Original Research Article

PHYSICAL ACTIVITY LEVEL AND DIETARY PATTERN OF UNDERGRADUATE STUDENTS OF KOGI STATE UNIVERSITY, ANYIGBA KOGI STATE,

Abstract

Undergraduates are vulnerable to malnutrition due to inadequate food intake and poor dietary patterns and this may affect their physical and mental development. The objective of this study was to assess the physical activity level and dietary pattern of undergraduate students of Kogi State University, Anyigba Kogi State. Study was focused on adolescents and young adults (18-25years). Ethical clearance was obtained from the Health Research ethics committee, Kogi state ministry of health. With the aid of a validated questionnaire interview was conducted to obtain information on demographic and physical activity levels after obtaining informed consent from the target population. Anthropometric measurements were carried out to ascertain the nutritional status, and dietary intakes were equally assessed using a food frequency questionnaire. 27.4% and 6.4% of target population recorded low and high levels of physical activity respectively. Healthy weight was recorded at 72% and obesity at 3.7%. Despite the high percentage in healthy weight, a low physical activity level was recorded, with inadequate meal patterns and food choices. This suggests an urgent necessity for improving overall health status of students by implementing a university based nutrition and exercise awareness programme.

Keywords: Undergraduates, adolescents, physical activity, dietary pattern, nutrition.

1. Introduction

~~Nutrition is the science that interprets the interaction of nutrients and other substances in food in relation to maintenance, growth, reproduction, health and disease of an organism. It includes food intake, absorption, assimilation, biosynthesis, catabolism and excretion. (1).~~

~~Nutritional status is the balance between the intake of nutrients and the expenditure of these in the processes of growth, reproduction, and health maintenance. Because this process is highly complex and quite individualized, nutritional status assessment can be directed at a wide variety of aspects of nutrition (2).~~

Physical inactivity has been identified as the fourth leading risk factor of global mortality. It accounted for 6% of death globally and has been estimated to be the main cause of the following disease conditions diabetes 27%, breast and colon cancer 21-25% and ischemic heart disease 30% burden in the world (3). During adolescence, young adults are assuming responsibility for their own eating habits, health attitudes and behaviours (4). In fact, attitudes play an important role in the adoption and maintenance of a variety of health and nutritional habits. Although adolescents' growing independence is often associated with unconventional eating patterns (5). Physical activity involvement has been confirmed to be beneficial to human physiology because it improves oxygen retention capacity of the lungs and blood circulation (6). The World Health Organization (WHO) has recommended moderate to vigorous physical activity practice for adolescents and young adults daily in order to reduce sedentary lifestyles. The physical activity also reduces symptoms of anxiety and depression, build self-confidence and develop neuromuscular awareness (coordination and movement control) of adolescents and maintain healthy body weight among them.

The quality of diet declines as children move from childhood to adolescence. Eating healthy is not a priority for adolescents. Poor eating patterns may thus add a risk for current and future health problems (7).

2. Materials and Methods

Study design, Location and population:

A cross-sectional study was carried out to determine the physical activity level of undergraduate students of Kogi state university, Anyigba. Anyigba, Nigeria. ~~is located at the Eastern part of Kogi State in Dekina Local Government Area, which lies between longitude 7^0 12^1 East of the Greenwich Meridian and latitude 7^0 36^1 North of the Equator. It is on the south eastern direction of Lokoja (capital of Kogi State) and the bearing of Anyigba from Lokoja is 135^0. Like most parts of Kogi State, the climate of Anyigba lies within tropical hinterland.~~ The study population were adolescents and young adults (18 - 25 years) undergraduate students of Kogi state university, Anyigba, Dekina Local Government Area of Kogi State.

Inclusion criteria

Physically and mentally fit adolescents and young adults (18 - 25 years) undergraduate students of Kogi state university, Anyigba, Dekina Local Government Area of Kogi State were recruited for the study.

Exclusion criteria

Undergraduate students of Kogi state university, Anyigba Dekina local government area of Kogi State Anyigba, not within the age range of 18 to 25 years, and who are mentally or physically challenged were excluded from the study.

Informed consent

Informed consent for inclusion into this study was obtained from the students using standard protocol.

Ethical approval

Ethical clearance was obtained from the Health Research Ethics Committee, Kogi State Ministry of Health in accordance with the code of ethics on human experimentation drafted by the World Medical Association in 1964.

Sampling technique

The research covered all faculties of the school. A multistage cluster sampling technique was used to select samples. One department was chosen from each faculty, adding up to 12 departments. Probability Proportional to Size Sampling Technique was carried out within the various faculties.

