Gender Difference in Nutritional Knowledge, Dietary Pattern and Nutritional Status of Undergraduates in Tartous University, Syria

Samer Younes*

Department of Pharmacy, University of Tartous, Syria

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*Corresponding author: Samer Younes, Department of Pharmacy, University of Tartous, Syria

Abstract

Introduction: Poor nutritional knowledge at early stage of life suggests developing poor dietary habits that later leads to obesity and attendant complications of non-communicable diseases. This study examined gender differences in nutritional knowledge, dietary pattern and the prevalence of overweight/obesity among students of a private tertiary institution in Tartous University, Syria.

Materials and Method: A total of 214 students were used for this study and were selected from the six colleges of the university. A semi-structured questionnaire was used to collect information on personal and lifestyle characteristics, feeding pattern and physical activity. Weight and height measures were used to calculate Body Mass Index (BMI). Data were analyzed using descriptive statistics and chi square test at 5% level of significance.

Results: The mean age of the students was 20.89±3.89years. Monthly allowance of ≥500, 000.00 Syrian pound was received by 64% of the students; 79.9% and 78% of them had fathers and mothers respectively with university degree. Physical body exercise was not done by 40.2% of the students. More than two thirds (69.2%) of the students took < 3meals/day and 59.8% of them skipped breakfast. Dietary diversity of the students showed 71.0% and 20.6% of average and high score respectively. The mean BMI was 24.60±3.70. The students had BMI <25 (63.6%) and ≥25 (36.4%). Nutritional knowledge of the students reflected 10.7% (low), 72.9% (average) and 16.4% (high). There was no gender difference BMI, knowledge and dietary diversity.

Conclusion: The study reveals inadequate nutritional knowledge, poor feeding habits and dietary diversity and high prevalence of overweight/obesity. Great emphasis needs to be given to nutrition education and promotion among university students.

Keywords: Nutritional knowledge; Dietary diversity; Overweight; Obesity

Introduction

The adolescent and young adulthood frames of life offer crucial window of opportunity for health promotion and disease prevention. At this stage, individuals are free from the influence of parents and take personal decision on food choices and other lifestyle habits. As a result, people are likely to develop unhealthy eating habits and have low physical activity level [1]. University students fall within this stage of the lifecycle. Therefore, university students can be a potential target for the promotion of healthy lifestyles so as to reduce the risks of lifestyle-related disorders later in life [2]. Such lifestyle-related disorders include obesity and non-communicable diseases such as heart disease, atherosclerosis, and stroke [3]. Obesity, diabetes, hypertension and cancer have been found among university students [4].

Lack of skills in selecting healthy foods may have a negative impact on their eating habits and nutritional status. Poor eating habits and obesity are critical public health issues among university students.

Globally, there is an increasing prevalence of overweight and obesity among university students. In Saudi Arabia, 31-52% of university students were overweight and obese [5,6]. In Egypt, 37% were found to be overweight and obese [7]. In Sudan, 14% were overweight and obese [8]. In Bahawalpur, 26% were overweight and obese [9].

In Nigeria reveal an increasing prevalence of overweight and obesity and poor dietary habits among university students.

In 2018, 20% of university students were overweight and obese [10]. In 2020, 22% were overweight and obese [11]. In 2019, 20% were overweight and obese [12]. 27% were overweight and obese in 2021 [13].

Several factors have been associated with poor dietary pattern and overweight and obesity. These include sedentary lifestyle [5,6], poor nutritional knowledge, low physical exercise [14]; [9], frequent snacking [6] [8], skipping breakfast [10], high monthly allowance [11], high socioeconomic status of parents [12], and gender [13]; [10]. This study was designed to assess the gender difference in dietary diversity, nutritional knowledge and weight status among students of a private university in Tartous, Syria. This could provide insights for the development of future intervention and nutrition education programs that aim to improve the nutritional status of university students.

Materials and Methods

Study design

A cross-sectional research design was conducted on a sample of 214 students in Tartous University among the six colleges.

