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The Prevalence Of Overweight , Obesity and the Level of Physical Activity Among Iranian Female College Students

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ABSTRACT: Background and aim: nowadays obesity is identified as a public health problem and it is also considered a risk factor in many chronic diseases such as cardiovascular diseases, high blood lipids, diabetics and cancer. Material and methods: the study was a descriptive one conducted on 426 female students aged 18 to 25 at Guilan University. In this study simple random sampling was used. Students' weight, height, waist circumference(WC), and hip circumference were measured using standard techniques. Having calculated Body Mass Index (BMI), overweight was defined as BMI between 25-29/9 (kg/m^2) ,obesity as BMI greater than or equal to 30 (kg/m^2) and abdominal obesity as waist-hip ratio (WHR) equal or greater than 85%. In order to identify samples level of physical activity, Baeck's physical activity questionnaire was used. Result: average age, BMI, and waist-hip ratio in samples were equal to 22.4 ± 2.3 years,21/9 ± 3/6(kg/m^2) and 0.74±0.05 respectively and the prevalence of overweight, obesity and abdominal obesity was 11.9%, 3.1% and 6.4%, respectively. The samples level of physical activity in three levels (light, moderate, heavy) were 67.1%, 13.1% and 19.8% respectively. The relationship between BMI and the level of physical activity was significant. Low physical activity had an independent role in predicting overweight and obesity (OR=1.7 with 15% CI: 1.1-2.5 and P=0.03). Conclusion: considering the rate of 15%, BMI greater than (kg/m^2) and proving the independent role of physical activity in predicting overweight and obesity, the programs regarding the prevalence of regular physical activity and creating necessary facilities for continuing them in women's lifelong in society are recommended.

***Keywords*:** Obesity, Overweight, Body mass index, Level of physical activity, college students.

INTRODUCTION

Nowadays overweight and obesity, the big problems in developed countries, have become an important problem in developing countries (20). Scientific and technological advancements have created a mechanical life and the availability of different and diverse tools and devices have caused some changes in people's lifestyle such as job and activity, sleep and rest, diet, consumption pattern and energy consumption (14 and 25). Finding the reasons of obesity is not easy and clear, obesity can be caused by many factors such as diet, genetics, the level of physical activity, cultural, social, economical, mental matters, and factors concerning inner exuding glands (endocrine) (20). On the other hand, overweight and obesity make people subject to suffering from different diseases such as high blood pressure (23), diabetics (14 and 23), an increase in the level of cholesterol and triglyceride in blood (14), cardiovascular diseases (14 and 23) and some cancers (23). In a national study conducted on 11326 Canadians who were over 25 years old , Heather . concluded that obesity was an important risk factor in mortality (23). In many studies a positive relationship between abdominal obesity and metabolic syndrome has been confirmed (13). In a study, Kuller . (2012) concluded that improvement in lifestyle by bringing about changes in diet in order for losing weight as well as increasing the level of physical activity, in women under study, leaded to a decrease in the level of triglyceride and low-density lipoprotein (LDL) and consequently leaded to a decrease in the probability of cardiovascular diseases (18). Physical activity has many positive effects on many risk factors in cardiovascular diseases such as blood pressure, obesity, levels of blood sugar and harmful blood lipids, stress, anxiety (24).

Many studies in the United States have indicated that the prevalence of overweight and obesity is increasing and it is estimated that up to 2030, 86.3 percent of adults will suffer from overweight and 51.1 percent will suffer from obesity (12). According to the statistics presented by the Health and Social Care Information Center in England in 2012, the prevalence of overweight in women over 16 was 32% and the prevalence of obesity was 26%, and 46% of women had waist circumference more than 88 centimeters (WC ≥ 88 cm) (26). Studying 484 Kuwaiti students aged 17 to 24, Almajed et al. (2010) calculated the prevalence of overweight, obesity and abdominal obesity equal to 30.6%, 19.8%, 41.8% respectively(8). Iran, like many developing countries, is experiencing global pandemic obesity and its effects (10). Some epidemiologic studies indicate that the prevalence of overweight and obesity and metabolic syndrome in Iran is equal or more than Europe and the United States (19). According to studies regarding blood sugar and blood lipids in Tehran, the prevalence of obesity (BMI≥30) in Tehranian women over 20 from 1999 to 2001, 2002 to 2005, 2006 to 2008 was 5.31%, 7.37%, 6.38% respectively and the prevalence of abdominal obesity (WC ≥ 80cm) was estimated 7.76%, 8.83%, and 6.83% respectively (1) in addition according to a report by World Health Organization, the prevalence of obesity in Iranian women and men over 20 in 2008 was 29.5% and 13.6% respectively (28). Masoumeh Tohidi et al. reported that the prevalence of overweight and obesity in Shirazi women aged 19 to 29 was 25% and 10% respectively (2). According to a study conducted on 1036 Guilani girls (ages 14 to 17) in 2006 by Mohsen Maddah, the prevalence of overweight and obesity was estimated 18.6 and 5.2 respectively (9). Likewise, the study of Homeira Nasiri in 2005 can be referred, based on this study the prevalence of overweight, obesity and abdominal obesity in young women (ages 18 to 25) in Tonkabon was figured out 21.2, 1.7 and 29.4 percent respectively (7). This number in Yazdi women aged 18 to 25 was 6.9, 6.9 and 18.4 percent (4). Most of the studies have dealt with adults and few studies have been done on young people as well as university students. Among the studies conducted on university students is Zahra Motasham's study. In this cross-sectional study that was conducted on 282 female students studying medicine in Guilan University (18 to 31 years old), the prevalence of overweight, obesity and abdominal obesity (WHR>0.8) was 12.7%, 0.4% and 14.8%. respectively. Fatemeh Rahmati et al. (1383) investigated the prevalence of overweight and obesity in 2360 female students at Tehran University and after stratifying the samples into different group ages, they reported that the prevalence of overweight, obesity in the age group of 20 to 29 was 12.4 and 2.2 respectively (3). Another study was carried out on female students at Shahid Beheshti University of Tehran with an average age of 260 ± 31 months, and the prevalence of overweight and obesity (BMI≥25) and abdominal obesity (WHR≥0.8) was 9.3 and 40.5 respectively (5). Moreover, according to a study regarding blood sugar and lipids of Tehran (2002-2004), the prevalence of inactivity in Tehranian men and women over 20 was 69.8 and 50.6 percent of men and 43.5 percent of women had physical activity less than 30 minutes each weak in their leisure time (21).

