

Overweight and Obesity among Yazd University Students

Seyyed Jalil Mirmohammadi¹, Mehrdad Mostaghaci¹, Amir Houshang Mehrparvar^{1*},
Mohammad Hossein Davari¹, Elham Naghshineh²

1- Occupational Medicine Department, Shahid Sadoughi University of Medical Sciences-Yazd, Iran.

2- Obstetrics/Gynecology Department, Isfahan University of Medical Sciences-Isfahan, Iran.

***Correspondence:**

Amir Houshang Mehrparvar, Shahid Rahnamoun hospital, Farrokhi Ave, Yazd, Iran.

Tel: (98) 351 622 9196

Email: ahmehrparvar@gmail.com

Received: 21 November 2013

Accepted: 10 February 2014

Published in March 2014

Abstract:

Objective: Obesity is a major health problem. Overweight and obesity have been identified as one of the 10 leading health indicators. This study was designed to evaluate the Body Mass Index in Iranian university student sample.

Materials and Methods: This was a cross-sectional study on 911 Iranian university students aged 18-25 years who were selected by simple random sampling. Weight, height and BMI were measured for all subjects. Body mass index was calculated as weight divided by the square of height. The measurements were compared between two genders. Subjects were classified according to their BMI into underweight, normal, overweight, obese, and extreme obese. Data was analyzed by SPSS (Ver. 19).

Results: A total of 911 Iranian university students (475 males and 436 females), 18-25 years old entered the study. Most subjects (639 persons) had normal weight. Five percent were underweight, 20.9% overweight and 3.8% obese and only one subject suffered from morbid obesity.

Conclusion: In this study the prevalence of abnormal weight in university students was lower than general population, and this prevalence was higher among males than females.

Keywords: Obesity, Overweight, University students

Introduction

Obesity is now considered as a major health problem all over the world (1,2). It may cause or aggravate health problems such as type 2 diabetes mellitus, coronary heart disease (CHD), hypertension, some forms of cancer (colon, rectum), obstructive sleep apnea and osteoarthritis (3-6). Overweight and obesity have been identified as one of the 10 leading health indicators (2). Obesity is a part of metabolic syndrome (7) and is replacing such health problems as infectious diseases (8).

The prevalence of obesity was estimated about 30.4% in the US adult population (9), and is increased continuously (10). It may affect life expectancy (3), although there is controversy about the effect of overweight and obesity on mortality.

Gender, socioeconomic status and geographical area may affect the obesity prevalence, so as it is more common in females than males (9,11). Heredity and life style are also concerned as a predisposing factor of obesity (12).

One of the main measures of overweight and obesity is body mass index (BMI) which is graded regardless of age (13-14,3), although some authors think it is not accurate for older individuals (15). It helps identify individuals at risk of morbidity and mortality (3).

There are different factors that may affect weight, height and BMI, like: geographic location, race, ethnicity, and nutrition. Mirmohammadi et al. in their study on a large sample of Iranian children showed the effect of ethnicity on BMI (16). Mirmohammadi et al. have measured some static anthropometric dimensions of a heterogeneous sample of Iranian university students in Yazd, Iran (17). Abbasszadeh et al. measured weight, height and BMI of a large sample of Iranian adult population in different age groups (18). We could find only one study conducted on university students. In this study Mortazavi et al. assessed BMI of about 700 Iranian university students in Zahedan (19).

University students in different provinces of Iran make a heterogeneous population regarding ethnicity because they come from different parts of Iran with different ethnicities. They contribute a large active and young population with such risk factors as sedentary and inadequate exercise. So, cardiovascular risk factors evaluation is important. The purpose of this study was to evaluate the frequency of different BMI grades in a population of Iranian university students.

Materials and Methods

In a cross-sectional study, 911 Iranian university students aged 18-25 years were assessed. The minimum sample size was measured to be 600 subjects (200 from each university). Our sample included 475 males and 436 females. Participants were selected by simple random sampling from students studying in Shahid Sadoughi University of Medical Sciences (394 persons), Yazd university (302 persons) and Azad university of Yazd (215 persons). Measurements were made from April 2010 till June 2010 in a 2

month period. An informed consent was obtained from each participant.

