OBESITY AMONG SECONDARY SCHOOLS FEMALE STUDENTS[+]

السمنة بين طالبات المدارس الثانوية

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Abstract:

The present paper is a cross-sectional study conducted on secondary schools female students in Benghazi, Libya, over a six-months period, from October 2007 to March 2008 . The survey adopted a multi-stage random sample. The number of students in the sample were 2509 from the total number of 21209 students, this sample represents 11.8% from the total number of female students. The dietary behavior , activity, obesity related knowledge and family history data were obtained . The chi-square (χ^2) test was used to compare the prevalence rate of obesity in relation to certain characteristics, dietary, and activity. Odds ratio (OR) and the corresponding 95% of confidence interval (95% C.I) were used to estimate the risk factors. The results of this study provide evidence of a high prevalence of overweight and obesity among the students (34.1%). The important risk factors for obesity observed in this study were family history, eating whilst watching television, lack of physical activity, and high calorie diet. It is noted that 67.6% of students did not monitor their weight regularly. In addition, it found that 98.3% agreed to the opinion that exercise is essential for health, and 94.5% agreed that obesity was dangerous for health. We also found that only 43.2% believed that fast food contains a lot of bad lipid.

We recommend that there should be an integrated program to raise awareness of the dangers of obesity and how to avoid it, as well as improving students' knowledge about nutrition and healthy eating habits to promote healthy body weight management and reduce the overweight and obesity.

المستخلص :

دراسة مقطعية أجريت على طالبات المدارس الثانوية في مدينه بنغازي في ليبيا للفترة من أكتوبر/تشرين الأول ٢٠٠٧ لغاية مارس/آذار ٢٠٠٨ باستخدام العينة المتعددة المراحل .لقد كان عدد الطالبات في العينة ٢٥٠٩ طالبه من مجموعهن البالغ ٢١٢٠٩ أي بنسبه مقدارها ١١,٨%من مجموع الكلي .حيث تم الحصول على بيانات عن سلوك التغذية وممارسه النشاط ربع كاي للمقارنة بين معدل انتشار السمنة وبالتغذية والنشاط . وتم استخدام نسبه الارجحيه بحدود ثقة مقدارها ٩٥% لتقدير عوامل الخطورة . حيث لوحظ ارتفاع في نسبة الطالبات اللائي أوزانهن فوق الطبيعي وكذلك المصابات بالسمنة ،إذ كانت هذه النسبة تساوي ٣٤,١% .إن أهم عوامل الخطورة التي تم الحصول عليها هي؛ إصابة احد الوالدين أو كلاهما بالسمنة ،الأكل إثناء مشاهدة التلفزيون، نقص في النشاط وكذلك عدم ممارسه الرياضة إضافة إلى احتواء الطعام على سعرات حرارية عاليه الرياضي والتاريخ المرضي للعائلة

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وكذالك بعض المعلومات وعلاقتها بخصائص معينه بظاهرة السمنة . لقد استخدم اختبار م.وقد لوحظ إن ٦٧,٦% من الطالبات لا يراقبن أوزانهن بصوره منتظمة، وان ٩٨,٣% منهن يعتقدن أن ممارسة الرياضة أمر ضروري لصحة الإنسان، وأن ٩٤,٥% من الطالبات يعرفن أن للسمنة مخاطر على الصحة . إضافة إلى ذلك فأنه فقط ٤٣,٢ منهن يعتقدن أن الأكلات السريعة تحوي على كمية من الدهون الضارة. و خرجت الدراسة بجملة من التوصيات ، منها ضرورة وضع برنامج متكامل للتحذير من مخاطر السمنة وكيفية تجنبها ، وكذلك تطوير معلومات الطالبات حول التغذية وعادات الأكل الصحية لضمان الحصول على الوزن الصحي وتقليل انتشار السمنة بين الطالبات.

