

THE EFFECTS OF EDUCATIONAL INTERVENTION ON THE  
HEALTHY EATING HABITS AND PHYSICAL ACTIVITY LEVELS OF  
ADOLESCENTS <sup>(1)</sup>EĞİTİM MÜDAHALESİNİN ADOLESANLARIN SAĞLIKLI BESLENME  
ALİŞKANLIKLARI VE FİZİKSEL AKTİVİTE DÜZEYLERİ ÜZERİNE  
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**Öz:** Bu araştırmayla, eğitim müdahalesinin lise öğrencilerinin sağlıklı beslenme alışkanlıkları ve fiziksel aktivite düzeyleri üzerindeki etkisinin saptanması amaçlanmıştır. Araştırma 4 okuldan toplam 800 öğrenciyle 25.12.2016- 31.05.2017 tarihleri arasında yürütülmüştür. Müdahale öncesinde tüm öğrencilere 21 sorudan oluşan anket formu uygulanmış, boy ve ağırlık ölçümleri yapılmıştır. Sonrasında ise planlanan eğitim müdahalesinin uygulaması (n=490) yanı sıra öğrencilerin boy ve ağırlık ölçümlerinin tekrarı yapılmıştır. Müdahale öncesinde öğrencilerin cinsiyetine göre vücut yapılarına yönelik algıları değişmektedir (p<0.05). Müdahale sonrasında ise öğrencilerin cinsiyetleri ile vücut algıları arasında ilişki görülmemiştir. Ayrıca müdahale sonrasında genel olarak sağlıklı beslendiklerini belirtenlerin oranının %38.8'den %52.2'ye yükseldiği saptanmıştır. Yapılan araştırmadan elde edilen sonuçlara göre kız öğrenciler erkek öğrencilere göre daha fazla oranlarla kilosunu yanlış algılamaktadır. Müdahale öğrencilerin BKİ değeri üzerine çok az etkili olmuş, aynı zamanda sağlıklı beslenenlerin ve fiziksel olarak aktif olanların oranı artmıştır. Elde edilen sonuçlardan yola çıkarak adolesanları hedef alan müdahale programlarının ve araştırmaların sayısının artırılmasının olumlu sonuçlar alınmasında etkili olacağı söylenebilir.

**Anahtar Kelimeler:** Adolesan Sağlığı, Eğitim Müdahalesi, Sağlıklı Beslenme, Fiziksel Aktivite

**Abstract:** This research was aimed to determine the effect of educational intervention on healthy eating habits and physical activity levels of high school students. The research was conducted with a total of 800 students from 4 schools between the dates of 25.12.2016-31.05.2017. Before the intervention, a questionnaire form consisting of 21 questions was applied to all students, and their height and weight measurements were collected. Afterwards, besides the implementation of the planned educational intervention (n = 490), the height and weight measurements of the students were repeated. The perception of students' body structures changed according to their genders before the intervention (p<0.05). After the intervention, there was no relationship between the gender of the students and their body perception of their bodies. In addition, it was determined that the rate of those who stated that they, generally, had a healthy diet after the intervention increased from 38.8% to 52.2%. According to the results obtained from the research conducted, female students, at higher rates, perceive their weight incorrectly than male students. The intervention had little effect on the BMI of the students, while the proportion of those who had a healthy diet, and those who were physically active had increased. Based on the results obtained, it can be said that increasing the number of intervention programs and studies targeting adolescents will be effective in achieving positive results.

**Keywords:** Adolescent Health, Educational Intervention, Healthy Eating, Physical Activity

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## INTRODUCTION

Adolescence is an important period of life in which growth and development are the fastest, which covers the transition from childhood to adulthood, and ensures the development of behavior and attitude regarding health (Erkan, 2011; Akman et al., 2012). The World Health Organization (WHO) defines the adolescence period as the period between the ages of 10-19, while the United Nations Convention on the Rights of the Child accepts the period up to the age of 21 as adolescence (WHO, 2005).