Then body weight, height and BMI were measured for all subjects. Weight was measured by a digital weight scale (Laica, Italy, accuracy: 100 grams). Height was measured by a digital stadiometer (BEFOUR, USA, HTR-990, accuracy: 0.003 cm). Body mass index (BMI) was calculated as weight in kilograms divided by the square of height in meters and was rounded to the nearest tenth (20). All measurements were conducted by trained technicians using similar techniques. Seven percent of measurements were rechecked by another observer. All subjects wore light clothing without shoes. The measurements were compared between two genders.

Subjects were classified according to their BMI into: <18.5: underweight, 18.5-24.99: normal, 25-29.99: overweight, 30-40: obese, and >40 extreme obese (9).

Data was analyzed by SPSS (Ver. 19). For assurance of normal distribution of data, we used Kolmogoroff-Smirnoff test. Independent samples t-test was used for comparison of means between two genders.

Results

A total of 911 Iranian university students (475 males and 436 females), 18-25 years old entered the study. Table 1 compares mean of age, height, weight and BMI between two genders. About 70% of the population had normal weight, 5% were underweight, 20.9% overweight, 3.8% obese and only one subject suffered from morbid obesity.

Figure 1 compares the frequency of different BMI categories (underweight, normal, overweight, obese and morbid obesity) between males and females. The female to male ratio for underweight, overweight, and obesity was 0.62, 0.96 and 0.32, respectively. Percentile values of weight, height and BMI are shown in table 2.

Table 1. Comparison of age, height, weight and BMI between two genders

Variable	Gender	Minimum	Maximum	Mean (SD)	SEM	P
Age (yr)	Female	18	25	21.61 (1.65)	0.11	<0.001
	Male	18	25	20.64 (2.88)	0.14	
Height (cm)	Female	142.50	182	159.49 (0.59)	0.02	<0.001
	Male	155	203	174.18 (0.63)	0.03	
Weight (kg)	Female	38	86	58.10 (8.63)	0.38	<0.001
	Male	45	130	70.13 (12.42)	0.62	
BMI (kg/m ²)	Female	16	35	22.83 (3.13)	0.13	0.216
	Male	16	40.64	23.13 (4.07)	0.20	

Table 2. Percentile values of weight, height and BMI

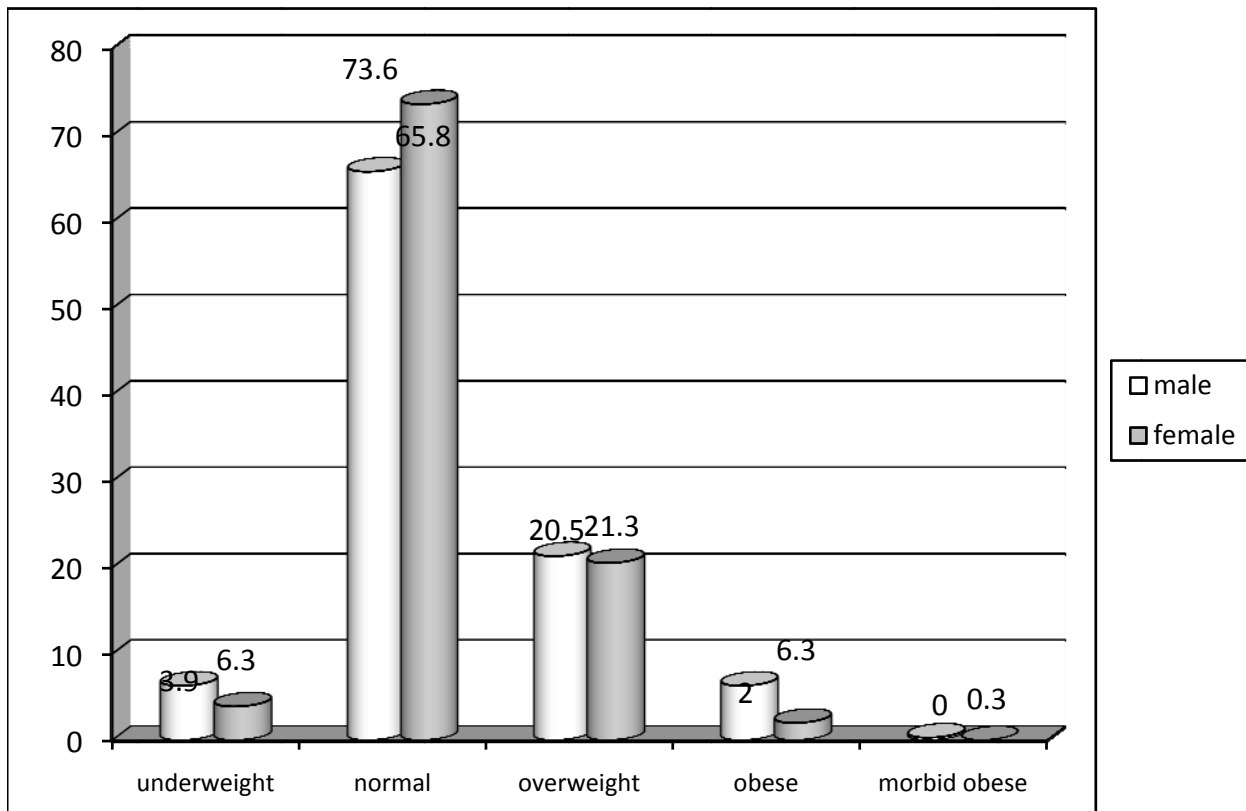
Variable	Gender	5th	50th	95th
Height (cm)	Male	163.52	174.50	183.50
	Female	149.30	159.50	169.70
Weight (kg)	Male	54	68.50	94
	Female	45	57	73
BMI (kg/m ²)	Male	17.57	22.45	30.66
	Female	18.14	22.54	28.44

