Original article

Evaluation of the nutritional status, compliance with the Mediterranean diet, physical activity levels, and obesity prejudices of adolescents

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Abstract. *Aim:* This research was planned and conducted as a cross-sectional descriptive study in order to determine the nutritional status, compliance with the Mediterranean diet, physical activity levels, and obesity prejudices of adolescents, and to evaluate the relationship between them. *Methods:* The research was conducted with 233 adolescents aged between 13 and 18 years who studied at a high school in the Üsküdar district of Istanbul. A 3-day food consumption record and anthropometric measurements of the participants were made, and the KIDMED scale, IPAQ scale, and GAMS-27 scale were applied. *Results:* 50.2% of the adolescents participating in the study were girls and 49.8% were boys; the mean age was 15.57 ± 1.12 years. The mean BMI scores of the girls and boys were 22.55 ± 3.85 kg/m^2 and 22.85 ± 3.52 kg/m^2, respectively ($p>0.05$). The average waist / height ratio for girls was 0.45 ± 0.05, and for boys it was 0.47±0.05 ($p<0.05$). It was determined that girls consumed an average of 1673.28 ± 469.36 calories daily and boys consumed 1823.31 ± 576.70 calories ($p<0.05$). The mean KIDMED score of the participants was 4.31 ± 2.48, the mean IPAQ score was 3524.65 ± 2236.81 MET, and the mean GAMS-27 score was 82.56 ± 11.46. *Discussion:* As a result of the research, it was concluded that the participants complied with the Mediterranean diet at a low-moderate level, were minimally active, and prone to having obesity prejudices.

Keywords: Mediterranean diet, adolescent, nutrition, physical activity, obesity prejudice

Introduction

The adolescent period is an important period that forms the basis of nutritional habits and includes physiologic and psychological changes (1). Healthy nutrition requirements and nutritional needs of adolescents are high because a rapid growth and development process is experienced in this period (2). However, studies have shown that adolescents tend to consume a diet that is generally rich in saturated fat, sugar, and salt, and poor in terms of fruits, vegetables, milk, and dairy products (3-7).

The American Diabetes Association (ADA) report states that the Mediterranean diet nutrient content is sufficient and varied and that this diet is compatible with healthy life (8). The Mediterranean diet, which is defined as a dietary model rich in vegetative foods, recommends high consumption of vegetative foods such

as vegetables and fruits and whole grains and legumes, moderate consumption of seafood, eggs, poultry, and dairy products such as cheese, yogurt, and low consumption of red meat. It also promotes the consumption of healthy fats such as olives, olive oil, and nuts (8, 9). The Mediterranean diet varies according to the culture of each country (9). In addition to the positive effects of the Mediterranean diet on cardiovascular health (10-12), other studies have shown that it has positive effects on visceral obesity, type 2 diabetes, some neurodegenerative diseases, cancer, and mortality (13-17).

In addition to the Mediterranean diet, daily physical activity also plays an important role in improving health and preventing chronic diseases. Regular physical activity contributes to physiologic, cognitive, and psychosocial development, as well as physical development in children (18, 19). It has been reported that the physical activity level of school age children has decreased significantly in recent times (20). Childhood and adolescence obesity, which develops due to the decreasing physical activity level and increasing unhealthy eating habits, has become an epidemic health problem (21). Physical activity and healthy eating are the basic building blocks in obesity prevention and body weight control. Regular physical activity and optimal nutrition in the adolescence period support the physical growth of the individual in accordance with the genetic potential (22). It is also stated that regular physical activity reduces symptoms of anxiety and depression, improves quality of life, contributes to social relationships, and improves self-confidence (23).

Obesity bias is defined as negative attitudes and behaviors towards obese individuals based on physical appearance (24, 25). Obesity is among the causes of social and psychological problems arising from exposure to prejudice and discrimination (26). It was shown that with the increase in the prevalence of childhood obesity, obesity prejudice against children has increased by 41%. In schools, obesity bias begins in childhood and becomes more common in adolescence (27). The stereotypical belief that is commonly seen in society and social media for obese individuals, "obese people are generally lazy, unsuccessful, and weak-willed", can direct individuals to negative attitudes and behaviors (28). Children and adolescents who are exposed to weight stigma and tend to be more depressed, have suicidal thoughts, low self-esteem, and have poor body image. In addition, individuals exposed to the weight stigma have serious psycho-social and physical problems, including risks such as distancing from the social environment, substance abuse, poor eating habits, eating greedily, decreased physical activity levels, and worsening obesity (27).

The adolescence period is a period when the individual's eating and physical activity habits are formed and physical and psycho-social development continues. The purpose of this study was to evaluate the nutritional status of adolescents, their compliance with the Mediterranean diet, their physical activity levels, and their prejudices regarding obesity, and to evaluate the relationship between them.

Materials and Methods

This research was planned and conducted as a cross-sectional descriptive study in order to determine the nutritional status of adolescents, their compliance with the Mediterranean diet, their physical activity levels, and their prejudices regarding obesity, and to evaluate the relationship between them.

This research was conducted in accordance with the Helsinki Declaration. In order to conduct the research, approval was obtained from Istanbul Okan University's ethical committee (Date: 08.01.2020, Number: 13) and from Istanbul Provincial Directorate of National Education (Date: 13.02.2020, Number: 3036618). The data were collected on a voluntary basis with written consents taken from adolescents and families.

The population of the study consisted of 589 adolescents who studied at an Anatolian High School in the Üsküdar district of Istanbul in the 2019-20 academic year. The number of samples was calculated as a minimum 233 people with 5% error margin and 95% confidence interval (CI). In order to reflect the population scientifically, stratified sampling and then voluntary sampling were used. A total of 233 volunteer adolescents participated in the study, including 54 students from 9th grade, 58 students from 10th grade, 70 students from 11th grade, and 51 students from 12th

grade. The voluntary participation form was read and signed by the parents of adolescents who wanted to participate in the research.

Measures

The survey method was used in the research as the data collection tool. The sociodemographic information and nutritional habits of the adolescents were determined through face-to-face interviews. Food consumption records were obtained for three consecutive days (two days on weekdays, one day at weekends). The participants' food consumption in one day was inquired by the researcher by asking the participants about all the foods and drinks they consumed in the last 24 hours, and the relevant information about the other two consecutive days was recorded by the participants. The Nutrition Information System (BeBIS, Nutrition Information System Version 8.2, Germany) package program was used to analyze the data obtained from the 3-day food consumption records.