Adolescents constitute 16% of the world population (WHO, 2020) and most of the life-long dietary habits are obtained in the adolescent period (Gonzales et al., 2007). Physical changes in adolescence change the nutrition requirement of the body, as the need for energy, protein, vitamins, and minerals increases so does the appetite. Depending on the changes in eating habits and food choices in this period, various problems may arise in meeting the increasing needs of the young person, and many unwanted dietary behaviors such as wrong food selection and unhealthy diet practices can be encountered as a result of aesthetic concerns. Also, as a result of malnutrition or poor dietary habits in adolescence, osteoporosis, obesity, hyperlipidemia, delayed sexual development, cardiovascular diseases, and cancer may appear as important problems in the years ahead (Erkan,

2008; Ministry of Health, 2020; Baltacı et al., 2006). In this period, the habits of skipping main meals and eating fast-food products in between meals can be formed. Watching TV and working at computer for long periods and snacking during these periods are among the common behaviors (Chandra-Mouli et al., 2006). Adolescents who develop unhealthy dietary habits are likely to continue this behavior into adulthood and this can lead to a higher risk for many chronic diseases. This is why, in recent years, special attention has been paid to nutritional behavior during this period of life (Holubcikova et al., 2016).

Although it has many benefits regarding health, it is known that physical activity is not on a sufficient level. According to the data of WHO (2016), the physical activity level of 81% of adolescents between the ages of 11-17 is insufficient. 27% of women over the age of 18 are inactive while the rate drops to 20% in men, and this rate is reported to be higher in women. According to the data of the National Child Health Survey (2016), less than a quarter (24%) of children between the ages of 6 and 17 in the United States participate in 60 minutes of physical activity every day, again in the United States (2018), only 26.1% of high school students were reported to have participated in at least 60 minutes of physical activity on 7 days of the last week (Laura et al., 2018). While in Turkey (2016), a seden-

tary lifestyle is common among people over the age of 15 and 54.6% of the population has insufficient levels of activity (48.1% in men, 61.2% in women) (WHO, 2016).

Adolescence and the dietary habits and physical activity level gained during this period are very important for the individual to maintain a healthy and quality lifestyle. Healthy lifestyle behaviors that are effective in improving health are acquired or tested during adolescence. This period determines what type of adult the individual will become in the future. Therefore, it should be considered as a priority group in terms of public health. Conducting studies in the type of intervention can be a guide on how to approach the youth to gain healthy dietary habits and increase their physical activity levels. By planning the study based on these facts, it was aimed to determine the effect of the applied educational intervention on the healthy dietary habits and physical activity levels of high school students.

## METHOD

### Research Type

This study is a quasi-experimental research.

### The Universe and Sample of the Research

The research was conducted with a total of 800 students from 4 high schools between the dates of 25.12.2016 - 31.05.2017. Within the

scope of the research, no sample was selected, it was aimed to reach the whole universe.

The place where the study was conducted is a town with a population of 90.000 located in the Central Anatolia Region of Turkey and there are 12 schools at the high school level in this town. Before the intervention, a questionnaire form consisting of 5 parts was applied to all students, and height and weight measurements were taken. Afterwards, the planned educational intervention was applied and the height and weight measurements of the students were taken again. Inclusion criteria in the study; being a high school student and voluntarily participating in the research.

### Data Collection Form

The data collection form used in the study consists of 5 parts. In the first part; There are five questions to determine the age, gender, family type, place of residence, and income status of the students. In the second part; There are six questions to determine the general health evaluations of the students on the date of the study and one year before the study, their height and weight, the statements they find suitable for their bodies, and their statements about the state of their body structures one year later. Also included in this section is the Figure rating scale (Childress et al., 1993). This scale allows adolescents to mark the body shape they find suitable to themselves.

ves or their desired body shape with a number from 1 to 8.

