Biomedical & Pharmacology Journal Vol. **8**(2), 1307-1314 (2015)

Determination of Prevalence of Obesity and Review of Some of Associated Factors in Ahvaz Primary School Students in 2009

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DOI: http://dx.doi.org/10.13005/bpj/891

(Received: November 01, 2015; accepted: December 20, 2015)

ABSTRACT

Overweight and obesity is a major problem of public health and is considered, as the prevalence of obesity among children and adolescents increased in in recent years in the communities, complications of obesity among this group are emerging.Few studies have been conducted in Iran on obesity and the possible risk factors. Therefore, the present study aims to investigate the prevalence of obesity among Iranian children as well as to identify the possible factors associated with obesity among the children. Total of 960 students of Ahvaz primary schools (aged 6-12 years) in 2009 were selected through a cluster sampling. Their height and weight and representative BMIs were calculated. The BMI was placed in the CDC 2000 BMI chart for age, individuals with a BMI equal or greater than 95 percentile were defined as obese and individuals with BMI between 85 to 95 percentiles as overweight. Then, the questionnaires were given to all students. Parents completed the questionnaires then, the questionnaires were collected. The probable factors that involved in prevalence of obesity, such as high birth weight, duration of breastfeeding, the habit of consuming junk foods, the hours of watching TV during a day and the numbers of fast food consumption during a week, were compared between obese and overweight and other children. Prevalence of obesity and overweight was 6% and 11.9%, respectively. There was no significant difference in prevalence of macrosomea at birth between obese and non obese children, while junk food consumption was significantly different. There were no significant differences for duration of breastfeeding between obese, overweight and healthy children. There were significant differences in fast food consumption during a week between those groups. The obese children consumed more fast food during a week than others. In addition, there were significant differences in TV watching hours per day between these three groups where overweight children spent more hours on TV watching. The prevalence of overweight and obesity in Ahvaz primary school students was relatively high. The features including eating snacks during a day, frequency of fast food consumption during a week, and watching TV hours during the day are different between obese children than overweight and healthy counterparts. However, the mother's breastfeeding duration in infancy was not significantly different between these groups.

Key words: Obesity, Prevalence, Primary school pupils, Body Mass Index

INTRODUCTION

Obesity and overweight are considered as a major problem of public health[1] and as the prevalence of obesity among children and adolescents increased in recent decades, complications of obesity among children happen. Therefore, prevention and treatment of obesity is one of the pediatrics' problems[2].

The obesity of an individual is estimated by Body Mass Index (BMI) chart based on age and

people in the 95th percentile and above are overweight and people between the 85th to 95th percentile are introduced as people at risk of overweight. However, in some sources, people between the 85th to 95th percentile are introduced overweight and people at the 95th percentile and above are presented obese[3]. Lack of appropriate height growth, accompanied by excessive weight gain can be a beginning point to investigate the possible pathology. In addition, in BMI above the 95th percentile, our attention must be to the signs and symptoms of morbid condition life threatening situations[4].

The National Health And Nutrition Examination Survey (NHANES) stated that during 1999-2000, 16% of children were overweight and 31% were at risk of overweight which showed 300% increase than 1960s and 45% than the previous NHANES survey for 1994- 1988[2].

Obesity has multiple effects such as psychosocial effects, including the isolation from peers and differentiates and getting ridiculed. Obesity causes respiratory problems, including asthma and shortness of breath during sleep "obstructive Obstructive sleep apnea" and cardiovascular complications, including high blood pressure, and sudden death and orthopedic complications such as bone protrusion, blount disease and slipped capital femoral epiphysis and metabolic complications such as insulin resistance and type 2 diabetes and high blood cholesterol and high blood triglyceride levels and metabolic syndrome[2]. The prevalence of obesity and its association with various diseases in children and adolescents suggest that the obesity prevention and treatment must be a priority test of physicians.

Obesity can be caused only when the consumed energy is lower than receiving energy by an individual. For example, foods consuming that are high in fat and calories, such as fast food, also this seems to be that a lack of physical activity and mobility are also other causes of obesity[5]. In addition, in according with multiple conducted studies, other factors such as gender, race, high birth weight, lack of mother breast feeding, obese parents, consumption of fast food, soft and alcoholic drinks are counted as the major risk factors for obesity[5,7-23]. Due to the lack of enough data on the effectiveness of lifestyle changes in the treatment of obesity, and increasing the knowledge in this field, the physiology of energy balance in the body and in particular because of the financial reasons, many pharmaceutical companies have started research programs in the field of obesity[24].

Knowing the prevalence of obesity in children and adolescents in the society and assessing some obesity-related causes will help an early intervention to take action and solve this problem when a high prevalence of obesity occurs. Therefore, this study aims to investigate the prevalence of obesity among Iranian as well as to identify the possible factors associated with obesity in children.

MATERIALS AND METHODS

This is a cross-sectional and descriptive study to assess the prevalence of obesity among primary school students in Ahvaz, Iran, investigate some possible factors involved in obesity among students.