The Mediterranean Diet Quality Index (KIDMED) developed by Serra-Majem, Ribas, and Ngo (29) in 2004 and adapted to Turkish by Erol et al. (30) in 2010 was used to evaluate the adolescents' compliance with the Mediterranean diet. Those who answered 'yes' to the positive questions of this scale received +1, and those who answered 'yes' to the negative questions received -1. Those who scored ≥8 were classified as good, those who scored 4-7 were moderate, and those who scored ≤3 were classified as low dietary compliance (30).

In order to determine the physical activity levels of the adolescents, the short form (IPAQ-Short Form) of the International Physical Activity Questionnaire, developed by Craig et al. (31) was employed. The validity and reliability of which was conducted by Öztürk (32) in 2005. The IPAQ protocol was used in physical activity scoring. Participants who received a total of score <600 metabolic equivalent minutes (MET) from the physical activity scale were evaluated to be inactive, participants receiving 600-3000 MET were minimally active, and participants receiving >3000 MET were evaluated to be very active (33).

The Obesity Bias Scale (GAMS-27), developed by Ercan et al. (26) in 2015, was used to evaluate the obesity prejudices of adolescents. The scale is a 5-point Likert-type scale. Positive items started from "strongly agree" 1 to 5; negative items were scored from 5 to 1, starting with the "absolutely agree" option. Those who scored ≤68 were considered as being without bias, those who scored between 68.01-84.99 were prone to bias, and those who scored ≥85 were classified as biased (26).

Anthropometric measurements

The heights of the participants were measured using an inelastic measuring tape while standing and their heads were in the Frankfort plane, feet side by side, and with the occipital region touching the wall. Body weight and body fat ratio was measured without shoes using a TANITA BC-545N model digital scale, which performs bioelectrical impedance analysis sensitive to 0.1 kg. Body weight (kg) was divided by the square of the height (m^2) and the body mass index (BMI) was calculated. The BMI classification was made according to the World Health Organization (WHO)-2007 percentile curves developed according to age and sex for children and adolescents aged 5-19 years. The BMI percentile value is classified as very thin / very short if <5, thin / short if 5-15, normal if 15-85, overweight / tall if 85-95, and obese / very tall if >95 (34).

Waist circumference was measured using a measuring tape by determining the middle axillary line at the end of several consecutive breaths, and even by determining the middle of the lower border of the rib and the upper limit of the iliac crest. The waist / height ratio was calculated by dividing the waist circumference (cm) by the height (cm). The waist / height ratio was assessed according to the classification developed by Ashwell (35). According to this classification, waist / height ratio is low risk if <0.4, appropriate if 0.4-0.5, risky if 0.5-0.6, and high risk if >0.6 (35).

Statistical analysis

Statistical analysis of the data was performed using the SPSS 22.0 program. In descriptive statistical analysis, frequency, percentage, mean, and standard deviation values were used. The normality of distribution

of the data was tested using the Kolmogorov-Smirnov test. The independent sample t-test was used in binary comparisons with normal distribution, and analysis of variance (ANOVA) was used in comparisons with more than two groups. The Mann-Whitney U test was used in binary comparisons that did not show normal distribution, and the Kruskal-Wallis test was used in comparisons with more than two groups. To determine the relationship between numerical variables, Pearson correlation analysis was used in those with normal distribution, and Spearman correlation analysis was used in those without normal distribution. The level of significance was evaluated as $p < 0.01$ and $p < 0.05$.

Results

Half (50.2%) of the 233 participants were female (n = 117), and 49.8% were male (n = 116). The mean age was 15.57 ± 1.12 years. Some 23.2% of the participants were in the 9th grade (n = 54), 24.9% were in the 10th grade (n = 58), 30.0% were in the 11th grade (n = 70), and 21.9% were in the 12th grade (n = 51).

When the eating habits of the participants were examined, it was found that 58.0% consumed at least three main meals a day. The average daily number of main meals was 2.57 ± 0.61; the number of snacks was 1.86 ± 1.14. It was determined that 54.1% of the

Table 1. Anthropometric measurements according to the sex of the participants

Anthropometric measurement	n	$\bar{x}$ ± SD	Minimum	Maximum	p
Height (cm)					
Girls	117	161.03±5.91	148.00	175.00	**<0.001**^{T**}
Boys	116	173.41±6.93	160.00	192.00	
Total	233	167.19±8.93	148.00	192.00	
Weight (kg)					
Girls	117	58.62±11.11	38.10	93.40	**<0.001**^{U**}
Boys	116	68.85±12.14	45.30	101.20	
Total	233	63.71±12.69	38.10	101.20	
BMI (kg / m²)					
Girls	117	22.55±3.85	15.10	35.60	0.355^{U}
Boys	116	22.85±3.52	16.10	32.30	
Total	233	22.70±3.68	15.10	35.60	
Fat ratio (%)					
Girls	117	27.52±6.35	12.70	46.30	**<0.001**^{U**}
Boys	116	19.48±5.54	10.30	33.60	
Total	233	23.52±7.18	10.30	46.30	
Waist circumference (cm)					
Girls	117	73.32±8.30	56.00	93.00	**0.000**^{U**}
Boys	116	81.35±9.17	62.00	104.00	
Total	233	77.31±9.61	56.00	104.00	
Waist / height ratio					
Girls	117	0.45±0.05	0.36	0.59	**0.036**^{U*}
Boys	116	0.47±0.05	0.36	0.60	
Total	233	0.46±0.05	0.36	0.60	

*U: Mann-Whitney U Test, T: Independent Sample T-Test *p<0.05, **p<0.01*

participants skipped meals, and 54.7% skipped breakfast. Just over half (54.9%) of the participants stated that they ate food at normal speed.

Table 1 shows the anthropometric measurements of the participants according to their sex. The average height of the girls was 161.03 ± 5.91 cm, and it was 173.41 ± 6.93 cm for the boys ($p < 0.01$). The average weight of the girls was 58.62 ± 11.11 kg, and it was 68.85 ± 12.14 kg for the boys ($p < 0.01$). The average BMI of the girls was 22.55 ± 3.85 kg/m^2, and it was 22.85 ± 3.52 kg/m^2 for the boys ($p > 0.05$). The average body fat rate of the girls was 27.52 ± 6.35, whereas it was 19.48 ± 5.54 for the boys ($p < 0.01$). The average waist circumference of the girls was 73.32 ± 8.30 cm, whereas it was 81.35 ± 9.17 cm for the boys ($p < 0.01$). The average waist / height ratio of the girls was 0.45 ± 0.05 and 0.47 ± 0.05 for the boys ($p < 0.05$). The boys' height ($p < 0.01$), body weight ($p < 0.01$), waist circumference ($p < 0.01$), and waist / height ratio ($p < 0.05$) were found to be statistically significantly higher than in the girls, but their fat ratio ($p < 0.01$) was found to be lower. There was no significant difference between the girls and boys in terms of BMI ($p > 0.05$).

