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Prevalence of Obesity among 11-14 Years Old Students in Sivas-Turkey

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Abstract: This study was performed to find out the prevalence of obesity among 11-14 years old children in Sivas province. BMI values higher than 95 percentile were accepted as being obese and those in between 85-94 percentile are accepted as overweight. Of the 2701 students; 3.1% were found obese, while 7.5% were overweight, and 7.6 were underweight according to their BMI values. Underweight children among the age of 14 yrs old children was significantly higher than the others. Obesity among boys were significantly higher than in girls. Prevalence of obesity was found higher in the children of high-income families and among children who gobbling. Underweight subjects were significantly higher among children who don't dine regularly and those who eat once a day. In conclusion; prevalence of obesity among children in Sivas is not high yet, and undernutrition seems to be a more serious problem than obesity.

Key words: Childhood obesity, adolescence, growth, overweight, underweight

Introduction

Obesity is getting to be a more prevailing disease all over the world (Seidell, 1999; James, 1999; Strauss, 1999). It is estimated that nearly 250 million obese and 2-3 fold of this overweight people exist in the world (Seidell, 1999; James, 1999). In the last tree decades childhood obesity also got prevalent as high as 18-30% in the developed countries (e.g. USA, Italy, Germany, England) (Seidell, 1999; James, 1999; Strauss, 1999; Bandini, 1992; Bellizzi and Dietz, 1999; Falkner and Michel, 1999; De Vito *et al*., 1999; Livingstone, 2000). Also in the developing countries, obesity prevalence is increasing, according to the data collected by WHO from 94 countries The mean prevalence of obesity is 3.3%, in these countries. In African and Asian countries underweight is 2.5-3.5 times more prevalent than obesity (de Onis and Blossner, 2000). In several studies, prevalence of obesity is found 2-13% and underweight 10-37% among 12-17 yrs old children, in Turkey (Akman *et al*., 1988; Bagci and Akdag, 1992; Ackurt and Wetherilt, 1991) .

It is well known that the risk of developing hypertension, dislipidemia, insulin resistance and hyperinsulinemia are highs in the obese subjects. Obesity is also an independent risk factor in CHD, Childhood obesity also has been shown to be having such negative effects on health, such as hypertension, abnormal glucose tolerance, X-syndrome, CVD, damage on self-esteem, body image and economic mobility and unhappiness (Bandini, 1992; Falkner and Michel, 1999; Must and Strauss, 1999). Development of obesity is affected by many factors, (e.g. genetic, family history, lack of physical activity, gender, income, nutritional habits of fatty meals-especially consumption, etc.) (Strauss, 1999; Livingstone, 2000; Maffeis, 2000; Chunning, 2000; Perusse and Bouchard, 2000; Olaughlin *et al*., 2000; Uavy *et al*., 2000; Hardly *et al*., 2000; Power and Parsons, 2000; Tanaseccu *et al*., 2000)

Materials and Methods

This study was carried on randomly selected 2701 primary school children, from 18 schools (out of 64) in Sivas province, Turkey. Data about the family histories, nutritional habits, physical activity status and food consumption frequency patterns of the students were collected through a questionnaire form. Two research fellows and intern doctors of the School of Medicine measured the weight, height, and the waist circumference of the students and then BMI of the students were evaluated. >95 percentile of the BMI was accepted as obese, 85-94 percentile as overweight and 3 < percentile as underweight. Statistical analyses were performed on a personal computer using the Statistical Package for the Social Sciences. Statistical comparisons used ANOVA and chi-square test. Statistical significance was assumed for a $p < 0.05$.

Results

Of the 2.701 students 7.6% were found underweight, 7.5% were overweight, and 3.1% were obese. BMI of the students by age and gender are shown on Table 1. Underweight among 14 yrs old children and obesity in male children were significantly higher than in the others ($p<0.05$). BMI of the children by their families' properties are shown on Table 2. Parental properties of the students were similar ($p>0.05$), obesity was more prevalent in children who belong to high-income families and whose fathers had higher education. On the other hand underweight was prevalent among the children of illiterate women ($p<0.05$).

71.4% of the students declared that they exercise some sports (eg, soccer, basketball, and swimming). No

Table 1: BMI of the students by age and gender

Age	Underweight		Normal		Overweight		Total
	n	%	n	%	n	%	n
11	50	7.6	534	81.2	74	11.2	658
12	56	6.1	757	82.6.	104	11.3	917
13	57	7.5	628	83.1	71	9.4	756
14*	43	11.6	290	78.4	37	10.0	370
Gender							
Girl	93	6.8	1154	84.1	125	9.1	1372
Boy*	113	8.5	1055	79.4	161	12.1	1329
Total	206	7.6	2209	81.8	286	10.6	2701

* $p < 0.05$

Table 2: BMI of the students by their families' properties (%)