Study setting

The study was carried out in Tartous University, Syria. The institution offers academic programmes in five colleges; College of Sciences, College of Law, College of Engineering, College of Social and Management Sciences, College of Medicine and Health Sciences. The University runs programs both at undergraduate and postgraduate levels.

Study Population

The respondents for this study were undergraduates from the six colleges of the University which are: College of Medicine and Health Sciences, College of Law, College of Sciences, College of Social and Management Sciences, College of Engineering and College of Pharmacy.

Sample Size Determination

Taking a precision of 0.05 at 95% confidence Interval (Z), the minimum sample size (N) was calculated by simple proportion based on 50% estimated prevalence of eating pattern, the minimum sample size used was 216.

Sampling procedures

Base on the sample size (216) this was divided among the six colleges in the university as follow: College of Science (28), College of Medicine and Health Sciences (61), College of Law (26), College of Social and Management Sciences (21), College of Engineering (14) and College of Pharmacy (64). These were further distributed to the various departments in each of the college, and further distributed to both male and female.

Instrument for Data Collection

A semi-structured interviewer-administered questionnaire was used to collect data. The questionnaire had six (6) sections based on the specific objectives. These include socio-demographic characteristics, life-style, feeding pattern, anthropometry profile, nutrition knowledge and dietary diversity. Socio-demographic data collected include age, gender, education levels of parents, and student's monthly allowance. Dietary diversity was used to collect information on dietary pattern. Bathroom scale and height meter were used to measure weight and height of the respondents respectively. These data were used to calculate Body Mass Index (BMI).

Data collection

Anthropometric measurements of the subjects were taken using standard apparatus. The measurements included weight and height.

Weight measurement: Weight was measured to the nearest 0.1kg with newly purchased portable bathroom scales (Harson bathroom scale, model: H89 DK BLUE FA00333) respondents were ask to step on scale removing their shoe and other materials like phone and other items that can add to weight, respondents were ask to stand straight looking straight, no movement of the body and toe not protruding.

Height measurement: Height was measured to the nearest 0.1m using a stadiometer. Each subject was ask to put off his or her shoes and stand upright with hands by the side and measurement was done to the nearest 0.1m.

Body Mass Index: (BMI) was calculated as weight (kg) divided by the square of height (m2) and then categorized according to WHO recommendations to define weight as follow: BMI <18.5 (underweight), BMI = 18.5-24.9 (normal weight), BMI = 25.0 - 29.9 (overweight) and BMI ≥30 (obesity).

Dietary diversity

The dietary diversity of the respondents was obtained from the dietary diversity score (DDS) which is defined as the number of different food groups consumed in the 24 hours preceding the interview (FAO, [15]). The information collected from the 24h dietary recall was used to calculate the DDS of each respondent. In this study, a 9 food-group aggregation was created from the list of food groups created from the 24hr recall. The aggregated 9 food groups (starchy staples, dark green leafy vegetables, other Vitamin A rich fruits and vegetables, other fruits and vegetables, organ meat, meat and fish, eggs, legumes and seeds/nuts, milk and milk products) was then used to create the diversity scores with each group carrying a score. Respondents with a score less than 3 were regarded as low dietary diversity; those with scores of 4 and 5 had medium dietary diversity while those with a score of 6 and above had high dietary diversity.

Nutrition knowledge

The nutrition knowledge of the respondents was measured using 15 questions reflecting nutrition matter. Correct answers were allocated a score of 1, while incorrect answers were allocated a score of zero. Based on their answers to these questions their scores were added up and graded into good (11-15), average (6-10) and low (0-5).

Data Analysis

Data entry and analysis was done using statistical package for the social science (SPSS) software version 20. Data cleaning was done by running frequencies of all relevant variables to identify inadequate entries and missing values. Descriptive statistics was generated; categorical variables were presented using frequency and percentages. Chi square was done to establish association between variables.

Ethical consideration

Informed consent form was given to the students to fill for consent. Participation was voluntary and anonymous with no incentives provided and data were confidential and protected. The details of the study was explained to the students and those students who were willing participated in the study. All measurements were taken during free or break periods so as not to disrupt academic activities. The Ethical Committee of Tartous University gave approval for the study.

