Anthropometry Measures and Prevalence of Obesity among Undergraduates of Public University Libya

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Abstract

This research examines demographics, socioeconomic, eating habits, andphysical activity on obesity prevalence in students of Libya. The present study population consists of undergraduate students joining the universities of the west coast of Libya. Specifically, the research has been carried out with undergraduate students of two public universities (Zawia University and Sabaratha University) of Libya. The present study has used a survey based on the constructs of the conceptual framework. Therefore, self-distributed questionnaires for each of 500 samples of the student to collect from the questionnaire. This research has done a comprehensive theoretical discussion to be able to come up with the research hypotheses. The hypotheses were that there is a significant relationship between demographic factors and obesity prevalence in undergraduate students of Libya. Also, there is no significant relationship between socioeconomic factors and obesity prevalence in undergraduate students of Libya and. Furthermore, there is a significant difference between male and female undergraduate students in terms of eating habits. And finally, there is a significant difference between male and female undergraduate students in physical activity.Moreover, the study proposes the management take the initiative for the implementation of strategies that will be helpful to get the awareness about obesity among students in Libya.

Key Words: *Demographic factors, socioeconomic factors, eating habits, physical activity*

INTRODUCTION

Obesity is a medical disease characterized by the accumulation of extra body fat in the body [(1)]. Obesity is a complex, multidimensional chronic disease caused by the interplay of genetics and the environment. Obesity is caused by a mix of social, behavioural, instructional, cultural, physical, psychological, and metabolic factors and genetic factors (2). The growing prevalence of weight gain shows the impact of the diet's lifestyle on its aetiology[(2-3)].

The relationship between socioeconomic variables and obesity is complex, and various types of obesity are more prevalent in women than men and adolescents [(4)]. Obesity is increasingly common in both wealthy and impoverished nations. The high incidence of obesity is attributable to wide socioeconomic disparities[(5)]. The rates of overweight and obesity have been increasing, which makes most of its population vulnerable to the preventable chronic

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diseases already mentioned [6]. What happens in a country declared in 2019 as one of the most inequitable in the world, where food insecurity is 42.7%, and the weight deficit in childhood reaches 13.2% [7]. The vast inequities that the country has without adequate intervention, in the long term, if it is not already affecting the health of Libyan, will deteriorate on a large scale due to the increased prevalence of diseases secondary to overweight and obesity.

Previous studies reporting risk factors and trends and the incidence of obesity in Libya focused on childhood. Moreover, there is a noticeable gap in current knowledge on the prevalence of obesity among undergraduate students in Libya. Therefore, this study will determine the prevalence of obesity in undergraduate students of Libya. The foundation for this is discussed below, along with a more detailed review of the literature.

Hypothesis Development

The Relation between demographic factors and obesity prevalence

Efforts to recognize the well-known increment in teenager obesity led to the problem of cause. Caloric imbalance resulted in overweight, and obesity expended for the number of calories consumed - and these were affected by several environmental factors, genetic and behavioral [7, 8].

The most important factors implicated with obesity were education, socioeconomic status, dietary alteration, physical inactivity, and fetal and child nutritional circumstances.

Bishwajit et al. [9] investigated the relationships between socioeconomic status (SES), physical activity, three types of sitting time (regular, weekend day, and leisure time sitting), and the potential mediation effects of sitting time and overweight or obesity. Gender, age, neighborhood socioeconomic (SES), working hours, schooling, and physical activity were shown to be independently linked to routine, weekend day, and leisure-related sitting time. These sitting time factors were also related to being overweight or obese independently. Leisure time acted as a moderator in relationships with gender, income, and obesity.

Borgeraas et, al.,[10] investigated if obesity was more prevalent in the adult population, particularly among women with less education. Furthermore, obesity was more prevalent among impoverished individuals in well-established civilizations due to familial nutrition modifications than those in less developed countries.

The relationship between obesity and socioeconomic factors:

Bratke[11] investigate the connection between obesity and socioeconomic position (SEP) and find a strong relationship between obesity and SEP. High SEP is distinguished by education, wages, family resources, and house type. Obesity was discovered to grow with age. Obesity was also related to a high income and a poor education level[12]. Çelik[13] identified a link between area-level socioeconomic status and people who have poor eating habits and are inactive. AL-SEP disclosures included the unemployment rate, the percentage of adult residents with a high school diploma or less, and the monthly income of the family's guardian.

