices of students.

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## DISCUSSION OF FINDINGS

Research question one revealed that most of the undergraduate students of Adeyemi Federal University, Education who participated in the study had normal BMI, and therefore those seem to be well nourished. This is similar to the findings of Omage & Omuema, (2018) and Al-Haj et al., (2015). The percentages of underweight (17.9%), overweight (24.3%) and obese (8.9%). The percentage of underweight obtained in this study was lower than the values obtained by various researches such as Ebead-Mohammed, (2020) but it was higher than the reported value of Omage & Omuema, (2018). The prevalence of overweight was similar to the values obtained by Ahmed, (2017). Prevalence of overweight and obesity among undergraduates may result from excessive consumption of selected food groups which are mostly energy-dense or refined and avoidance of food groups with low energy and necessary vitamins and minerals Ebead-Mohammed, (2020). This may be true as those who had medium dietary diversity were more obese and overweight than those who had high dietary diversity. This is dangerous for their health as obesity or overweight predisposes them to risk of NCDs (Berg, et al., 2013).

Research question two revealed that 40.1% reported no physical activity that lasted for at least 10-min continuously in any of the three physical activity domains. Whereas, 59.9% who reported doing physical activity for at least 10-min continuously, 61.0% reported moderate-intensity physical activity at academic activity, 69.9% reported activity during travel to and from places. In line with the finding of Stalsberg and Pedersen (2018) indicated that individuals from a higher socioeconomic status were likely to be contributing to a higher level of leisure-time physical activity. Lack of physical activity i.e leaving a sedentary life can lead to the occurrence of non-communicable diseases (musaigier et al., (2016).

Research question three revealed that undergraduate has adequate knowledge on nutrition. Contrary to the findings Mirmiran et al (2017) opined that good nutritional knowledge is important because it usually has a positive influence on healthy food choices and health. This was demonstrated in this study because the level of knowledge was significantly associated with the nutritional status of the adolescents. Most of the students who had good nutritional knowledge were within the normal range of Body Mass Index. This finding similar to that of another study in India where nutritional knowledge had great impact on the health status of adolescents (Suneetha, 2014).

Research question four above revealed that undergraduate has good dietary pattern in the study area. The dietary pattern of the respondents shows that most of them ate two or three main meals a day which is necessary for good health. This is similar to findings of Achinihu, (2009) who confirmed that skipping of meals is a very common practice among undergraduates. Although breakfast is very important for the health and well-being of the body, students may find it difficult to take as they are always in a hurry to go for their classes. Some may deliberately skip breakfast because of the consciousness of their body weight and appearance. This is more common among females who are more conscious of their diet (Carmel & Camilleri, 2011). Majority of the respondents ate snacks in-between meals, possibly to enable them cope with the energy needs of the body as they go about their normal academic activities.

Furthermore, consumption of appropriate dietary pattern, diet high in saturated fats or sugars and inappropriate diet/food affected the dietary pattern of undergraduate which led to nutrient deficiencies and result to variety of health problems. Support this findings by Spear (2016) who opined that socioeconomic factors have a pervasive influence on quantity and quality of diets, irrespective of lifecycle groups; adolescents are not different in this respect, perhaps with the exception of the great influence upon their eating habits by the commercial environment, particularly mass media. Moreover, psychosocial factors are probably those with particular importance during adolescence. The search for identity, the struggle for independence and acceptance, and concern about appearance, are changes that may have a great impact on lifestyle, eating patterns and intakes of adolescents.

Lastly, in-availability of healthy food, access to social media, academic stress, peer group, family background and cultural beliefs have adverse effect on the food choices of students are the factors associated

with dietary pattern of undergraduates. Neumark-Sztainer, Story and Blum, (2016) viewed that major concerns identified included the high rate of inadequate consumption of fruits, vegetables and dairy products, unhealthy weight-control practices and overweight. Inadequate consumption of fruits and vegetables was more widespread in adolescents from low socioeconomic backgrounds. American Indians were at greatest risk of inadequate fruit consumption, and African Americans, of inadequate vegetable consumption. Psychosocial correlates of inadequate consumption included low family connectedness, weight dissatisfaction, and poor academic achievement. In another study, girls were more likely to have eaten fruit and vegetables the previous day, and less likely to have eaten high-fat meats and snacks than boys (Dinger and Waigandt, 2017).

## CONCLUSION

The study revealed that certain percentage of the undergraduate had good nutritional status however, some categories are malnourished as indicated by underweight, overweight as well as obesity. The physical activity of undergraduate were of vigorous and moderate-intensity during their leisure-time which were commonly practiced among students. Moreover, majority of undergraduate has adequate knowledge of their nutrition even though, it does not manifest in some of the undergraduate's nutritional status.

## RECOMMENDATIONS

Based on the findings made and the conclusion drawn, the following recommendations were made:

1. School management should develop feeding menu that will promote the intake of a wide range of foods to step up the quality of meals available to students
2. Students should engage in regular recreational and physical activities to attain and maintain ideal body weight.
3. Intervention programs on nutritious food availability should be put in to ensure proper e healthy food consumption pattern.

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