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Short Communication

Prevalence of overweight and obesity among junior high school students in a district of Tehran

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Abstract

BACKGROUND: To determine the prevalence of overweight and obesity among a sample of middle class junior high school students in a district of Tehran and its association with certain demographic and dietary factors this study was carried out.

METHODS: Weight, height, waist and hip circumferences were measured and information on two-day food intake and demographics on 398 students aged 10-15 years from district 6 in Tehran were collected.

RESULTS: Prevalence of overweight and obesity in the studied girls were 19%, 6.5% and in boys were 14%, 13%, respectively. There was an inverse relationship between numbers of siblings and BMI. Overweight/obese students, bought snacks from school shops more frequently than other students did.

CONCLUSIONS: Findings showed that the high prevalence of overweight/obesity can be related to the household size, including the number of siblings and the pattern of snack purchase by the students.

KEY WORDS: Obesity, body weight, body mass index, waist-hip ratio, overweight, adolescents.

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The problem of childhood obesity is global and increasingly extends into the developing world [1]. In Iran, data on the prevalence of overweight and obesity among children and adolescents are few and scattered. According to a study, prevalence of overweight and obesity in male and female secondary students in Tehran was 17.9 and 7.1%, respectively [2]. In another study prevalence of overweight and obesity among female adolescents were reported 13.3% and 4.4%, respectively [3]. Childhood obesity seems to be an increasingly problem in Iran, thus there is a need to confirm the findings through up-to-date studies. This study was conducted to determine the prevalence of overweight and obesity and type of obesity using height, weight, waist and hip circumferences and to determine associated factors including food intake, TV watching, demographic information and amount of pocket money in a sample of junior high school students in a district of Tehran, capital of Iran.

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Methods

A sample of 398 students (199 girls and 199 boys) aged 10-15 years was recruited in the study through a two-stage random sampling during 2000/1 school year. In the first stage, twelve middle schools from public and private schools of the district 6 were selected. In the second stage, in each school, 11 students from each grade (first, second, and third) were randomly selected. District 6 was chosen due to the fact that it is a harmonious, middle class district in the city of Tehran. Weight was measured to the nearest 0.5 kg by a digital scale (Soehnle, Germany) with the subjects wearing light clothes and without shoes. Height was measured to the nearest 0.5 cm by a tape fixed on the wall [4]. Waist and hip circumferences were measured by a flexible tape to the nearest 0.5 cm. Circumferences were measured midway between the lower rib margin and the superior iliac spine and at the widest point over the greater trochanters, respectively. Overweight and obesity were defined based on age and sex- specific body mass index (BMI) percentile, ≥85 and ≥95th, respectively (CDC, 2000) [5]. Waist to hip ratio was calculated for determination of abdominal obesity [6,7]. Ratios ≥0.8 for girls and ≥0.95 for boys were considered as abdominal obesity. Information on food intake was collected using a 24-h food recall and a 1-day record. For the first day applying 24 h recall provided two purposes, first data collection and second instructing the students how to fill food record. In addition, to make sure of accuracy of data a written guide with a short introduction about the study, which implicitly had gotten permission for taking part in the study was given to the parents by the students. In this guide the students were directed on how to record food items by aid of their parents. The questions were mainly focused on food items consumed in each episode of eating on a day; their quantities were not asked. Therefore, information on frequency of food consumption during 2 days was collected simultaneously. Other information including demographic and socioeconomic information, time spent on TV watching, family size, education of parents, amount of pocket money and the places which students purchased snacks was collected through interview, using a questionnaire. The study protocol was approved by the high education council of faculty of Nutrition and Food Sciences in Shahid Beheshti University of Medical Sciences and Health Services.

Results

Table 1, depicts general characteristics of the sample. Prevalence of overweight and obesity in the studied subjects is shown in table 2. Abdominal obesity (upper trunk obesity) was prevalent in 2% (n = 4) of boys as opposed to 27% (n = 54) of girls. Within the overweight and/or obese girls, 36% (n = 18) had abdominal obesity, while only about 6% (n = 3) of overweight/obese boys were abdominally obese. Based on Pearson's simple correlation analysis, there was an inverse relationship between frequencies of consumption of breakfast with BMI, i.e., more frequent consumption of breakfast was related to lower BMI ($r = -0.2$, $P<0.01$). Frequency of breakfast consumption among non-overweight/obese and overweight/obese students is presented in table 3. There was no relationship between consumption frequency of junk foods, fruits and vegetables with BMI. In this study, junk foods were high calorie foods, which provided more than 500 kcal per 100 gram and included soft drinks, potato chips, puffed cereals (a fat, salty and crunchy snack, made from corn flour), and chocolates. The relationships between the times spent on TV watching, family size, parents' literacy and amount of pocket money paid to students with BMI were not significant. There was an inverse relationship between the number of siblings and BMI ($r = -0.100$, $P<0.04$); in other words, students with more siblings were less obese. Chi-square test showed that overweight/obese students, bought from school shops more frequently than others ($P<0.01$).