Introduction

Obesity is the excessive accumulation of adipose tissue to an extent that health is impaired [1]. Obesity is usually determined by using the body mass index(BMI). It is a complex condition, with serious social and psychological dimensions[2]. Overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, hypertension, and cardiovascular diseases[3], and several cancers such as endometrial and breast cancer [4,5,6,and7]. The risk of coronary heart disease is doubled if the body mass index (BMI) is >25 and nearly quadrupled if BMI is >29[8]. Obesity affects virtually all age and socioeconomic groups and threatens to overwhelm both developed and developing countries [9]. It is becoming a public health problem worldwide especially in recent years. For instance, globally, there are more than one billion overweight adults and at least 300 million of whom are obese [10]. The death risks for overweight and obese people are in many instances closer to (0.5 – 1.75) time above those for people with normal weight [11]. In Iraq, the prevalence of obesity was 23.16% in women aged 25 years old and above [12]. The prevalence of obesity among women is 20.26% in Saudi Arabia [13] and 37.6% in Jordan [14]. The objective of this study is to find the prevalence of obesity in secondary schools female students in Benghazi, Libya and the epidemiological factors related to obesity.

Study design:

The present paper is a cross-sectional study conducted on secondary schools female students, in Benghazi, Libya, over a six – months period, from October 2007 to March 2008. The sample for the survey was selected to represent the whole secondary schools female students in the city. The survey adopted a multi-stage random sample. In the first stage, all the 24 districts of Benghazi were chosen, in each one or two schools randomly chosen according to the number of the schools in each district . The total is 35 schools out of 52 schools (67%). In the second stage, a sampling frame for the students was conducted for each school chosen in the first stage, and a number of students were selected according to the total number of students in each school. The number of students in this sample were 2509 from the total number of 21209 students, thus the sample represents 11.8% from the total number of female secondary schools students in Benghazi. The dietary behavior , activity, obesity–related knowledge, and family history data were obtained . Height was measured without shoes and weight with light clothes and without shoes. The body mass index(= weight in kg / square of height in meters) was used to assess students weight status .Weight status was classified into four categories. Students were considered; underweight if their BMI was < 18.5; normal if their BMI was 18.5 – 24.9 ; overweight if their BMI was 25-29.9; and obese if their BMI was >= 30 [10]. Chi-square (χ^2) test used to compare the prevalence rate of obesity in relation to certain characteristics, dietary and activity history. Odds ratio (OR) and the corresponding 95% of confidence interval (95% C.I) were used to estimate the risk factors. The data were

analyzed using the statistical package for social sciences (SPSS ver.12). A (p- value < 0.05) considered significant.

Results:

The age of students ranged from 14 to 21 years, the mean age being (17.1 ± 1.43) year. Table 1 shows the mean BMI and body weight status among various education levels. The number of students were almost equally distributed in education levels. Of 2509 students, 209(8.3%) were under weight, 1443(57.3%) were normal, 638(25.4%) were overweight, and219(8.7%) were obese. The BMI mean for all education level was within (23.42- 24.32), while the mean weight range was (58.42 – 61.00) kg, and the mean weight and standard deviation was 60.1± 11.7 kg .

Table1-Mean BMI , body weight status, and prevalence of BMI according to various education levels.

Education Level	total n (%)	Weight(kg) (mean± SD)	BMI (mean± SD)	Under weight n (%)	normal weight n (%)	Overweight n (%)	Obese n (%)
1st year	650 (25.9)	58.42 ± 11.62	23.42 ± 4.42	62 (29.7)	385(26.7)	163(25.5)	40(18.3)
2nd year	603 (24.9)	59.79 ± 11.56	23.81 ± 4.64	59(28.2)	332(23.0)	161(25.2)	51(23.3)
3rd year	610(24.3)	61.00 ± 12.02	23.98 ± 4.58	52(24.9)	343(23.8)	158(24.8)	57(26.0)
4th year	646(25.7)	61.00 ± 11.41	24.32 ± 4.50	36(17.2)	383(26.5)	156(24.5)	71(32.4)
Total	2509(100)	60.10 ± 11.70	23.88 ± 4.50	209(8.3)	144(57.5)	638(25.4)	219(8.7)

Table 2 shows the percentage of BMI according to certain risk factors of obesity. There was a strong relationship between obesity and family history of obesity, the odds ratio (95% C.I) = 2.54 (1.9 - 3.94). The obesity was also related with eating whilst watching TV, the odds ratio (95% C.I) = 1.82 (1.22 – 2.70). In addition, there was a strong relationship between obesity and frequency of exercise; the more exercise less obesity resulted, the odds ratio (95% C.I) =0.68 (0.19 – 2.44). It was found there is a relationship between obesity and soft drinks; the more drinking more obesity resulted, the odds ratio (95% C.I) = 2.49 (1.64 – 3.77) for drinking more than 2.5 litters / week and 1.82 (1.17 -2.84) for drinking between(1.5 – 2.5) litters / week. It was found that there was a strong relationship between obesity and sweets diet, the more eating more obesity resulted, odds ratio(95% C.I) =3.75 (1.82 – 4.16) for eating more than(11)times /week and 2.01 (1.31 – 3.10) for eating between (6 – 10) times / week.

