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Research Article

Prevalence of overweight and obesity in students in city center vocational hıgh school in Turkey

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ABSTRACT

Background: This study was performed in order to determine the prevalence of obesity and the affecting factors in male boarding high school students within the age group of 14-19 in Mus city center, Turkey.
Methods: The study is cross-sectional and was conducted between May and June 2014. Students in a male boarding high school in Muş were surveyed. No samples were selected in the study. All the students in the high school were surveyed. A total of 337 students were accessed. Researchers went into the classrooms and measured students' height and weight.
Results: Among those who participated to the study 69.4% was normal weight, 8.0% was overweight and 3.0% was obese. It was determined that those who ate less than three meals daily, those who lived biggest part of their lives in the urban areas, students with no sports activity were overweight/obese ($p<0.05$). Those who predominantly ate fries in their meals had a risk factor to be overweight/obese (OR = 2.28, CI = 1.08-4.84).
Conclusions: The overweight percentage of the students' was determined to be high. This situation implies that obesity might emerge as a health problem in these age groups in the future.

Keywords: Body mass index, Obesity, Student

INTRODUCTION

Obesity is defined by the World Health Organization (WHO) as "abnormal increase in the adiposity that may impair health".[1] WHO reports that obesity is an important public health problem the prevalence of which gradually increased in recent years. In Europe, 150 million adults, 15 million children and adolescents are thought to be obese by the year 2010.[2] The rate of obesity in children is determined as 11% in the USA, 10% in Russia and 3.4% in China.[3] In the prevalence studies conducted in our country in recent years, obesity is reported to increase in the adults, children and adolescents.[4,5] In the 2010 study report of Turkish Nutrition and Health Research (TBSA) I the percentage of overweight and obese was determined as 26.4% in 0-5 age group and 22.5% in 6-18 age group.[6]

Psychological factors, genetics, sedentary life style, nutrition habits, socio-economic reasons, endocrine disorders and drugs take part among causes of obesity.[7] Obesity leads to hypercholesterolemia, hypertension, hyperinsulinism in the long run and to coronary artery disease and diabetes mellitus over the time.[8]

This study was performed in order to determine the prevalence of obesity and the affecting factors in boarding Competition Authority Technical High School and Industrial Vocational School students within the age group of 12-19 in Mus city center.

METHODS

The study is cross-sectional and was conducted between May and June 2014. Students in a male boarding high school in Mus were surveyed. No samples were selected in the study. All the students in the high school were surveyed. Among 450 students, 337 were accessed and the answering rate was 74.9%. On the survey form, there are questions on student's age, height, weight, sociodemographic features, nutrition and physical activity statuses. Researchers went into the classrooms and measured students' height and weight. Weights were measured with light clothes and no shoes using a portable balance. Heights were measured by having students take off their shoes, make their heels joined together, their hip and shoulders leaning against the wall using a tape measure. Body Mass Index (BMI) was calculated using the formula of body weight (kg)/height(m)^2. Percentile tables and graphs of body mass indexes with respect to age and gender presented by World Health Organization were used in the evaluation of BMI's. Those with BMI between 85 and 97 percentile were accepted as overweight and those >97 were accepted as obese.[9] Required consents were obtained from Firat University Medical Faculty ethical committee and Mus National Education Directorate before the study.

The data were analyzed using the SPSS pocket program. Chi-square test and Fisher's exact test were used in the comparison of severely underweight/underweight, normal, overweight/obesity groups. The level of significance was set as p<0.05. Multivariate stepwise logistic regression analysis was also utilized. Only variables with significant associations (i.e. p value <0.05) with children's weight status in the Chi-square test tests were considered in the logistic regressions. Overweight and obese children were few in number; hence, they were collected in one group. They were compared for risk factors with children of normal weight (overweight/obesity weight: 1, normal weight: 0). The odds ratio (OR) and its 95% Confidence Interval (CI) were calculated for each categorical variable. SPSS program was used for the analysis of data. fisher's exact test and Chi-square test were used as statistical analysis methods. The value of p<0.05 was accepted as the statistical significance level in all tests.

RESULTS

All the participants of the study were males with an average age of 16.35±1.40 years and 57.9% of them were at the 14-16 age group whereas 42.1% were at the 17-19 age group. Their average height was 168.2±9.03 cm, average weight was 58.4±10.5 kg and average BMI was 20.54±2.84. Among the mothers of students', 57.6% were not graduates of any school whereas 53.4% of fathers were primary school graduates. Among participants, 19.6% were severely underweight/underweight whereas 11% were overweight and obese. When the data was examined according to age groups, 8.7% was overweight and 3.6% was obese in the 14-16 age group whereas 7.0% was overweight and 2.1% was obese in the 17-19 age group. The difference between them is statistically significant (p<0.05) (Table 1).