Sample size

The sample size for this study was obtained using the formula:

$n = (z^2pq/d^2)$

Where:

n= the desired sample size

z= the standard normal deviation, usually set at 1.96 (≈2.0)

p= the proportion in the target population having the particular trait or Prevalence.

q= 1.0-p

d= degree of accuracy desired, usually set at 0.05. (Equation 1)

In Kogi state, an undernutrition prevalence of 20 % among adolescents and young adults was reported [8]. Therefore, at 20 % prevalence, using 5 % precision at 95 % confidence interval, the minimum sample size n for this study was calculated as 246. Therefore, 246 students were selected for the study.

Data Collection

The tools used for the data collection include; locally made standiometer, digital personal weighing scale model 2003B measuring up to 150kg, questionnaire, measuring tapes, etc.

The questionnaire was pre-tested by administering the questionnaires to few numbers of the study population. Questionnaire was administered to the respondents**.** The interview was conducted with validated questionnaire after obtaining informed consent from adolescents and young adults (18 - 25 years) undergraduate students of Kogi state university, Anyigba, Dekina Local Government Area of Kogi State**.**

Anthropometry

Weight and height measurements were obtained as described in the Food and Nutrition Technical Assistance Guide (9). Weight measurements were taken with minimal number of clothes and no shoes on. A digital weighing scale was used. The height measurements taken to the nearest 0.1cm will be obtained with the volunteers having no shoes on. A locally made manual standiometer was used.

BMI for Age is a commonly accepted index for classifying nutritional status in adolescents. It is defined as body weight in kilograms divided by the square of the height, in meters squared (10).

Determination of demographic and physical activity characteristics

Demographic and Physical Activity were collected using questionnaire which asked for background, characteristics and Physical Activities of participant. A modified Physical Activity questionnaire for Adolescents (PAQ-A) will be used to classify physical activity into five classes:
Low (1.00-1.49), fairly low (1.50-2.49), moderate (2.50-3.49), fairly high (3.50-4.49) and high (4.50-5.00).

Dietary intake records

The dietary intake was assessed using a Food Frequency Questionnaire (FFQ).

Statistical Analysis

Data obtained was statistically analyzed and compared using SPSS version 20.0. Descriptive statistics was used to present data as means, frequencies, and percentages. P-values less than 0.05 were considered significant.

Comment [d1]: Please indicate the type of test used.

3. Results

The results as shown in Table 1, showed that more females (61.0 %) participated in the study than males (39.0%). Also age groups between 21-23years (42.3%) were more. 39.4 % of the studied population more of the Igala ethnic group.

Table 1: Demographic characteristics of undergraduate students attending Kogi State University, Anyigba, Kogi State

Characteristics	Group	Frequency (F)	Percentage (%)
Age	18 – 20	72	29.3
	21 – 23	104	42.3
	24 – 26	70	28.4
Sex	Male	96	39.0
	Female	150	61.0
Level	100	46	18.7
	200	74	30.0
	300	50	20.3
	400	52	21.2
	500	24	9.8
Ethnicity	Igala	97	39.4
	Okun	20	8.1
	Ebira	30	12.3
	Igbo	20	8.1
	Yoruba	46	18.7
	Hausa	16	6.5
	Others	17	6.9

Dietary patterns of undergraduate students attending Kogi State University, Anyigba, Kogi State as shown in Table 2 showed that vegetables and fruits are the least consumed at 27.6 % followed by milk and dairy products at 27.2 %, with bread, cereals and starch having the highest frequency (1- 4 times per day) of consumption at 71 %.

Table 2: Dietary patterns of undergraduate students attending Kogi State University, Anyigba, Kogi State.

Food Type	Frequency of food intakes n = 246					
	1 – 4 times per day		1 – 4 times per week		1 – 4 times per month	
	F	%	F	%	F	%

Bread, Cereals and Starch	71	28.8	42	17.0	55	22.4
Meat, Fish, Poultry	45	18.3	50	20.3	60	24.3
Milk and Dairy Products	50	20.3	41	16.7	34	13.8
Fats and Oils	39	15.9	58	23.6	41	16.7
Vegetables and fruits	41	16.7	55	22.4	56	22.8

The nutritional status distribution of undergraduate students attending Kogi State University Anyigba as shown in fig1 indicates that 72% of the study population are having healthy weight, with males at 39 % and females at 33 %, Obesity was recorded at 3.7 % with males at 1.7% and females at 2%, 13.5 % of the population was overweight with males at 4.3% and females at 9.2%, percentage underweight was observed at 10.8 % with males at 6.2 % and females at 4.6 %.

