Overweight, Obesity and Related Factors in 7 to 11-year-Old Female Students in Robat-Karim, Iran in 2014.

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Abstract

Objective: In recent years, the prevalence of overweight and obesity had a significant growth in children. Obesity is a serious health problem all over the world. In this study, we aimed to determine the prevalence of overweight and obesity in elementary students in Robat-Karim, Iran in 2014.

Materials and Methods: This cross-sectional study was conducted on 490 female students of elementary school aged between 7 to 11 years in Robat-Karim, Iran in 2014. The percentages of Centers for Diseases Control and Prevention growth charts (CDC) have been utilized to determine overweight and obesity. SPSS-16 software has been applied for statistical analysis.

Results Mean age of the students was 8.97+ 1.38 years. According to CDC, 28 (5.7%) of the students were obese, and 75 (5.78%) of the students were overweight. Overweight and obesity were significantly related with birth weight, body mass index(BMI) of parents, and time spent for watching TV, computer games and other electronic entertainments (P <0.001).

Conclusion: According to obtained results, interventional programs should be done to correct life-style and prevent overweight and obesity among elementary school students.

Keywords: Overweight, Obesity, Elementary school.

Introduction

Changing in lifestyle causes non-communicable diseases (NCD) prevalent such as diabetes and cardiovascular disease (1). It is predicted 60% of all diseases and their mortality is related to NCD in developing countries by 2020. Obesity is considered as an important risk factor for most of NCD (2). In recent years, the prevalence of overweight and obesity had a significant growth in children. Obesity is a

serious health problem all over the world (3). Obesity in childhood and adolescence represented as a strong predictor of adult obesity. Adult obesity is about 2 to 3 times more prevalent in obese than non-obese children (4-5). Obesity in childhood and adolescence is important not only for the physical and psychological consequences, but also for the increased incidence of diseases, mortality and burden on society (6).

The obesity increases risk of some diseases such as cardiovascular disease, type 2 diabetes, cancers, hypertension, hyperlipidemia, stroke and liver diseases (7). The prevalence of obesity and overweight in the 5 to 11year old Canadian children were 13.1 % and 19.7 % between 2009 and 2011, respectively (8). Furthermore, the prevalence of obesity in 6 to 11year old children was 18 % between 2009 and 2010 in the US (9). In Iran, the prevalence of obesity in children was reported between 1.2 % and 21.08 % (10-13). There are various factors considered as the main reasons of children obesity such as race, ethnicity, parental obesity, physical inactivity, eating fast foods and long term watching TV (14-16). It seems that identifying children overweight and obesity is important because of early recognition and treatment. In this study, the prevalence of overweight, obesity and related factors were studied in 7 to 11years old girls in Robat-Karim, Iran 2014.

Materials and Methods

This cross-sectional study was conducted on 490 female students of elementary school aged 7 to 11 years in Robat-Karim (a region in Tehran Province - Iran) in 2014-2015. Subjects were selected through two stages by cluster sample techniques. In the first stage, five schools have been selected out of 21 elementary schools. Then, according to the each school population and total population of elementary school students, a sub-sample was selected from each class. Measuring the weight of students was done using Seca digital scale (allowing for an error of 100 gr) while they had light clothes and bare foot. The height of each student was measured in a standard manner (allowing for an error of 0.5 centimeter). Then, each student's body mass index (BMI) was measured. The percentages of Centers for Diseases Control and Prevention growth charts (CDC) were utilized to determine overweight and obesity (17). Thus, 85-95th percentiles were considered as overweight with respect to age and gender; and ≥95th percentile as obese. The questionnaire was applied to collect the survey data included questions such as birth weight (Gram), duration of watching TV, duration of playing computer games and other electronic entertainments, duration of breast-feeding (Month), BMI of parents, parental education and occupation. Informed consent form for participation in study was filling out by student's parents. Finally, SPSS software was used for statistical analysis.

Results

This study was conducted on 490 female students of elementary school in Robat-Karim, Iran 2014. The mean (±standard deviation) age of the students was 8.97 (± 1.38) years. About 95 (19.4%) cases were7 years, 100 (20.4%) were 8 years, 105 (21.4%) cases 9 years, 104 (21.2%) cases 10 years, and 86 (17/6%) cases was 11 years. According to the Centers for Disease Control and Prevention (CDC), 28 (5.7%) of the students were obese. The most frequent were among children aged 8 years (39.3%) and least frequent in the age group of 7 and 9 years (7.1%). About 75 (5.78%) of the students were overweight. The most frequent were in the age group of 9 years (37.3%) and least frequent in the age group of 8 years (4%). The comparison of overweight and obesity prevalence in the female students of elementary school by age is shown in Table1.The mean (SD) of BMI in obese and overweight students were 24 ± 2.4. Also the mean of time spent for watching TV, computer games and other electronic entertainments in obese and overweight students was 4.2 ± 1.6 hours (Table.2).

Table 3 shows the comparison of demographic characteristics between two groups of students. Statistical analysis showed that overweight and obesity were significantly related to birth weight, BMI of parents, time spent for watching TV, computer games and other electronic entertainments (P<0.05) (Table.3).

Discussion

The findings indicate that prevalence of obesity and overweight in female students of elementary school in Robat-Karim was 5.7 % and 15.3 %, respectively. Findings of studies in Iran and other countries express different levels of obesity and overweight among female students of elementary school. In most studies, the prevalence of obesity among female students of elementary students was higher than our study. According to a study conducted in Birjand on 6 to 11 year-old girls, the prevalence of obesity was 7.9 % (18). The prevalence of obesity was 13.7 % in the female students of elementary school aged 7 to 11 year-old in Babol (North of Iran) (19). In Golestan (North of Iran), the obesity among female students of elementary school aged 6 to 11 year-old was 12.65 percent (20). Aminzadeh et al. showed that the prevalence of obesity in 6 to 10 year-old girls, in Ahwaz (South of Iran) was 21.08 % (21).