Results

Respondents' personal and lifestyle characteristics

Tables 1 and 2 show the personal and lifestyle characteristics of the respondents with 68.7% below age 20years and 31.3% having age above 20years (Table 1). The mean age of the respondents was 20.89 ±3.89years. A greater proportion (74.8%) of the females were below age 20years compare with 58.2% of males. A little above one third (36.0%) received less than 500,000.00 Syrian pounds in a month and 64.0% received ≥500,000.00 Syrian pound in a month. Majority (79.9%) of their fathers had university degree and 78.0% of their mothers had university degree. More (83.5%) of the mothers of the male students compare to female students (74.8%) had university degree.

Table 1: Respondents' personal characteristics

Characteristics	Male Freq (%)	Female Freq (%)	Total Freq (%)
Age (years)			
<20	46 (58.2)	101 (74.8)	147 (68.7)
≥20	33 (41.8)	34 (25.2)	67 (31.3)
Monthly allowance			
<500,000.00 SP	28 (35.4)	49 (36.3)	77 (36.0)
≥500,000.00 SP	51 (64.6)	86 (63.7)	137 (64.0)
Father education			
Post-secondary or less	16 (20.3)	27 (20.0)	43 (20.1)
University degree	63 (79.7)	108 (80.0)	171 (79.9)
Mother education			
Post-secondary or less	13 (16.5)	34 (25.2)	47 (22.0)
University degree	66 (83.5)	101 (74.8)	167 (78.0)

Mean age (male)=21.20±2.06. Mean age (female)=20.71±1.78. Mean age (total)=20.89 ±3.89.

Table 2: Lifestyle characteristics of respondents.

Characteristics	Male Freq (%)	Female Freq (%)	Total Freq (%)
Taking alcohol			
Yes	51 (58.2)	101 (25.2)	152 (71.1)
No	28 (41.8)	34 (74.8)	62 (28.9)
Smoking			
Yes	24 (30.4)	28 (20.7)	24 (11.2)

No	55 (69.6)	107 (79.3)	190 (88.8)
Taking soft drink			
Yes	59 (74.7)	103 (76.3)	52 (74.3)
No	20 (25.3)	32 (23.7)	61 (25.7)
Body exercise			
Daily	13 (16.5)	24 (17.8)	37 (17.3)
Occasionally	45 (57.0)	49 (36.3)	94 (43.9)
Rarely	21 (26.5)	62 (45.9)	83 (38.8)
Body exercise/week			
None	25 (31.6)	61 (45.2)	86 (40.2)
1-3 times	39 (49.4)	56 (41.5)	95 (44.4)
≥4 times	15 (19.0)	18 (13.3)	33 (15.4)
Hour of body exercise/day			
<1	40 (50.6)	92 (68.1)	132 (61.7)
≥1	39 (49.4)	43 (31.9)	82 (38.3)

Respondents' lifestyle characteristics (Table 2) reveals that majority of the respondents did not take alcohol (75.7%) nor smoke (88.8%) but took soft drink (74.3%). Only 17.3% of the respondents carried out physical body exercise daily and 40.2% did not perform physical body exercise in a week.

Feeding habits of respondents

Table 3 shows the feeding habits of the respondents. About one third (30.8%) took three or more meals in a day and 72.0% skipped meals. The major meal skipped was breakfast (59.8%) and 64.5% took it ≤3 times in a week. Females took more meals than males.

