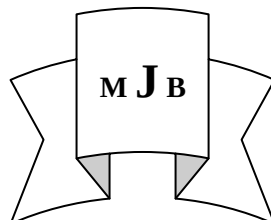


Obesity and Overweight among Sample of Foundation of Technical Education Students in Iraq During 2011

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Abstract

The aims of this study are to find the prevalence of obesity among the studied sample, the BMI, waist and hip ratio, and to find out any association between BMI, W/H Ratio and socio-demographic variables.

Methods:- A cross-sectional study conducted in College of Health and Medical Technology, College of Administration Technology, Almansour medical technology Institute, Bab-almoadham Medical Technology Institute. The data was collected by self recording of a previously designed questionnaire to obtain socio-demographic information and the sampling was systematic random one.

Results: 63.8% of the studied sample of students was in the age 21-25 years. The studied ample was 500 students 64.4% male and 35.6% female, about 35.5% of students were overweight. A significant association between the family history of obesity and gender with BMI. Highly significant association of Hip circumference with age and BMI . The mean age for male was 20.9 ± 23.7 years, while for female was $19.1 \pm$ years, there was significant association with W / H Ratio ($p=0.000$) for both sexes. A positive correlation was obtained between BMI and age , WC., HC., W/ H Ratio.

Conclusions: A significant association between the family history of obesity and gender with BMI. Hip circumference was significantly associated with age and BMI. A positive correlation was obtained between BMI and age , WC., HC., W/ H Ratio.

Key Words: BMI (body mass index), W/H ratio (waist/ hip ratio), WC (waist circumference), HC (hip circumference) , students.

الخلاصة

الهدف من الدراسة هو تحديد معدل شيوع السمنة لعينة من الطلاب وإيجاد اي ارتباط بين مؤشر كتلة الجسم ، ونسبة محيط الخصر / لمحيط الورك والعوامل الديموغرافية.

المنهجية: وهي دراسة مقطعية أجريت في كلية التقنيات الصحية والطبية، وكلية التقنية الادارية والمعهد التقني الطبي / المنصور والمعهد الطبي التقني باب الموصل. حيث جمعت المعلومات والبيانات باستخدام الاسئلة المباشرة طبقا لاستبانة معدة مسبقا للحصول على المعلومات الاجتماعية والديموغرافية للعينة العشوائية التطبيقية.

النتائج: ٦٣.٨% من عينة الطلاب كانت في عمر ٢١-٢٥ سنة وعينة الدراسة كانت ٥٠٠ طالب ، ٦٤.٤% كانوا ذكورا و ٣٥.٦% اناثا ، وحوالي ٣٥.٥% من الطلاب يعانون من زيادة الوزن ووجد ارتباط معنوي بين التاريخ العائلي للإصابة بالسمنة والجنس ومؤشر كتلة الجسم، وارتباط معنوي عالي لمحيط الورك مع العمر ومؤشر كتلة الجسم. متوسط العمر للذكور كان 20.9 ± 23.7 سنة بينما للإناث كان $19.1 \pm$ سنة، واختلاف معنوي لنسبة محيط الخصر / لمحيط الورك لكلا الجنسين ، وارتباط عالي بين مؤشر كتلة الجسم والعمر ومحيط الخصر ومحيط الورك ونسبة محيط الخصر / لمحيط الورك

الاستنتاجات: نستنتج من هذه الدراسة وجود ارتباط معنوي بين التاريخ العائلي للإصابة بالسمنة والجنس ومؤشر كتلة الجسم، وارتباط معنوي عالي لمحيط الورك مع العمر ومؤشر كتلة الجسم، وارتباط عالي بين مؤشر كتلة الجسم والعمر ومحيط الخصر ومحيط الورك ونسبة محيط الخصر / لمحيط الورك.

Introduction

Obesity continues to be an important public health problem worldwide. Its prevalence is increasing in both developed and developing nations with changes in dietary habits and activity level [1-4]. Obese who are overweight are at higher risk for a variety of disabling and life-threatening chronic conditions and premature mortality [5-7]. Abdominal obesity is considered as an independent predictor of several risk factors and morbidity [8]. Obesity results not only in medical consequences but it has a strong inverse relationship with social position, as reported from many affluent societies [9-10].

