

PREVALENCE OF OBESITY, ABDOMINAL OBESITY AND THE ASSOCIATED FACTORS AMONG A GROUP OF TURKISH ADULTS

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ABSTRACT

Objectives: The purpose of this study was to determine the prevalence of obesity and abdominal obesity and some causative factors.

Methodology: In this cross-sectional study were included 1066 adults (527 men, 539 women) ranging in age from 18 to 59 years old studying in Ankara, Turkey. Weight, height, waist and hip circumferences of adults were measured, Body Mass Index (BMI) and Waist Hip Ratio (WHR) were calculated. The association between age, nutritional factors and BMI, waist circumference and WHR were evaluated.

Results: The overall prevalence of obesity was 9.7% and overweight was 34.8%. The prevalence of abdominal obesity was 21.6% in men, 41.4% in women. Obesity and abdominal obesity was positively associated with daily energy intake, percentage of energy from fats, sugar intakes, whereas it was negatively associated with daily fiber, calcium intake and age.

Conclusions: It would be useful to examine the factors related to obesity and abdominal obesity in the prevention of obesity in adults.

KEY WORDS: Obesity, abdominal obesity, overweight, adults.

Abbreviations: BMI: Body Mass Index, WC: Waist Circumference, WHR: Waist Hip Ratio, WHO: World Health Organization.

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INTRODUCTION

Obesity, in particular abdominal obesity, is closely related to diseases decreasing the quality of life.¹ The method used most commonly in the determination of overweight and obesity is BMI. However, BMI does not provide enough information regarding the distribution of fat in body. Therefore, WHR and waist circumference are the simplest anthropometric measurements to be used to determine both the description of obesity and chronic diseases.²

The rate of obesity and overweight among adults population ranges from 15 to 60%.^{3,4} According to World Health Organization (WHO) report,³ obesity has become epidemic in the

world. In that way, description of obesity, its treatment and the last but not least the prevention of obesity is of crucial importance in terms of public health. Turkey has a function of an important bridging between the East and the West in the world. It is a developing country having the habits of nutrition affected by both European and Asian cultures. Prevalence of obesity was found 22.0%, and 30.4% for abdominal obesity in two different national studies among adults.^{5,6}

The current study was planned to determine obesity and abdominal obesity prevalence and the effects of age and nutritional factors on BMI, WHR and waist circumference at a group of adults in Ankara, the capital city of Turkey.

METHODOLOGY

Procedure and subjects: This cross-sectional study was conducted in the area where Department of Food and Nutrition Education in Vocational Education Faculty in Gazi University is located in the city of Ankara (the district of Gazi / Ankara) between the months of January–June 2007. It was planned to include the volunteer adults with no health problem, chronic or acute, between the ages 18 to 59. The data that was approximately 5.000 people between the ages of 18 and 59 living in the area was obtained from the headman of the area and it was estimated that the groups should be consisted of 440 people at least depending on the fact that the number of the people to be included in the research was 880 for both genders in total within the range of 95% for both men and women with a 3% chance of error. The data belonging to 527 men and 539 women was obtained by making necessary controls. The subjects were categorized into four age groups. 18-29, 30-39, 40-49 and 50-59 years.

Nutritional factors: Dietary intake data was gathered using 24-hour dietary recalls. Adults record everything they eat and drink, during one-day period. The average energy (kcal), percentage of energy from fat (%), fiber (g), calcium (mg) and sugar intake (g) was analyzed by a computer program (BeBiS, Stuttgart, Germany).

Anthropometric measurements: Weight was measured on electronic scales to the nearest 0.1 kg and height was measured to the nearest 0.1 cm with a wall-mounted stadiometer with subjects wearing light clothing and no shoes. BMI (in kg/m²) was calculated. Waist and hip circumferences were measured to the nearest 0.1 cm with an anthropometric tape over light clothing. Waist circumference was measured at the minimum circumference between the iliac crest and the rib cage and hip circumference at the maximum width over the greater trochanters. WHR was then calculated.⁷

According to WHO standards, underweight was diagnosed when the BMI was less than 18.5 kg/m²; normal weight when the BMI between 18.5-24.9 kg/m²; whereas overweight the BMI 25.0-29.9 kg/m²; and obesity the BMI exceeding 29.9 kg/m² were classified as obese. Abdominal obesity was defined as WHR >1.0 in men and >0.85 in women or waist circumference >102 cm in men and >88 cm in women.³

Statistical analysis: SPSS for Windows 11.5 (Chicago, IL, USA) was used in statistical analysis. Overweight, obesity and abdominal obesity prevalence were given according to age and gender, chi-square tests was used where available. The association between anthropometric measurements, age and nutritional factors were examined through Pearson correlation. $p < 0.05$ was considered significant.