Cluster sampling was used to select the study population, so that the population of primary school students in Ahvaz that according to statistics was the number of 88 347 people, are divided in according to the Department of Education segmentation and gender separation in eight classes and from each classes, 2 schools were randomly selected and from each school 60 students were selected in a way that from each educational grade 12 subjects were entered the study and finally the number of 960 students with 6-12 years old (480 females and 480 males) have been studied in the 16 primary schools in Ahvaz city in winter 1388. A questionnaire was given to all participants. Students' height was measured according to standard methods by a fabric meter and on a flat surface with no shoes standing straight with feet closed with 1cm accuracy and students' weight were measured by using a balance and with 1kg accuracy with minimal clothing and people's BMI was calculated by dividing the weight in weight (kg)/height (m^2) and individual's BMI is placed on the CDC2000 BMI chart age (Center for Disease Control and prevention.

The CDC2000 reference defines the BMI percentile charts for age and gender separately for 2- 20 years old people by reforming 14 growth charts related to the 1978 National Center for Health Statistics (NCHS) and adding national survey information NHANES II and NHANES III survey of the National Center of Health and the American Dietetic, and in accordance with the above chart, the people at the 95th percentile and above are defined as obese. The suggested questionnaires were to assess the information related to age, sex, birth weight, duration of breastfeeding in infancy and snack consumption habits and the amount of fast food consumption during the week, watching TV and computer hours by students during the day. Questionnaires were completed by parents. The results of the questionnaire and students' BMI were studied by using a statistical software spss version 17 and Chi square statistical test, Fisher exact test, and analysis of variance tests.

RESULTS

Among the 960 studied students, 480 were girls and 480 were boys. 58 of them were obese and 114 were overweight and 788 were other individuals that the prevalence of obesity among primary school students in Ahvaz was reported 6% and the prevalence of overweight among children was reported 11.9% respectively (Table 1).

The prevalence of obesity and overweight among boys was 6.5% and 12.9%, respectively. The prevalence of obesity and overweight among girls was 5.6% and 10.8%, respectively (Tables 2 and 3).

By comparing the prevalence of obesity among boys and girls, the statistically significant difference between the two groups was not seen.

Table 1: Prevalence of overweight and obesity in studied students

Weight group	Number	percentage	Valid percentage	The cumulative percentage
Obese	58	6.0	6.0	6.0
Overweight	114	11.9	11.9	17.9
Others	788	82.1	82.1	100.0
Total	960	100.0	100.0	

Table 2: Prevalence of obesity among boys

Weight group	Number	percentage	Valid percentage	The cumulative percentage
Obese	31	6.5	6.5	6.5
Overweight	62	12.9	12.9	19.4
Others	38.7	80.6	80.6	100.0
Total	480	100.0	100.0	

Table 3: Prevalence of obesity among girls

Weight group	Number	percentage	Valid percentage	The cumulative percentage
Obese	27	5.6	5.6	5.6
Overweight	52	10.8	10.8	16.5
Others	401	83.5	83.5	100.0
total	480	100.0	100.0	

The prevalence of obesity among children of 7, 8, 9, 10 and 11 years old was 6.3%, 6.7%, 6.3%, 6.3%, and 4.7%, respectively that the highest and lowest prevalence of obesity was at the age of 8 years and 11 years, respectively (Table 4).

Macrosomia birth rate among obese children was reported % 12.1 and others was 7% that by using a fisher s exact test with Pvalue = 0.184, the statistically significant difference between the two groups was not observed.

In comparing the habit of junk food consumption among obese children, overweight children and others, using the Chi square test, a statistically significant difference among the three groups was observed and the obese children are more accustomed to consume snacks during the day than others.

By comparing the average duration of breastfeeding in infancy among obese and overweight people and others, the average duration of breast feeding in obese was 16.45 months and in those with overweight was 18 months and in others was 18.53 months, which are shown in Table 5. Using analysis of variance ANOVA wasn't observed a significant difference among the weight

Table 4: Comparison of the prevalence of obesity among different age groups

Age group	Frequency	Weight Group			Total
		Obese	Overweight	Others	
7	Number	12	21	159	192
	Percentage in age group	6.3%	70.9%	82.8%	100.0%
8	Number	13	26	153	192
	Percentage in age group	6.7%	13.5%	79.6%	100.0%
9	Number	12	28	152	192
	Percentage in age group	6.3%	14.6%	79.2%	100.0%
10	Number	12	18	162	192
	Percentage in age group	6.3%	9.4%	84.4%	100.0%
11	Number	9	21	162	192
	Percentage in age group	4.7%	10.9%	84.4%	100.0%
Total	Number	58	114	788	960
	Percentage	6.0%	11.9%	82.1%	100.0%

Table 5: Comparing the duration of breastfeeding in infancy between weight groups

(I) Weight Group	(J) weight Group	Average difference (I-J))	Std. Error	Sig.	95% Confidence Intervals	
					Low Band	Up Band
obese	Overweight	-1.552	1.343	.480	-4.70	1.60
	others	-2.085	1.133	.157	-4.74	.57
Overweight	Obese	1.552	1.343	.480	-1.60	4.70
	Others	-.533	.834	.799	-2.49	1.43
Others	Obese	2.085	1.133	.157	-.57	4.74
	Overweight	.533	.834	.799	-1.43	2.49