Questions were created to determine the eating habits (Akman et al., 2012; Baltacı et al., 2006; Carfora et al., 2016; Philippi et al., 2015; Straker et al., 2014) and physical activity levels (Akman et al., 2012; Esatbeyoglu and Kin İşler, 2018; Kantaništa et al., 2015; Straker et al. (2014) of the students by literature review. In the third part, there are seven questions created to learn the characteristics of the dietary habits of the students. In the fourth part; There are two questions to determine the physical activity, entertainment, and other activities of the students. Questions created to learn their all meals are grouped in “I eat at least four days a week”, and “I eat at least three days and less”, options. The food and beverages consumed between meals were divided into healthy and unhealthy options and evaluated according to their placement in these two groups: “I eat at least 2-3 times a week”, and “I rarely eat or not at all”.

Similarly, the characteristics of the students regarding their food consumption in the last four weeks were divided into two groups as healthy (Fruit, yoghurt, ayran, raw vegetables, milk, cooked vegetables, egg) and unhealthy (Biscuit, cracker, bread, pastries, dessert, pie, chocolate, cake, ice cream, fries, hamburger) food and beverages, and the results were evaluated based on the options of

consuming these foods and beverages for “a few days or more a week”, and “consuming a few days a month or not consuming at all”, before and after the intervention. The physical activity characteristics of the students were approached as “yesterday” and “in general”, and those who did more than 15 minutes of physical activity yesterday were evaluated as sufficient, those who did less than 15 minutes of physical activity or none at all were considered insufficient. In the case of doing physical activity “in general”, those who marked “none or less” option were considered insufficient, and those marking the “more option” were considered sufficient. Finally, within the scope of the research, the entertainment and other activities that the students did yesterday were also evaluated, those who did none or less than 30 minutes were considered as one group, those who did more than 30 minutes as the other group, and their pre-and post-intervention situations were evaluated.

### Education Intervention

The education program, given to students by the researcher, who is a public health academic member, consists of the topics of adolescence period and its characteristics, nutrition in adolescence, and physical activity in adolescence. The education programs were applied, in approximately four sessions (in groups of 50 people) in each school, to a total of 800 students by ensuring the participation of 200

students from each school, and no sample selection was made. The applied education was carried out in two 40-minute periods with a 15-minute break, one day a week that was determined with the school administration in a total of 3 weeks. The subjects, which were prepared in accordance with the purpose of the study, were taught based on the education program and by using interactive training techniques, such as demonstration, role-play, question-answer, and brain-storming during the course periods. In order to determine the dates of the education programs, the school administrations were consulted, and the course periods were decided, between the dates of 25.12.2017 - 21.01.2017, in accordance with the students' schedules to implement education programs. At the end of the education program, the participants were asked to evaluate the program, and they were given additional time for evaluation. In addition, visual and written warnings about nutrition and physical activity prepared in coordination with the education program organized to increase the motivation of students were used, for 3 months (12.02.2017 - 12.05.2017) visual and written warnings were hung on various parts of the schools, where students could easily notice, such as school boards, entrances and exits, stairs, and cafeteria. 3 months after the education program (14.05.2017-31.05.2017), taking the course hours of the students into account and by providing information about

the research, different posttest questionnaires were given to each class, information about the forms was provided, and before the questionnaire forms were collected, students were given approximately 15-20 minutes to fill out their answers. A total of 490 students completed the education intervention. In addition, the weight measurements of students were taken again (n = 490), and the effectiveness of the education intervention and written-visual warnings related to nutrition and physical activity were evaluated.

### Statistical Analysis

The data obtained were evaluated using the SPSS 17.0 (Statistical Package for Social Sciences for Windows) package program. In addition to evaluating the data with percentages and numbers, Chi-Square calculation between Pre Test-Post Test groups, One Way Anova Test, t-test for dependent groups and t-test for independent groups were used.

### Ethical Consent of the Study

Within the scope of this study, in addition to obtaining written permission from Konya Provincial Directorate of National Education, the verbal consent of the school administrations was also obtained. In addition, the study was conducted by obtaining the verbal and written consent of the participants, as well as the permission obtained from the Selçuk University Ethics Committee (23/12/2016-



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## RESULTS

A total of 800 students from 4 schools participated in the study. The ages of the students

vary between 14 and 18, and their arithmetic average is  $15.87 \pm 0.81$ . With close percentages to each other, 50.2% of the participants were male and 49.8% were female students (Table 1).

