Original Article

Association of Body Mass Index with Eating Attitudes, Self Concept and Social Comparison in High School Students

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Abstract

Aim: In this study we aimed to investigate the association of body mass index with eating behaviours and psychosocial characteristics.
Method: This was a cross sectional study that utilised a questionnaire form that included data related to socioeconomic and psychosocial characteristics of subjects. The data were gathered via student identification form, eating habit inventory Eating Attitude (EAT-40) test", Piers-Harris Children's Self-Concept Scale and Social Comparison Scale. Weight, height, waist and hip circumferences were measured. The study was conducted among 936 high school students who were randomly sampled through 9 different types of high schools in Bursa city.
Results: Among the cases 56.9% were are female (n: 542), and 43.1% were male (n: 411) and the mean age of the whole study group was 15, 74±1, 27. The mean body mass index (BMI) of the students was 21.14±3.43 kg/m2. Of the students; the mean eating attitude test score was 20.59±11.69, the mean self-esteem score was 56.07±10.13, and the mean social comparison scale score was 69.51±25.31. No significant association was found between body weight, eating disorders and self esteem scores (p>0.05).A weight perception problem exists evident as the finding that 50% of thin students and 35.4% of normal weight students thought they were overweight. Approximately, 73% of overweight and 80% of obese students were aware of their status.
Conclusions: The development of the adolescents and environmental factors make the group susceptible to eating disorders and this age group needs to be closely monitored.

Key Words: Eating attitudes, Self-concept, Body mass index, Social comparison, Adolescents

Introduction

Adequate and balanced nutrition is essential for being healthy in every period of life and adolescent period has particular importance (Baysal, 2009). During these periods of development of individual behaviour patterns that may affect the whole life occur. Self-concept is the core of personality development and is affected by many variables. These are; physical changes associated with changes in body image, mental growth, increased emotional independence, values, sexual behaviour, social and occupational role changes, and decisions such as choosing friends (Coleman and Hendry, 1991). Search for identity can

be defined in a way as combining the individual's past and present experience, and self-identification as different from the others in a consistent manner (Jackson, D.B. and Saunders, 1993).

In a study conducted in four high schools in Bakırköy in Istanbul in 1992; 1022 girls and 956 boys were screened. Of students at ages between 14-19 there was bulimia in 2,5% (50 people) and anorexia in 2% (4 persons) (Demir, 2006).   A survey was made to evaluate the eating disorders in Turkey. BMI was below the normal limit in 42.9% of cases, 6.3% cases were overweight, 0.7% were obese. 11.5% of girls in the study had eating disorders (Baş et al., 2004). Various other research done in our country, showed that the eating habits of students were inappropriate (Tanrıverdi et al., 2011; Toker, 2008). Low self-esteem in students lead to negative eating habits (Toker, 2008; Yang et al., 2010).

Hypothesis of the Study

In adolescents the body mass index is associated with;

1.	The scores of the Social Comparison Scale of Pier Harris.
2.	Self-esteem determined by the Pier-Harris Scale (The Way of How I feel About Myself).
3.	The Eating Attitude Test scores.

Background

Perception of the body image, starts with comments of the family about adolescent's body measures, then comes the social comparisons, cultural influences and period of creation of a body image schema; that is shaped by the influence of others' opinions (Devecioğlu, 2008). In case of inconsistencies with body image created for him and the measures presented by others; negative perceptions of body image occur (Rosenberg, 1965). Particularly; perceptions of height, weight and perceptions like being thin is associated with being handsome and these are given extreme importance by the adolescent (Jackson, D.B. and Saunders, 1993).

Materials and Methods

The study was conducted in Bursa, in Turkey. Students of 9 high schools were enrolled attending to 9-12th classes. By the use of stratified random sampling method 953 students were included into the study, who gave their consent for participation. The study had no exclusion criteria. Number of students in both genders included was determined according to the total number of students and gender distribution in the schools. Descriptive data gathered included the socioeconomical status of the family and the students. A face to face interview method was used. A questionnaire was applied and some data were collected from the school registries.