Weight Group	Number	Average
Obese	58	16.45
Overweight	114	18.00
Others	788	18.53

Table 6: Comparing the frequency of fast food consumption over a week among the weight groups

(I) Weight Group	(J) weight Group	Average difference (I-J))	Std. Error	Sig.	95% Confidence Intervals	
					Low Band	Up Band
obese	Overweight	.367*	.136	.020	.05	.69
	others	1.304*	.115	.000	1.03	1.57
Overweight	Obese	-.367*	.136	.020	-.69	-.05
	Others	.937*	.085	.000	.74	1.14
Others	Obese	-1.304*	.115	.000	-1.57	-1.03
	Overweight	-.937*	.085	.000	-1.14	-.74

*The average difference is significant at the 0.05 level

Weight Group	Average	Number	Standard deviation	Maximum	Minimum
Obese	2.10	58	1.334	4	0
Overweight	1.74	114	1.227	4	0
Other	.80	788	.724	4	0
Total	.99	960	.940	4	0

Table 7: Comparing watching TV hours during the day among the weight groups

(I) Weight Group	(J) weight Group	Average difference (I-J))	Std. Error	Sig.	95% Confidence Intervals	
					Low Band	Up Band
obese	Overweight	-1.303*	.238	.000	-1.86	-.74
	others	.770*	.201	.000	.30	1.24
Overweight	Obese	1.303*	.238	.000	.74	1.86
	Others	2.074*	.148	.000	1.73	2.42
Others	Obese	-.770*	.201	.000	1.24	-.30
	Overweight	-2.074*	.148	.000	-2.42	-1.73

The average difference is significant at the 0.05 level

Weight Group	Average	Number	Standard deviation	Maximum	Minimum
Obese	3.29	58	1.676	0	6
Overweight	4.60	114	1.361	2	7
Other	2.52	788	1.477	0	7
Total	2.82	960	1.624	0	7

groups for the duration of breastfeeding in infancy.

To compare the number of fast food consumption in a week among obese and overweight and other people, the average consumption of fast food during a week among obese people was 2.1 and the average consumption of fast food in overweight group was 1.74 and in others was 0.8 , respectively (table 6). By using the analysis of variance ANOVA, a significant difference among the 3 groups was observed in the use of prepared food.

By comparing the number of watching television and computers hours among obese children and overweight and others, obese children were watching TV and computer by an average of 3.29 hours of overweight children by an average of 4.60 hours and other children 2.52 hours during the day (table 7).

By using the analysis of variance ANOVA test, a significant difference between the 3 weight groups was observed in this case that the overweight people are significantly watched TV and computer more than obese people and obese and overweight people are significantly watched TV and computers more than others.

DISCUSSION

In the present study, it was reviewed in the prevalence of obesity among primary school students in Ahvaz and some of the possible factors involved in obesity that the prevalence of obesity among elementary school students in Ahvaz was reported 6% and the prevalence of overweight was 11.9%. Also the prevalence of obesity among boys was 6.5% and the prevalence of overweight among boys was 12.9%, respectively.

While the prevalence of obesity among girls was reported 5.6% and the prevalence of overweight was 10.8% that comparing the prevalence of obesity among boys and girls were not significantly different. The prevalence of obesity in this study is comparable to the prevalence of obesity in a study conducted in northern Jordan[7], it was more than some conducted studies in Iran[11-13] and was lower than other studies in several countries[8-10, 14].

In this study, the amount of birth macrosomia among obese children was reported 12.1% and among other children were 7% that a statistically significant difference was not observed between the two groups in terms of birth macrosomia. While similar studies, there was a significant difference between these two variables[18,17].

By comparing the average time spent during breastfeeding in infancy among the obese, overweight, and others, the average time of breastfeeding was 16.45 months in the obese and overweight, it was 18 months and the other was 18.53 months that a significant difference among the weight groups in breastfeeding duration in infancy was not observed and the protective effect of mother's breast milk was not proved to prevent obesity in older age. But in similar studies that had been done in Scotland and Iran,a statistically significant difference in obesity rates between children who consumed breast milk and who did not, was observed[23,19]. Although there are other studies that was not proved the protective effect of breastfeeding in the prevention of obesity[25,24].

The prevalence of overweight (11.9%) and obesity (6%) in Ahvaz primary school students was relatively high. There was no significant difference in prevalence of macrosomea at birth between obese and non obese children, while junk food consumption was significantly different. There were no significant differences for duration of breastfeeding between obese, overweight and healthy children. There were significant differences in fast food consumption during a week between those groups. The obese children consumed more fast food during a week than others. In addition, there were significant differences in TV watching hours per day between these three groups where overweight children spent more hours on TV watching.

The features including eating snacks during a day, frequency of fast food consumption during a week, and watching TV hours during the day are different between obese children than overweight and healthy counterparts.

ACKNOWLEDGMENTS

The present study was financially supported by Ahvaz Jundishapur University of Medical Sciences (Grant No.: U-88103).

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