Champilomati[14] observed weight gain-related problems and threats. 1000 child aged between 6-11 years was screen out. The questionnaire was used to collect information. Statistical analysis indicated that viewing T.V. more than two h/day, physical exercise, and child order, and parent's obesity was related to the child's weight gain and obesity. Chung [15] analyzed body weight misunderstanding and eating behavior in Chinese adolescents. Total of 2641 students from school partaken in this experimental study. People

with a low degree of material prosperity and family income, on the other hand, were more likely to have a sedentary lifestyle [16].

The relationship between gender and eating habit

Dai et al. [17]) investigated the relationship between take-out meal intake and obesity in Chinese university students. This poll included 1220 Chinese college students. Take-out food consumption may be influenced by significant category, preference for high fat-high sugar (HFHS) food, graduation, and BMI. According to the findings, excessive take-out meal intake increased the prevalence of obesity and the risk of metabolic disorders.

Libyan individuals (401 men and 265 females) aged 20 to 86 were taken to participate in the weight increase and obesity incidence study. Adults were randomly selected from the Benghazi election registration using a multistage sampling method. Anthropometric measures were taken using a body composition analyzer and a stadiometer. The findings revealed that 76.5 percent of people are overweight or obese (the prevalence of overweight in women was 33.2 percent compared to 32.4 percent in men, and 47.4 percent of women are obese compared to males).

Day et al., [18] investigated the links between obesity and food quality, dietary power density, and energy expenditures. Many health inequalities were linked to educational and economic inequality. Scarcity and food insecurity were also related to lower food expenditure, lower fruit and vegetable consumption, and poor-quality diets.

The relationship between gender and physical activity

Obesity in females has been related to mortality and significant morbidities, according to Yongwen Jiang, Reilly-Chammat, and Viner-Brown (2018). Kornet-van der Aa, Mayer, Gómez et al., [19] investigated the prevalence and socio-spatial variations in obesity, individual and family circle traits, quality of living, and dietary habits obesity [20,21]. Hassan [22] investigated the relationships between BMI and waist circumference and obesity and physical activity categories. Physical activity ranging from moderate to vigorous included home activities, walks, exercise, and outdoor games and was categorized as inactive, insufficiently active, and appropriately active for anticipated health reimbursement and obesity prevention. Television and other screen-based leisure time were referred to as sedentary time (TVSL). The TVSL was directly related to waist circumference and BMI regardless of physical activity intensity ranging from moderate to high; walk and outdoor activities were inversely related to waist circumference, while the only walk was directly related to BMI.

Methodology

Questionnaire and Pre-test

Anthropometry is the science of measuring the human body in bone, muscles, and adipose (fat) tissue measurements. Subcutaneous adipose tissue measurements are significant because those with high levels are more likely to develop hypertension, adult-onset diabetes, cardiovascular disease, obesity, and other diseases [19]. The survey questionnaire used in the current research was developed from previous studies in which instruments have been tested for reliability and validity. The reliability and validity of the study were evaluated by Exploratory Factor Analysis EFA and Confirmatory Factor Analysis CFA.

Sample design and data collection

The present study population consists of undergraduate students joining the universities of the west coast of Libya. Specifically, the research will carry out with undergraduate students of two public universities (Zawia University and Sabaratha

University) of Libya. In selecting the participating students in this study, the samples will randomly be collected for present research from the west coast of Libya. For the data collection instruments, the present study will be used a survey based on the constructs of the conceptual framework. Therefore, self-distributed questionnaires for each of 500 samples of the student will be collected from the questionnaire.

Empirical Findings and DiscussiONS

This section produces the result obtained from the data analysis. This chapter is divided into four sections. The first section provides the profile respondents, while the rest three sections are specified for this study objectives.

The Relation between demographic factors and obesity prevalence

Table 1 shows that 500 respondents comprise the total sample of this study, 250 male and 250 female categorized into three groups of age ranged from 18 to 24. Most of the respondents belong to the age range between 20 and 21, where male composites the higher percentage of this age level by 124.

