Journal of Home Economics

Volume 26, Number (3), 2016

http://homeEcon.menofia.edu.eg

Journal of Home Economics

ISSN 1110-2578

Prevalence of ObesityAmong University Female Students :Season of Comparative Study

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Abstract

This study was conducted to assess a comparisonof the prevalence of obesity among Damiettauniversity female students, in the years 2007 and 2016. Heights, weight, body mass index (BMI) were measured for211and 174 students in 2007 and 2016, respectively. Study aged ranged18-23 years, filled questionnaires to evaluate theirknowledgeaboutcausesof overweight and obesity, Twentyfourhours recall method was used to recognize the calories intake. Obtained results showed that ratio of 13.7% and 13.8%, 43.6% and 33.3%, 31.3% and 36.2%, 11.4% and 16.7% of girls wereunderweight,normal weight,overweight, and obesity in the years 2007 and 2016 respectively.This proved that in 2016 the prevalence of overweight and obesity is higher than in 2007. In contrast, ratio of 23.9% and 21.7%, 76.1% and 78.3%of girls were beginningoverweight and obesity in childhood and after maturityrespectively.Moreover,ratio of 19.4%,and 56.3%, 49.8%, and 30.5%, 30.8%, and 13.2% of girls intake<1500, 1500-2000, and >2000 caloriesin the years 2007 and 2016 respectively.

Key Words:Obesity in university students, Questionnaires, Calorie intake, BMI.

Introduction

Obesity and overweight are considered a public health problem due to their high prevalence in different age groups, mainly in young adults **(Barquera and Tolentino; 2010)**It is linked to 60% of deaths due to

noncommunicable diseases **(Soca, and Alvett; 2009)**Figures reported in 2010 by the World Health Organization , indicate that worldwide, approximately one billion people over the age of 20 are overweight and that more than 300 million are obese. Additionally, it is estimated that in 2015, there will be approximately 1.5 billion overweight and 700 million obese adults **(WHO; 2010)**

Some of the population groups vulnerable to the problems of obesity and overweight are university students due to many factors including increasing energy needs by age, increasing consumption of high calorie and fat diet, decreasing physical activity, and emotional changes (mainly anxiety and depression) that stimulate food intake**(Carretero *et al*., 2010)**

One of the major challenges facing developed countries as well as developping countries is the double burden of emotional and weight problems. Young adults between 18 and 25 years of age, especially university students constitute a particularly vulnerable group with high prevalence rates of both problems **(Obermeyer *et al*., 2015 and Poobalan., 2016).**

Adolescent obesity in particular has shown to be a growing problem. For example, in the United States, obesity in 12–19 years old has increased dramatically in the past decades with about 35 % being overweight or obese in 2011 **(Ogden *et al*., 2014)**.

The phenomenon of weight gain in the first year of university has often been referred as "Freshman 15". This is in reference to the claim that on average, students reported gaining 15 lb (6.8 kg) in their first year of university **(Brown., 2008)**.

In 2011-2012, the prevalence of obesity in the United States was 16.9% in youth and 34.9% in adults. The overall prevalence of obesity among youth remained unchanged compared with that in 2009-2010 (16.9%), and there was no significant change since 2003-2004 **(Ogden *et al*., 2012)**

In 2014, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 600 million were obese, 39% of adults aged 18 years and over were overweight in 2014, and 13% were obese.Most of the world's population live in countries where overweight and obesity kills more people than underweight**(WHO:2016).**

A high prevalence of overweight status among African adolescents, surpassing the 11% overweight projection for the year 2025. The prevalence of underweight is comparable to findings of a previous study **(de Onis *et al*., 2004 and Black *et al*., 2013).**

females had a higher overweight and obese prevalence than males while the reverse was true for underweight. This is different however to findings of previous studies in high income countries **(Yngve *et al*., 2008 and Peltzer., 2013)**for example inKingdom of Saudi Arabia studies on college students revealed higher rates of obesity in males than in females **(Huang *et al*., 2003 andYahia *et al*., 2008)**and documented that 30.6% of female college students were either overweight or obese **(Rasheed *et al*., 1994)..**

In Egypt more than one-quarter of the students from Alexandria University were overweight28.9%, 6.6% were obese and 6.1% were underweight **(Heba *et al*., 2016).**

This work aimed tocompare the prevalence of obesity among university female studentsin Damietta University.