Body mass Index (BMI) was calculated by the formula: BMI= weight (kg) / height (m^2). Categories of World Health Organisation were used for body mass index as; 15 percentile: lean, 15-85: normal, 85.-95: "overweight", >95percentile "obese" (de Onis et al., 2012). Also waist to hip ratios of the adolescents was determined. SPSS 21.0 software programme was used for statistical analysis. The data were presented as mean and percentages. Pearson ki-square, Yates ki-square, and Mann-Whitney U tests were used in the statistical analysis. Statistical significance was assumed in case of a p value < 0.05. Informed consents were taken from all participants. The local ethical committee permission (number is 2013-18/01 and required permissions from the government were obtained.

Four different parts of data gathering questionnaire was used. The first part included student identification form. The other three forms were the tests used for evaluating eating attitudes [EAT-40 – "Eating Attitude Test"], self-esteem [Pier-Harris – "The Way of How I feel About Myself"], and social comparisons [Pier-Harris – "Social Comparison Scale"].

EAT-40 (Eating Attitude Test) was developed by Garner and Garfinkel in 1979. EAT 40 has forty questions (Garner and Garfinkel, 1979). EAT-40 score 30 or above shows high risk, a score between ≥21 and <30 denotes intermediate risk and scores <21 show low risk (Savaşır and Erol, 1989). Piers-Harris Self Concept Scale determines the self-concept in children. Psychological self-concept, age and gender predict children's activity preferences and leisure

participation (Goltz and Brown, 2014). It has the original name "The Way of How I feel About Myself". It measures self-confidence, self-concept, and self-perception. The score ranges from 0 to 80 and Yan et al. in 1999 defined the moderate score between 45 and 60. A high score is >60 and a low score is <45. Çataklı and Öner has adapted and validated the scale to the Turkish population (Öner, 1996).

Social Comparison Scale was developed by Gilbert et al. and adapted for Turkish by Şahin and Şahin (Allan and Gilbert, 1995; Sahin and Sahin, 1992). The items are evaluated by giving a score from 1 to 6. High scores indicate perceiving positively. It is used for adolescents and adults. Minimum and maximum scores are 18 and 108; respectively. High scores indicate a positive self scheme (Sahin and Sahin, 1992).

Results

Among the students surveyed (n=953); 56.9% (n = 542) were female, 43.1% (n = 411) were male and the mean age was 15.74 ± 1.27. The majority of the students (77.6%) chose their school willingly, and more than half (54.8%) had a moderate success. The majority of mothers (34.1%) were primary school graduates while 29.4% of them graduated from high school. Some of the fathers had (34.6%) graduated from university. Majority of mothers were housewife (67.2%) and of fathers 26.2% were self-employed. Rate of coverage by social security among participants was 94.2% and the monthly income of 67.8% was below 1090 EUR. Most of the students (85.4%) were living in a core type family. The average number of people living in the same house was 4.35 ± 1.17.

In Table 1 the characteristics related to body weight of adolescents are given. The mean body mass index of the cases was 21.14±3.43, and 81.4% were of normal weight. The overweight, obese and lean cases constituted the 12.6%, 3.3% and 2.7% of study group; respectively. The waist to hip ratio of the cases was 0.78±0.16. In Table 2 the distribution of the cases according to having eating disorder, self conception and perception of body weight are illustrated. The percentage of all the cases having eating disorder was 12.3%. The obese cases had the

highest rate of eating disorders but the inter group difference was not statistically significant (p>0.05). Among the cases 14.3% had low self-esteem. However; self-esteem was not related to body weight (p>0.05). When perception of body weight according to body mass index was evaluated, 50% of lean cases perceived themselves as being overweight. Of normal weight cases 35.4% thought that they were overweight. Of the overweight and obese cases, 73.3% and 80.6% respectively, perceived their body weight status correctly. Taking body mass index into consideration, true perception of their body weight was more frequent in normal weight, overweight and obese adolescents compared to lean ones (p<0.05).