When the BMI classification of the participants by age was evaluated; 0.4% (n = 1) were found to be very this, 3.9% (n = 9) thin, 60.1% (n = 140) normal, 21.0% (n = 56) overweight, and 11.6% (n = 27) were obese. When the waist / height ratios of the participants were evaluated, it was found that 6% (n = 14) were low, 70% (n = 163) were normal, 23.6% (n = 55) were at risk, and 0.4% (n = 1) were high risk.

Table 2 shows the daily energy and macronutrient consumption amounts and the meeting ratio of daily recommended intake levels according to the sex of the participants. It was determined that girls consumed an average of 1673.28 ± 469.36 calories daily and boys consumed 1823.31 ± 576.70 calories ($p < 0.05$). It was calculated that the girls' daily energy consumption met 74.0% of the recommended intake level and this ratio was 63.7% for the boys. The ratio of energy supplied from carbohydrates was 41.97 ± 6.81% in the girls and 42.18 ± 7.19% in the boys. The ratio of energy supplied from protein was 14.75 ± 3.02% in the girls and 14.65 ± 3.22% in the boys. The rate of energy supplied from fat was 43.24 ± 5.97% in the girls and 43.15 ± 6.17% in the boys. The polyunsaturated fatty acids and omega 6 consumption of the boys (20.90 ± 12.42 g and 18.18 ± 10.35 g, respectively) was found to be higher than in the girls (17.68 ± 6.45 g and 15.38 ± 5.62 g, respectively) ($p < 0.05$ and $p < 0.01$, respectively). It was found that the girls consumed 15.24 ± 5.66 g of pulp daily and boys consumed 16.00 ± 6.62 g of pulp. It was calculated that the daily pulp consumption of the girls met 58.6% of the recommended intake level and this ratio was 55.2% for the boys.

When the points received by the participants from the KIDMED scale were evaluated, it was found that 37.3% (n = 87) of the participants had low level (very low diet quality), 53.6% (n = 125) medium level (diet intervention required), and 9.0% (n = 21) had a good level (optimal diet). Participants scored 4.31 ± 2.48 points on average on the KIDMED scale. No statistically significant difference was found between the girls (4.03 ± 2.54) and boys (4.60 ± 2.40) in terms of KIDMED scores ($p = 0.103$).

When the participants' scores on the IPAQ scale were evaluated, it was determined that 12.4% (n = 29) were inactive, 51.5% (n = 120) were minimally active, and 36.1% (n = 84) were very active. Participants received an average of 3524.65 ± 2236.81 MET points from the IPAQ scale. Girls' IPAQ scale scores (3756.40 ± 2174.71 MET) were statistically significantly higher than in the boys (3290.90 ± 2283.28 MET) ($p = 0.031$).

When the scores of the participants on the GAMS-27 scale were evaluated, it was determined that 10.7% (n = 25) did not have bias related to obesity, 47.2% (n = 110) were prone to obesity bias, and 42.1% (n = 98) were biased. Participants scored an average of 82.56 ± 11.46 on the GAMS-27 scale. Boys' GAMS-27 scale scores (84.31 ± 11.88) were statistically significantly higher than in the girls (80.82 ± 10.80) ($p = 0.021$).

As presented in Table 3, no statistically significant correlation was found between the scores of participants obtained from the KIDMED, IPAQ, and GAMS-27 scales ($p > 0.05$).

As seen in Table 4, no statistically significant correlation was found between the participants' body weight, BMI, waist circumference and waist / height ratio, and KIDMED, IPAQ, and GAMS-27 scores

Table 2. According to the sex of the participants, daily energy and macronutrient consumption amounts and the daily recommended intake level meeting ratio

Nutrients	n	$\bar{x}$ ± SD	Min	Max	RDA	RDA (%)	p*
Energy (kcal)	117						
Girls	116	1673.28 ± 469.36	817.29	3652.78	2260	74.0	**0.045**[U*]
Boys	233	1823.31 ± 576.70	953.75	4294.30	2860	63.7	
Total		1747.97 ± 529.77	817.29	4294.30	-	-	
Carbohydrate (g)							
Girls	117	172.73 ± 59.00	60.16	425.28	130	132.9	0.074 [U]
Boys	116	187.94 ± 66.63	71.84	427.46	130	144.6	
Total	233	180.31 ± 63.24	60.16	427.46	-	-	
Carbohydrate (%)							
Girls	117	41.97 ± 6.81	28.00	63.00	45-60	79.9	0.822[T]
Boys	116	42.18 ± 7.19	21.00	67.00	45-60	80.3	
Total	233	42.08 ± 6.99	21.00	67.00	-	-	
Protein (g)							
Girls	117	60.10 ± 19.94	25.32	144.63	43-66	110.2	0.216[U]
Boys	116	64.87 ± 23.94	24.03	168.88	54-71.5	103.4	
Total	233	62.48 ± 22.11	24.03	168.88	-	-	
Protein (%)							
Girls	117	14.75 ± 3.02	8.00	24.00	9-20	100.0	0.559[U]
Boys	116	14.65 ± 3.22	9.00	25.00	8-20	100.0	
Total	233	14.70 ± 3.12	8.00	25.00	-	-	
Fat (g)							
Girls	117	81.08 ± 24.87	33.58	197.09	-	-	0.076[U]
Boys	116	88.68 ± 32.53	39.30	257.21	-	-	
Total	233	84.86 ± 29.13	33.58	257.21	-	-	
Fat (%)							
Girls	117	43.24 ± 5.97	25.00	59.00	20-35	157.2	0.455[U]
Boys	116	43.15 ± 6.17	24.00	64.00	20-35	156.9	
Total	233	43.20 ± 6.06	24.00	64.00	-	-	
Saturated fatty acids (g)							
Girls	117	28.52 ± 10.19	10.47	64.41	-	-	0.184[U]
Boys	116	30.44 ± 11.39	14.40	81.10	-	-	
Total	233	29.48 ± 10.83	10.47	81.10	-	-	
Monounsaturated fatty acids (g)							
Girls	117	28.21 ± 9.82	11.89	70.67	-	-	0.248[U]
Boys	116	29.73 ± 10.63	12.66	65.90	-	-	
Total	233	28.97 ± 10.24	11.89	70.67	-	-	

(*Continued*)

Table 2. (Continued)