Obesity is basically due to energy imbalance between calorie consumption and expenditure, there are several complex underlying factors related to genetics, environment and behavior that influence the outcome, among these factors, diet plays a central role. As people take meals that consist of complex combinations of nutrients and non-nutrients, it is important to consider the total meals, rather than single nutrients when relating dietary intake with nutritional status. In light of the complex influence of diet, researchers have become increasingly interested in studying dietary patterns towards understanding the growing problem of obesity [11].

Obesity is not only considered as a disease in itself, but it also gives rise to and aggravates many others, and is thus known to be a risk factor for certain chronic diseases, in particular being closely associated with pathologies like diabetes, cardiovascular diseases, osteoporosis and certain types of cancer, pathologies that present high rates of morbidity and mortality in Europe and the other developed countries [12].

Personal characteristics such as psychological factors, socioeconomic status, levels of education and life styles

can determine eating behaviours leading to a greater risk of overweight and obesity. Therefore, clinicians and nutritionists cannot ignore these characteristics if they wish effectively to modify the customary diet, not only of their patients but of the general population [13,14].

Recently estimates of waist circumference (WC) were gaining increasing importance as a more useful tool in the assessment of body fat distribution and in the diagnosis of abdominal obesity. Abdominal obesity is now an established cardio metabolic risk factor. Indices of abdominal adiposity such as waist-to-hip ratio (WHR) and WC, predict coronary heart disease and stroke better than Body Mass Index (BMI). Individuals with abdominal obesity are at a great risk for developing diabetes and atherosclerotic [15]. Abdominal obesity is commonly associated with hyperinsulinemia, impaired glucose tolerance, hyperglycemia, as well as increase in plasma triglycerides. Also, abdominal obesity is a major component of the metabolic syndrome. The diagnosis of abdominal obesity depends on measurement of WC. An increase of WC beyond a specific cut-off point will establish the diagnosis. In Arab and Middle Eastern countries, the thresholds of WC diagnostic of abdominal obesity are derived from European data [16]. There is a need to develop national guidelines for definition of abdominal obesity.

the prevalence of abdominal obesity Among Students of Hawler Medical University was higher in female students than male students increasing with the age of the students. excess body weight appears to be quite common in Iran. More women than men present with overweight and abdominal obesity [17, 18].

In European men and women, abdominal obesity defined according to cut-off

values between 90-102 cm for men and 80-92 cm for women . In Cameron-Africa- there is a prevalence of abdominal obesity of 18% in men (WC > 94 cm) and 66% in women (WC > 80 cm) [19,20,21].

The study aims to find the prevalence of obesity among the studied sample and to find BMI, Waist & hip ratio. To find out any association between BMI , W/ H ratio and socio demographic variables.

Methods

$$N = \frac{N \times P(1-P)}{[N-1 \times (d^2 \div z^2) + p(1-p)]}$$

N= community size

Z= standard degree = 1.96

D=error ratio = 0.05

P=rate of availability of property = 0.50.

Data collection was by self recording of a previously designed questionnaire to obtain socio-demographic information (age, the student stage in the college, marital status, family history of obesity, smoking,).

Instruments used:

Weight was measured while the student without shoes using the same scale for all students (Tanita scale, model 1801, Japan, max. 135 kg $\pm$ 0.1 kg).

Height measured at the time of interview while the child is standing without shoes using board with a horizontal head that can be brought in contact with the upper most point on the head.

Body mass index was calculated by dividing body weight in kilograms by the square of body height in metres. BMI categories are defined by The Centers for Disease Control and Prevention and The World Health Organization as:

- Under weight < 18.5 kg/m²
- Normal 18.5–24.9 kg/m²
- Overweight 25–29.9 kg/m²
- Obese 30–39.9 kg/m² or Class I obesity 30–34.9 kg/m² and Class II obesity 35–39.9 kg/m²

The study design : was cross – sectional, conducted in College of health & medical technology , college of administration technology, al-man sour medical technology institute, Bab-almoadham medical technology institute , for the period from 1st March till 10th July 2011.