Table 1. Socio-Demographic Characteristics of Students (N=800)

	Min-Max	$\bar{x} \pm SS$
<b>Age</b>	14-18	15.87 $\pm$ 0.81
<b>Sex</b>	<b>n</b>	<b>%</b>
Male	402	50.2
Female	398	49.8
<b>Family Type</b>		
Nuclear Family	602	75.2
Extended Family	176	22.0
Broken Family	22	2.8
<b>Place of Residence</b>		
County Town	482	60.2
Village-Town	318	39.8
<b>Income Status</b>		
Low	49	6.1
Middle	527	65.9
High	224	28.0
<b>Total</b>	800	100.0

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Table 2. The Views of Students on Health and Body Perception (n=490)

	PRE TEST				POST TEST				
	Male	Female	Total	p*	Male	Female	Total	p*	p**
<b>General Health Assessment</b>									
	%	%	%		%	%	%		
Excellent	19.4	7.0	12.9	p<0.001	18.1	6.6	12.0	p<0.001	p<0.001
Very Good	36.6	25.2	30.6		32.8	29.8	31.2		
Good	34.5	46.5	40.8		33.6	47.7	41.0		
Average	7.8	18.6	13.5		14.2	15.5	14.9		
Bad	1.7	2.7	2.2		1.3	.4	.9		
<b>Health Assessment Compared to Previous Year</b>									
Better	15.9	11.6	13.7	.352	13.4	11.2	12.2	.149	.423
Slightly Better	34.5	29.8	32.0		36.2	28.7	32.2		
Same	31.9	38.8	35.5		40.1	43.8	42.0		
Slightly Worse	14.7	16.7	15.7		9.9	14.7	12.4		
Much Worse	3.0	3.1	3.1		.4	1.6	1.2		
<b>The expression you find suitable to your body</b>									
I have thinner body than the standard body	24.1	13.2	18.4	p<0.05	22.0	14.0	17.8	.052	.770
I have a standard body	54.7	59.7	57.3		56.0	58.9	57.6		
I have a fatter body than the standard body	21.2	27.1	24.3		22.0	27.1	24.6		
<b>Statement about the state of your physique for one year later</b>									
It would be better if I gained some weight	36.6	14.4	24.9	p<0.001	36.2	14.3	24.7	p<0.001	.025
I'm happy with my physique. I don't want it to change	31.1	29.8	30.4		32.8	36.8	34.9		
It would be better if I lost some weight	32.3	55.8	44.7		31.0	48.8	40.4		
<b>Total</b>	100.0	100.0	100.0		100.0	100.0	100.0		

\*Chi-Square calculation was made according to sex.