RESULTS

Obesity prevalence was 8.3% in men and it was 10.9% in women while overweight prevalence was 41.0% in men and 28.3% in women. The prevalence of obesity and overweight increase by age at all adults included in the study ($p < 0.001$). For all individuals obesity was most common at the age group of 50-59, while overweight was most common at the age groups of 40-49. The prevalence of obesity in women and the prevalence of overweight in man were found high (Table-I).

Abdominal obesity prevalence for WHR was 10.8% in men and 36.2% in women; it was 21.6% in men and 41.4% in women by waist circumference, and the difference between age groups

Table-I: Prevalence of obesity in the Men and Women by age groups

	<i>n</i>	<i>Underweight</i>		<i>Normal</i>		<i>Overweight</i>		<i>Obese</i>		
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
<i>Age groups (years)</i>										
<i>Men</i>										
18-29	175	4	2.3	111	63.4	55	31.4	5	2.9	
30-39	154	-	-	94	61.0	48	31.2	12	7.8	
40-49	121	-	-	37	30.6	71	58.7	13	10.7	
50-59	77	2	2.6	19	24.7	42	54.5	14	18.2	
Total	527	6	1.2	261	49.5	216	41.0	44	8.3	
$\chi = 72.26, p < 0.001$										
<i>Women</i>										
18-29	213	19	8.9	162	76.1	30	14.1	2	0.9	
30-39	160	3	1.9	98	61.3	47	29.3	12	7.5	
40-49	113	-	-	34	30.1	52	46.0	27	23.9	
50-59	53	-	-	9	17.0	26	49.0	18	34.0	
Total	539	22	4.1	303	56.2	155	28.8	59	10.9	
$\chi = 164.22, p < 0.001$										
<i>All</i>										
18-29	388	23	5.9	273	70.4	85	21.9	7	1.8	
30-39	314	3	1.0	192	61.1	95	30.3	24	7.6	
40-49	234	-	-	71	30.3	123	52.6	40	17.1	
50-59	130	2	1.5	28	21.6	68	52.3	32	24.6	
Total	1066	28	2.6	564	52.9	371	34.8	103	9.7	
$\chi = 221.88, p < 0.001$										

for both genders was found statistically significance ($p < 0.001$) (Table-II).

Daily energy, total fat, dietary fiber, calcium and sugar intakes by gender are given in Table-III. Significant positive correlations were found between age and weight ($r = 0.33, p < 0.01$); BMI ($r = 0.44, p < 0.01$); waist circumference ($r = 0.36, p < 0.01$) and WHR ($r = 0.22, p < 0.01$). A negative but not statistically significant correlation was found between weight, BMI, waist circumference and WHR and daily fiber and calcium intake, while a positive but not statistically significant correlation was found between the percentage of energy from fats, daily energy and sugar intakes.

DISCUSSION

Obesity is a major problem of public health today.^{4,8} Such anthropometric measurements as BMI, WHR and waist circumference are frequently used to define obesity.²

The obesity prevalence in adults in the current study was found 9.7%, whereas overweight

prevalence was found higher (41.0% in men, 28.8% in women). Overweight prevalence according to the studies carried out in Canada,⁹ Israel,¹⁰ and Greece,¹¹ was higher than the one in Turkey while it was lower in the studies carried out in China,⁸ and Italy.¹²

Obesity prevalence was found higher in the studies conducted in Canada,⁹ Israel,¹⁰ Greece,¹¹ the USA,¹³ Korea,¹⁴ and England¹⁵ compared to Turkey, and lower in the studies carried out in China⁸ and Italy.¹² While overweight prevalence was 29.0-47.9% in various European Countries,^{11,12} it was around 24.0% in such Asian countries as China.⁸ Obesity prevalence was 30.4% in the USA,¹³ 8.0-24.0% in Europe,^{11,15} 30.6% in Korea¹⁴ and 3.9% in China.⁸ While the prevalence of those having a BMI over 25.0 kg/m² in Europe and the USA increased rapidly, the fact that the overweight prevalence was high in Turkey revealed that some measures should be taken in the short time to cope with obesity. The increase in the consumption of foods with high fat and energy content, widespread