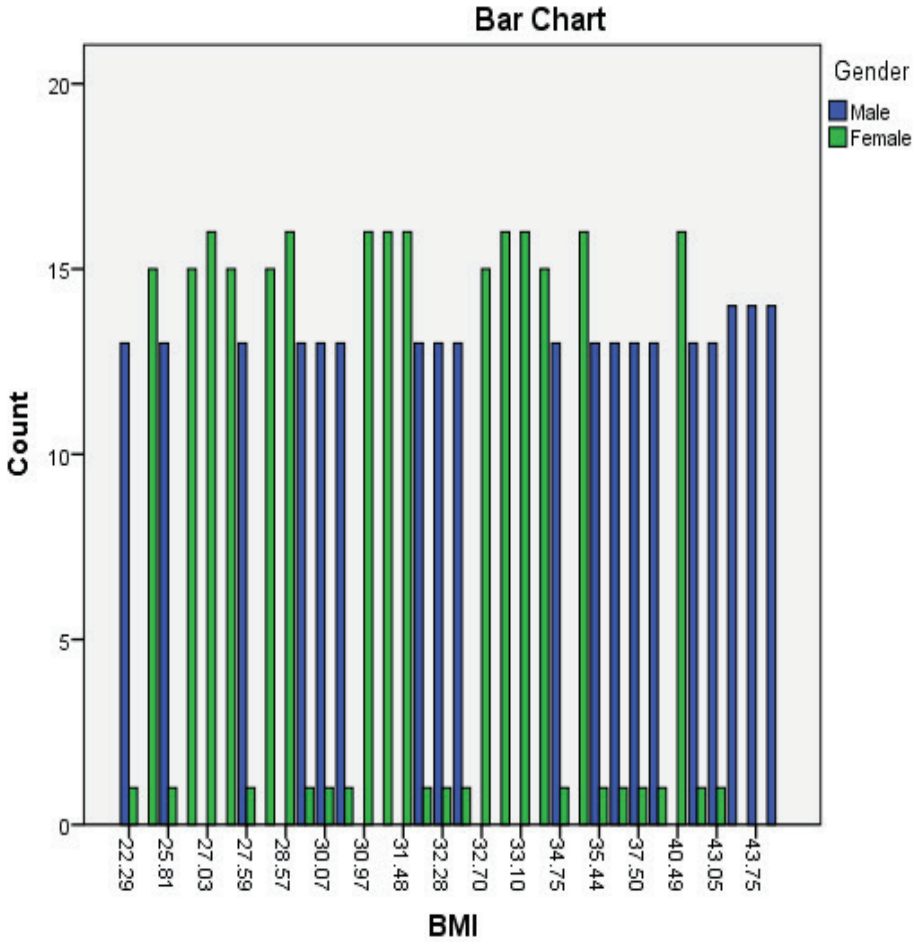

Figure 1: BMI * Gender

Figure 1 provides the descriptive statistics for the height, weight, and BMI of the female respondents. The minimum height for females was 1.41 cm, and the maximum 1.76, the mean of height 1.56 cm. For the weight, the minimum weight for females was 36 kg and the maximum 67, the mean of weight 48.6 kg. For the BMI, the minimum BMI for females was 22.29, and the maximum 43.05, the mean BMI 31.2. Based on that, there is overweight and obesity as the average BMI higher than 30. The descriptive statistics for the height, weight, and BMI of the male respondents. The minimum height for males was 1.41 cm, and the maximum 1.76, the mean of height 1.62 cm. For the weight, the minimum weight for males was 37 kg and the maximum 76, the mean of weight 56.3 kg. For the BMI, the minimum BMI for males was 22.29, and the maximum 44.71, the mean BMI 34.88. Thus, there is overweight and obesity as the average BMI higher than 30; also, the male students suffer an average higher risk of obesity than the female students.

The relationship between obesity and socioeconomic status

Table 1 provides the result of logistic regression based on the dependent factor than BMI as a measurement of obesity. The result obtained revealed that two determinants have a significant and positive impact on obesity: income level at (β=0.104, p=0.000), and Expenditure on food at (β=0.104, p=0.000), where more gaining income and Expenditure on food lead to obesity. Three determinants were found with a significant and negative prediction on obesity that gender, Physical activity, and Degrees of activity. The significant and negative estimation of gender reported at (β=-0.924, p=0.000), physical activity at (β=-0.027, p=0.015), and degrees of activity (β=-0.033, p=0.008). This result confirmed that gender plays a crucial factor in determining obesity. Also, low physical activity leads to an increase in the risk of overweight and obesity, the same for the degrees of activity, as low degrees of activity will higher risk of overweight and obesity.