Table 2- Distribution of BMI according to some risk factors of obesity.

Risk factor	total	underweight	normal weight	overweight	obese	odds ratio
	n (%)	n (%)	n (%)	n (%)	n (%)	(95 % C.I.)
Family history of obesity						
Yes*	1012(40.3)	63(30.1)	527(36.5)	292(45.8)	130(59.4)	2.54(1.90 - 3.94)
No	1497(59.7)	146(69.9)	916(63.5)	346(54.2)	89(40.6)	
Eating whilst watching TV						
Yes*	906(36.1)	39(18.7)	516(35.8)	242(37.9)	109(49.8)	1.82(1.22 – 2.70)
Some times	974(38.8)	47(22.5)	609(42.2)	245(38.4)	73(33.3)	1.03(0.68 – 1.57)
No	629(25.1)	123(58.9)	318(22.0)	151(23.7)	37(16.9)	
Exercise > 30 minutes /time						
No*	1632(65.0)	63(30.1)	976(67.6)	427(66.9)	166(75.8)	2.00(1.16 – 3.49)
1 – 2 times / week	460(18.3)	60(28.7)	238(16.5)	127(19.9)	35(16.0)	1.74(0.92 – 3.28)
3 – 4 times / week	313(12.5)	57(27.3)	177(12.3)	64 (10.0)	15(6.8)	
5 – 7 times / week	104(4.1)	29(13.9)	52(3.6)	20 (3.1)	3(1.4)	0.68(0.19 – 2.44)
Soft drink						
No	469(18.7)	35(16.7)	389(27.0)	8(1.3)	37(16.9)	
0.25 – 1.25 litter / week	841(33.5)	124(59.3)	395(27.4)	276(43.3)	46(21.0)	1.22(0.78 – 1.93)
1.50 – 2.50 litter / week*	626(25.0)	50(23.9)	317(22.0)	204(32.0)	55(25.0)	1.82(1.17 – 2.84)
≥2.5 litter / week*	573(22.8)	0(0.0)	342(23.7)	150(23.5)	81(37.0)	2.49(1.64 – 3.77)
Eating sweet diet						
No	487(19.4)	15(7.2)	411(28.5)	20(3.1)	41(18.7)	
1 – 5 times / week	1040(41.5)	154(73.7)	499(34.6)	335(52.5)	52(23.7)	1.04(0.68 – 1.61)
6 – 10 times / week*	620(24.7)	40(19.1)	274(19.0)	251(39.3)	55(25.1)	2.01(1.31 – 3.10)
≥11 times / week*	362(14.4)	0 (0.0)	259(17.9)	32(5.0)	71(32.4)	3.75(1.82 – 4.16)

*** P< 0.05 (statistically significant in comparing obese to normal weight)**

From table 3, we can be noticed that the distribution of BMI according to certain characteristics .The table shows that 67.6% of students did not monitor their weight regularly and there was no statistical significant difference among various body weights, (p-value >0.05). In addition only 31.9%, believe they are obese. However, there is a strong association between BMI categories and planning to reduce weight, planning of regular exercise, loss of appetite, school sport, and the belief that the student is obese, (p -value< 0.05).

Table 3- Distribution of BMI according to certain characteristics.