Polyunsaturated fatty acids (g)							
Girls	117	17.68 ± 6.45	7.02	50.17	-	-	**0.011**^{U*}
Boys	116	20.90 ± 12.42	7.31	125.89	-	-	
Total	233	19.28 ± 10.00	7.02	125.89	-	-	
Omega 3 (g)							
Girls	117	1.62 ± 1.00	0.52	6.95	1.1	147.3	0.851^{U}
Boys	116	1.90 ± 2.18	0.49	21.14	1.6	118.7	
Total	233	1.77 ± 1.69	0.49	21.14	-	-	
Omega 6 (g)							
Girls	117	15.38 ± 5.62	5.90	41.24	11	139.8	**0.009**^{U**}
Boys	116	18.18 ± 10.35	6.38	104.31	17	106.9	
Total	233	16.78 ± 8.42	5.90	104.31	-	-	
Cholesterol (mg)							
Girls	117	303.54 ± 156.10	49.75	1012.38	-	-	0.171^{U}
Boys	116	331.57 ± 163.95	75.17	836.79	-	-	
Total	233	317.49 ± 160.35	49.75	1012.38	-	-	
Fiber (g)							
Girls	117	15.24 ± 5.66	6.09	34.93	26	58.6	0.526^{U}
Boys	116	16.00 ± 6.62	5.23	48.08	29	55.2	
Total	233	15.62 ± 6.15	5.23	48.08	-	-	

*^{U}: Mann-Whitney U Test, ^{T}: Independent Sample T-Test, RDA: Recommended Intake Level *p<0.05, **p<0.01*

Table 3. Relationships between participants' scores on KIDMED, IPAQ, and GAMS-27 scales

	KIDMED		**IPAQ**		**GAMS-27**	
	r	**p**	**r**	**p**	**r**	**p**
KIDMED	-	1	-0.018	0.785	-0.055	0.401
IPAQ	-0.018	0.785	-	1	-0.009	0.889
GAMS-27	-0.055	0.401	-0.009	0.889	-	1

Spearman Correlation Analysis Results

($p > 0.05$). Although no statistically significant correlation was found between the body fat ratio and KIDMED and GAMS-27 scores ($p > 0.05$), a positive and very weakly significant relationship was found between IPAQ scores and the body fat ratio ($r = 0.133$; $p < 0.05$).

The correlation analysis results between the participants' daily energy and macronutrient consumption and KIDMED, IPAQ, and GAMS-27 scores are given in Table 5. No statistically significant relationship was found between KIDMED and GAMS-27 scores and energy and nutrients ($p > 0.05$). A very weak and positively significant correlation was found between IPAQ scores and the protein ratio supplied from the energy of the diet ($r = 0.205$; $p < 0.01$), and the diet and the amount of protein taken daily ($r = 0.189$; $p < 0.01$), cholesterol ($r = 0.144$; $p < 0.05$), and fiber ($r = 0.155$; $p < 0.05$).

Table 4. Relationship between the anthropometric measurements of the participants and their KIDMED, physical activity, and obesity bias scale scores

Anthropometric measurement	KIDMED		IPAQ		GAMS-27	
	r	p	r	p	r	p
Body weight (kg)	0.013	0.841	0.020	0.766	0.081	0.218
BMI (kg / m²)	0.001	0.982	0.094	0,152	0.016	0.804
Fat ratio (%)	-0.078	0.233[t]	0.133	**0.042***	-0.069	0.292[t]
Waist circumference (cm)	-0.020	0.757	0.023	0.726	0.010	0.885
Waist / height ratio	-0.035	0.591	0.075	0.257	-0.052	0.432

*Spearman correlation analysis, [t]Pearson correlation analysis * p <0.05*

Table 5. The relationship between the energy, macro and micro nutrients that participants take daily with diet and KIDMED, physical activity, and obesity prejudice scores

Nutrients	KIDMED		IPAQ		GAMS-27	
	r	p	r	p	r	p
Energy (kcal)	0.008	0.907	0,088	0.182	0.065	0.323
Protein (%)	0.023	0.725	0.205	**0.002****	0.014	0.832
Protein (g)	0.057	0.385	0.189	**0.004****	0.064	0.330
Fat (%)	0.043	0.513	-0.020	0.763	-0.007	0.912
Fat (g)	0.021	0.745	0.073	0.266	0.059	0.371
Carbohydrate (%)	-0.058	0.376[t]	-0.044	0.507	-0.005	0.937[t]
Carbohydrate (g)	-0.015	0.821	0.058	0.380	0.059	0.370
Saturated fatty acids (g)	0.008	0.899	0.068	0.302	0.026	0.696
Monounsaturated fatty acids (g)	0.014	0.829	0.072	0.276	0.067	0.307
Polyunsaturated fatty acids (g)	0.089	0.177	0.024	0.711	0.054	0.411
Omega 3 (g)	0.097	0.138	0.079	0.231	-0.039	0.554
Omega 6 (g)	0.073	0.267	-0.006	0.932	0.055	0.407
Cholesterol (mg)	0.053	0.421	0.144	**0.028***	0.102	0.119
Fiber (g)	0.022	0.742	0.155	**0.018***	0.044	0.506

*Spearman correlation analysis, [t]Pearson correlation analysis *p<0.05, **p<0.01*

Discussion

The Mediterranean diet and physical activity are key to a healthy life with a protective effect on obesity and chronic diseases (36, 37). Childhood and adolescence obesity, which develop due to decreasing physical activity levels and increasing unhealthy eating habits, has become an epidemic health problem (21). Obesity causes individuals to be more exposed to prejudice, and discrimination leads to social and psychological problems such as anger, anxiety, depression, tendency to violence, decreased self-esteem, low body image, and substance use (28, 38). This research was conducted to determine the nutritional status of adolescents, their compliance with the Mediterranean diet, their physical activity levels, and their prejudices regarding obesity, and to evaluate the relationship between them.

Half (50.2%) of the adolescents participating in the study were girls and 49.8% were boys; the mean age was 15.57 ± 1.12 years. The adolescence period is an important period that forms the basis of nutritional habits and includes physiologic and psychological changes (1). During this period, adolescents want to have more control over their food, and they often obtain negative eating habits such as skipping breakfast, choosing fast-food-style foods or not eating regularly (39). In this study, it was found that only 58.0% of the participants consumed at least three main meals a day, 54.1% skipped meals, with 54.7% of them skipping breakfast. In a study examining the nutritional habits of adolescents, it was determined that 87.7% of the participants missed meals (40). In their study, Deshmukh-Taskar et al. (41) found that 20.0% of children aged 9-13 years and 35.9% of adolescents aged 14-18 years missed breakfast. In a study conducted by Aksoydan and Çakır (42), it was found that adolescents skipped breakfast most frequently, the frequency of eating from the school restaurant decreased, and the consumption of 'fast food' increased as the grade level increased. In a different study, it was stated that those who skipped meals, especially those who skipped breakfast, had higher BMIs and there was an inverse proportion between meal frequency and BMI values (43).