Dietary diversity of respondents

Figure 1 reveals the dietary diversity of the respondents with 71.0% having medium dietary diversity with more females (74.8%) than males (64.6%).
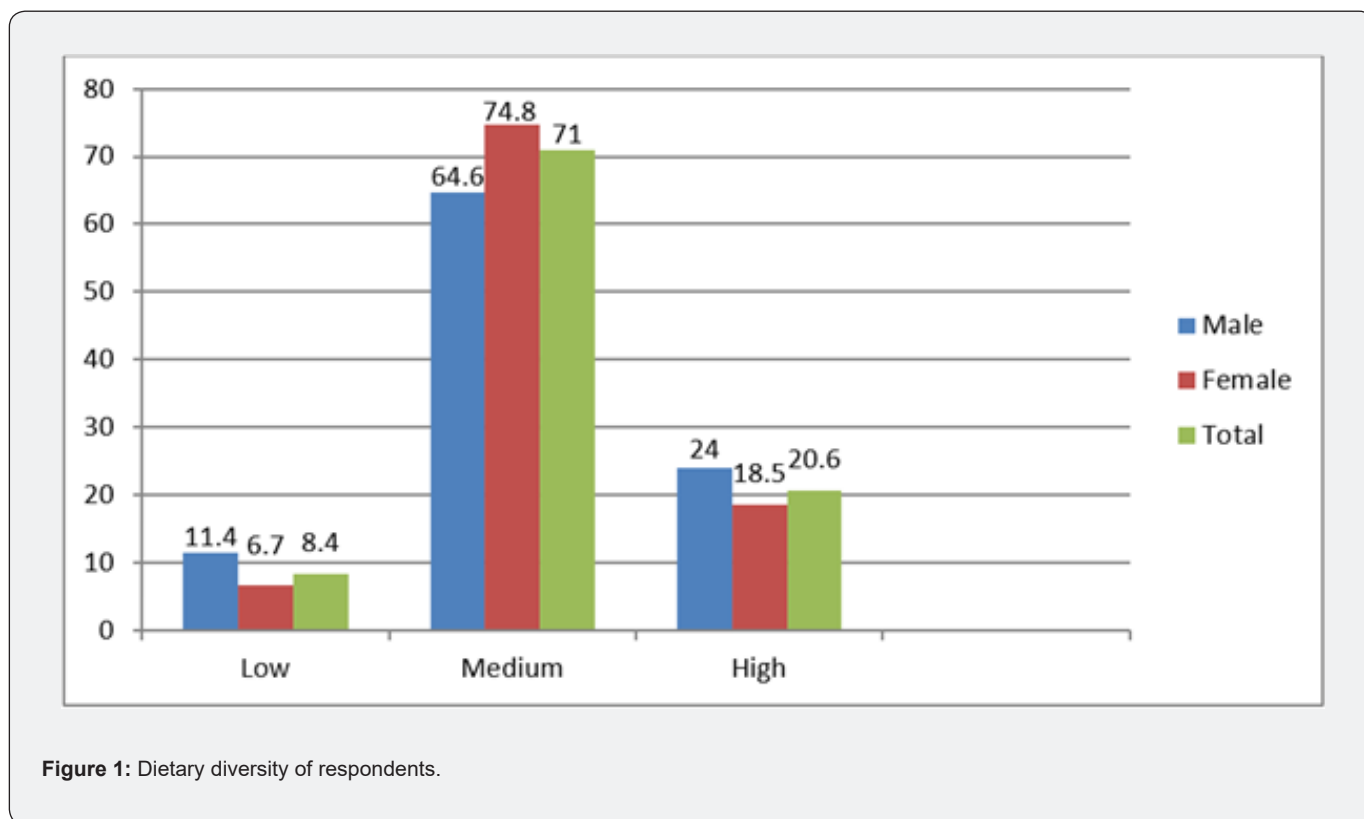

Figure 1: Dietary diversity of respondents.

Nutritional knowledge of respondents

Figure 2 shows the nutritional knowledge of the respondents.