Table-II: Prevalence of abdominal obesity in the Men and Women by age groups for WHR and WC

	n	%	n	%	n	%	n	%
Men	WHR <1.0		WHR >1.0		WC <102 cm		WC >102 cm	
18-29	157	89.7	18	10.3	155	88.6	20	11.4
30-39	145	94.2	9	5.8	127	82.5	27	17.5
40-49	110	90.9	11	9.1	85	70.2	36	29.8
50-59	58	75.3	19	24.7	46	59.7	31	40.3
Total	470	88.2	57	10.8	413	78.4	114	21.6
	$\chi^2 = 19.70, p < 0.001$		$\chi^2 = 32.74, p < 0.001$					
Women	WHR <0.85		WHR >0.85		WC <88 cm		WC >88 cm	
18-29	158	74.2	55	25.8	175	82.2	38	17.8
30-39	98	61.2	62	38.8	91	56.9	69	43.1
40-49	63	55.8	50	44.2	40	35.4	73	64.6
50-59	25	47.2	28	52.8	10	18.9	43	81.1
Total	344	63.8	195	36.2	316	58.6	223	41.4
	$\chi^2 = 19.91, p < 0.001$		$\chi^2 = 108.5, p < 0.001$					

sedentary way of life lead to the increase in the prevalence of obesity.

Abdominal obesity prevalence has increased in recent years in Turkey.⁶ In a study carried out on adults in Turkey, it was indicated that the waist circumference of 15.8% of individuals and WHR of 42.0% of them are over the desired limits.² In the current study, the prevalence of those whose WHR and waist circumference are over the desired limit are 10.8% and 21.6% for men and 36.2% and 41.4% for women respectively. Abdominal obesity prevalence is lower at people living in Israel¹⁰ and South Africa¹⁶ according to the results of studies carried out on adult individuals there. It was thought that these differences could result from different ethnicity, cultures and nutrition habits.

Both obesity and abdominal obesity have been affected by various factors. It was suggested that the factor of age has an impact on obesity and abdominal obesity and that BMI, waist circum-

ference and WHR values increase by age up to the age of 60s.^{9,17}

Nutritional habits and dietary intake had their effects on obesity. The increase in foods with high content of energy, fat and sugar and low content of vitamin and mineral, less consumption of food like vegetables, fruit, milk and dairy products are considered among the major reasons of obesity. It was also indicated that the increase in the percentage of the energy from fat and the decrease in complex carbohydrate and fiber intake lead to obesity.¹⁸ Increasing the amount of dietary fiber has an important effect on the prevention of obesity and abdominal obesity.¹⁹ Azadbakht and Esmailzadeh²⁰ indicated that low calcium intake leads to the increase at waist circumference and that there is a negative relationship between daily milk and dairy products and waist circumference. In the current study, a positive correlation was found between BMI, waist circumference, WHR and daily energy, sugar intake, the percentage of

Table-III: Dietary Intakes by Gender

	Men (n:527)	Women (n:539)	
Dietary intake (day)	Mean±SEM	Mean±SEM	p value
Energy (kcal)	2326.1±32.2	1879.5±26.6	<0.001
Total fat (%energy)	31.3±0.4	34.1±0.4	<0.001
Dietary fiber (g)	33.3±0.6	29.9±0.6	<0.001
Calcium (mg)	695.9±14.6	642.1±12.4	0.01
Sugar (g)	30.9±1.5	25.7±1.3	0.005

p<0.05 indicate differences between men and women by t-tests.

energy from fat; and a negative correlation was found between calcium and fiber intake.

CONCLUSION

It was determined that obesity and abdominal obesity is prevailing and demographic and nutrition factors affect obesity and abdominal obesity. In order to prevent obesity and a great many chronic diseases causing obesity, it is necessary to put a fight against obesity. Therefore, it is considered that necessary studies be carried out so as to make individuals attract healthy nutritional habits and increase their physical activity levels.

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