Subjects and Methods

A random sample of 211and 174 university female students in the years 2007 and 2016 respectively, aged 18-23 years, were selected from Damietta University toapply some anthropometric measurements.

The study contains threequestionnaires; as follows:1)name, age, anthropometric measurements: height (cm), weight (k.g), and BMI**(Qiang et al., 2014)**

as follows: 2)measuring knowledgment and reason about obesity**.**

(Mehelba, 1999)

and: 3)Twenty four hour recall method **(Abd El-Salam, 1998)**

Height and weight were measured to the nearest 0.1 cm and 0.1 kg, respectively.

BMI as an indicator of obesity was calculated according to the following form

BMI = Weight (Kg) / Height (m^2)

The grades of obesity utilizing the BMI are described as follows:

Under weight	<20
Normal weight	20 to 25
Overweight	25 to 30
Obesity	>30

Results and Discussion

Table (1) and Figure(1) showed the comparison of female students by their grade of BMIin 2007 and 2016. It is noted that 29(13.7%) in 2007 in compare with 24 (13.9%)in 2016 of female students were underweight, 92(43.6%) in 2007 in compare with 58 (33.3%)in 2016 of female students were normal weight, 66(31.3%) in 2007 in compare with63 (36.2%)in 2016 of female students were overweight, and 24(11.4%) in 2007 in compare with 29 (16.7%)in 2016 of female students wereobese.

These results showed that overweight and obesity in 2016 is more than in 2007, while normal weight in 2007 more than in 2016.

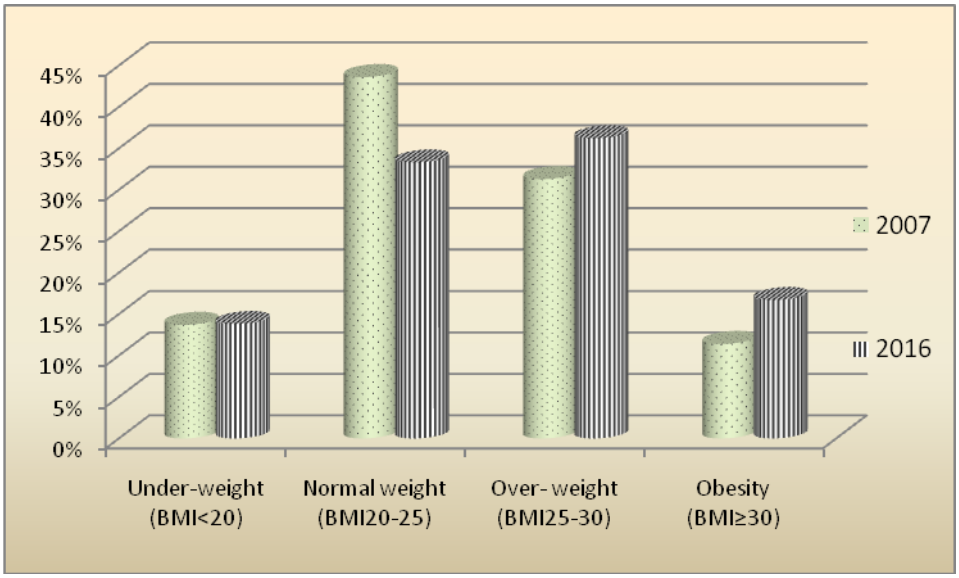
Total of overweight and obesity in 2016 were 92(52.9%), this mean more than half of students were overweight and obesity, but they were 90 (42.7%) in 2007 of students were overweight and obesity.

These findings in similar with **Heba*et al.*, (2016)**who study,found that more than one-quarter of the students were overweight 28.9%, while 6.6% were obese and 6.1% were underweight in Alexandria University 2012-2013.