higher than 25Kg/m² which was lower than the previous study in the Iranian population, although in that study conducted by Pishdad et al. (20) the samples had been selected from the general population (27-74 years), but our study was on university students (18-25 years).

In the US approximately 1/3 of adults and 1/6 of children are overweight. Frequency of overweight and obesity have been increased during recent years (21). Prevalence of overweight differs by race, sex, and geographic location. The prevalence of obesity and overweight in our study was higher than some Asian countries such as China and India (22), and lower than the prevalence in most

Discussion

Obesity is epidemic with serious social, economic, and health consequences (2). In this study, we found the frequency of underweight, overweight, obese and morbid obese cases in a population of Iranian university students. About 25% of the university students had BMI

**Figure 1. Frequency of different BMI categories between males and females**

other populations i.e. Italy, Netherlands, Saudi Arabia and Kuwait (23-26). Although it should be mentioned most aforementioned studies have been conducted in the general population, but our sample was selected from university students.

In most studies the prevalence of overweight in males was higher than females, which was according with our findings, although some studies indicated higher prevalence among females (22-23). Almost all previous studies have shown a higher prevalence of obesity among females than males, but in the current study males were more frequently obese than

females which can be explained, most of our female subjects were singles without the history of pregnancy and delivery.

We could find only one study on BMI among university students in our population which have been conducted on 720 Iranian university students (16).

Conclusion

The prevalence of abnormal BMI in university students was lower than general population. The abnormal BMI is more prevalent among males than females.

