Original Article

PREVALENCE OF OBESITY AND ABDOMINAL OBESITY IN A SAMPLE OF URBAN ADULT POPULATION WITHIN SOUTH EAST OF IRAN

Mohsen Rezaeian[1], Zinat Salem[2]

ABSTRACT

Objective: Obesity is now considered as a major health challenges in the both developed and developing countries. The prevalence of this phenomenon has been reported up to 36.7% in some of the urban regions of Iran. Since, there has been no previous study regarding prevalence of obesity in the adult population within South East of Iran, this study was carried out in the year 2002 to estimate the prevalence of obesity and abdominal obesity in adults 30 years and older in Rafsanjan.

Methodology: This survey was a cross sectional study in which a random sample of adults (n=756, age>30) were selected. For each individual a questionnaire was completed, in which height, weight, waist circumference and demographic characteristics were recorded. The overweight and obesity were defined by BMI=25-29.9 and BMI >30, respectively. The abdominal obesity was defined for women and men by waist circumference >88cm and >102cm, respectively.

Results: The prevalence of obesity (type 1 and 2) and overweight were 11.6% and 38.2%, respectively. In addition 164 (37.5%) of women and 118 (36.9%) of men were overweight. Seventy eight (18.2%) of women and 15 (4.7%) of men were obese, 248 (56.9%) of women and 52 (16.6%) of men suffered from abdominal obesity.

Conclusion: The results of this study showed that the obesity and abdominal obesity are among the most important health problems within South East of Iran. Therefore, it can be suggested that an interventional approach is needed in order to change people's lifestyle, which by itself may also have an important effect in reducing morbidity and mortality from other chronic diseases.

KEY WORDS: Obesity, Abdominal Obesity, Prevalence, Adults, Iran.

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INTRODUCTION

Obesity which is usually defined as an overload of body fat[1] is considered as a major risk factor for the non-communicable diseases including coronary heart disease (CHD), hypertension, hyperlipidemia, diabetes mellitus and different types of cancer.[1,2] The etiology of obesity is multi-factorial which involves genetic, endocrinological and psychological factors. Age, gender, occupation, lifestyles such as lack of exercise and high energy intake could also play an important role in the etiology of obesity.[1]

It has been estimated that throughout the world there are more than one billion overweight adults, out of which 300 million are obese.[3] The prevalence of obesity has rapidly increased in the both developed and developing countries.[3] For instance, in the past decades the prevalence of obesity has increased in the United States of America[4] and in Australia.[5]

1. Dr. Mohsen Rezaeian
2. Zinat Salem
1-2: Social Medicine Department, Medical Faculty, Rafsanjan Medical School, Iran.

Correspondences:

Dr. Mohsen Rezaeian, Social Medicine Department, Rafsanjan Medical School, Rafsanjan - IRAN.
E-mail: moeygmr2@yahoo.co.uk

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Similarly, different studies within Saudi Arabia have also reported a high prevalence of obesity.[6,7]

In Iran, with a nutritional transition status and due to changes in the lifestyles, the prevalence of obesity has also increased.[8] A recent review on the prevalence of obesity in Iran has revealed that overweight and obesity are among the most important national problems especially for women in urban areas.[9] Furthermore, the results of a study within Tehran show that 40% of the adult sample populations were overweight and 23.1% of them were obese.[10] Another recent study within the same city but on the blood donors also shows that 47% of the studied adult populations were overweight and 24% of them were obese.[11] In another study in Gholestan, North East of Iran, 38% and 36.7% of urban adults more than 40 years of age were reported to be overweight and obese, respectively.[12]

Since, there has been no previous study reporting prevalence of obesity in the South East of Iran; the present study was carried out in the year 2002 to estimate the prevalence of obesity in adults aged 30 years and older. Moreover, since the central adiposity due to its positive association with hypertension has been determined as an important risk factor of cardiovascular disease,[1] we also determined the abdominal obesity in our sample population.

SUBJECTS AND METHODS

This survey was a cross sectional study carried out among people 30 years and older who were living in Rafsanjan, a city that is located in the South Eastern of Iran and is one of the major cities within Kerman Province. The city is famous all over the world for its agricultural product i.e. pistachio.