Unhealthy food consumption habits in childhood and adolescence causes health problems in young people due to obesity formation and nutrient deficiency (1). In this study, the average BMI of the girls was 22.55 ± 3.85 kg/m^2, and it was 22.85 ± 3.52 kg/m^2 for the boys ($p > 0.05$). According to the WHO classification for children and adolescents aged 5-19, 21.0% of the participants were overweight and 11.6% were obese. It is reported that the frequency of obesity is between 3-30% in adolescents (38). According to WHO data, the prevalence of overweight and obesity among children aged 5-19 years and adolescents was over 18% in 2016 (44).

In the process of physical growth in adolescents, muscle tissue increases in boys and fat mass increases in girls (45). The body fat rate of the female adolescents who participated in this study was found to be higher than that of the boys ($p < 0.01$). Similarly, in another study, the body fat rate of the girls was found to be higher than that of the boys (46).

The average waist / height ratio, which is an important marker in the diagnosis of visceral obesity, was found as 0.45 ± 0.05 and 0.47 ± 0.05 in the girls and boys, respectively ($p < 0.05$). These rates are similar to the waist / height ratio results obtained from studies conducted with adolescents by Ramirez-Velez et al. (47) and Aslan, Yardım, and Özçelik (48). When waist / height ratios were evaluated, 23.6% of the participants were in the risky group.

The energy consumption of the girls in the present study was found to be statistically significantly lower than in the boys ($p < 0.05$). It was calculated that girls' daily energy consumption met 74.0% of the recommended intake level and 63.7% for boys. The fact that daily energy consumption did not meet the recommended levels can be attributed to the possibility of the participants not expressing the food consumption correctly and adequately, to the prevalence of skipping meals in the research group, and to the absence of dining halls and canteens in the school where the research was conducted. When the ratios of energy supplied from macro nutrients were examined, it was found that the rate of fat consumed was higher than healthy nutrition recommendations, and the consumption of fiber was below the recommended level. Across Turkey in the age group of 15-18 years, boys were found to receive an average of 23.2 g of fiber daily and girls were found to receive 18.9 g (3). In a study conducted by Gümüş, Bulduk, and Akdevelioğlu (49), it was found that adolescents aged 13-18 years received 18.5 g / day fiber. The food consumption results of the participants indicate that they tended to be unhealthy. It is believed that the preference of cheap, easily accessible, and practical foods outside the school period due to skipping morning and lunch meals is effective in these results.

The Mediterranean diet is a healthy form of nutrition that protects against chronic diseases such as cardiovascular diseases, cancer, diabetes, and obesity. The basis of the Mediterranean diet is the use of vegetable oils made of olive oil, as well as a vegetable variety and consumption of whole grain foods (50). The average score of the participants from the KIDMED scale was 4.31 ± 2.48, and no significant difference was found between the girls and boys in terms of KIDMED scores ($p > 0.05$). In the study conducted by Buscemi et al.

(51), the KIDMED score of adolescents was found as 4.3 ± 2.1, and that 29.9% followed the Mediterranean diet at a low level, 61.0% at a moderate level, and 9.1% at a good level. In a study conducted with children and adolescents, the average KIDMED score was found as 5.72 ± 2.33, and no significant difference was found between the sexes (52). In this study, it was determined that the participants complied with the Mediterranean diet at a low and moderate level in general, and only 9.0% of the participants were found to have high compliance with the Mediterranean diet. In a study conducted with adolescents who played sports, it was found that 28.8% of adolescents aged 10-14 years and 22.6% of adolescents aged 15-18 years had nutrition according to the Mediterranean diet (53). In a study conducted with male adolescents, 25.3% of the participants were found to have high compliance with the Mediterranean diet and 64.2% at a moderate level (54). In a study conducted in Spain, 50.1% of young people were found to have moderate compliance with the Mediterranean diet and 44.6% had good compliance (29). The differences observed in the compliance with the Mediterranean diet may be due to geographic location, cultural differences, and eating habits.

There was no relationship between the anthropometric measurements and the food consumption of the participants and their compliance with the Mediterranean diet ($p > 0.05$). According to the results of a study by Mistretta et al. (55), an reverse relationship was found between adolescents' compliance with the Mediterranean diet and BMI, waist circumference, and body fat mass. The findings of the present study differ from the results of Mistretta et al. (55), but are similar to those of Galan-Lopez et al. (56). Possible reasons are that there was no correlation between compliance with the Mediterranean diet and anthropometric measurements, Mediterranean diet applied being more than one variety, the differences in nutritional habits, and the compliance with the Mediterranean diet not being found too high in the research.

Regular physical activity contributes to children's physical, cognitive, and psycho-social development (19). Physical activity plays an important role in the development of bone, muscle, the cardiovascular system, and the prevention of obesity (18). It was determined that 51.5% of the adolescents participating in the present study were minimally active and 36.1% were very active. In a study conducted with adolescents, 51.8% were reported to have low physical activity, 30.4% had moderate, and 17.8% had high levels of physical activity (57). In another study conducted with adolescents, it was found that the vast majority of girls (86.4%) and boys (70.6%) were physically inactive (42). In the present study, the physical activity level of the girls was found to be higher than in the boys ($p < 0.05$). In some studies, on the other hand, girls' physical activity levels were shown to be lower than in boys (51, 58, 59, 60). Today, girls think of being healthy as "being slim" and boys as "being muscular." Therefore, the relationships between the level of physical activity by sex differs between studies.

Among the anthropometric measurements of the participants, a positive and very weakly significant relationship was only found between body fat ratio and physical activity level ($r = 0.133$; $p < 0.05$). Aerobic exercise reduces fat tissue, and combined aerobic and resistant exercise has an effect on the increase of whole-body lean body mass locally (61). According to the findings, the fact that there was a significant relationship between physical activity level and body fat ratio suggests that participants exercised to change their physical appearance. There was no significant relationship between participants' body weight, BMI, waist circumference, waist / height ratio, and physical activity level ($p > 0.05$).

A positive correlation was found between participants' protein ($r = 0.189$; $p < 0.01$), cholesterol ($r = 0.144$; $p < 0.05$) and fiber ($r = 0.155$; $p < 0.05$) consumption and physical activity levels. Some studies have shown that there is a positive relationship between physical activity levels and healthy nutrition (46, 60, 62).

According to the results of the study, there was no significant relationship found between the participants' compliance with the Mediterranean diet and their physical activity levels. In their study, Farajian et al. (63) found no significant difference between physical activity levels and compliance with the Mediterranean diet. However, in the study conducted by Santi et al. (64), compliance with the Mediterranean diet was found to be higher in adolescents who did physical activity than in those who did not. In addition, as

a result of other studies, opposite relationships were shown between physical activity and KIDMED scores (65, 66, 67, 68).