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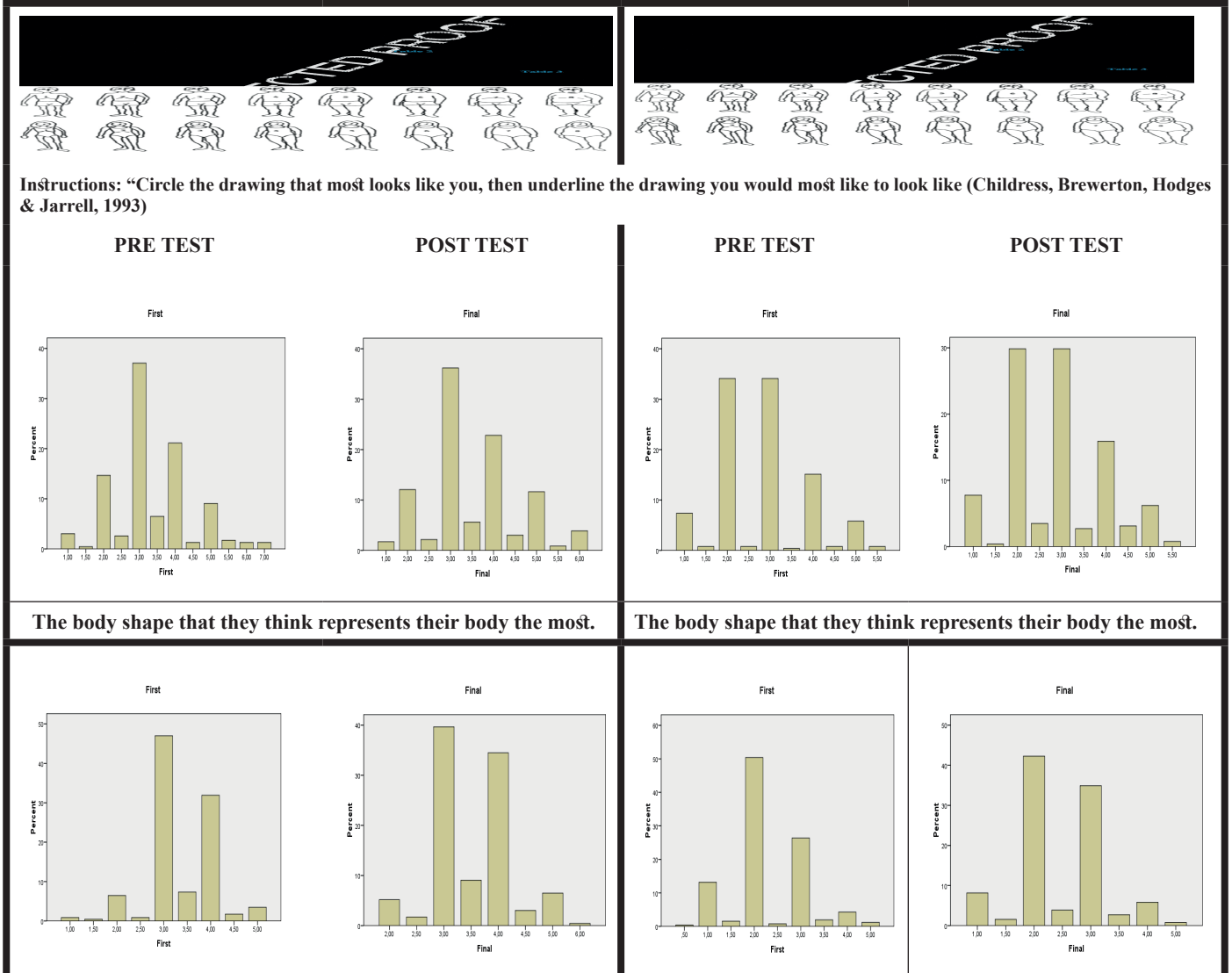
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**\*\*Chi-Square calculation was made between Pre-Test-Post-Test groups.**

In Table 2 the evaluations of the students regarding their health and body perception are included. Within the scope of the study, the students, by using the figure rating scale, were asked to mark the number under the fi-

gure that they think represents their body the most (Childress et al., 1993). Before the intervention, 34.1% of the female students marked the number 2 as the one that represented their body the most, while another 34.1% marked number 3, after the intervention, the rate of those who marked the numbers 2 and 3 decreased to 29.8% (Figure 1).