In Table 3 the items in Social Comparison Scale according to according to body mass index of patients are given. The item scores of the overweight cases showed that they more often perceived themselves as being incompetent, inferior, unlikable, left out, unconfident, and outsider compared to others (p<0.05).

In Table 5 the eating attitude test, self-esteem and social comparison scale scores are given according the descriptive characteristics of the cases. Eating attitude test revealed higher scores in girls, in cases with illiterate mothers compared to cases with mothers graduated from high school or university, in cases with fathers of middle school graduates compared to fathers of high school and university graduates and in cases with lower monthly income (p<0.05-0.001). The eating attitude test revealed higher scores in cases with health problems (p<0.05). The eating attitude test scores of normal weight cases revealed low risk profile. However; overweight, obese and lean cases were in the average risk group. Inter group statistical analysis revealed no significant difference (p >0.05). Cases with overweight mothers were in the average risk profile of eating attitude test scores and had significantly higher scores than the cases with non-overweight mothers (p<0.05). The eating attitude test score increased with increasing number of siblings and household members, but the relation is not statistically significant. Also other variables and eating attitude test scores are not associated with each other (p>0.05).

Comparison of mean self-esteem scores showed higher scores existed in boys. The scores were lower for cases with illiterate mothers. Overweight parents caused lower self-esteem scores. Increasing age and number of siblings caused a reduction in self-esteem scores (p<0.05). Cases with health problems, cases that did not exercise, or took nutrient supplements or smoked had lower self-esteem scores. Also cases who had no sleep disturbances had high scores (p<0.05). No significant association was found between other variables and self-esteem scores. Comparison of social scale scores, revealed that significantly lower scores were present in cases whose fathers were unemployed, whose mothers were workers, whose fathers were middle school graduates, and who had average monthly income. Also in cases with mothers of university degree the scores were higher. Boys had higher social comparison scores than girls in this study (p<0.001). The number of siblings and household members was not related to social comparison scale (0.10).

Discussion

The mean body mass index in the adolescents in our study is similar to the results of a study that enrolled adolescents at ages of 15 to 18 and revealed a body mass index of 21.9 ±4.7 kg/m^2 and 22.2 ±3.7 kg/m^2 for girls for boys; respectively (Besler et al., 2010). Being obese and overweight rates were 3.3% and 12.6%, respectively in our study. Various studies reported adolescent obesity rates of 4.1-8.2% and being overweight rates of 8.8-14.3% (Kutlu and Çivi, 2009; Sancak et al., 2010). In our study rate of being lean was 2.7% and in the literature this was ranging 3.1% and 6.5% (Jacalyn J. Robert-McComb and Gary, 2014; Kılıç, 2006; Kjelsas et al., 2004; Lucas et al., 1991; Vardar and Erzengin, 2011).

Kutlu et al. in their study reported that 13.3% of girls of 14 years of age were lean. Among boys of 7 years of age 33.3% was overweight. Among 10 year old boys obesity rate was 20 percent (Kutlu and Çivi, 2009)**.** These results show that body weight is an important problem for children and adolescents.

Rate of eating disorder in our study was 12.3% and eating disorder was more frequent among obese adolescents. The previous studies among adolescents reported rates of eating disorders ranging between 2.33% and 11,5% (Baş et al., 2004; Demir, 2006; Favaro et al.; Güler et al., 2009; Tanrıverdi et al., 2011; Toker, 2008; Vardar and Erzengin, 2011). Some studies show association of eating disorders and body mass [49-51]. In our study a significant but weak association of body mass index with eating attitude test scores was present (p<0.05). The self-esteem scores of the adolescents were not related to body mass index in this study (Table 2).