Table1: Variables in the Logistic regression equation

		B	S.E.	Wald	df	Sig.
Step 1[a]	Gender	-.924	.215	18.412	1	.000
	Age	-.051	.133	.145	1	.703
	Income	.104	.151	14.469	1	.000
	Expenditure on food	.201	.072	7.853	1	.005
	Living status	.207	.174	1.412	1	.235
	Physical activity	-.027	.115	9.055	1	.015
	Degrees of activity	-.033	.122	13.073	1	.008
	Leisure-time physical activity	-.025	.050	.254	1	.614
	Time in leisure time physical activity	.037	.101	.135	1	.714
	Constant	2.917	.632	21.274	1	.000

a. Variable(s) entered on step 1: Gender, Age, Income, Expenditureonfood, Livingstatus, Physicalactivity, Degreesofactivity, Leisuretime physical activity, Time inleisure time physicalactivity.

Eating habits/pattern for assessing the prevalence of obesity

To investigate the eating habits among undergraduate students to assess obesity, three categories of food habits are food groups, mealtime, and processed food items. Table 2 shows that most respondents have a higher percentage within the meat, fish, poultry, and eggs at 30%, where the male was 59.3% compared to 40.7% for female respondents. The fats, oils, and sweets food groups were followed by 26.4%, where the female respondents reported at 57.6% compared to male respondents consuming by 42.4%.

Table2: Food groups * Gender Cross tabulation

			Gender		Total
			Male	Female	
Food groups	Bread, cereals, rice, noodles, and other grains	Count	45	21	66
		% within Food groups	68.2%	31.8%	100.0%
		% within Gender	18.0%	8.4%	13.2%
	Milk and milk products	Count	30	20	50
		% within Food groups	60.0%	40.0%	100.0%
		% within Gender	12.0%	8.0%	10.0%
	Meat, fish, poultry, and eggs	Count	89	61	150
		% within Food groups	59.3%	40.7%	100.0%
		% within Gender	35.6%	24.4%	30.0%
	Vegetables, legumes, and pulses	Count	15	37	52
		% within Food groups	28.8%	71.2%	100.0%
		% within Gender	6.0%	14.8%	10.4%
	Fruits	Count	15	35	50
		% within Food groups	30.0%	70.0%	100.0%
		% within Gender	6.0%	14.0%	10.0%
	Fats, oils, and sweets	Count	56	76	132
		% within Food groups	42.4%	57.6%	100.0%
		% within Gender	22.4%	30.4%	26.4%
Total		Count	250	250	500
		% within Food groups	50.0%	50.0%	100.0%
		% within Gender	100.0%	100.0%	100.0%

Table 3 provides processed food items, which categories into seven food items: baked foods, fried foods, junk foods, fast foods, artificially sweetened foods, soda and cola beverages and juices, and tea and coffee. The result found that most of the respondents were found with a high percentage of consuming fast foods by 32.8%, where the male respondents have the higher consumption of fast food by 54.9% and 45.1% for females. Followed by 22.8% of the respondents, followed by tea and coffee, the male respondents have the higher consumption of fast food by 52.6% and 47.4% for female.

Table3: Processed food item * Gender Cross tabulation

			Gender		Total
			Male	Female	
Processed food item	Baked foods	Count	13	23	36
		% within the Processed food item	36.1%	63.9%	100.0%
		% within Gender	5.2%	9.2%	7.2%
	Fried foods	Count	39	36	75
		% within the Processed food item	52.0%	48.0%	100.0%
		% within Gender	15.6%	14.4%	15.0%
	Junk foods	Count	0	11	11
		% within the Processed food item	0.0%	100.0%	100.0%
		% within Gender	0.0%	4.4%	2.2%
	Fast food	Count	90	74	164
		% within the Processed food item	54.9%	45.1%	100.0%
		% within Gender	36.0%	29.6%	32.8%
	Artificial Sweetened foods	Count	12	13	25
		% within the Processed food item	48.0%	52.0%	100.0%
		% within Gender	4.8%	5.2%	5.0%
	Soda and cola beverages and juices	Count	36	39	75
		% within the Processed food item	48.0%	52.0%	100.0%
		% within Gender	14.4%	15.6%	15.0%
	Tea and coffee	Count	60	54	114
		% within the Processed food item	52.6%	47.4%	100.0%
		% within Gender	24.0%	21.6%	22.8%
Total		Count	250	250	500
		% within the Processed food item	50.0%	50.0%	100.0%
		% within Gender	100.0%	100.0%	100.0%

The independent sample t-test is conducted to test if there is a significant difference between male and female students regarding food groups, mealtime, and processed food item. Table 4 confirmed that there is a significant difference between male and female respondents in term of food groups, i.e., male (M=3.37, SD=1.74) and for female (M=3.37, SD=1.74) conditions; t (498) = -4.77, p=0.000), and for mealtime as for male (M=4.012, SD=0.773) and female (M=4.232, SD=0.622) conditions; t (498) = -3.503, p=0.001), while there is no significant difference found between male and female respondents in term of the processed food item.