Table 1: Body mass index values of students with respect to age groups distributed with standards in percentile intervals.

Age groups	Percentiles (Body mass index) (kg/m^2)										χ^2 test p value
	<0.03 (Severely underweight)		0.03-0.15 (Underweight)		0.15-0.85 (Normal)		0.85-0.97 (Overweight)		>0.97 (Obese)		
	n	%	n	%	n	%	n	%	n	%	
14-16	22	11.3	11	5.6	138	70.8	17	8.7	7	3.6	χ^2=16.87 p=0.002
17-19	7	4.9	26	18.3	96	67.6	10	7.0	3	2.1	
Total	29	8.6	37	11.0	234	69.4	27	8.0	10	3.0	

The job status of the father was classified as artisan, officer, retired, unemployed and compared with BMI's of the students but no statistically significant result was obtained (p>0.05) (Table 2).

Among those who spent most of their lives in the country side, 6.4% were overweight and obese whereas 17.4% of those who spent most of their lives in the urban areas were overweight and obese (p<0.005). Students with no sports activity are overweight and obese at a higher rate compared to students doing sports activities (p<0.05). When the nutritional habits were examined, those who ate three meals a day were determined to be overweight and obese at a higher rate compared to those who did not (p<0.05). Multivariate logistic regression showed that those who predominantly ate fries in their meals have an increased risk of overweight/obesity (OR 2.28, 95%1.08-4.84) (Table 3).

No statistically significant difference was found between being overweight/obese and educational status of mother, educational status of father, monthly status income, number of siblings, family type or presence of obese individual in the family (p>0.05) (Table 2).

Table 2: Distribution of body mass index groups of students with respect to certain.

Variables	Body mass index (kg/m²)						χ^2 test p value
	Severely underweight and underweight		Normal		Overweight and obese		
	n	%	n	%	n	%	
Educational status of mother							
Not graduated from elementary school	33	17.0	138	71.1	23	11.9	χ^2=4.20 p=0.379
Primary school graduate	28	21.5	89	68.5	13	10.0	
High school graduate and ↑	5	38.5	7	53.8	1	7.7	
Educational status of father							
Not graduated from elementary school	18	20.0	60	66.7	12	13.3	χ^2=2.49 p=0.646
Primary school graduate	32	17.8	131	72.8	17	9.4	
High school graduate and ↑	16	23.9	43	64.2	8	11.9	
Father's job							
Artisan	46	22.4	142	69.3	17	8.3	χ^2=10.72 p=0.097
Officer	11	15.7	49	70.0	10	14.3	
Retired	0	0.0	9	69.2	4	30.8	
Unemployed	9	18.4	34	69.4	6	12.2	
Monthly income status							
Poor	14	21.9	30	60.9	11	17.2	χ^2=6.88 p=0.142
Intermediate	40	17.5	165	72.1	24	10.5	
Good	12	27.3	30	68.2	2	4.5	
Number of siblings							
3 and ↓	16	25.0	40	62.5	8	12.5	χ^2=1.89 p=0.387
4 and ↑	50	18.5	194	71.1	29	10.6	
Type of family							
Elementary family	47	17.6	190	71.2	30	11.2	χ^2=3.20 p=0.201
Extended family	19	27.1	44	62.9	7	10.0	
Residence							
Country	37	21.5	124	72.1	11	6.4	χ^2=15.26 p=0.004
District	1	3.7	24	88.9	2	7.4	
Urban	28	20.3	86	62.3	24	17.4	
Sports activity status							
Yes	36	19.1	139	73.9	13	6.9	χ^2=7.67 p=0.022
No	30	20.1	95	63.8	24	16.1	
Number of meals eaten daily							
<3	12	16.9	43	60.6	16	22.5	χ^2=12.29 p=0.002
Three times	54	20.3	191	71.8	21	7.9	
Eating predominantly fries in meals							
Yes	15	23.4	37	57.8	12	18.8	χ^2=6.48 p=0.03
No	51	18.7	197	72.2	25	9.2	
Presence of obese individual in the family							
Present	6	14.6	29	70.7	6	14.6	χ^2=1.16 p=0.55
Absent	60	20.3	205	69.3	31	10.5	

Table 3: Comparison of overweight and obese students with those of normal weight according to variables.