Alsothese findings wereharmonized with **Abd E-Salam(1998)**who found that 48.5% were in normal weight and 16.5% were underweight but not agree with this study in overweight were 18.5%. In the other hand obese grade I andgrade II were 16.5% and no one were in gradeIII obesity.

Table (1): Frequency and distribution of students by grade of body mass indexin 2007 and 2016

Under-weight (BMI<20)				**Normal weight (BMI20-25)**				**Over- weight (BMI25-30)**				**Obesity (BMI≥30)**			
2007		2016		2007		2016		2007		2016		2007		2016	
No	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**
29	**13.7**	**24**	**13.8**	**92**	**43.6**	**58**	**33.3**	**66**	**31.3**	**63**	**36.2**	**24**	**11.4**	**29**	**16.7**



Figure(1): Frequency and distribution of students by grade of body mass indexin 2007 and 2016

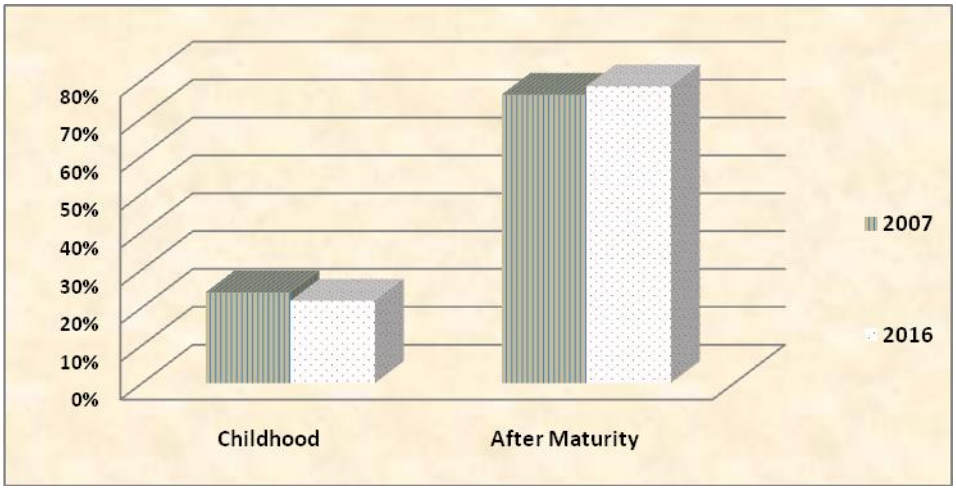
Table(2) and Figure(2) showed distribution of students according to the period of the beginningoverweight and obesity problem in 2007 and 2016

It is noted that 21(23.9%) in 2007 in compare with 20 (21.7%) in 2016 of female students beganoverweight or obesity in childhood, 67(76.1%) in 2007 in compare with72 (78.3%)in 2016 of female studentsbeganoverweight or obesity after maturity.These results showed that most of female students began overweight and obesity after maturity both in 2007 and in 2016.

These results are within the range of results obtained by **Mehliba .,(1999)** who found that most samples started obesity problem after maturity 64% and in Childhood36%.

Table (2): Distribution of students according to the period of beginning obesity.

Stage			Total
Childhood	**2007**	**N**	21
		%	23.9
	2016	**N**	20
		%	21.7
After Maturity	**2007**	**N**	67
		%	76.1
	2016	**N**	72
		%	78.3