The sampling methods was systematic random sample and sample size was (500), this study was examined the sample size using Steven Thompson's formula [22] as following:

- Very obese ≥ 40 kg/m² [23]

The WHO stepwise approach had been followed for measuring the waist circumferences of the participants by the same measuring tape. Were used as measures of abdominal obesity. Waist circumference was calculated as an average of one measurement taken after inspiration and one taken after expiration at the level of mid-distance between the bottom of the rib cage and the top of the iliac crest. Hip circumference was measured at the level of the trochanter major. Waist-to-hip ratio was calculated as the ratio of the circumference of the waist to the hip.

Data were analyzed using descriptive statistics (frequencies and percentages), and analytic statistics (chi-square test for association between two variables with results being considered as statistically significant when the p value was < 0.05, person correlation two ways ANOVA.

Results

Table 1 Frequency and percentage distribution of studied sample of student according to age, gender , Residency , Married status, Family history of obesity by BMI (N=500)

Variables	BMI						
	<18.5	18.5-24.9	25-29.9	>30	Total	X2	p. value
Age years	No. %	No. %	No. %	No. %	No. %		
≤20	11 7.3%	59 39.3%	77 51.4%	3 2%	150 100%	4.366	0.6273
21-25	3 1%	189 59.2%	94 29.5%	33 10.3%	319 100%		
26-30	3 16.7%	9 50%	4 22.2%	2 11.1%	18 100%		
>30	2 15.4%	6 46.1%	4 30.8%	1 7.7%	13 100%		
Gender Male	7 2.2%	187 58.1%	102 31.6%	26 8.1%	322 100%	10.665	0.0137
Female	12 6.7%	76 42.7%	77 43.3%	13 7.3%	178 100%		
Residency Urban	13 2.9%	243 53.4%	169 37.1%	30 6.6%	455 100%	0.5925	0.8981
Rural	6 13.3%	20 44.5%	10 22.2%	9 20%	45 100%		
Marital status							
Marital	3 4.2%	53 73.6%	14 19.4%	2 2.8%	72 100%	1.4054	0.9978
Single	14 3.3%	208 49.5%	162 38.6%	36 8.6%	420 100%		
Divorced	1 20%	1 20%	2 40%	1 20%	5 100%		
Widowed	1 33.3%	1 33.3%	1 33.3%	-	3 100%		
Family history of obesity							
Yes	3 2.2%	100 72.5%	10 7.2%	25 18.1%	138 100%	123.85	0.0001
No	16 4%	163 45%	169 46%	19 5%	362 100%		

There is a significant association between the family history of obesity and gender

with BMI this is clearly shown in Table 1.

Table 2 Frequency and percentage distribution of studied sample of student according to type of sport , smoking status, type of smoking , take of drugs by BMI(N=500)

Variables	BMI				Total		
Type of sport	<18.5	18.5-24.9	25-29.9	>30		X2	p. value
	No. %	No. %	No. %	No. %	No. %		
Football	2 1.8%	56 50%	50 44.6%	4 3.6%	112 100%	11.342	0.876
Basketball	1 7.1%	3 21.4%	9 64.4%	1 7.1%	14 100%		
Tennis	2 18.2%	3 27.2%	4 36.4%	2 18.2%	11 100%		
Pedestrian	3 1.5%	132 65%	64 31.5%	4 2%	203 100%		
Swimming	1 16.7%	3 49.9%	1 16.7%	1 16.7%	6 100%		
Others	6 13%	23 50%	10 21.7%	7 15.3%	46 100%		
Non any sport	4 3.7%	43 39.8%	41 38%	20 18.5%	108 100%		
Smoking status						0.921	0.9884
Smoker	3 3.8%	45 57%	20 25.2%	11 14%	79 100%		
Previous smoker	6 21.4%	6 21.4%	10 35.8%	6 21.4%	28 100%		
Non smoker	10 2.5%	212 54%	149 38%	22 55%	393 100%		
Type of smoking							
Non smoker	2 0.5%	228 56.7%	146 36.3%	26 6.5%	402 100%	1.8584	0.9935
Cigarette	16 16.8%	34 35.8%	32 33.7%	13 13.7%	95 100%		
Nrkillh	1 33.3%	1 33.3%	1 33.3%	-	3 100%		
gallon	-	-	-	-	-		
Drug intake							
Yes	7 10.5%	20 29.9%	13 19.4%	27 40.2%	67 100%	54.565	0.0001
No	12 2.8%	243 56.1%	166 38.3%	12 2.8%	433 100%		

There is a significant association between drug intake and BMI. This is clearly shown in Table 2.