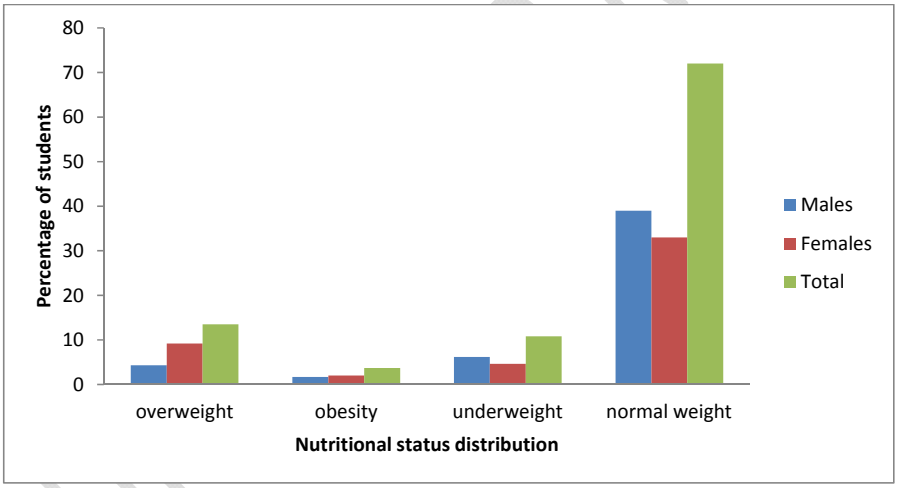

Fig 1: Nutritional status distribution of undergraduate students attending Kogi State University, Anyigba.

The physical activity level distribution as shown in fig. 2 shows that 31.0% of the undergraduate students physical activity level is fairly low with males at 13.8 % and females at 17.2%, 27.4% was low with males at 12.75 % and females at 14.65%, 24.0 % was moderate, with males at 12.2 % and females at 11.8 %, 11.2% was fairly high with males at 6.8 % and females at 4.4 %, 6.4% of the population was found to have a high level of physical activity with males at 3.5 % and females at 2.9 %.

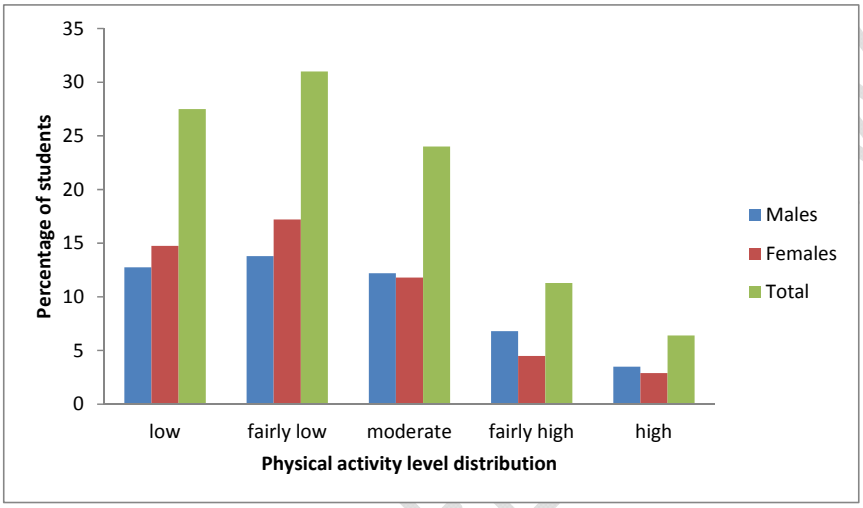

Figure 2: Physical activity level distributions of undergraduate students attending Kogi State University, Anyigba, Kogi State

4 Discussion

This study explored the relationship between physical activity level and dietary pattern among undergraduate students of Kogi State University, Anyigba. The study population consisted of a total of 246 individuals. Due to the size of the population, a descriptive study was performed. The result contains a higher percentage of females than males, which reflects gender distribution within the university environment. Results of previous studies have shown that female students were more than male students (11). The Findings in this study on body mass index (BMI) indicated a higher percentage of normal weight amongst the study population as compared to the observed frequency and percentage overweight, obesity and underweight. A low level of physical activity was observed amongst the student population with Male undergraduates having a slightly higher percentage of physical activity level than their female counterparts. This is in agreement with the works of Gosnik et al., 2002 (12). Considering the fact that the questionnaire did not include the reasons for physical inactivity, it could be guessed that the reasons lay in a large number of study related duties both at school and at home. Namely, students spend a large portion of time sitting behind a computer or desk, working on different projects, and the time available for physical activity has decreased.