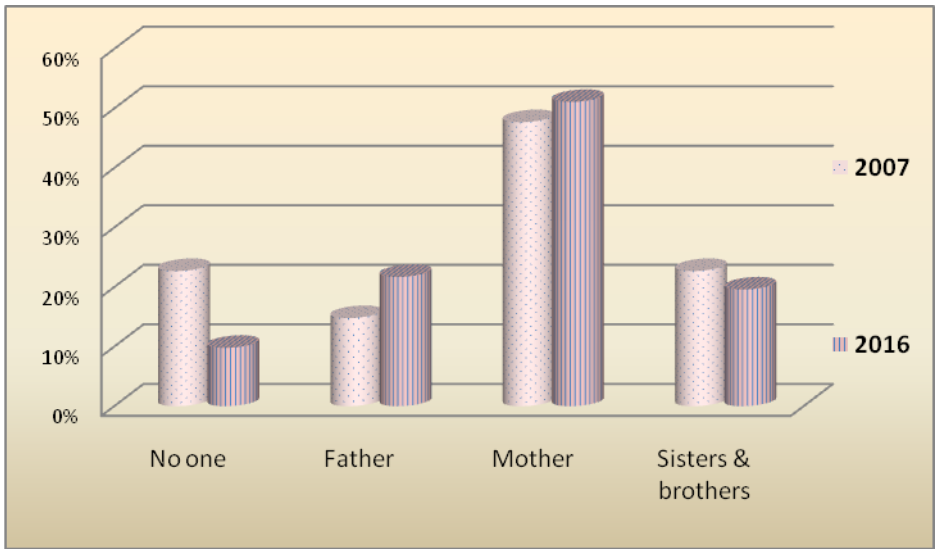


Figure(2): Distribution of students according to the period of beginning of obesity problem.

Table(3) and Figure(3) showed distribution of students according toratio of obese in family membersin 2007 and 2016. It is noted that in 2007 and 2016 obese motherswere 42(47.7%), and 47 (51.1%) respectively.While in 2007, the next percentage 20 (22.7%) of students whodidn't have cases ofobesity wereequal to those whom brothers and sisters were obese, In 2016 the next percentage was 20 (21.7%) of students their fathers were obese.

Table (3):**Distribution of students according to**ratio **of obese family members.**

Obesefamily member			Total
Non	**2007**	**N**	20
		%	22.7
	2016	**N**	9
		%	9.8
Father	**2007**	**N**	13
		%	14.8
	2016	**N**	20
		%	21.7
Mother	**2007**	**N**	42
		%	47.7
	2016	**N**	47
		%	51.1
Sisters and brothers	**2007**	**N**	20
		%	22.7
	2016	**N**	18
		%	19.6

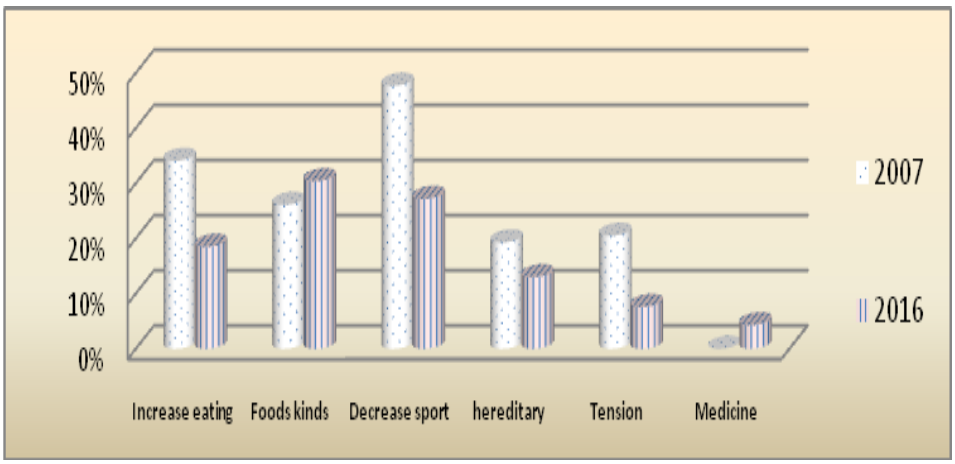


Figure(3): Distribution of students according toratio of obese in family members.

Table(4) and Figure(4) showed distribution of students according to their opinion about the causes of overweight andobesityin 2007 and 2016
In 2007, the opinion of 42 students (47.7%) about the causes of overweight and obesity because of decreasing activities, then the secondfactor was increased eating 30 students(34.1%), whilein 2016 the first reason of being obesity wasfood kinds28 students (30.4%), the second factor was decrease activities 25 students (27.2%).

Table (4):Distribution of students according to their opinion about the causes of overweight and obesity.