Table 3 Frequency and percentage distribution of studied sample of student according to age, BMI, family history of obesity by waist circumference (N=500)

Variables	Waist circumference		Total	X2	p. value
Age (years)	Male	Female			
	No. (%)	No. (%)	No. (%)		
≤20	86 (57.3%)	64 42.7%	150 100%	0.7548	0.8602
21-25	214 67.1%	105 32.9%	319 100%		
26-30	13 72.2%	5 27.8%	18 100%		
>30	9 69.2%	4 30.8%	13 100%		
BMI <18.5	11 57.9%	8 42.1%	19 100%	1.9174	0.5897
18.5-24.9	187 71.1%	76 28.9%	263 100%		
25-29.9	103 57.5%	76 42.5%	179 100%		
>30	21 53.8%	18 46.2%	39 100%		
Family history of obesity				0.525	0.4687
Yes	97 70.3%	41 29.7%	138 100%		
No	225 62.2%	137 37.8%	362 100%		

There is no relationship of waist C. with age, BMI, family history of obesity (**Table 3**).

Table 4 Frequency and percentage distribution of studied sample of student according to age, BMI, family history of obesity by hip circumference (N=500)

Variables	hip circumference		Total	X2	p. value
Age (years)	Male	Female			
	No. %	No. %	No. %		
≤20	56 37.3%	94 62.7%	150 100%	18.458	0.0004
21-25	259 81.2%	60 18.8%	319 100%		
26-30	3 16.7%	15 83.3%	18 100%		
>30	4 30.8%	9 69.2%	13 100%		
BMI <18.5	6 31.6%	13 68.4%	19 100%	11.482	0.0094
18.5-24.9	133 50.6%	130 49.4%	263 100%		
25-29.9	154 86%	25 14%	179 100%		
>30	29 74.4%	10 25.6%	39 100%		
Family history of obesity				0.253	0.6150
Yes	81 58.7%	57 41.3%	138 100%		
No	241 66.6%	121 33.4%	362 100%		

There was a highly significant association of Hip C. with age and BMI

This is clearly shown in (Table 4).

Table 5 Characteristics of the studied sample by sex and age

	Male (n=322)		Female (n=178)		Total (N=500)		P value
	Mean	SD	Mean	SD	Mean	SD	
Age (years)	21.5	40.7	20.5	39.5	62.5	82.1	0.1976
BMI(KG/m ²)	80.5	83.42	44.5	33.7	62.5	58.56	0.9558
WC(CM)	80.5	95.7	44.5	49.12	62.5	72.41	0.2263
HC (CM)	80.5	121.5	44.5	40.08	62.5	80.79	0.186
W/H ratio (%)	1	0.8	1	1.2	1	1	0000

The mean age for male was 21.5 ± 40.7 years, while for female was 20.5 ± 39.5

years, there is significant association of age with W/H ratio (Table 5).

Table 6 correlation of BMI ratio with age, WC, HC, W/H ratio

	BMI					
	Male		Female		Total	
	r	p	r	p	r	p
Age (years)	0.4386	0.00	0.9409	0.00	0.6898	0.000
WC	0.5823	0.00	0.7358	0.00	0.6590	0.000
HC	0.4376	0.00	0.9661	0.00	0.7019	0.000
W/H ratio (%)	1.33	0.00	0.761	0.00	1.0456	0.000

There was a positive correlation between BMI and age, WC, HC, W/H ration (Table 6).

Discussion

Overweight and obesity have led to health problems such as diabetes, hypertension, coronary heart disease, stroke, gallbladder disease, cancer, breathing problems, and osteoarthritis [24].

According to the National Health and Nutrition Examination Survey (NHANES), over 72 million adults in the United States were considered obese in 2005-2006 [25]. Overweight adults comprise about two-thirds of the United States population [24]. Often college students are thought to be some of the

healthiest young adults; however, about 20% of college students in a nationwide survey were considered overweight and 11% were obese [26].