The sample size was estimated based on (á = 0.05 %, d = 3.5, P=40%), therefore, 756 persons were selected by simple random sampling technique and after giving their informed consent, entered into the study. Two medical students, who have been already trained, completed a questionnaire by interviewing each individual. They also measured anthropometric indices. Each subject's weight was measured with at least clothe by a Seca scale (made in Germany). The scale was calibrated every day before starting the measurement and also after carrying out each 20 measurements. Height was measured without shoes by a Seca tape (also made in Germany) and waist circumference was measured by a steal tape at the midway between the lower rib margin and iliac crest.

Obesity was determined by Body Mass Index (BMI), which is calculated by dividing the individual's weight (kg) by the square of his/her height (m). Classification scheme introduced by the World Health Organization (WHO) was used for defining overweight (BMI=25-29.9) and obesity type 1 and 2 (BMI=30-34.9 and BMI $\geq$35, respectively).[1,3] Abdominal obesity was defined as waist circumference for women $\geq$88 cm and for men $\geq$102 cm.[1] Data were analyzed using SPSS version 12 software applying Chi square test.

RESULTS

Demographic characteristics of the sample population showed that 316 of them (41.8 %) were male, 292 (38.6 %) were in the age group (30-44 years) whilst 106 (14.1 %) were in the age group (65 and more) (Table-I). Furthermore, only 137 (31 %) of women had a job besides their house works whilst all males had a job and almost more than half of males 167(53.4 %) worked in farms or factories.

Overall, nine (1.1%) of the participant were obese (type two), 80(10.4%) of them were obese (type one) and 289 (38.2%) of them were overweight (Fig-1). Distribution of obesity by gender showed that 171 (38.9%) and 75 (17%) of women were overweight and obese (Type I&II), respectively. Whilst 118 (37.3%) and 12

Table-I: Demographic characteristics of the participants

	Variables	*N*	*%*
Gender	Male	316	41.8
	Female	440	58.2
Age Group	30-44	292	38.6
	45-54	224	29.6
	55-64	134	17.7
	$\geq$65	106	14.1

Table-II: Distribution of obesity by gender

BMI	*Normal*		*Over weight*		*Obesity I & II*		*Total*	
Gender	N	%	N	%	N	%	N	%
Female	194	44.1	171	38.9	75	17	440	100
Male	186	58.9	118	37.3	12	3.8	316	100
Total	380	50.3	289	38.2	87	11.5	756	100

$X^2 = 36.14$ df = 2 p<0.001

(3.8%) of men were overweight and obese (Type I&II), respectively (Table-II). The Chi square test shows that these differences are statistically significant (p<0.001).

Distribution of obesity by age groups reveals that the most age group at risk of being overweight or obese was between (45-54 years). Ninety seven (43.3%) and 18 (8.03%) of the people in this age group were overweight or obese, respectively. The least age group at risk of being overweight or obese was the last one (≥65 years). Forty (37.7%) and three (2.8%) of the people in this age group were overweight or obese, respectively (Table-III). The Chi square test shows that these differences are statistically significant (p<0.001). Finally, 248 (56.4%) of women and 52 (16.6%) of men had abdominal obesity (Fig-2). The Chi square test shows that these differences are statistically significant (p<0.001).

DISCUSSION

The prevalence of obesity and overweight is high in urban adult population within south east of Iran which is similar to other studies in the country.[9] The comparison of our results with other studies[10-12] reveals that the prevalence of overweight is more or less similar in all the studies (between 38-40%) with the exception of 47% which reported on the blood donors adult population within Tehran.[11] The higher prevalence of overweight among the blood donors adult population could be partially explained by this fact that usually more overweight people in Iran, who think that they are healthier than other people, are keen to donate their bloods. Similar views that overweight is a sign of good health, happiness, and prosperity has also been reported from different parts of the world.[13,14]

Table-III: Distribution of obesity by age groups

BMI	*Normal*		*Over weight*		*Obesity I & II*		*Total*	
Age group	N	%	N	%	N	%	N	%
30-44	144	49.3	101	34.6	47	16.1	292	100
45-54	109	48.7	97	43.3	18	8.0	224	100
55-64	64	47.8	51	38.0	19	14.2	134	100
≥65	63	59.5	40	37.7	3	2.8	106	100
Total	380	50.3	289	38.2	87	11.5	756	100

$X^2 = 22.7$ df = 6 P=<0.001

The comparison of our results with other studies[10-12] also reveals that the prevalence of obesity in our study is less. This could be partially due to the fact that urbanization and changes in the people's lifestyles have occurred more recently in this area compared with other regions, especially central and northern regions of Iran. Therefore, it seems that more time is needed before one will be able to fully investigate the effect of these alterations on people's health.