There are studies that reported increased body dissatisfaction with increasing body mass index, eventually triggering eating disorders (Hawkins et al., 2004; Malkemus et al., 2008). Among cases 42.1% identified themselves as being overweight in this study. Oktan and Şahin in their study reported that self-esteem sores lowered with increasing body mass index in girls (Adana et al., 2012). Sancak et al. in their study found that obese individuals physically were less active (Sancak et al., 2010). The recommended amount of physical activity for adolescents is the one that caused sweating, shortness of breath. The beginning should include 30 minutes of exercise for 3 days a week. After 4 weeks the exercise should be increased to five or more days a week with a duration of exercise for 45 to 60 minutes (Baltacı et al., 2008). This type of exercise is required to name it as regular. In our study the mean duration amount of exercise was 234.59±184.91 minutes in exercising adolescents. We couldn't find an association between eating attitude test scores and physical activity. However; among exercising adolescents, self-esteem scores and social comparison scale scores were significantly higher (p<0.05). Exercising adolescents may have better self perception by getting positive feedbacks from the environment. By the results of our study we can conclude that; children in order to gain confidence and be social should be directed to sports. World Health Organization has addressed the importance of physical activity in solution of the problems related to nutrition (WHO, 2004).

Table 1. Characteristics of the students' body weight (n=953)

Characteristics of Body Weight	(Mean ± SD)	Range
Body Mass Index	21.14±3.43	(11.25-43.52)
Waist to hip ratio	0.78±0.16	(0.58-5.23)
	n	**%**
Body weight Status		
Normal	776	81.4
Overweight	120	12.6
Fat	31	3.3
Slim	26	2.7

Table 2: Characteristics of the students' body weight and eating disorders status (n=953)

	Normal		Overweight		Fat		Slim		Total		
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*Probability*
Eating disorders											
Yes	87	11.2	19	15,8	7	22.5	4	15.3	117	12.3	X^2=5.517,
No	689	88.8	101	84,2	24	77.5	22	84.7	836	87.7	p=0.138
Level of Self-Concept											
Low	114	14.7	16	13.3	3	9.7	4	15.4	137	14.3	X^2=9.704,
Normal	346	44.6	40	33.3	17	54.9	9	34.6	412	43.3	p=0.138
High	316	40.7	64	53.4	11	35.4	13	50.0	404	42.4	
Weight perceiving											
Much	275	35.4	88	73,3	25	80,6	13	50.0	401	42.1	X^2=83.106,
Normal	501	64.6	32	26,7	6	19,4	13	50.0	552	57.9	**p=0.001**
Total	776	81.4	120	12,6	31	3,3	26	2.7	953	100.0	

* Column percentage is taken.

Table 3. Social comparison subscale scores according to body weight status of students (n = 953)