High prevalence of overweight and obesity in women as compared with men, in the world (16) and in Iran (15) and specially in middle age and the menopause (22), has made women more vulnerable to dangers and diseases arising from overweight; therefore, the most logical and the cheapest way is prevention of obesity, improvement of women's lifestyle, in early ages. As there is little information available regarding Iranian youths and specially university students' prevalence of obesity, abdominal obesity and physical activity, this study aiming at identifying the prevalence of overweight, obesity, and abdominal obesity and the level of physical activity was done on female students (ages 18 to 25) at Guilan University in 2012.

MATERIALS AND METHODS

The present study is a descriptive-analytic and cross-sectional one. This study was conducted in the spring of 2012 on 426 female students (ages 18 to 25) at Guilan University, who were selected randomly. After oral presentation of the goal of carrying out the project, the demographic information was gathered by a questionnaire. Then, test-takers filled out Baeck's physical activity questionnaire in order to measure their level of physical activity. The students' weight, while wearing clothes, was measured by Seca scale made in Germany with the accuracy of 0.1 kilogram and the students' height was measured by a tape measure which was installed on the wall vertically and with the accuracy of 0.5 cm.

BMI in participants was calculated by dividing weight (kg) by squared height (meter). In order to evaluate the condition of BMI, the classification of World Health Organization was used which follows:

classification	$BMI\ (kg/m^2)$
underweight	<18.5
desirable weight	18.5 -<25
overweight	25 -<30
obese	30 ≤

The waist was defined as the midpoint between the lowest rib and the upper margin of the iliac crest.The hips were measured at the widest circumference around the buttocks below the iliac crest. waist-hip ratio (WHR) was calculated by dividing the waist circumference (cm) by hip circumference (cm) (30). waist circumference equal or greater than 85(cm) and waist-hip ratio(WHR) equal or greater than 0.85, was considered as abdominal obesity (30).

Statistical calculations was done using SPSS software version 15 and by a Chi-squared test. The level of chance with 95% confidence and confidence interval (CI) for variables that had significant relationship with BMI were calculated and $p<0.05$ was set for significance level.

RESULTS AND DISCUSSION

Result

The average age, weight, waist-hip ratio (WHR) and BMI of participants were 22.4±2.3, 56.9±9.7, 0.74±0.05, 21.9±3.6, respectively.

Table 1 shows the information related to anthropometry of 426 participants.

Table 1. Female students' personal characteristics at Guilan University (ages 18 to 25)

Variable	Minimum	Maximum	Average	Standard deviation
Age (year)	18	25	22.4	2.3
Weight (kg)	36.3	108.2	56.9	9.7
Height (cm)	146	190.5	161	5.8
WC (cm)	52.5	108.5	71.7	7.6
WHR	0.46	0.96	0.74	0.05
$BMI\ (\frac{kg}{m^2})$	15.2	43.1	21.9	3.6

10.1% of students were underweight, 74.9% students were desirable weight, 11.9% of students were overweight and 3.1% students were obese. The prevalence of abdominal obesity (WC ≥ 80 cm) was 13.3% and with the criterion of the ratio of belt size to hip size equal to or greater than 0.85 (WHR ≥ 0.85) , it was 6.4% (table 2).

Table 2. The prevalence of underweight, desirable weight, overweight, obesity, and abdominal obesity based on BMI, WC and WHR

Classification of the weight based on the different indices …	The prevalence of obesity	
$BMI\ (\frac{kg}{m^2})$	Underweight 18.5 >	10.1%
	Desirable weight 18.5-<25	74.9%
	Overweight 25-<30	11.9%
	Obesity 30 ≤	3.1%
WC(cm)	Abdominal obesity 80 ≤ WC	13.3%
WHR	Abdominal obesity 0.85≤WHR	6.4%

The prevalence of overweight and obesity (BMI ≥25) and abdominal obesity in different age ranges from 18 to 25 is presented in table 3 and figure 1.