The study of Asadi in Bandar Abbas (South of Iran) showed that the 6.2 percent of 7 to 11 year-old female students in elementary school were obese (22). In 7 to 12 year-old Costa Rican female students of elementary school, the prevalence of obesity was 22.5 % (23). For the 5 to 12 year-old girls in Pakistan, the prevalence of obesity was 6.1 % (24). In Argentina, the prevalence of overweight and obesity among 7 to 11 year-old girls was 17.4 % (25). In some studies, the prevalence of obesity was lower than our study. In a study conducted by Taheri, the prevalence of obesity for female students of elementary school was 1.2 % (26). The conducted study in Marand showed that the prevalence of obesity in female students of elementary school was 3.3% (27). There were significant relations between overweight and obesity with some of the factors mentioned in this study such as birth weight, BMI of parents, time spent for watching TV, computer games and other electronic entertainments. In this study, BMI of parents was related to the overweight and obesity of children so that overweight and obesity was high in students who had parents with high BMI. In other conducted studies, a significant relationship was observed between obese parents and the obesity of children (28-30). In some studies, high maternal BMI was positively associated with the children obesity (31-32). The results of this study showed that children with high birth weight were more likely to be overweight or obese in their school age. Neutzling et al. showed that high birth weight is associated with overweight and obesity in children (28). Comparing birth weight between the two groups of obese and normal children, Michels et al. showed that the birth weight of obese group was higher than normal group, but this relationship was not significant (30). Siqueira et al. observed that obesity was increased in 6 to 11-year-old children by increasing birth weight (32). Furthermore, the mean time spent for watching TV, computer games and other electronic entertainments had a significant relationship

Table1. Prevalence of overweight, obesity and normal weight in students

Variables	CDC reference					
	Obese		Overweight		Normal	
Age (Years)	frequency	Percent	frequency	percent	frequency	percent
7	2	7.1	5	6.7	88	22.7
8	11	39.3	3	4	86	22.2
9	2	7.1	28	37.3	75	19.4
10	8	28.6	15	20	81	20.9
11	5	17.9	24	32	57	14.8
Total	28	5.7	75	15.3	387	79

with overweight and obesity of students in the study group.

Neutzling et al. demonstrated that the average time spent for watching TV, computer games and other electronic entertainments was one of the most important risk factors for obesity in childhood (28). According to the study of Kalantari et al., the significant relationship between watching TV and obesity was not observed (29).

In this study, there was not a statistically significant relationship between overweight and obesity and duration of breastfeeding in infancy. In most conducted studies, the breastfeeding was considered as a protective factor against overweight and obesity so that the higher duration of breastfeeding led to lower obesity rates in the following years (33-34).

Conclusions

It is recommended that educational

Table 2. Mean and standard deviation of variables in 7 to 11-year-old female students

Variables	Overweight and obese		Normal		*P*-value
	Mean	SD	Mean	SD	
Student Height (cm)	136.6	9.5	135.1	10.2	0.180
Student weight (kg)	45.4	3.2	28.7	5.1	0.001
BMI of Student	24	2.4	15.6	1.7	0.001
Birth weight	3354	508.9	2969	273.8	0.001
Duration of breastfeeding (Month)	18.5	5.8	19	3.7	0.102
Time spent for watching TV, computer games and other electronic entertainments	4.2	1.6	2.9	0.9	0.001
Father's age (years)	42.1	8.6	40	5.9	0.016
Mother's age (years)	37.6	8.8	34.6	4.9	0.011
BMI of Mother	28.1	4.6	23	1.7	0.001
BMI of Father	25.4	3.2	24.2	1.1	0.001

Table3. Frequency of demographic characteristics of study population

Variables	Categories	Overweight and obese		Normal		*P*-value
		frequency	percent	frequency	percent	
Birth weight	Less than 2500 g	8	7.8	28	7.2	0.001
	2500-3900 g	81	78.6	358	92.5	
	More than 3900 g	14	13.6	1	0.3	
Time spent for watching TV, computer games and other electronic entertainments	Less than 3 hours	36	34.9	359	92.8	0.001
	3-4 hours	19	18.5	16	4.1	
	More than 4 hours	48	46.6	12	3.1	
Mother*BMI	Less than 25	30	30.9	225	59.1	0.001
	25-30	57	58.8	152	39.9	
	More than 30	10	10.3	4	1	
Father*BMI	Less than 25	41	40.6	209	54.6	0.001
	25-30	44	43.6	170	44.4	
	More than 30	16	15.8	4	1	
Mother* Occupation	Housekeeper	82	84.5	300	78.7	0.149
	Employed	15	15.5	81	21.3	
Mother* Education	Illiterate	16	16.5	57	14.9	0.131
	Under diploma	71	73.2	290	76.1	
	Diploma and above	10	10.3	34	9	
Duration of breastfeeding (Month)	0	1	0.9	2	0.5	0.102
	Under 6	4	3.9	7	1.8	
	6-12	15	14.6	18	4.7	
	12-24	80	77.7	359	92.8	
	More than 24	3	2.9	1	0.2	

* Some parents were dead or separated.

interventions should be applied to increase parental awareness about the causes of obesity and its complications. Moreover, some interventions are suggested to be done for children to increase physical activity and reduce the time spent on watching TV, computer games and other electronic entertainments.

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