In our study the prevalence of both obesity and overweight is higher in females in comparison to males. Furthermore, our results also show that abdominal obesity is also prevalent in the region and its prevalence is substantially higher in females in comparison to males. These results are similar to other studies which have been conducted in the different parts of Iran,[15-19] Saudi Arabia[7] Kuwait[20] Mexico[21] and the United States of America.[22,23]

These differences could be due to the fact that usually women have less physical activity than men either due to the nature of their jobs or leisure activities. This important issue has been documented within the United States of America[22] and Tehran.[24] Furthermore, as we have determined nearly 79% of women in our study were house-workers hence associated with less physical activity and higher intake of energy. On the other hand all the men had a job which demands higher physical activities. Finally, distribution of obesity by age groups reveals that the age group least at risk of being overweight or obese is ≥65 years of age. These results are in accordance with another study which have been conducted within Iran[18] and

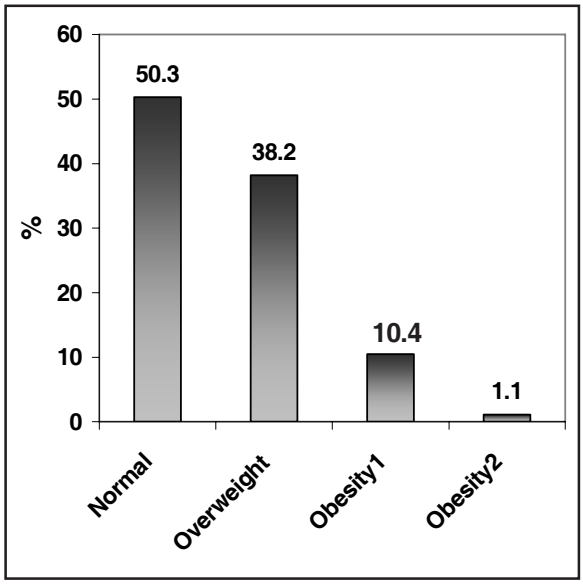

Fig-1: Distribution of obesity by type

could be due to the fact that elderly people may be less influenced by urbanization and changes in lifestyles in comparison to the middle-aged and younger generation.

What should be done to prevent the problem of obesity in this region? In the recent review of obesity within Iran the following measures have been considered as the immediate and underlying causes for overweight and obesity in the country:

"1. Changing dietary habits and physical activity pattern because of rapid urbanization and technological transition.
2. Limited outdoor activities because of specific climatic and/or social conditions.
3. Cultural preferences among some sub-communities and social classes (weight gain and fat storage as signs of health and prosperity.
4. Untargeted government subsidization of the energy dense foods (e.g. fat and sugar)
5. High prevalence of malnutrition among children".[9]

In another recent review of obesity within Iran it has also been noted that:

"Each Iranian citizen consumes 42 liters of carbonated beverages per year. These drinks contain considerable amounts of sucrose (28g/300ml) in addition to the pressurized gas.

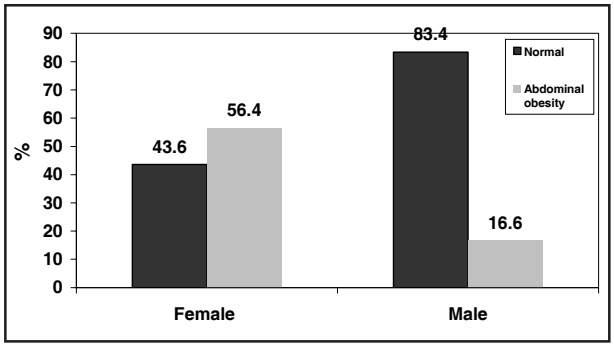

Fig-2: Distribution of abdominal obesity by gender

About 40% of Iranians consume more food than they need and the average Iranian consumes 40% more carbohydrate and 30% more fat than needed. Added to these is the increased interest of the community in a more westernized diet containing junk and fast food (sandwiches, pizza, potato chips, and snacks) that are fatty, spicy, and salty themselves and are usually served with fatty and spicy sauces. Sedentary lifestyle due to lack of adequate exercise and decreased walking, and stressful life conditions should be added to this constellation. All these factors contribute to the emergence of obesity epidemic in Iran.[25]

Since the same reasons could be applied for the people within South East of Iran, therefore it can be concluded that within this region some interventional approaches are needed in order to change people's lifestyle, especially towards healthy eating, increasing physical activity and avoiding stress.

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