Only 16.4% of the respondents had good knowledge while majority (72.9%) had average knowledge.
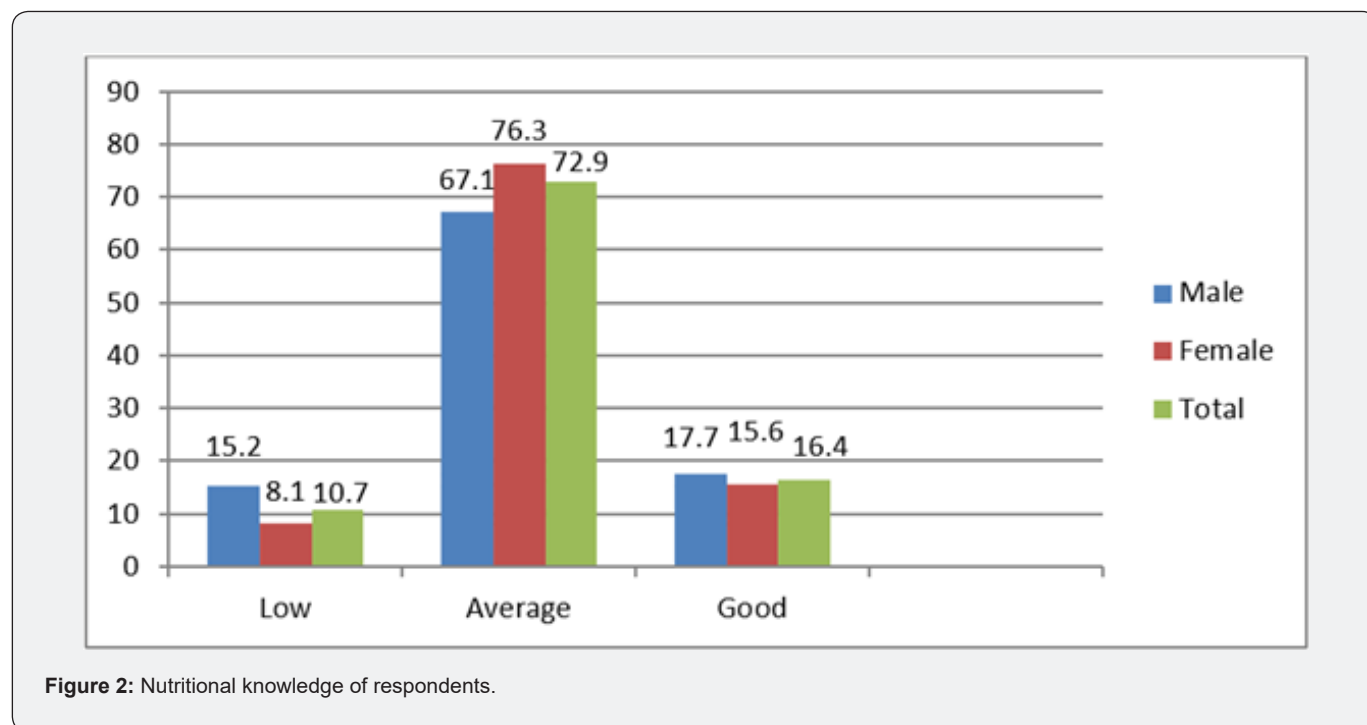

Figure 2: Nutritional knowledge of respondents.

Weight perception and Body Mass Index of respondents

Respondents' weight perception and BMI are shown in Tables 4. Majority (73.8%) believed that they had normal weight, 77.6% were satisfied with their weight and 22.4% were dissatisfied. Only 37.4% were trying to lose weight. More than one third (36.5%) of the respondents were overweight/obese and 6.1% were underweight.

Table 3: Feeding habits of respondents.

Characteristics	Male Freq (%)	Female Freq (%)	Total Freq (%)
Number of meals/day			
<3	57 (72.2)	91 (67.4)	148 (69.2)
3	17 (21.5)	19 (14.1)	36 (16.8)
>3	5 (6.3)	25 18.5)	30 (14.0)
Skipping meals			
Yes	55 (69.6)	99 (73.3)	154 (72.0)
No	24 (30.4)	36 (26.7)	60 (28.0)
Meal skipped			
Breakfast	53 (67.1)	75 (55.6)	128 (59.8)
Lunch	24 (30.4)	51 (37.8)	75 (35.0)
Dinner	2 (2.5)	9 (6.6)	11 (5.2)
Number breakfast/week			
≤3	54 (68.4)	84 (62.2)	138 (64.5)
5-Apr	17 (21.5)	38 (28.1)	55 (25.7)
7-Jun	8 (10.1)	13 (9.7)	21 (9.8)

Table 4: Weight perception and BMI of respondents.