Student opinion			Total
Increased eating	2007	N	30
		%	34.1
	2016	N	16
		%	18.5
Foods kinds	2007	N	23
		%	26.1
	2016	N	28
		%	30.4
Decreasedactivities	2007	N	42
		%	47.7
	2016	N	25
		%	27.2
Hereditary	2007	N	17
		%	19.3
	2016	N	12
		%	13
Tension	2007	N	18
		%	20.5
	2016	N	7
		%	7.6
Medicine	2007	N	0
		%	0
	2016	N	4
		%	4.3



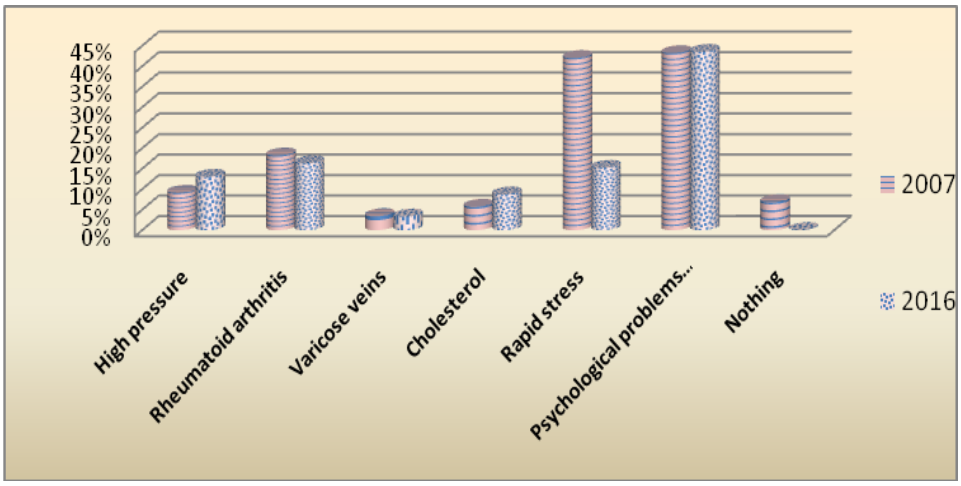
Figure(4): Distribution of students according to their opinion about causes of overweight and obesity.

Table (5) and Figure (5) showed distribution of students according to their health problemsbecause of overweight and obesity in 2007 and 2016 Similar findings aboutpsychological problems (tension andanxiety) in 2007 and 2016 were 38(43.2%),and 40 (43.5%) respectively.The secondproblemin 2007 was rapid stress 37 (42%), and rheumatoid arthritis 15 (16.3%) in 2016.

Table (6):Distribution of students according to their health problem because of **overweight andobesity**

Health problems			**Total**
High pressure	**2007**	**N**	**8**
		%	**9.1**
	2016	**N**	**12**
		%	**13**
Rheumatoid arthritis	**2007**	**N**	**16**
		%	**18.2**
	2016	**N**	**15**
		%	**16.3**
Varicose veins	**2007**	**N**	**3**
		%	**3.4**
	2016	**N**	**3**
		%	**3.3**
Cholesterol	**2007**	**N**	**5**
		%	**5.7**
	2016	**N**	**8**
		%	**8.7**

Rapid stress	**2007**	**N**	**37**
		%	**42**
	2016	**N**	**14**
		%	**15.2**
Psychological problems (tension andanxiety)	**2007**	**N**	**38**
		%	**43.2**
	2016	**N**	**40**
		%	**43.5**
Nothing	**2007**	**N**	**6**
		%	**6.8**
	2016	**N**	**0**
		%	**0**