Today, the imbalance in energy intake and consumption, combined with modern life, leads to a decrease in the level of daily physical activity. The global spread of modern technology has caused obesity to emerge as a global public health problem. Moreover, obesity can reveal prejudice and discrimination for individuals and cause social and psychological problems (26). It was found that the adolescents in this study were generally prone to obesity bias. In another study examining the level of obesity prejudice among adolescents, similar results were reported (69). Although detailed studies reporting on the situation in Europe are insufficient, a study conducted in a country in Western Europe found that 18.7% of overweight people and 38.0% of obese people experienced stigmatization (25). High school students who reported that they felt negative feelings due to weight-based victimization, were likely to avoid physical activity, including physical education lessons, and to consume more nutrients by causing a binge eating disorder (28). Girls respond more negatively to weight-based stigmatization than boys (70). The obesity prejudice score of the male adolescents participating in the study was found to be statistically significantly higher than in the girls ($p < 0.05$). In a study with adolescents, 45.6% of boys and 48.4% of girls were prone to prejudice, and no significant difference was found according to sex (69).

No significant relationship was found between the obesity prejudice level of the adolescents participating in the study and the compliance with the Mediterranean diet and physical activity level. Gaspar et al. (71) and Coelho et al. (72) stated that physical activity had a protective effect on body image dissatisfaction, and an inverse relationship was found between body image dissatisfaction and intensity of physical activity. In the study of Bibiloni, Pons, and Tur (73), there was no significant relationship between physical dissatisfaction and compliance with the Mediterranean diet. However, Albaladejo-Blazque et al. (74) found that adolescents with high victimization had lower compliance with the Mediterranean diet. Chronic stress has been reported to cause adverse effects in adolescents' quality of life and diet (75). Adolescents who are chronically stressed are less likely to have a healthy lifestyle (75, 76). Michels et al. (77) showed that children and adolescents who were under stress tended to consume more sweet and fatty foods rather than fruit and vegetables.

Limitations

The sample of the research cannot be generalized because it was limited to adolescents who studied at a single school and volunteered to participate in the research. The data of the research are limited to the questionnaire form prepared by the researcher in accordance with the relevant literature and the content of the scales used, and the data obtained are based on the participants' own statements.

Conclusion

The adolescence period, which is an important period for growth and development, is the window of opportunity for the foundation of healthy lifestyle habits and the preservation of future physiologic and psychological health. It is known that compliance with the Mediterranean diet, in which vegetative foods are emphasized, and physical activity have important effects on prevention of chronic diseases, especially obesity and cardiovascular diseases. In order to protect the current and future health of adolescents, who are generally prone to irregular nutrition and consuming unhealthy food, healthy nutrition education should be given more place in school programs, and nutrition education practices should be developed by ensuring participation of teachers and parents. Along with this education, practices should be developed in schools where adolescents spend most of their time, making it easier for them to access food and drink that will contribute to healthy nutrition. Programs to increase the level of physical activity in school should be given more place, and adolescents should be directed to various sports activities according to their interests. With the widely used social media network, applications to promote healthy nutrition and physical activity should be increased.

Preventing obesity bias starting from the adolescent period, which is an important period in terms of psycho-social development, is important in terms of ensuring empathy with individuals with obesity and preventing their exclusion from society in terms of improving public health. Prevention of obesity prejudice will also improve the psycho-social health of society by preventing the spread of eating disorders and body dissatisfaction, which are seen more and more after the adolescence period.

References

1. Vanhelst J, Beghin L, Drumez E et al. Adolescents' diet quality in relation to their relatives' and peers' diet engagement and encouragement: the Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA) study. Public Health Nutrition 2017; 21: 3192–3201.
2. Özdemir A. Macronutrients in Adolescence. International Journal of Caring Sciences 2016; 9: 1162–6.
3. Republic of Turkey Ministry of Health, Hacettepe University. Turkey Health Nutrition Survey (THNS) 2010. (2014). https://hsgm.saglik.gov.tr/depo/birimler/saglikli-beslenme-hareketli-hayat-db/Yayinlar/kitaplar/diger-kitaplar/TBSA-Beslenme-Yayini.pdf . (accessed February 2020).
4. United States Department of Agriculture (USDA), United States Department of Health and Human Services (USDHHS). Scientific report of the 2015 Dietary Guidelines Advisory Committee. (2015). https://ods.od.nih.gov/pubs/2015_dgac_scientific_report.pdf . (accessed February 2020).
5. Deka MK, Malhotra AK, Yadav R, Gupta S. Dietary pattern and nutritional deficiencies among urban adolescents. J Family Med Prim Care 2015; 4: 364–368.
6. Chien LY, Liou YM, Chang P. Low defecation frequency in Taiwanese adolescents: Association with dietary intake, physical activity and sedentary behavior. J Paediatr Child Health 2011; 47: 381–386.
7. Santaliestra-Pasias AM, Mouratidou T, Verbestel V, et al. Food Consumption and Screen-Based Sedentary Behaviors in European Adolescents: The HELENA Study. Arch Pediatr Adolesc Med 2012; 166: 1010–20.
8. American Diabetes Association. Standards of medical care in diabetes-2017. Diabetes Care 2017; 40: 11–24.
9. Dernini S, Berry EM. Mediterranean diet: from a healthy diet to a sustainable dietary pattern. Front Nutrition 2015; 2: 1–7.
10. Martinez-Gonzalez M, Garcia-Lopez M, Bes-Rastrollo M, et al. Mediterranean diet and the incidence of cardiovascular disease: A Spanish cohort. Nutr Metab Cardiovasc Dis 2011; 21: 237–44.
11. Akgüllü Ç, Sırıken F, Eryılmaz U, et al. The relation between compliance with the Mediterranean diet and the extensiveness of coronary artery disease. Türk Kardiyol Dern Arş 2015; 43: 340–9.
12. Casas R, Sacanella E, Urpi-Sarda M, et al. The effects of the Mediterranean Diet on Biomarkers of Vascular Wall Inflammation and Plaque Vulnerability in Subjects with High Risk for Cardiovascular Disease: A Randomized Trial. PLos ONE 2014; 9: 1–11.
13. Romaguera D, Guevara M, Norat T, et al. Mediterranean diet and type 2 diabetes risk in the European Prospective Investigation into Cancer and Nutrition (EPIC) study: the InterAct project. Diabetes Care 2011; 34: 1913–8.
14. Perez-Martinez P, Garcia-Rios A, Delgado-Lista J, Perez-Jimenez F, Lopez-Miranda J. Mediterranean diet rich in olive oil and obesity, metabolic syndrome and diabetes mellitus. Curr Pharm Des 2011; 17: 769–77.
15. Sofi F, Macchi C, Abbate R, Gensini GF, Casini A. Mediterranean Diet and Health. Biofactors 2013; 39: 335–42.
16. Schwingshackl L, Hoffmann G. Adherence to Mediterranean diet and risk of cancer: A systematic review and meta-analysis of observational studies. Int J Cancer 2014; 135: 1884–97.
17. Buckland G, Agudo A, Travier N, et al. Adherence to the Mediterranean diet reduces mortality in the Spanish cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC-Spain). Br J Nutr 2011; 106: 1581–91.
18. Landry BW, Driscoll SW. Physical activity in children and adolescents. PM&R 2012; 4:826–832.
19. Biddle SJH, Asare M. Physical activity and mental health in children and adolescents: a review of reviews. Br J Sports Med 2011; 45: 886–95.
20. Taşkın G, ahin-Özdemir FN. The Importance of Exercise in Children. Gazi Journal of Physical Education and Sports Sciences 2018; 23: 131–41.
21. Ayhan D., Günaydın E, Gönlüaçık E, Arslan U, Çetinkaya F, Asimi H, Uncu Y. Nutritional Habits of Uludağ University Medical Faculty Students and Factors Affecting Them. Journal of Uludağ University Faculty of Medicine 2012; 38: 97–104.
22. Hills AP, Andersen LB, Byrne NM. Physical activity and obesity in children. Br J Sports Med 2011; 45: 866–70.
23. Can S, Arslan E, Ersöz G. Physical Activity with a Current Perspective. Ankara University Faculty of Sport Sciences 2014; 12: 1–10.
24. Welborn S. Comparison Of Obesity Bias, Attitudes, and Beliefs Among Under Graduate Dietetic Students, Dietetic Interns, and Practicing Registered Dietitians. PhD Thesis, University of East Tennessee State. 2013.
25. World Health Organization. Weight bias and obesity stigma: considerations for the WHO European Region. (2017). http://www.euro.who.int/__data/assets/pdf_file/0017/351026/WeightBias.pdf?ua=1. (accessed January 2020).
26. Ercan A, Ok MA, Kızıltan G, Altun S. Development of Obesity Bias Scale for Health Sciences Students: GAMS