Variables	Odds ratio	95% Confidence interval	p
Residence			
Urban	1		
District	0.32	0.15-0.68	0.003
Country	0.38	0.08-1.71	0.208
Sports activity status			
No	1		
Yes	0.38	0.19-0.78	0.009
Number of meals eaten daily			
<3	1		
Three times	0.71	0.34-1.47	0.367
Eating predominantly fries in meals			
No	1		
Yes	2.28	1.08-4.84	0.031

DISCUSSION

It was determined in our study that 8.6% of the students are severely underweight, 11% are underweight, 69.4% are at the normal weight, 8% are overweight and 3% are obese. In another study, 12.9% of adolescents were stated to be underweight and 27.2% were stated to be obese.[10] In a different study, underweight was reported as 26.4% and obesity as 21.4% in the age group between 15 and 18.[11] These studies report higher values than our study. In a study conducted by Ece et al.[12] on 3040 students between the ages 9 and 17; the ratio of overweight children were found as 2.1%, ratio of obese children as 0.9% and 21.7% of the children constituted the low weight group. In the study of Şimşek et al.,[13] the frequency of obesity in children between the ages 12 and 17 was found to be 5.4%. In extrinsic literature, obesity prevalence changes between 15% and 82% in several studies on this subject.[14,15] The percentage of being overweight and obese in our study, is lower in comparison to the other studies, except the study of Aydin et al.

In our study, statistically significant correlation between the educational status of parents and obesity ($p>0.05$) was not found. In the literature, besides papers that show no correlation between the educational status of parents and obesity,[16] studies that show the effect of educational status of parents on obesity[17] are present. Those who spent most of their lives in urban areas were found to be overweight and obese at a higher rate when compared to those who spent most of their lives in countries. While obesity ratio in China in boys and girls was 0.2% and 0.1%, respectively; it increased to 4% in 1990, 6-8% in 1995 and 9-12% in 2000. However, obesity continued as 1.5% in the middle class and 0.9-1.2% in individuals who live in country sides.[18] Another reason of the lower ratio of overweight and obese in country sides might be that children and adolescents do not have a sedentary life in country sides, as in the urban areas. Murata[19] states that in Japan obesity ratio of school children increases gradually and was around 10% in 2000 as a result of increased energy intake and sedentary life style. In our study, individuals who do not engage in a sports activity were found to be overweight and obese. In a study that includes thirty four countries and 137593 school children it was concluded that regular physical activity apparently reduces overweight and when compared to individuals in normal weight obese adolescents show less physical activity and watch television more. In obesity treatment guides in USA, Canada and United Kingdom, at least 30-60 minutes of physical activity in most of the days of a week is suggested to young.[20] In another study 45.7% of 878 adolescents between the ages 11 and 15 were found to be overweight and less than one hour daily hard physical activity, spending much time watching television, excess calorie intake were found to be the most effective factors on being overweight.[21] For this reason students should be encouraged to do regular physical exercise to avoid obesity. Sedentary life style should be avoided.

It was found that those who eat less than three meals daily are overweight and obese at a higher rate in comparison to those who eat three meals daily ($p<0.05$). For sufficient and well-balanced nutrition 3 main meals should be eaten regularly. However skipping a meal is a common attitude in adolescent period. When it is transformed into a habit, nutrition of the individual is prevented and problems due to insufficient nutrition arise. In a study conducted on 355 school children in Wales between 1994 and 1998, it was determined that obese adolescents skip breakfast two times a week and normal weight adolescents skip breakfast once a week.[22] In our study the most skipped meal is breakfast. For those who mainly eat fried food in their meals, to be overweight and obese was found to be an important factor. Intense calorie and fat intake in modern day nutrition (fast food style nutrition) is a risk factor in the increment of obesity frequency.[23] Birch and Davidson also states in their study that overweight children take their excess energy from fat.[24] In the nutrition of societies, a nutrition which is rich for fat, sucrose, sodium and poor for pulp is observed and consumption of untreated food is gradually decreasing. It is thought that the main problem originates from unbalance in fat and carbohydrate in nutrition and is correlated with threpsology.[25]

CONCLUSION

In our study, students who do not exercise, eat less than three meals daily, spend most of their lives in urban areas were found to be overweight/obese at a higher rate. For those who mainly eat fried foods as a nutritional habit, obesity might be a risk factor. Even the ratio of obesity was not found to be high in students; ratio of being overweight was high. This gives rise to the thought that obesity might confront as a health problem in this age group in the future. For this reason students should eat

healthily, should not skip a meal, should exercise and increase in weight should be monitored. Programs related to active life such as healthy eating habits and doing exercise are suggested to put into school syllabus.

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