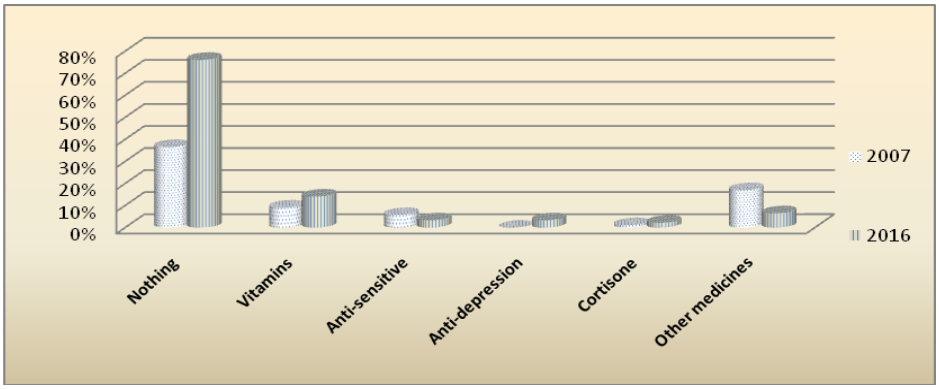


Figure(5): Distribution of students according to their health problemsbecause of overweight andobesity

Table (6) and Figure (6) showed the distribution of students according to used drugsin 2007 and 2016. It is noted that56 (36.6%) students didn't use drugs in 2007, in compare 70 (76.1%) in 2016.

Table (6):Distribution of students according to the drugs used.

Drugsused			Total
None	2007	N	56
		%	36.6
	2016	N	70
		%	76.1
Vitamins	2007	N	8
		%	9.1
	2016	N	13
		%	14.1
Anti-allergic	2007	N	5
		%	5.7
	2016	N	3
		%	3.3
Anti-depression	2007	N	0
		%	0
	2016	N	3
		%	3.3
Cortisone	2007	N	1
		%	1.1
	2016	N	2
		%	2.2
Other drugs	2007	N	15
		%	17
	2016	N	6
		%	6.5

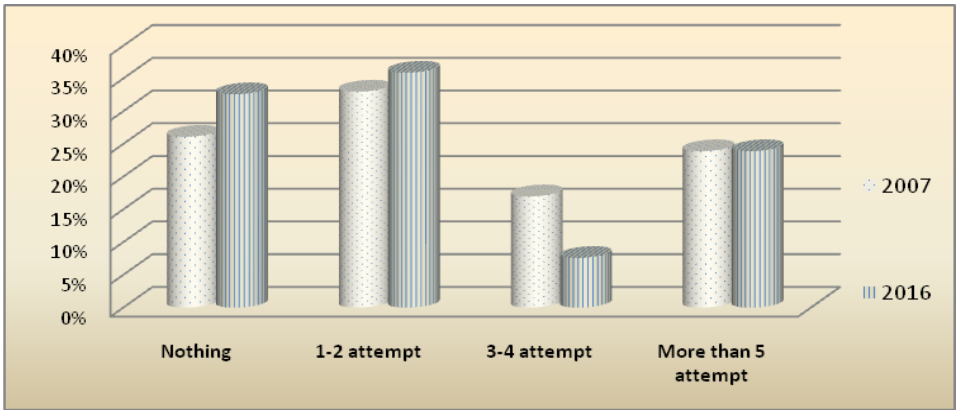


Figure(6): Distribution of students according to the drugs used

Table(7) and Figure(7) showed distribution of students according to their attemptstodecrease weight in 2007 and 2016. It was noted that there was from1-2 attempts in both of 2007 and 2016 to decrease weight,29 (33%), and 33 (35.9%) respectively,The second percentage either in 2007 or in 2016 didn't have any attempts to decrease weight, 23 (26.1%), and 30 (32.6%) respectively

Table (7):Distribution of students according to attemptsto decrease weight.

Attemptsnumber			**Total**
None	2007	N	23
		%	26.1
	2016	N	30
		%	32.6
1-2 attempts	2007	N	29
		%	33
	2016	N	33
		%	35.9
3-4 attempts	2007	N	15
		%	17
	2016	N	7
		%	7.6
More than 5 attempts	2007	N	21
		%	23.9
	2016	N	22
		%	23.9



Figure(7): Distribution of students according to attemptsto decrease weight.