Characteristics	Male Freq (%)	Female Freq (%)	Total Freq (%)
Weight perception			
Underweight	11 (13.9)	21 (15.6)	32 (15.0)
Normal weight	59 (74.7)	99 (73.3)	158 (73.8)
Overweight	6 (7.6)	15 (11.1)	21 (9.8)
Obesity	3 (3.8)	0 (0.0)	3 (1.4)
Satisfied with current weight			
Very satisfied	19 (24.1)	31 (23.0)	50 (23.4)
Satisfied	40 (50.5)	76 (56.3)	116 (54.2)
Dissatisfied	10 (12.7)	23 (17.0)	33 (15.4)
Very dissatisfied	10 (12.7)	5 (3.7)	15 (7.0)
Tried to loose weight in the last 12months			
Yes	23 (29.1)	57 (42.2)	80 (37.4)
No	56 (70.9)	78 (57.8)	134 (62.6)
BMI Underweight			
(<18.5)	5 (6.3)	8 (5.9)	13 (6.1)
Normal weight			
(18.5-24.99)	46 (58.2)	77 (57.0)	123 (57.5)
Overweight			
(25.0-29.99)	19 (24.1)	25 (18.5)	44 (20.6)
Obesity			
(≥30)	9 (11.4)	25 (18.5)	34 (15.9)

Gender differences in dietary diversity, nutritional knowledge and Body Mass Index of respondents

Tables 5 shows the gender differences in dietary diversity, nutritional knowledge and BMI of the respondents. There was no gender difference in dietary diversity, nutritional knowledge and body mass index of the respondents.

Table 5: Dietary diversity, nutritional knowledge and BMI by gender of respondents.

	Gender				
	Male N (%)	Female N (%)	Total N	Chi-square	p-value
Dietary diversity					
Low (<3)	9 (50.0)	9 (50.0)	18	2.803	0.246
Average (3-5)	51 (33.6)	101 (66.4)	152		
Good (6-7)	19 (43.2)	25 (56.8)	44		
Knowledge					
Low (0-5)	12 (52.2)	11 (47.8)	23	3.022	0.221
Average (6-10)	53 (34.0)	103 (66.0)	156		
Good (11-15)	14 (40.0)	21 (60.0)	35		
BMI					

<18.5	5 (38.5)	8 (61.5)	13	2.36	0.501
18.5-24.99	46 (37.4)	77 (62.6)	123		
25.0-29.99	19 (43.2)	25 (56.8)	44		
≥30.0	9 (26.5)	25 (73.5)	34		

Discussion

Personal and Lifestyle Characteristics

The study samples were majorly adolescents and young adults and having parents with high socio-economic status. This finding is similar to that of the students of Igbinedion University in Nigeria with 85% of the students having parents with tertiary level education (Omage and Omuemu, [12]). The monthly allowance is higher than that of public university students (Udo and Offor, [16]; Olatona et al, [10]; Lano-Maduagu, [11]).

They had a sedentary lifestyle. Their physical activity level is similar to the finding of Shehata et al among Saudi Arabia university students [5] but a higher proportion of the sample performed physical exercise per week compared to the students at the University of Tartous with 4% of them engaging in physical exercise between 3-5 times a week [14] and Pakistanian University students in Bahawalpur with 2% vigorously active [9]. Students with high monthly allowances frequently consume energy-laden snacks which is a risk factor of overweight and obesity.

Feeding and dietary diversity of respondents

Nearly one-third of the students took three or more meals in a day. More than two-thirds skipped meals and nearly two-thirds skipped breakfast. There was no gender difference in meal skipping. The finding on breakfast consumption is higher compared to some Nigerian studies [17]; Ikujenlola and Adekoya, [18]; Ogundele et al, [19]) where 50% or less skipped breakfast. However, it is lower in comparison with the Indian students [20] and other Nigerian students in Sagamu [13] where more than two-third skipped breakfast. Finding on meal skipping is similar to that of [10] among university students in Lagos State Nigeria and higher than the findings of Lano-Maduagu [11] which was 52%. It is however lower than 92% found among students in Sagamu Nigeria [29]. The current study is similar to Dahal et al. 2022 because there was no gender difference in meal skipping.