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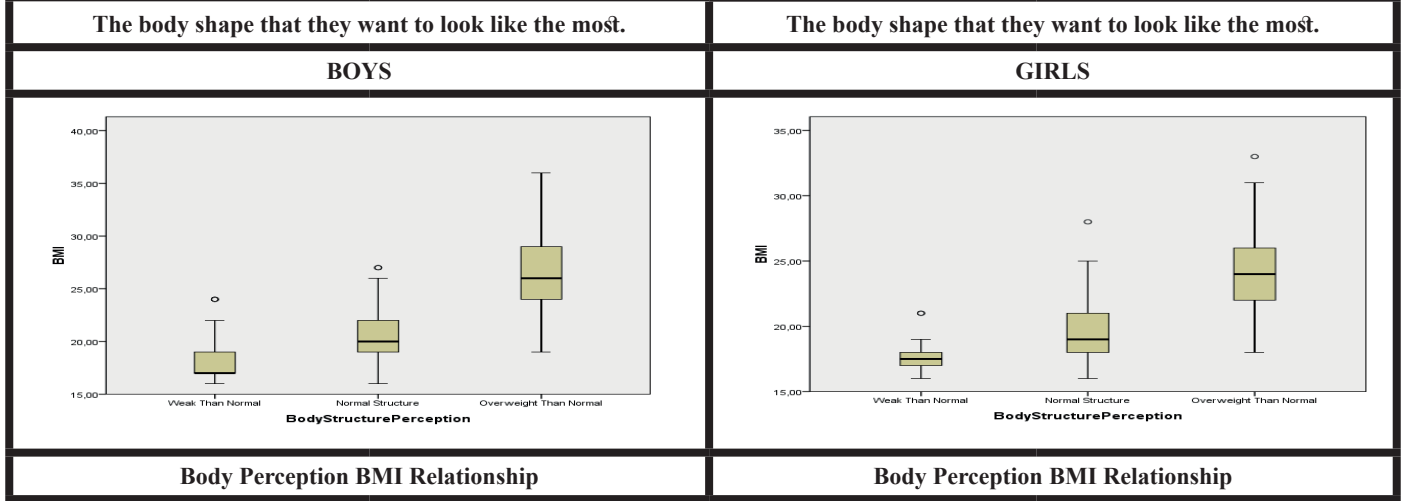
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**Figure 1. The Opinions of Students About Which Body Shape Represents Their Bodies and The Body Shape They Want Their Bodies to Resemble and Their Relationship with BMI (n=490)**

In addition, BMI values of the students were compared with their perceptions of their physiques, as a result of the One-way ANOVA and Welch Test that were applied statistically significant results were found in both

female students ( $F=96.354$ ,  $p<0.001$ ) and male students ( $F=91.335$ ,  $p<0.001$ ), and it was observed that students of both sexes had body perceptions fitting to their BMI values (Figure 1).

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Table 3. Comparison of BMI Values of Students (n = 490)

PRE TEST		POST TEST		
<i>Min-Max</i>	$\bar{x}\pm SS$	<i>Min-Max</i>	$\bar{x}\pm SS$	
<i>BKİ</i>	16.00-36.00	20.95±3.62	16.00-35.00	20.60±3.51
<i>t</i>		<i>p</i> *		
10.504		<i>p</i> <0.001		
MALE (n=232)		FEMALE (n=258)		
PRE TEST	POST TEST	PRE TEST	POST TEST	
<i>Min-Max:</i> 16.00-36.00	<i>Min-Max:</i> 16.00-35.00	<i>Min-Max:</i> 16.00-33.00	<i>Min-Max:</i> 16.00-33.00	
$\bar{X}\pm SS$ : 21.17±3.99	$\bar{X}\pm SS$ : 20.84 ±3.88	$\bar{X}\pm SS$ : 20.74±3.24	$\bar{X}\pm SS$ : 20.39 ±3.13	
<i>t</i>	<i>p</i> *	<i>t</i>	<i>p</i> *	
7.183	<i>p</i> <0.001	7.652	<i>p</i> <0.001	
%	%	%	%	
<18.50	28.0	29.3	29.0	31.8
18.50 - 24.99	54.7	55.6	59.6	58.4
25.00 - 29.99	12.4	10.7	9.8	9.0
> 30.00	4.9	4.4	1.6	0.8
Total	100.0	100.0	100.0	100.0

\* t test was used in the dependent groups.

Table 3 contains the pre-test and post-test BMI values of the students. While the BMI value of the students before the intervention ranged between 16 and 36, it varied between

16 and 35 after the intervention, as a result of the statistical analysis conducted, it was determined that there was a difference between the BMI values before and after the intervention (*p*<0.001), and the BMI value slightly decreased after the intervention.