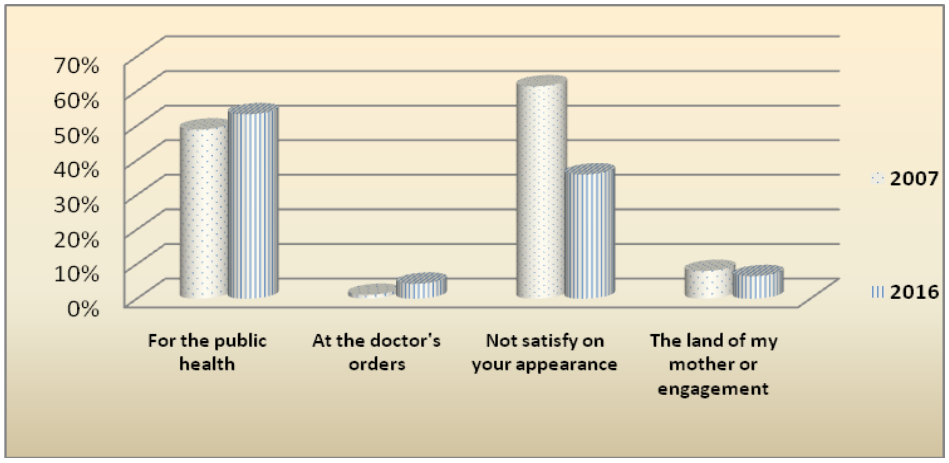
Table(8) and Figure(8) showed the distribution of students according to their trendto decreasetheir weightin 2007 and 2016

It is noted that in 2007,54 (61.4%) of studentsdecreased their weight because they weren't satisfiedabout their appearance, and the secondstudents 43 (48.9%)wasfor their public health, while in 2016 ,49 (53.3%)of studentsdecreased their weight for their public health, and the second 33 (35.9%)because they weren't satisfied about their appearance.

The results in 2016 agree with**Mehliba .,(1999)**who showed that thetrend to decrease weight was for the women public health (57%) and the second trend because they werenot satisfied abouttheir appearance(40%).

Table (8):Distribution of students according to their trend to decrease weight

The trendto decrease weight			Total
For public health	2007	N	43
		%	48.9
	2016	N	49
		%	53.3
Due to doctor's orders	2007	N	1
		%	1.1
	2016	N	4
		%	4.3
Not satisfied ofmy appearance	2007	N	54
		%	61.4
	2016	N	33
		%	35.9
Because of my mother or engagement	2007	N	7
		%	8
	2016	N	6
		%	6.5

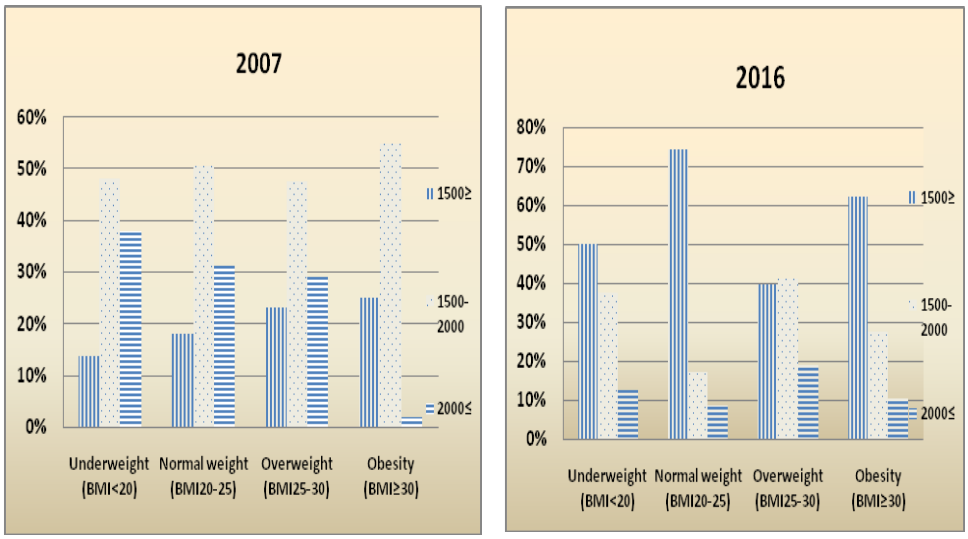


Figure(8): Distribution of students according to their trend to decrease weight

Table(9)and Figure(9)showed distribution of students by their caloric intake per day in 2007 and 2016, It is noted that in 2007 the highest percentage of student whom used1500-2000Kcal \day (49.8%), in underweight, normal weight, overweight and obesity they were14(48.3%), 47(50.5%), 31(47.7%) and 13(55%)respectively, whilein 2016the highest percentage of student whom used **<1500**Kcal \day (56.3%), in underweight, normal weight, and obesity 12(50%), 43(74.2%), and 18(62.1%)respectively,