This dietary habit of skipping meals especially breakfast meal is a risk for accumulation of weight and cardiovascular problems [21]. Skipping meals has been associated with obesity [22]. Obesity has been associated with skipping of meals [6]. They found obese students consuming foods rich in calories such as snacks. Consumption of snacks had been associated with overweight among university students in Nigeria [23].

Dietary diversity

More than two-thirds had medium dietary diversity. Both gender were in the same category. This finding is higher compared to 35% of Indian students with poor dietary diversity in 2020 [20]. But lower compared to another Indian study in 2021 with 61% students having high dietary diversity score [24].

However, there was no gender difference in the current study unlike in the Indian students which had significant gender difference in the mean of dietary diversity score. Poor dietary diversity has been associated with abnormal weight gain [20]. Dietary practices have been associated with obesity [25] among private university students.

Nutritional Knowledge

About three-quarters of the respondents were having average nutritional knowledge, this was higher in female than male. Our finding is lower compared to students in public institutions in Nigeria which had between 52% and 75% students with good knowledge [17]; [14]. However, it correlates to these students from public institutions in term of gender difference.

Overweight and Obesity

More than one-third of the students were overweight and obese. This prevalence is lower in comparison with students of the University of Uyo, Nigeria with 42% prevalence [26] and university students in Saudi Arabia where the prevalence was 52% [5]. But similar to the findings of [6] among Saudi Arabian university students in 2022 and Egyptian students with 37% prevalence in 2020 [7]. It is however higher than Indian students of 26% [9] and Sudanese students of 14% [8] and other Nigerian students which were about one-quarter. [10];[11]; [13].

Greater proportion of the females were overweight and obese but this was not significant. This is similar to the finding of Riggs [27] among American students and University of Uyo students, Nigeria [26].

Weight Perception

One-tenth of the sampled students perceived that they were overweight and obese. This is lower compared to American college students with 26% [27]). About one quarter of the students were not satisfied with their current weight. This is in contrast to 50% among American students. Those who desired weight loss were lower compared to 65% among American students [27].

There is a wide gap between the proportion of students that were overweight and obese in relation to those that perceived that they were overweight and obese. This implies that a good proportion of the students lacked knowledge of their weight status. Overweight and obese students have been observed to have lower academic performance [5]; [28]. Chronic health problems such as hypertension and asthma are more reported among obese students globally [5]. Overweight and obesity is a risk factor of cardiovascular diseases. Obesity was found to affect dietary habits among students of Igbinedion University, Nigeria [12].

Gender differences in Dietary Diversity, Nutritional Knowledge and Body Mass Index

It was observed that there was no significant difference in dietary diversity, nutritional knowledge, and BMI across gender. There are studies whose findings are contrary to the findings of this current study. The findings of Samuel et al. [29] among secondary school adolescents in Owo LGA, Nigeria showed that there was significant gender difference in BMI. The study of Sholeye et al. [13] revealed a significant gender difference in overweight and obesity with females more overweight and obese. But, Magulod Jr and Capili [28] and Alkazemi [30] found males having higher weight than females. Significant gender difference in dietary diversity score was also observed by Kumar et al. [20] among Indian students where higher Dietary Diversity Score mean was observed in males compared to females.

Higher weight was found among males than females among university students in Asia country in 2019 [28]. A study among University of Nigeria, Nsukka, found females to have significant good nutrition knowledge compared to males [14]. Males were more obese than female students in Saudi Arabia [5]. Females were more obese compared to males among university students of Health and Allied Sciences in Sagamu, Nigeria [13]). Dietary diversity score was higher in males than females among students in Karnataka, India [31].

Conclusion

This study revealed high prevalence of overweight and obesity with no gender differences in weight, nutritional knowledge and dietary diversity. The students had a fair perception of their weight but their dietary and lifestyle practices betray their weight perception.

Recommendation

Nutrition education intervention programme is suggested among university students. This should focus on behavior change in nutrition knowledge, dietary habits and lifestyle practices.

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