References

1. Aurelius G, Khanh NC, Truc DB, Ha TT, Lindgren G. Height, weight, and body mass index (BMI) of Vietnamese (Hanoi) school children aged 7-11 years related to parents' occupation and education. *J Trop Pediatr* 1996;42(1):21-6.
2. US Department of Health and Human Services. Healthy People 2010. US Government Printing Office: Washington, DC, 2000.
3. Kopelman P G. Obesity as a medical problem, *NATURE*, 2000;404(6778):635-43.
4. WCRF/AICR. Second expert report. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. World Cancer Research Fund/American Institute for Cancer Research, 2007, available at: <http://www.dietandcancerreport.org/p4ER>.
5. Hart CL, Hole DJ, Lawlor DA, Davey Smith G. How many cases of type 2 diabetes mellitus are due to being overweight in middle age? Evidence from the Midspan prospective cohort studies using mention of diabetes mellitus on hospital discharge or death records. *Diabet Med* 2007;24:73-80.
6. Groessl EJ, Kaplan RM, Barrett-Connor E, Ganiats TG. Body mass index and quality of well-being in a community of older adults. *Am J Prev Med* 2004;26:126-9.
7. Receiver-operated characteristics (ROCs) of the relationships between obesity Indices and multiple risk factors (MRFs) for atherosclerosis at different ages in men and women Ichiro Wakabayashi, Takashi Daimon, *Archives of Gerontology and Geriatrics*, 2012;55(1):96-100.
8. World Health Organization. Obesity: Preventing and Managing the Global Epidemic. WHO technical series no. 894. WHO: Geneva, 2000.
9. Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, Flegal KM, Prevalence of Overweight and Obesity Among US Children, Adolescents, and Adults, 1999-2002, *JAMA*, June 16, 2004 291(23):2847-50.
10. Baskin ML, Ard J, Franklin F, Allison DB, Prevalence of obesity in the United States. *Obesity reviews* 2005(6):5-7.
11. Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999-2000. *JAMA* 2002; 288(14):1728-32.
12. Eckel RH. Obesity and heart disease: a statement for health care professional from the nutrition committee. *Circulation* 1997;96:3248-55.
13. Schaefer F, Georgi M, Wuhl E, Schärer K. Body mass index and percentage fat mass in healthy German school children and adolescents. *Int J Obes* 1998;22(5):461-9.
14. Cole T J, Freeman J V, Preece M A, Body mass index reference curves for the UK, 1990, *Arch Dis Child* 1995;73:25-9
15. Romero-Corral A, Somers V K, Sierra-Johnson J, Thomas R J, Collazo-Clavell M L, Korinek J, Accuracy of body mass index in diagnosing obesity in the adult general population, *Int J Obes* 2008;32:959-66.
16. Mirmohammadi SJ, Hafezi R, Mehrparvar AH, Rezaeian B, Akbari, H. Prevalence of overweight and obesity among Iranian school children in different ethnicities. *IJP* 2011;21(4):514-20.
17. Mirmohammadi SJ, Mehrparvar AH, Jafari S, Mostaghaci M, An assessment of the anthropometric data of Iranian university students. *IJOH* 2011;3(2):85-9.
18. Abbaszadeh Ahranjani SH, Kashani H, Forouzanfar MH, Aghaei Meybodi HR, Larijani B, Aalaa M, et al. Waist Circumference, Weight, and Body Mass Index of Iranians based on National Non-Communicable Disease Risk Factors Surveillance, *Iranian J Publ Health*, 2012;41(4),35-45

19. Mortazavi Z, Shahrakipour M. Body mass index in Zahedan University of Medical Sciences students. *ZJRMS* 2002;4(2):81-6.
20. Ogden CL, Carroll M.D, Curtin L.R, McDowell MA, Tabak CJ, Flegal KM. Prevalence of Overweight and Obesity in the United States, 1999-2004. *JAMA* 2006; 295(13):1549-5
20. Pishdad GR. Overweight and obesity in adults aged 20–74 in southern Iran. *Int J Obes* 1996;20:963-5.
21. Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, Flegal KM. Prevalence of overweight and obesity among US children, adolescents, and adults, 1999-2002. *JAMA* 2004;291:2847-50.
22. Popkin BM, Doak CM. The obesity epidemic is a worldwide phenomenon. *Nutr Rev* 1998;56:106-14.
23. Seidell JC, Verschuren WMM, Kromhout D. Prevalence and trends of obesity in The Netherlands 1987-1991. *Int J Obes* 1995;19:924-7.
24. Pagano R, LaVecchia C. Overweight and obesity in Italy, 1990–91. *Int J Obes* 1994;18:665-9.
25. Al-Nuaim AR, Al-Rubeaan K, Al-Mazrou Y, Al-Attas O, Al-Daghari N, Khoja T. High prevalence of overweight and obesity in Saudi Arabia. *Int J Obes* 1996;20:547-52.
26. Al-Isa AN. Prevalence of obesity among adult Kuwaitis: a cross-sectional study. *Int J Obes* 1995;19:431-3.