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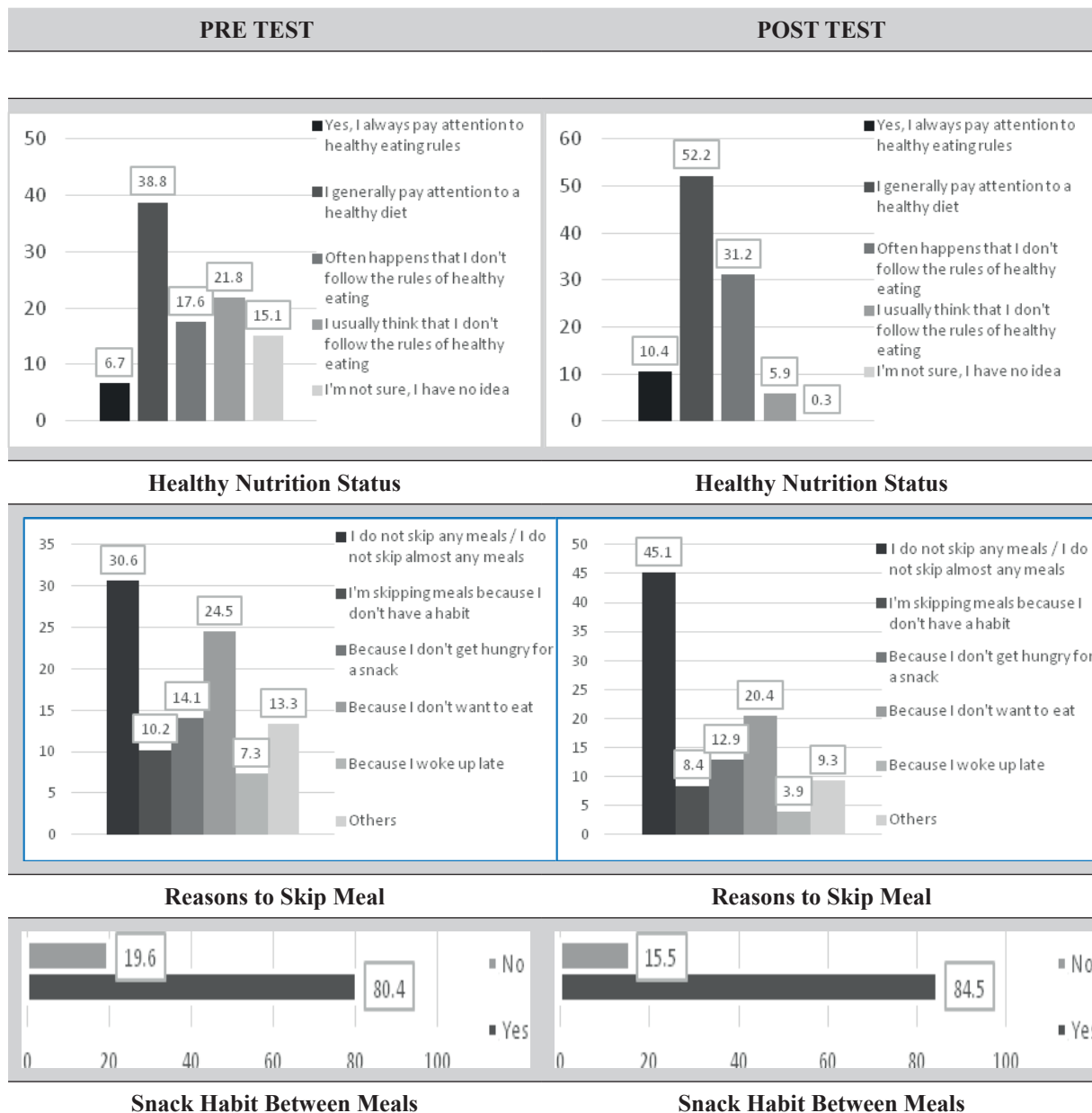


Figure 2. The Evaluation of Students on Their Nutritional Status (n = 490)

Table 4 contains the nutritional status of the students and the comparison of BMI values. After the intervention, the percentage of

students who stated that they had a healthy diet increased from 45.5% to 62.7%, also an increase was observed in their healthy dietary

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habits ( $p < 0.001$ ).