27-Obesity Bias Scale. International Refereed Journal of Nutrition Research 2015; 3: 29–43.
27. Nutter S, Ireland A, Alberga AS, Brun I, Lefebvre D, Hayden A, Mayhew SR. Weight Bias in Educational Settings: a Systematic Review. Curr Obes Rep 2019; 8: 185–200.
28. Sutin AR, Terracciano A. Perceived Weight Discrimination and Obesity. PLos One 2013; 8: 1–4.
29. Serra-Majem L, Ribas L, Ngo J. Food, youth and the Mediterranean diet in Spain. Development of KIDMED, Mediterranean Diet Quality Index in children and adolescents. Public Health Nutrition 2004; 7: 931–5.
30. Erol E, Ersoy G, Pulur A, Özdemir G, Bektaş Y. Evaluation of the Mediterranean Diet Quality Index (KIDMED) in adolescents in Turkey. International Journal of Human Sciences 2010; 7: 647–64.
31. Craig CL, Marshall LA, Sjöström M, et al. International Physical Activity Questionnaire: 12-Country Reliability and Validity. Med Sci Sports Exerc 2003; 35: 1381–95.
32. Öztürk M. Validity and reliability of the international physical activity survey and determination of the levels of physical activity among students studying at the university. PhD Thesis, University of Hacettepe Ankara. 2005.
33. International Physical Activity Questionnaire. IPAQ scoring protocol. (2005). https://sites.google.com/site/theipaq/scoring-protocol. (accessed March 2020).
34. World Health Organization. BMI-for-age (5–19 years). (2007) https://www.who.int/growthref/who2007_bmi_for_age/en/. (accessed February 2020).
35. Ashwell M. Waist to height ratio and the Ashwell shape chart could predict the health risks of obesity in adults and children in all ethnic groups. Nutrition and Food Science 2005; 35: 359–64.
36. Gerber M, Hoffman R. The Mediterranean diet: health, science and society. British Journal of Nutrition 2015; 113: 4–10.
37. Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT. (2012) Impact of Physical Inactivity on the World's Major Non-Communicable Diseases. Lancet 2012; 380: 219–29.
38. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents 1999–2010. JAMA 2012; 307: 483–90.
39. Keast DR, Nicklas TA, O'Neil CE. Snacking is associated with reduced risk of overweight and reduced abdominal obesity in adolescents: National Health and Nutrition Examination Survey (NHANES). Am J Clin Nutr 2010; 92: 428–35.
40. Aktaş D, Öztürk FN, Kapan Y. Frequency of obesity in adolescents and risk factors affecting it, determination of nutritional habits. TAF Preventive Medicine Bulletin 2015; 14: 406–12.
41. Deshmukh-Taskar PR, Nicklas TA, Oneil CE, Keast DR, Radcliffe JD, Cho S. The relationship of breakfast skipping and type of breakfast consumption with nutrient intake and weight status in children and adolescents: The National Health and Nutrition Examination Survey 1999–2006. Journal of American Dietetic Association 2010; 110: 869–78.
42. Aksoydan E, Çakır N. Evaluation of nutritional habits, physical activity levels and body mass indexes of adolescents. Gülhane Medical Journal 2011; 53: 264–70.
43. Azadbakht L, Hajishafiee M, Golshahi J, Esmaillzadeh A. Snacking behavior and obesity among female adolescents in Isfahan, Iran. J Am Coll Nutr 2015; 35: 405–12.
44. World Health Organization. Obesity and overweight. (2020). https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight. (accessed May 2020).
45. Ergül , Kalkım A. An important chronic disease: obesity in childhood and adolescence. TAF Preventive Medicene Bulletin 2011; 10: 223–30.
46. Yabancı N, Pekcan G. The effect of nutritional status and physical activity level on body composition and bone mineral density in adolescents. Journal of Family, Community Education and Culture Research 2010; 6: 9–20.
47. Ramirez-Velez R, Moreno-Jimenez J, Correa-Bautista JE, et al. Using LMS tables to determine waist circumference and waist-to-height ratios in Colombian children and adolescents: the FUPRECOL study. BMC Pediatrics 2017; 17: 162–73.
48. Aslan NN, Yardımcı H, Özçelik AÖ. Relationship between macro-nutrient intakes and anthropometric measurements of students preparing for the university exam. Erciyes University Journal of Health Sciences Faculty 2017; 4: 39–48.
49. Gümüş H, Bulduk S, Akdevelioğlu Y. Determination of the relationship between the nutritional and physical activity status of adolescents staying in orphanages and their body composition. Journal of Human Science 2011; 8: 786–808.
50. Tüfekçi ME, Güleç GS. Mediterranean Diet. In: Tüfekçi ME (ed) Diets and Facts, 1st edn. Hatiboğlu, Ankara, 2016, pp 123–160.
51. Buscemi S, Marventano S, Castellano S, et al. Role of anthropometric factors, self-perception, and diet on weight misperception among young adolescents: a cross-sectional study. Eat Weight Disord 2018; 23: 107–15.
52. Kabaran S, Gezer C. Determination of Obesity by Compliance with the Mediterranean Diet in Children and Adolescents in the Turkish Republic of Northern Cyprus. Turkish Journal of Pediatric Disease 2013; 7: 11–20.
53. Kılınç FN, Çakır B, Durmaz SE. Are sports adolescents fed optimally? Obesity states and Mediterranean Diet compliance levels. Turkey Clinics Journal of Sports Science 2020; 12: 49–57.
54. Torun-Toktaş N, Yildiz Y. Assessment of nutritional status of 10–14 years old adolescents using Mediterranean diet quality index (KIDMED). Procedia Social and Behavioral Science 2013; 106: 512–8.
55. Mistretta A, Marventano S, Antoci M, et al. Mediterranean diet adherence and body composition among Southern Italian adolescents. Obes Res Clin Pract 2017; 11: 215–26.
56. Galan-Lopez P, Sanchez-Oliver A, Ries F, Gonzalez-Jurado JA. Mediterranean Diet, Physical Fitness and Body