Social Comparison Scale Lower Dimensions	Normal (Mean ± SD)	Overweight (Mean ± SD)	Fat (Mean ± SD)	Slim (Mean ± SD)	**Probability**
Inferior	3.63±1.72	4.24±1.64	3.42±1.64	3.27±1.68	KW=16.775 **p=0.001**
Incompetent	3.75±1.81	4.28±1.73	3.52±1.63	3.46±1.86	KW=11.403 **p=0.010**
Unsuccessful	3.67±1.69	4.19±1.64	3.52±1.58	3.35±1.85	KW=12.474 **p=0.006**
Unpopular	3.85±2.01	4.38±1.86	3.77±1.80	3.27±2.07	KW=10.352 **p=0.016**
Insider	3.59±1.79	4.06±1.70	3.81±1.49	3.69±1.87	KW=7.503 **p=0.057**
Alone	3.77±1.90	4.18±1.90	3.97±1.70	3.46±2.04	KW=6.470 p=0.091
Left out	3.86±1.97	4.49±1.83	4.00±1.80	3.50±2.02	KW=13.085 **p=0.004**
Impatient	3.64±1.80	3.79±1.68	3.68±1.51	4.19±1.65	KW=2.839 p=0.417
Intolerant	3.98±1.93	4.37±1.81	4.13±1.83	3.65±2.19	KW=4.473 p=0.215
Makes Told	3.99±1.65	4.31±1.57	3.77±1.78	3.50±1.77	KW=6.743 p=0.081
Funky	3.90±1.83	4.30±1.74	4.00±1.67	3.85±1.78	KW=5.208 p=0.157
Low Self-Esteem	3.85±1.87	4.44±1.82	3.97±1.74	3.62±2.04	KW=12.513 **p=0.006**
Timid	3.66±1.78	4.261.62	3.941.69	3.381.74	KW=13.163 **p=0.004**
Dispersed	3.55±1.73	3.66±1.75	4.23±1.54	3.38±1.62	KW=5.179 p=0.159
Passive	3.82±1.83	4.13±1.78	4.29±1.55	3.58±1.88	KW=4.826 p=0.185
Unstable	3.94±1.73	4.23±1.70	4.13±1.74	3.73±1.63	KW=4.249 p=0.236
Unattractive	3.98±1.91	4.33±1.80	4.10±1.55	3.50±1.96	KW=5.408 p=0.144
Submissive	4.12±1.97	4.64±1.81	4.55±1.76	3.62±1.94	KW=12.110 **p=0.007**

KW= Kruskal Wallis Test

Table 4. Distribution according to the characteristics of the students' health status and habits

(n = 953) Attributes related to health status and habits	n	%
The presence of a health problem		
Yes	115	12.1
No	838	87.9
Regular exercise level		
Yes	339	35.6
No	614	64.4
Weekly exercise time (minutes) (n = 339)	**Mean ± SD**	**Range**
	234.59±184.91	(15-900)
Nutritional supplements receive status		
Yes	67	7.0
No	886	93.0
Received nutritional supplements (n = 67)		
Fish Oil	8	11.9
Blood Drug	6	9.0
Herbalife	2	3.0
Bvit	3	4.5
Vitamin	16	23.9
Gingivitis	1	1.5
Naturway	1	1.5
Protein Powder	4	6.0
Zinco	1	1.5
Unanswered	25	37.2
Smoking habits		
Yes	99	10.4
No	854	89.6
Smoking amount (quantity) (n = 99)	**Mean ± SD**	**Range**
	9.66±6.22	1-20

Those performed in case of weight gain

Eating junk food	223	23.4
Dieting	120	12.6
Using appetite suppressant	6	.6
Skipping meal	64	6.7
Doing sports	287	30.2
Unanswered	253	26.5

Overweight individuals in the family (n=926)

Yes	623	67.3
No	303	32.7

People who care about body weight in the family

Mother	374	39.2
Father	176	18.5
Sister	227	23.8
Brother	112	11.8
Unanswered	64	6.7

Regular meals habits status

Making breakfast	542	56.9
Having lunch	605	63.5
Having dinner	795	83.4

KW= Kruskal Wallis Test

Table 5. The eating attitude test, self-concept and social comparison scale scores of students according to the descriptive characteristics (n=953)