Table (9):**Frequency and distribution of students by theircaloricintake per day.**

Energy expenditure Per day	Underweight (BMI<20)				Normal weight (BMI20-25)				Overweight (BMI25-30)				Obesity (BMI≥30)				Total	
	2007		2016		2007		2016		2007		2016		2007		2016		2007	2016
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	%	%
<1500	4	13.8	12	50	17	18.2	43	74.2	15	23.1	25	39.7	5	25	18	62.1	19.4	56.3
1500-2000	14	48.3	9	37.5	47	50.5	10	17.2	31	47.7	26	41.3	13	55	8	27.6	49.8	30.5
>2000	11	37.9	3	12.5	29	31.2	5	8.6	19	29.2	12	19	6	2	3	10.3	30.8	13.2
Total	29	100	24	100	93	100	58	100	65	100	63	100	24	100	29	100	100	100



Figure(9): Frequency and distribution of students by their energy intake per day.

Conclusion

In conclusion, the results showed that in 2016 the prevalence of overweight and obesity is higher than in 2007. However,most female studentsbeginningoverweight and obesity after maturity.

Recommendation

1) Other studies are needed to determine the reasons for prevalence of obesity.
2)Other studies are needed for all age groups.
3)Weight-loss and weight-maintenance therapies should include a reduced-calorie diet, increased physical activity, and behavioral therapy.

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إنتشارالسمنة بين طالبات الجامعة: دراسة مقارنة موسمية

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الملخص العربى:

اجريت هذه الدراسه للمقارنة بين اتجاهات السمنة بين طالبات الجامعة في العامين ٢٠٠٧و ٢٠١٦بين فتيات جامعة دمياط. فقد تم قياس كلا من الطول والوزن والتعرف على كتلة الجسم, لعدد ٢١١و ١٧٤ فتاة جامعية في العامين ٢٠٠٧ و ٢٠١٦ على التوالي,في المرحلة العمرية من ١٨-٢٣ سنة. كما تم عمل استبيان للتعرف على معلومات وأسباب زيادة الوزن والسمنة بالنسبة للفتيات واسترجاع ٢٤ ساعة للتعرف على السعرات الحرارية المتناولة وأظهرت النتائج أن: ١٣,٧%, ١٣,٨% من الفتياتوزنهن أقل من الطبيعي, ٤٣,٦%, ٣٣,٣% وزنهن طبيعي, ٣١,٣%, ٣٦,٢ يعانون من زيادة الوزن, ١١,٤%, ١٦,٧% يعانون من السمنةفي العامين ٢٠٠٧ و٢٠١٦ على التوالي.وهذا يثبت أن زيادة الوزن والسمنة كانت في العام ٢٠١٦ أعلى من عام ٢٠٠٧.في المقابل ان ٢٣,٩% , ٢١,٧% و ٧٦,١%, ٧٨,٣% من الفتيات اصيبوا بزيادة الوزن والسمنة في طفولتهن وبعد البلوغفي العامين ٢٠٠٧ و٢٠١٦ على التوالي .علاوه على ذلك ١٩,٤%,٥٦,٣% يتناولن<١٥٠٠ كالوري في اليوم , ٣٠,٨%,١٩,٤%يتناولن ١٥٠٠ - ٢٠٠٠كالوري في اليوم ٣٠,٨%, ١٣,٢% يتناولن>٢٠٠٠ كالوري في اليومفي العامين ٢٠٠٧ و٢٠١٦ على التوالي .