The prevalence of obesity in this study was 29.3%. In May 2000 a joint FAO/ World Food. Program mission visited Iraq to assess the country's food and nutrition situation, and conducted a nutritional survey in three governorates Baghdad, Diala and Karbala, the prevalence of obesity in that study was 27% in Karbala [27].

In May 2006 the Ministry of Health in collaboration with the WHO conducted a population-based cross-sectional survey for chronic non-communicable diseases risk factors in all

the governorates in Iraq. The prevalence of obesity in that study was 32.8 % [28]. Colleges and universities across the nation have implemented programs promoting physical fitness, proper nutrition, and weight management behaviors among students [29]. Yet the percent of overweight and obese college students has nearly tripled in the past 25 years [30]. One study found only 20 percent of college students participated in adequate moderate physical activities each week. Only one-fourth of students ate the recommended daily servings of fruits and vegetables [30].

In this study, the percentage of obesity 7.8% only but overweight was in a rate of 35.8% which hold a danger of incoming obesity in a future. This finding disagrees in about 16 countries in the Eastern Mediterranean region the overall prevalence of obesity (BMI>30) in student was 16.6% compared to 28.0% in USA and 23% in UK [31] while percentage of obesity is less than 5% in China [32].who found that student of overweight with age group ≤ 20 years are similar to study conducted in United States approximately 55% [33].The issue of underassessment or misperception of overweight and obesity for college students creates a perilous combination for higher morbidity and mortality.

The mean BMI of male students were slightly higher compared to female students Higher BMI of male students compared to female students was also reported among Venezuelan university students [34] and among groups of college students at a large Midwestern University, US [35] and Kuala Lumpur [36]. The lower prevalence of obesity among female students was expected, since females are more cautious about their weight status than male, because of society perceptions which encourage females to be slim or slender. Obviously, pictures of movie stars and models in fashion magazines and mass media have a strong impact on girl's body shape and

image perception [37]. Obesity was (18.1%) among student who had family history, these same results were in Brazil [38].

Type of sport, the difference in mean was no significant low rates of sport are associated with increased risk for overweight and obesity. In the adolescent population, minorities have been shown to have a higher rate of inactivity, especially in women. African American and Hispanic females showed much lower rates of physical activity. This is Females participating in high levels of sport are more likely to be Caucasian or Asian. Consistent with findings those minority populations tend to be more obese [39]. College students spend 150minutes per day watching television and playing video games and 162 minutes per day on the computer [40]. Research shows that self-efficacy, perceived enjoyment of physical activity, and self-motivation were some of the strongest influences on college students' involvements in physical activity [41].

Regarding smoking status the findings indicated that (57 %) normal weight of the students were smokers, and (55%)obese of the present study never smoked, smoking was common in the studied sample of university students, in agreement with findings in Jordan [42]. There is significant association between drug intake and body mass index, these same result were seen in Australia [43]. This may be because the use of drugs to assist in management of obesity has always been controversial. This is partly due to the widespread belief that losing weight and maintaining weight loss is simply a matter of exercising free will, which has even led to a suggestion that it is unethical to be obese [43].The present study shows highly significant association between hip circumference with age, the finding of the present study is agreement with findings reported in Anhui [44]. The presence of significant association between gender with W/H

Ration, the finding of the present study is agreement with findings reported in Egypt [45]. Many studies of general obesity have indicated a significantly higher prevalence of obesity among females than among males [46]. Such findings are in agreement with the findings of the present study, and may be attributed to socio cultural factors in Egyptian communities, such as high unemployment, restricted outdoor activities and the high illiteracy rate among females [46, 47]

A positive correlation between BMI and age, WC.HC,W/C ratio in agreement of a study with findings in Saudi Arabia [48].

Conclusions

- 1- A significant association between the family history of obesity and gender with overweight.
- 2- Hip circumference was significantly associated with age and overweight .
- 3- A positive correlation was obtained between BMI and age , WC., HC., W / H Ratio.

Recommendations

- 1-promoted regular exercise practicing for prevention of obesity among college and Institutes.
- 2- promoted more strongly health education programs for students a bout healthy life style.

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