Socio-demographic Characteristics	Eating Attitudes	Self-concept	social comparison
	Mean ± SD	Mean ± SD	Mean ± SD
Age	r=-0.028, p=0.383	r=-0.100, p=0.002	r=0.009, p=0.780
Gender			
Female	21.98±11.56	55.29±10.31	65.00±25.15
Male	18.76±11.6	57.11±9.81	75.48±24.30
Probability	t=4.247, **p=0.001**	t=-2.753, p=0.006	t=-6.446, **p=0.001**
Body Mass Index	r=0.074, p=0.022	r=-0.005, p=0.867	r=0.077, p=0.018
Waist / hip ratio	r=-0.036, p=0.265	r=-0.015, p=0.634	r=0.090, p=0.006
Education Level of Mother			
Illiterate	28.84±7.51	52.07±11.45	67.46±25.28
Literate	20.95±7.05	60.60±10.01	59.85±29.80
primary school	21.68±11.76	55.42±10.24	68.22±24.59
secondary school	23.87±14.65	54.75±9.45	67.21±25.53
high school	18.13±9.16	56.92±9.69	67.64±25.92
university	19.31±12.20	56.75±10.82	77.85±23.40
Probability	KW=51.392, **p=0.001**	KW=13.787,p=0.017	KW=26.101,**p=0.001**
Education Level of Father			
illiterate	17.33±4.50	51.66±8.32	74.00±12.49
literate	18.00±5.61	62.80±14.49	69.00±27.50
primary school	22.90±13.16	56.25±9.39	67.12±25.05
secondary school	23.38±12.57	54.33±10.25	64.49±26.45
high school	18.96±10.13	56.32±9.78	67.71±25.29
university	19.58±11.42	56.43±10.69	74.54±24.36
Probability	KW=33.279, p**=0.001**	KW=10.142, p=0.071	KW=21.061, p**=0.001**

Mother's Job

Housewife	21.18±12.23	55.85±10.14	68.40±25.71
worker	19.85±8.45	56.47±8.91	59.85±23.07
officer	19.30±12.99	55.40±10.89	75.86±23.18
Self-employment	20.19±8.48	57.04±9.66	73.76±23.91
other	18.71±10.41	57.30±10.68	77.71±23.37
Probability	KW=11.748, p=0.019	KW=2.496, p=0.645	KW=31.633, p=**0.001**

Father's Job

Unemployed	20.85±9.87	52.09±9.36	62.33±24.07
worker	21.28±11.69	56.26±9.59	64.95±25.34
officer	20.31±11.40	54.85±10.81	71.57±24.45
Self-employment	20.87±11.30	56.39±9.79	69.30±25.99
other	20.00±12.35	56.71±10.38	72.34±24.88
Probability	KW=5.298, p=0.258	KW=7.409, p=0.116	KW=13.206, p=0.010

Monthly Income

263 EUR or lower	23.84±13.51	54.14±11.29	72.84±24.55
263-1090 EUR	20.33±10.87	56.38±9.94	68.02±25.05
> 1090 EUR	19.92±13.00	56.03±10.12	72.57±26.14
Probability	KW=15.958, **p=0.001**	KW=3.760, p=0.153	KW=7.915,p=0.019

Presence of Health Problems

Yes	24.80±17.09	53.58±10.13	66.86±26.14
No	20.02±10.63	56.42±10.09	69.87±25.19
Probability	Z=-2.831 **p=0.005**	Z=-2.807 **p=0.005**	Z =-0.979 p=0.328

Smoking

Yes	21.83±13.34	52.30±11.01	70.25±23.99
No	20.45±11.49	56.51±9.94	69.43±25.47
Probability	Z=-1.069, p=0.285	Z=3.693 **p=0.001**	Z=-0.154 p=0.877

Alcohol Consumption

Yes	22.09±18.40	54.97±10.20	76.22±24.94
No	20.47±10.94	56.17±10.13	68.94±25.28
Probability	Z=0.703 p=0.481	Z=1.103 p=0.270	Z=-2.498 p=0.012

Body Weight

Normal	20.25±11.33	55.85±10.10	68.60±25.42
Overweight	21.68±13.19	57.43±10.45	76.26±24.55
Obese	23.80±11.75	55.58±9.02	70.77±20.25
Slim	21.96±14.39	57.19±10.96	64.00±26.89
Probability	KW=5.252, p=0.154	KW=4.166, p=0.244	KW=12.168, p= 0.007

Accurate Perception of Body Weight

As it is (552)	23.02±12.76	50.09±9.53	69.84±26.59
Heavier than the real weight (401)	18.83±10.52	53.30±10.17	69.06±23.47
Probability	t=5.538,**p=0.001**	t=-7.403, **p=0.001**	t=0.471,p=0.638