Table 3. The prevalence of overweight, obesity, and abdominal obesity in different age ranges (ages 18 to 25)

Age group / Prevalence %	18	19	20	21	22	23	24	25
Overweight and obesity	15.02	12.04	21.81	9.8	14.81	8.01	9.7	8.8
Abdominal obesity	7.38	6.9	7.87	11.97	12.38	13.26	14.02	26.21

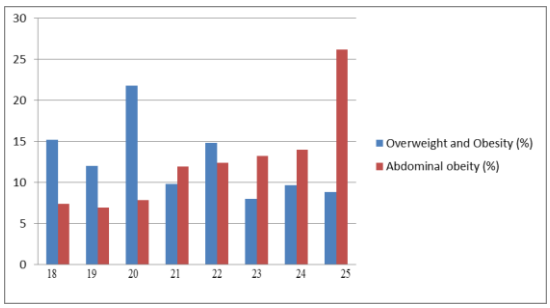

Figure 1. The prevalence of overweight, obesity, abdominal obesity in female students (aged 18 to 25) at Guilan University in 2012

The level of light, moderate and heavy physical activity was 6.2, 13.1, and 24.8, respectively. BMI had a negative significant relationship with the level of physical activity (P=0.03). As figure 2 shows, the ratio of chance for BMI is equal to or greater than 25 and light physical activity was 1.7 (OR=1.7, CI 95%= 1.13-2.56).

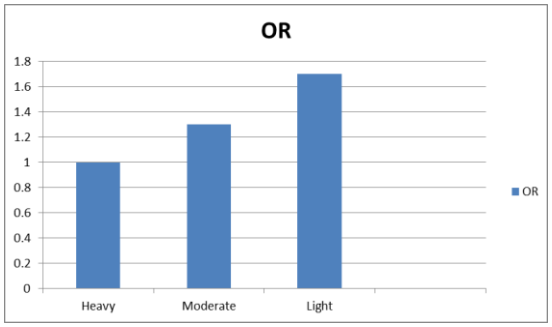

Figure 2. The ratio of chance overweight and obesity in female students' different levels of physical activity (aged 18 to 25) at Guilan University

Discussion and Conclusion

The results of this study indicates that about 75% of female university students under investigation had a desirable weight and the prevalence of overweight, obesity and abdominal obesity (WHR≥0.85) was 11.9, 3.1 and 6.4 percent, respectively. Similar results are reported about the prevalence of overweight and obesity (12.4 and 3.2 percent, respectively) in students at Tehran University (3). Furthermore, in female students at Guilan University of Medical Science (6) female students at the Shahid Beheshti University of Tehran (5) the calculated overweight prevalence was similar to the present study. In other studies such as a study that was conducted by Tohidi . on Shirazian women (aged 19 to 29) in 2009, the prevalence of overweight and obesity (25 and 10 percent, respectively) was more than the present study (2). Moreover, according to a study conducted by Majibiyan the prevalence of obesity and abdominal obesity in women (aged 20 to 24) in Yazd was reported more than the present study (4). The prevalence of overweight and abdominal obesity in young women (aged 18 to 25) in Tonkabon was also equal to 21.2 and 29.4, respectively (7). In a study conducted by Janghorbani . the prevalence of overweight, obesity and abdominal obesity in women (aged 15 to 24) was 19.3, 6.3 and 18.1, respectively and had a reversed and significant relationship (15).

It seems that the difference in sampling procedures, eating habits, the level of physical activity, cultural, economical and social differences among the participants, are the reasons for such differences in the results. A fifteen-percent prevalence of overweight and obesity in participants in this study, was similar to the quantities obtained from a study conducted on Greek's women with the same age group. However, Greeks' abdominal obesity was reported more than the present study (11), which could be because of the different criteria in measuring waist circumference for identifying the abdominal obesity. Moreover, it is possible to refer to the high prevalence of overweight, obesity and abdominal obesity in Kuwaiti university students (aged 17 to 24), which was done by Almajed . in 2010 (8). As it was mentioned, difference in eating habits, the level of physical activity and cultural differences can cause high prevalence of obesity in Kuwait.

One of the reasons of low prevalence of overweight and obesity in the present study is an increase in participants' knowledge and attitude toward how to control the weight and importance of controlling weight. Another important reason is the 37.9-percent average and intense physical activity of participants. A significant relationship between

low physical activity and the prevalence of obesity has been confirmed in many articles (15 , 28 , 17 and 29). Finally, it can be concluded that the prevalence of overweight and obesity in female students at Guilan University was not high and that with implementing the policies of promoting the regular physical activity and with increasing people's knowledge and attitude toward the importance of physical activity and weight-control, it is possible to play an effective role in controlling the weight of some women.

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