Prevalence of overweight and obesity was higher amongst female undergraduates than their male counterparts. This finding is in accordance with the findings from a similar study conducted by Olubanji-

Ojofeitimi *et al*., (13) among adolescents in private and public schools in Osun state, Nigeria which reported a higher prevalence of overweight and obesity among girls attending private and public schools as compared to their male counterparts. The level of obesity observed in this study was 3.7 % (males (1.7 %), females (2 %)). This figure is slightly lower than the 4 % reported for China (14) but much lower than the 19.3 % and over 20 % found in Jamaica and the United states of America respectively (15, 16). The present study however shows that obesity was much lower in males than in females which further agrees with the reports of Gam *et al.,* (17), Dietz (18), Jackson *et al.,* (15) and Monyeki *et al.,* (19) that reported a higher prevalence of overweight and obesity in females, but disagrees with Ukegbu *et al.,* (20).

The observed level of obesity, although not high, is still worrisome since obesity in young adults and adolescents often persist in adulthood (21) especially for females (17).

The physical activity pattern of the participants indicates a high prevalence of a fairly low performance among the undergraduate students. The finding of this study supports the study conducted by Eberechukwu *et al*., (22) in Nigeria among the rural and urban adolescents. The higher percentage of physical activity level in males compared to females is in agreement with the works of Atikovic et al., (23). The study reported a low physical activity among these young adults in the school which is attributed to environments that are not conducive. This phenomenon contributes to the prevalence of overweight and obesity among the young adult in Nigeria (24).

One of the factors that could discourage adolescents and young adults to actively participate in sporting activity in the school as a form of physical activity is the lack of sport and recreation facilities in school or at home, lack of parks, sidewalks, lack of physical activity awareness, air pollution and dirty environment, fear of violence and crime in outdoor areas (25). However the school in this study was not well equipped with sporting facilities which contributed largely to the result which shows a fairly low physical activity among the young adults. Furthermore, findings also shows that most of the undergraduate students does not partake much in physical activity in their free times which also result in low physical activity level of the students. Carbohydrates in form of bread, cereals and starch were mostly consumed by the participants in this study. The finding of similar study carried out by (26) in Chicago among African- American adolescents is in agreement with the findings in this study because about 75% of the adolescent in Chicago consume snacks in three or more times per day. Fatty protein consumption in form of dairy products (cheese and yogurt) was consumed by the majority of participants in this study. The finding in this study shows that 50 % of participants consume dairy products 1 – 4 times per day. A similar study by Palenzuela-Paniagua et al., (27) revealed that about 40.7% of adolescents in his study consume dairy products daily. However, the finding of this study disagrees with the finding of a similar study conducted by Jimoh, (28) among adolescents between (12-18) years old and reported that animal protein consumption (dairy products) was low, and about 73% of the participants did not consume eggs and fish. The mostly consumed fats and oil rich foods were palm oil, vegetable oil and soybeans cheese. These are energy dense foods that contain fat soluble vitamins such as Vitamins A, D, E, and K. They also facilitate absorption of these vitamins from other source. The mean consumption of fat and oil by the respondents was moderate with 39 % consuming 1- 4 times per day.

5 Conclusion

- This study revealed that the subjects have a positive attitude towards nutrition, considering the high percentage normal weight observed. Prevalence of overweight and obesity of the participants was low and this was in line with several similar studies. Dietary practices of the students were not optimal and students possessed a fairly low physical activity level, there was no record of optional or elective courses in Physical Education, considering the fact that this type of education promotes physical activity, it is of utmost importance to develop the awareness of the need of everyday exercising and of its positive impact on the health status of students. The

study population showed inadequate meal patterns and their foods were predominantly refined cereal products, high sugar and fat products compared to healthier food choices. Students contradicted themselves in practices despite exhibiting average nutritional knowledge and positive attitude towards nutrition. This research builds on existing knowledge by giving a better understanding of physical activity and healthy eating behaviours among undergraduate students. Further studies can be conducted on students" strategic nutrients intake and factors influencing their dietary practices be investigated since they exhibited average nutritional knowledge, fairly low physical activity level, strong positive attitude towards nutrition, normal nutritional status but non optimal dietary practices.

~~6. Recommendation.~~

- ~~Based on the results of this research there is need to enhance nutrition and physical education among the students.~~
- ~~Universities curriculum may provide common undergraduate nutrition and physical education courses for all students particularly disciplines where nutrition and health is not directly or indirectly taught.~~

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