Weight of Mother

Heavier than normal weight	23.55±10.33	53.98±10.55	67.62±24.17
Normal	20.00±11.86	56.50±10.00	69.89±25.53
Probability	Z=-5.390, **p=0.001**	Z=2.722, p=0.006	Z=1.350, p=0.177

Weight of father

Heavier than normal weight	20.96±9.67	54.49±10.28	71.09±25.28
Normal	20.51±12.10	56.43±10.08	69.16±25.32
Probability	Z=-1.746, p=0.081	Z=2.437, p=0.015	Z=-0.923, p=0.354

Exercising

Yes	20.45±11.81	57.77±10.03	73.45±26.44
No	20.13±10.67	52.54±10.38	66.64±23.10
Sometimes	20.96±12.13	56.54±9.64	67.74±25.13
Probability	KW=0.806, p=0.668	KW=34.685, **p=0.001**	KW=18.441,**p=0.001**
Sleep Duration (hour)	r=0.022, p=0.507	r=0.032, p=0.317	r=-0.063, p=0.054

Sleep Quality

Comfortable	20.01±11.73	59.54±9.14	69.55±27.11
Problem in falling asleep	22.58±13.21	51.90±9.88	67.69±24.70
Can't sleep in case of stress	22.81±12.51	53.51±9.77	69.54±24.48
Tired in the morning	19.83±10.53	53.46±9.96	70.24±22.95
Other	21.88±11.33	51.38±11.62	68.96±23.90
Probability	KW=10.708, p=0.030	KW=104.166, **p=0.001**	KW=1.173, p=0.883

Dieting

Yes	25.69±14.19	54.01±10.34	69.52±25.88
No	19.08±10.38	56.69±10.	69.51±25.16
Probability	Z=-7.791,**p=0.001**	Z=3.513,**p=0.001**	Z=0.080,p=0.936

Regular Breakfat

Yes	19.42±10.23	57.66±9.88	69.78±25.93
No	22.14±13.23	53.99±10.10	69.17±24.50
Probability	Z=3.201,**p=0.001**	Z=-5.654,**p=0.001**	Z=-0.647,p=0.518

Regular Dinner

Yes	20.07±11.14	56.83±9.99	70.50±25.52
No	23.24±13.87	52.29±10.05	64.56±23.72
Probability	Z=3.009, p=0.003	Z=-5.281, **p=0.001**	Z=-3.230, **p=0.001**

Nutritional Supplement

Yes	23.50±15.71	55.28±10.62	69.65±26.25
No	20.39±11.39	56.45±10.09	69.17±25.53
Sometimes	20.15±10.34	52.18±9.42	73.60±21.30
Probability	KW=2.712, p=0.258	KW=12.360, p=0.002	KW=1.147, p=0.564

Body Weight Measurement			
Daily	25.98±13.76	54.34±9.90	70.32±23.90
Once a week	23.66±14.22	55.58±11.14	69.25±27.61
Once in 15 days	20.67±11.56	56.86±9.28	71.80±22.96
Once a month	19.57±10.97	56.73±10.03	67.75±26.33
Other	19.91±10.88	55.37±10.18	71.20±23.88
Probability	KW=21.490, **p=0.001**	KW=5.798, p=0.215	KW=2.980, p=0.561
Those performed in case of weight gain			
Eating junk food	19.68±9.18	56.69±9.34	67.60±24.46
Dieting	26.68±14.26	54.37±10.17	67.55±27.23
Using appetite suppressant	24.83±12.41	47.83±9.96	76.50±28.16
Skipping meal	22.00±14.42	51.29±9.86	67.29±22.55
Doing sports	19.73±11.34	58.05±10.34	73.33±26.25
Unanswered	19.03±11.08	55.51±10.04	68.18±24.36
Probability	KW=45.440, **p=0.001**	KW=36.008, **p=0.001**	KW=13.636, p=0.018
Number of Siblings			
Probability	r=0.124, **p=0.001**	r=-0.109, **p=0.001**	r=-0.074, p=0.023
Number of Household Members			
Probability	r=0.083, p=0.011	r=-0.034, p=0.296	r=-0.071, p=0.029