Item	Total n (%)	Under weight n (%)	Normal weight n (%)	Over weight n (%)	Obese n (%)	χ^2	P-value
Regular weighing						4.94	0.177
Yes	813(32.4)	76(36.4)	482(33.4)	191(29.9)	64(29.2)		
No	1696(67.6)	133(63.6)	961(66.6)	447(70.1)	155(70.8)		
Planning to reduce weight						460.9	0.000
Yes	308(52.1)	32(15.3)	591(41.0)	490(76.8)	195(89.0)		
No	1201(47.9)	177(84.7)	852(59.0)	148(23.3)	24(11.0)		
Planning to do regular exercise						44.31	0.000
Yes	1948(77.6)	140(67.0)	1082(75.0)	539(84.5)	187(85.4)		
No	561(22.4)	69(33.0)	361(25.0)	99(15.5)	32(14.6)		
Loss of appetite						24.62	0.000
Yes	1046(41.7)	115(55.0)	611(42.3)	248(38.9)	72(32.9)		
No	1463(58.3)	94(45.0)	832(57.7)	390(61.1)	147(67.1)		
School's sport						13.48	0.036
Yes	844(33.6)	76(36.4)	511(31.7)	202(31.7)	55(25.1)		
Some time	1221(48.7)	96(45.9)	676(46.8)	321(50.3)			
No	444(17.7)	37(17.7)	256(17.7)	115(18.0)	128(58.4)		
					36(16.4)		
Belief that student is obese						1364.5	0.000
Yes	806(31.9)	8(3.8)	276(19.1)	339(53.1)	178(81.3)		
No	1708(68.1)	1708(68.1)	1167(80.9)	299(46.9)	41(18.7)		

Table 4 presents the assessment of students responses regarding some questions. It was found that 98.3% agreed to the opinion that exercise was essential for health, and 94.5% agreed that obesity was dangerous for health, and there was no statistical significant difference between various BMI categories for the above two questions,(P-value > 0.05). However, 43.2% believed that fast food contains a lot of bad lipid with no significant difference between various BMI categories.

Table 4- Assessment of knowledge of obesity.

Item	Total n (%)	Under weight n (%)	Normal weight n (%)	Over weight n (%)	Obese n (%)	χ^2	P-value
Exercise is essential for health	2467(98.3)	206(98.6)	1413(97.9)	632(99.1)	216(98.6)	3.719	0.293
Yes	42(1.7)	3(1.4)	30(2.1)	6(0.9)	3(1.4)		
No							
Fast food contain a lot of bad lipid	1083(43.2)	78(37.3)	622(43.1)	294(46.1)	89(43.2)	5.694	0.128
Yes	1426(56.8)	131(62.7)	821(56.9)	344(53.9)	30(56.8)		
No							
Obesity is dangerous for health Yes	2372(94.5)	193(92.3)	1360(94.2)	610(95.6)	209(95.4)	3.947	0.267
	137(5.5)	16(7.7)	83(5.8)	28(4.4)	10(4.0)		
No							

Discussion:

The results of this study provide evidence of a high prevalence of overweigh and obesity among the students (34.1%). The high prevalence of obesity among students reflects the profound changes in social and behavioral patterns of the community over the last 20 years. In recent years, with the huge advances in technology and improved living standards, the overall energy intake has increased due to over nutrition. If this trend continues, it can be alarming to general health status. The important risk factors for obesity observed in this study were family history, eating whilst watching television, lack of physical, activity and high calorie diet. Eating in front of the television or computer was reported as one of biggest problems of overeating because viewers are too distracted to notice when they are full, and the risk of obesity is correlated with amount of television watched [15]. The television commercials promote new high calorie food brands and soft drinks, intended to influence viewers. Eating habits shows excessive ingestion of soft drinks and fast food. We need to consider those whenever a dietary education program is established. The majority of students do not measure their weight regularly and there is no difference between the various BMI classifications .It is noted that 53.1% and 81.3% of overweight and obese participants did think they were overweight or obese respectively. Apparently, the majority of obese know this because of their outward appearance. It is noted that 89% of the obese plane to lose weight in different ways, including sports. We also noted that the majority of students know the importance of sports and the risks of obesity on human health. In addition, more than half of them are ignorant of the fact that fast food contains harmful fats. Therefore, we recommended that there be an integrated program to raise awareness of the dangers of obesity and how to avoid it . However, it is recommended for treatment of obesity to start early, involve the family and schools. Parenting skills are the foundation for successful intervention that put in place gradual, targeted increases in activity and targeted reductions in high fat, high-calorie foods. Lack of nutritional education and reduced physical activity, might lead to weight gain. Improving students knowledge about nutrition and healthy eating habits may promote healthy body weight management and reduce the prevalence of overweight and obesity. A recent study conducted among students reported that increased knowledge of dietary guidance appeared to be positively related to healthier eating patterns , thus the better eaters had a higher level of knowledge about nutrition [16].

Limitations:

The findings of this study are limited to the sample of students from just one district (Benghazi) which May not be representative of all students in Libya. However, baseline information about weight status and epidemiological factors related to obesity among a sample of secondary school female students was certainly obtained from the present study.

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