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Table 1. Age, BMI and WHR of junior high school students in district 6 of Tehran, 2000-2001.

Sex	Age (year)* Mean ± SD (n)	BMI Mean ± SD (n)	**WHR Mean ± SD (n)
Girls	12.5 ± 0.9 (197)	19.9 ± 3.7 (197)	0.77 ± 0.06 (198)
Boys	12.7 ± 0.9 (198)	19.7 ± 4 (199)	0.83 ± 0.06 (197)
Total	12.6 ± 0.9 (395)	19.8 ± 3.8 (396)	0.8 ± 0.07 (395)

* The difference between girls and boys was significant by t-test (P<0.05).
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Table 2. Prevalence (%) of overweight and obesity among junior high school students in district 6 of Tehran, 2000-2001.

Sex	Overweight n (%)	Obesity* n (%)
Girls (n = 199)	37 (19)	13 (6.5)
Boys (n = 199)	27 (14)	26 (13)
Total (n = 398)	64 (16)	39 (10)

* Differences between girls and boys was significant by chi square test (P<0.05)

Table 3. Frequency consumptions of breakfast during two days among junior high school students in district 6 of Tehran, 2000-2001.

Frequency of breakfast consumption	Non-overweight non-obese n (%)	Overweight/obese n (%)	Total n
0	20 (54)	17 (46)	37
1	84 (69)	37 (31)	121
2	183 (81)	43 (19)	226
Total	287 (75)	97 (25)	384*

*Data on food intake of some students were not accessible.

Discussion

Findings demonstrate that almost 1 in every 4 students in this sample was either overweight or obese. Childhood obesity is a growing national concern and this study and other recent studies [2,8] confirm that it has become a major public health challenge in urban areas of Iran. Although prevalence of overweight plus obesity in both sexes was almost similar, prevalence of obesity among boys was two times as many as girls' and this difference was statistically significant (table 2). A recent study in Tehran showed that the prevalence of overweight among girl students was significantly higher than that among boys [8]. This may be explained by the difference in sample size of studied districts carried out in 7 districts of Tehran, compared with our study, which was held only in one district. In another more up-to-date study in Tehran with similar age group, prevalence of overweight and obesity were reported 17.9 and 7.1%, respectively [2]. These findings are similar to ours, whereas sample size of the study was much more than our sample size. More than one third of obese girls were abdominally obese. So that abdominal obesity among girls is shown to be an emerging issue in this study. Based on the findings of food pattern, there was no relationship between consumption of junk foods, such as potato chips and soft drinks, with BMI. According to other studies, more consumption of junk foods may cause overweight [9]. As mentioned before, in the current study we asked only about fre-

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quency of food consumption but, the actual amount of foods consumed were not asked. In addition, we had diet history of only 2 days; one-day recall and one-day record; for accurate evaluation of food intake there is a need to have diet recalls/records of more days. In addition, data on food intake were not quantitative and possibly were not informative enough in this case. Students who had had breakfast were less obese. This result confirms other studies on the importance of breakfast as a very important main meal [10] and those which showed more breakfast skipping among obese and overweight adolescents [11]. The time spent on TV watching was not correlated with BMI. However, there is a growing body of evidence that indicate TV watching can lead to overweight [12]. As information on TV watching was self-reported and the students were the only source of information about duration of TV watching, their report may not be reliable enough to show their actual time spent on TV watching. There was an inverse relationship between the numbers of siblings with BMI. Whether this finding is due to the competition for food or lower parental concern on each child's individual feeding pattern in larger families needs further investigation. However, there was no significant relation between family size and child's BMI. This finding confirms a previous study [13] which showed no difference in family size in normal and obese students. According to our findings overweight/obese students, bought from school shops more frequently, compared with other students. It can reflect the situation of school shops that is not promising and is filled with high calorie food items, which in turn have an important role in overweight and obesity. Our data indicated a high prevalence of overweigh/obesity among adolescents in district 6 of Tehran and confirmed other up-to-date findings. Distribution of fat, especially among girls, showed most of obese samples had android type obesity that is understood to be a greater risk factor for cardiovascular disease. More strict regulation of sources which children obtain snacks such as shops at schools, beside modification of food choices through effective education strategies may play a significant role in control of overweight and obesity among this age group.

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