U=Mann Whitney U test   KW= Kruskal Wallis Test   r=Spearman correlation test

F= One-way Annova test   t= t test

Seven percent of the cases in our study used nutritional supplements (Table 4). The most widely used supplements are vitamins (23,9%), fish oil (11,9%) and some drugs for anaemia (9,0%). In Turkey among 15 to 18 years of age adolescents; consumption of nutritional supplement is 0,8% and mostly vitamins, minerals, and omega-3 fatty acids are used for this purpose (Çetin et al., 2008; Sarıkaya et al., 2010; Şanlıer and Arıkan, 2000). Darvishi et al. in their study reported that nutritional suplements are taken without adequate knowledge and with inaproprate recommendations (Darvishi et al., 2013). Also important side effects are reported. Certain drugs like steroids may cause depression, aggression, sleep disturbances, paranoia, increased risk of myocardial infarction, high bold pressure, and in woman especially infertility, hypertrichosis (Miller et al., 2005).

Regularly having breakfast is extremely important for maintenance during the day in

office or school. In our study, 43.1% did not regularly have breakfast. De Jong et al. in their study among 12 to 15 years of age adolescents stated that the factors effecting to have breakfast are child's attitude and decision, attitudes of families and friends, parental guidance and physical conditions (DeJong et al., 2009). In order to settle a positive behaviour education of mothers and exhibition of positive family actions are needed (Dilek Özmen et al., 2007).

 Rate of skipping lunch was 36.5% in our study. In Turkey this rate is 17.8% (Irmak et al., 2011). Rate of skipping dinner was 5,1% in Turkey and 16.6% in our study (Irmak et al., 2011). These results show that the most regularly attended meal was dinner in adolescents. Adolescents with an obese family member had increased eating attitude test scores and lower self-esteem scores (Table 5). The waist to hip ratio of the adolescents was 0.78±0.16 in our study (Table 5).

Similarly**,** a study in Turkey among 15 to 18 years of age adolescents reported these ratios for girls and boys as 0.76± 0.78 and 0.82±0.85; respectively. There are studies reporting that 92,5% of girls have a waist to hip ratio below 0,8 (Kılınç and Çağdaş, 2012; *Turkey Healthy Eating and Active Life Programme (2010-2014).*, n.d.).

The adolescents on diet had significantly higher eating attitude test scores and lower self-esteem scores (p<0.05). Also the social comparison scale scores were insignificantly higher (p>0.05). By these data we can conclude that the adolescents on a diet are a risky population for eating disorders and must be closely monitored. In our study alcohol consumption was not related to eating attitude test scores, self-esteem scores and social comparison scale scores (Table 5). Some studies reported association of eating disorders with smoking and alcohol consumption. Of course there were contradictory data (Dilek Özmen et al., 2007; Oktan and Şahin, 2010). Regular meals was associated with low eating test scores and high self-esteem scores (Table 5, p<0.05).

Having regular meals may have beneficial effects on adolescents to develop healthy eating behaviours. Adolescents with a health problem have high eating attitude test scores

and low self perception scores (Table 5). Adolescents with a health problem may have impaired perception of body composition, lowered self-esteem and may have developed disordered eating behaviour. Some studies have found an association of health problems and eating disorders and some reported contradictory results (Adana et al., 2012; Smith et al., 2008; Yeo and Sawyer, 2005).

We demonstrated the presence of eating disorders among high school students. These results may be related to body mass index, self-esteem, and socialization. That's why we recommend regular examination of adolescents and measuring weight, height, body mass index, waist to hip ratios. Also surveillance for bad eating habits is important.

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