Table4: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Food groups	Equal variances assumed	.179	.673	-4.765	498	.000	-.72000	.15110	-1.01688	-.42312
	Equal variances not assumed			-4.765	496.119	.000	-.72000	.15110	-1.01688	-.42312
Mealtime	Equal variances assumed	5.023	.025	-3.503	498	.001	-.22000	.06280	-.34339	-.09661
	Equal variances not assumed			-3.503	476.286	.001	-.22000	.06280	-.34340	-.09660
Processed food item	Equal variances assumed	.734	.392	1.065	498	.287	.18400	.17280	-.15551	.52351
	Equal variances not assumed			1.065	496.740	.287	.18400	.17280	-.15551	.52351

Practical Implementations

Obesity and sedentary behavior are well-known risk factors for the progression of cardiovascular disease. It is a critical sovereign translator of cardiovascular illness in both men and women, including cardiovascular disease, coronary mortality, and heart dysfunction [21]. Obese men and females had higher rates of cardiovascular risk factors (including angina, myocardial infarction, and heart disease or fondle) [22]. Obesity is the leading cause of high blood pressure, cardiovascular disease, diabetes, and mortality. Overweight and obesity are associated with increasing age, socioeconomic status, decreased physical activity and changing eating habits. Obesity and overweight are also associated with poor socioeconomic status and a lack of education [23]. This research indicates that obesity incidence is rapidly rising in Libya, suggesting that more effort is required for preventative and therapeutic measures to decrease the impact of this prevalent disease.

In Libya, the rates of overweight and obesity have been increasing, which makes most of its population vulnerable to the preventable chronic diseases already mentioned [24]. There is evidence in homes of the coexistence of excess and deficit of weight, called "double nutritional load," and deficiencies of various nutrients despite macronutrients and energy above the population recommendations. What happens in a country declared in 2019 as one of the most inequitable in the world, where food insecurity is 42.7%, and the weight deficit in childhood reaches 13.2% [20]. The vast inequities that the country has without adequate intervention, in the long term, if it is not already affecting the health of Libyan, was deteriorate on a large scale due to the increased prevalence of diseases secondary to overweight and obesity.

This research has done a comprehensive theoretical discussion to be able to come up with the research hypotheses. The hypotheses were that there is a significant relationship between demographic factors and obesity prevalence in undergraduate students of Libya. Finally, there is a substantial difference in physical activity between male and female undergraduate students.The present study has used a survey based on the constructs of the conceptual framework. Therefore, self-distributed questionnaires for each of 500 samples of the student to collect from the questionnaire.

Limitations and Future Recommendations

In addition to the limitations of any cross-sectional study, this research did not include other food groups such as meat or dairy. In this sense, future research could deepen this section with a complete nutritional analysis of these universities' populations. On the other hand, it was not possible to include the students in the last year of their studies due to the limited time available to them at that stage of their training and their geographic dispersion in multiple education sectors in the country.

Both for this university population and in future prevalence studies with a focus and areas of interest similar to those of this research, it would be advisable to delve into the analysis of alcoholic beverage consumption (types of alcohol, volume of each intake, frequency).

This research recommends carrying out strategies to promote physical activity in the Libyan public universities' population to prevent these future students from developing overweight obesity. One of the primary ways that colleges may utilize to have a good and direct effect on health is to educate students on health. This is one of the university's primary responsibilities. Proper nutrition and physical activity may be integrated throughout the semester's different topics and curricula, with an emphasis on teaching skills that aid in the acquisition of healthy habits and the maintenance of a healthy lifestyle. In addition,

customized plans for physical education courses are developed, considering students' requirements and their appropriateness to their skills and interests. Also, add passing or failing grades in physical training courses to pique the attention of both parents and kids.

Conflict of Interest: There is no conflict of interestthat exist in the present study.

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