	Under weight	Normal	Over weight	Total (n = 2701)
Mother's age				
20-29	12.7	82.5	4.8	65
30-39	7.1	83.1	9.8	1853
40-49	8.6	79.3	12.1	692
50 +	8.1	76.7	15.1	91
Father's age				
30-39	5.7	83.9	10.4	928
40-49	8.8	81.5	9.7	1490
50 +	7.1	78.3	14.6	283
Mother's education				
Illiterate	9.1	82.7	8.2	340
Primary school	8.3	81.4	10.3	1470
Secondary school	6.3	83.0	10.7	345
Lycee	5.4	81.5	13.1	418
High school	4.8	83.9	11.3	128
Father's education				
Illiterate	8.5	85.1	6.4	49
Primary school	9.2	81.9	8.9	733
Secondary school	7.1	80.1	12.8	454
Lycee	6.8	83.3	9.9	976
High school	6.6	80.7	12.7	489
Mother's occupation				
House wife	7.9	81.9	10.1	2462
Official	3.5	81.9	14.6	147
Retired	6.7	80.0	13.3	15
Self-employed	6.7	73.3	20.0	46
Worker	3.2	87.1	9.7	31
Father's occupation				
Self-employed	7.9	81.8	10.4	542
Official	7.3	81.7	11.1	760
Worker	6.9	83.9	9.1	752
Tradesman	8.4	79.5	12.1	310
Retired	5.6	78.3	16.2	206
Farmer	9.9	84.6	5.5	95
Unemployed	20.0	71.4	8.6	36
Socio-economic level				
Low	17.9	76.5	5.6	480
Medium	5.5	84.0	10.5	1642
High	5.2	79.8	15.0 *	579
Family size				
≤4	6.4	79.6	14.0	743
5-7	7.7	82.9	9.4	1696
≥8	10.0	81.1	8.9	262

* $p < 0.05$

Table 3: BMI of the students by their several activities

Activity type	Underweight (Mean ± SD)	Normal (Mean ± SD)	Overweight (Mean ± SD)	Total (Mean ± SD)
Sleeping (h/day)	8.9 ± 1.6	8.9 ± 1.4	8.8 ± 1.3	8.9 ± 1.6
Playing-watching TV (h/day)	2.7 ± 1.5	2.9 ± 1.5	2.9 ± 1.6	2.9 ± 1.7
Playing outdoors (h/day)	2.1 ± 1.5	2.0 ± 1.4	1.9 ± 1.7	1.8 ± 1.5
Sporting (h/week)	5.4 ± 2.4	5.2 ± 2.8	4.6 ± 2.9	4.5 ± 2.6

Table 4: BMI of the students by their nutritional habits (%) (n = 2701)

	Underweight (%)	Normal (%)	Overweight (%)	Total (%)
Nutritional habits				
Regularly breakfast	7.1	82.7	10.2	81.1
Regularly lunch	7.5	82.0	10.5	89.4
Regularly dinner	7.4	82.1	10.5	95.5
Snacking	7.9	82.6	9.5	59.6
Swallowing big pieces	6.3	79.1	14.6*	14.8
Gobbling	6.4	78.7	14.8*	24.8
Number of meal / day				
1	20.0	66.7	13.3	0.6
2	4.4	76.5	19.1	7.7
3	7.7	82.5	9.8	82.2
4+	9.1	80.7	10.2	9.6

* $p < 0.05$

relation was observed in between BMI of the students and their physical activities, duration of sleep and watching TV, etc. (Table 3)

Prevalence of obesity was significantly higher in habitually rapid eating children (14.8%) and in those who habitually swallow large pieces (14.6%) ($p<0.05$) (Table 4).

Discussion

Prevalence of overweight and obesity in 11-14 yrs old children is found 10.6% in this study. This is lower than in developed countries (Seidell, 1999; James, 1999; Strauss, 1999; Bandini, 1992; Bellizzi and Dietz, 1999; Falkner and Michel, 1999; De Vito *et al*., 1999; Livingstone, 2000).

There is some correlation between obesity and income levels of the subject. Controversy, obesity is prevalent among the low income groups in developed countries (Power and Parsons, 2000; Hardly *et al*., 2000; Booth *et al*., 1999; Bray, 1999) while it is more prevalent in the high income groups in the developing countries. In a cohord study which is carried on in GB, especially the women who grew up in low income families face obesity more than the others (Power and Parsons, 2000; Hardly *et al*., 2000). Obesity increases as the income levels rise in Turkey (Akman *et al*., 1988; Bagci and Akdag, 1992; Ackurt and Wetherilt, 1991). Our findings were similar also. In a study in Kuwait no relation was observed in between income levels and obesity (Moussa *et al*., 1999).

Lack of physical activity and spending spare times by watching TV or playing TV-video games lead to obesity as shown by many studies (Strauss, 1999; De Vito *et al*., 1999; Maffeis, 2000; Olaughlin *et al*., 2000; Booth *et al*., 1999). We didn't observe such a relation in our study. Tough 71.2% of the students say that they exercise sports, duration of sports greatly differs from subject to subject. No relation was observed in the Kuwait study also (Moussa, 1999). This may be explained by the poor guestionnaire replies.

Fast food cause obesity as shown in many studies (James and Ralph, 1999; Strauss, 1999; Maffeis, 2000; Chunning, 2000; Uavy *et al*., 2000; Bray, 1999; Robinson, 1999). These sort of meals are rather fatty and include less fiber. Consumption of fast food was quite less in our study group.

Behaviours as rapidly eating and swallowing large pieces may lead obesity, by slowering the (conduction, neurotransmission) of saturation signals to the brain and consumption of much food meanwhile. We observed such behaviours in the obese children.

Our results show that childhood obesity is not a serious problem at the moment in Sivas. But since it will cause some health problems in the future, it would be useful to take some preventive measures during childhood. It is shown that giving education to children for six months, to reduce to spare times by playing TV-video games and watching TV, triceps thickens , waist circumference and waist/hip ratio significantly lessens as compared by the controls (Robinson, 1999). Physical activity programmes should be put on the schools. Any treatment plan for overweight children and adolescents should include

three major components: diets, exercise and family-based behavior management and they should not be placed on restrictive diets because adequate calories are needed for proper growth (Quinzi, 1999).

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