Composition in Sevillian Adolescents: A Healthy Lifestyle. Nutrients 2019; 11: 2009–23.
57. Devran BS, Saka M. The effect of nutrition education given to high school students on nutritional habits, nutritional knowledge level and physical activity. Journal of Nutrition and Dietetics 2019; 47: 5–14.
58. Alper Y, Pündük Z, Akçakoyun F, Göktaş Z. Investigation of nutrition and physical activity habits of students of Balıkesir Science High School. Sports View: Journal of Sports and Educational Sciences 2017; 4: 101–10.
59. Bebiş H, Akpunar D, Özdemir S, Kılıç S. Investigation of Health Promotion Behaviors of Adolescents in a Secondary School. Gülhane Medical Journal 2015; 57: 129–35.
60. Christofaro DGD, De-Andrade SM, Mesas AE, Fernandes RA, Junior JCF. Higher Screen Time Is Associated With Overweight, Poor Dietary Habits and Physical Inactivity in Brazilian Adolescents Mainly among Girls. Eur J Sport Sci 2016; 16: 498–506.
61. Sanal E, Ardıç F, Kıraç S. Effects of aerobic or combined aerobic resistance exercise on body composition in overweight and obese adults: gender differences: A randomized intervention study. Eur J Phys Rehabil Med 2013; 49: 1–11.
62. Keskin K, Alpkaya U, Çubuk A, Öztürk Y. Examining the relationship between the physical activity levels of children 12–14 years old and their nutritional behaviors. IU Journal of Sports Sciences 2017; 7: 34–43.
63. Farajian P, Risvas G, Karasouli K, et al. Very high childhood obesity prevalence and low adherence rates to the Mediterranean diet in Greek children: The GRECO study. Atherosclerosis 2011; 217: 525–30.
64. Santi MD, Callari F, Brandi G et al. Mediterranean diet adherence and weight status among Sicilian Middle school adolescents. International Journal of Food Sciences and Nutrition; 2020.
65. Peng W, Goldsmith R, Berry EM. Demographic and lifestyle factors associated with adherence to the Mediterranean diet in relation to overweight / obesity among Israeli adolescents: findings from the Mabat Israeli national youth health and nutrition survey. Public Health Nutrition 2016; 20: 883–92.
66. Papadaki S, Mavrikaki E. Greek adolescents and the Mediterranean diet: factors affecting quality and adherence. Nutrition 2015; 31: 345–9.
67. Santomauro F, Lorini C, Tanini T, et al. Adherence to Mediterranean diet in a sample of Tuscan adolescents. Nutrition 2014; 30: 1379–83.
68. Arriscado D, Muros JJ, Zabala M, Dalmau JM. Factors associated with low adherence to a Mediterranean diet in healthy children in Northern Spain. Appetite 2014; 80: 28–34.
69. Bayram S, Köseler-Beyaz E, Türker PF, Saka M. The evaluation of obesity prejudices among adolescents. Acta scientific nutritional health 2019; 3: 166–71.
70. Puhl RM, Luedicke J. Weight-Based Victimization Among Adolescents in the School Setting: Emotional Reactions and Coping Behaviors. J Youth Adolescence 2012; 41: 27–40.
71. Gaspar MJM, Amaral TF, Oliveira BMPM, Borges N. Protective effect of physical activity on dissatisfaction with body image in children: A cross-sectional study. Psychology of Sport and Exercise 2011; 12: 563–9.
72. Coelho CG, Giatti L, Molina MDCB, Nunes MAA, Barreto SM. Body Image and Nutritional Status Are Associated with Physical Activity in Men and Women: The ELSA-Brasil Study. Int J Environ Res Public Health 2015; 12: 6179–96.
73. Bibiloni MDM, Pons A, Tur JA. Compliance with the Mediterranean Diet Quality Index (KIDMED) among Balearic Islands' Adolescents and Its Association with Socioeconomic, Antropometric and Lifestyle Factors. Ann Nutr Metab 2016; 68: 42–50.
74. Albaladejo-Blázquez N, Ferrer-Cascales R, Riziz-Robledill N, Sapa-Sansegundo M, Clement-Carbonell V, Zaragoza-Martí A. Poor Dietary Habits in Bullied Adolescents: The Moderating Effects of Diet on Depression. Int J Environ Res Public Health 2018; 15: 1569–79.
75. De-Vriendt T, Clays E, Huybrecht I, et al. European adolescents' level of perceived stress is inversely related to their diet quality: The healthy lifestyle in Europe by Nutrition in Adolescence study. British Journal of Nutrition 2012; 108: 371–80.
76. Hou F, Xu S, Zhao Y, Lu Q, Zhang S, Zu P, Sun Y et al. Effects of emotional symptoms and life stress on eating behaviors among adolescents. Appetite 2013; 68: 63–8.
77. Michels N, Sioen I, Braet C, et al. Stress, emotional eating behavior and dietary patterns in children. Appetite 2012; 59: 762–9.

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