Table 4. Comparison of The Nutritional Status and BMI Values of The Students (n=490)

			PRE TEST	POST TEST	X <sup>2</sup>	p <sup>*</sup>	
Healthy Diet			45.5	62.7	43.601	p<0.001	
Unhealthy Diet			54.5	37.3			
Total			100.0	100.0			
PRE TEST			POST TEST				
	%		t	p <sup>*</sup>	%	t	p <sup>**</sup>
Healthy Diet	45.5	<i>Min-Max:</i> 16.00-33.00 <i>̄x</i> ±SS: 20.68±3.38	-1.465	.085	62.7	<i>Min-Max:</i> 16.00-34.00 <i>̄x</i> ±SS: 20.40±3.32	-1.639 .102
Unhealthy Diet	54.5	<i>Min-Max:</i> 16.00-36.00 <i>̄x</i> ±SS: 21.17±3.80			37.3	<i>Min-Max:</i> 16.00-35.00 <i>̄x</i> ±SS: 20.95±3.80	

\*Chi-Square calculation was made between Pre-Test-Post-Test groups

\*\* t test was used in the independent groups.

When the dietary habits of the students were examined, it was seen that the percentage of those who had breakfast at least 4 days a week increased from 73.3% to 79.2% after the intervention, while the percentage of those who had lunch at least 4 days a week increased from 93.3% to 95.9% after the intervention, and after the intervention, the ra-

tio of having breakfast and lunch also increased (**Breakfast**;  $p < 0.05$ , **Lunch**;  $p < 0.05$ ). When the level of physical activities, such as cycling, exercising, basketball, playing football, playing volleyball, walking, and running, and on which level these activities were done by students, on the day before and in general, were examined, it was seen that there was an increase in the amount of sufficiently done physical activity in all physical activity groups ( $p < 0.001$ ).

**Table 5. The Characteristics of Students Based on Meals, Food Consumption in The Last 4 Weeks, Physical Activity Status, Entertainment and Other Activities (n = 490)**

**a. Food Consumption at Meals and Between Meals**

	PRE TEST	POST TEST	p*		PRE TEST	POSTTEST	p*		PRE TEST	POSTTEST	p*
<b>Breakfast</b>	%	%		<b>Lunch</b>	%	%		<b>Dinner</b>	%	%	
I have breakfast at least 4 days a week	73.3	79.2	p<0.05	I have lunch at least 4 days a week	93.3	95.9	p<0.05	I have dinner at least 4 times a week	96.7	96.3	.845
<b>UNHEALTHY FOOD</b>											
<b>Biscuit/ cracker/ bread/ pastries</b>				<b>Dessert/pie/chocolate/cake/ice cream</b>				<b>Dried nuts/popcorn/non-alcoholic beverages</b>			
I consume at least 2-3 times a week	87.8	85.5	.329	I consume at least 2-3 times a week	81.0	80.4	.794	I consume at least 2-3 times a week	69.8	66.7	.258
<b>HEALTHY FOOD</b>											
<b>Fruit/yoghurt/ayran</b>											
I consume at least 2-3 times a week	81.4	86.9	p<0.05								

**b. Food consumption within the last 4 weeks**

	PRE TEST	POSTTEST	p		PRE TEST	POST TEST	p		PRE TEST	POST TEST	p
<b>Fruit</b>				<b>Raw vegetables</b>				<b>Cooked vegetables</b>			
A few days a week or more	86.7	85.3	.483	A few days a week or more	46.1	55.5	p<0.05	A few days a week or more	63.5	67.3	.110
<b>Yoghurt</b>				<b>Milk</b>				<b>Egg</b>			
A few days a week or more	81.6	82.4	.771	A few days a week or more	57.1	61.0	.110	A few days a week or more	65.7	70.4	p<0.05
<b>UNHEALTHY FOOD</b>											
<b>Carbonated Beverages</b>				<b>Fries - Hamburger</b>				<b>Cake/ Pastry</b>			
A few days a week or more	71.2	71.6	.923	A few days a week or more	46.3	50.4	.121	A few days a week or more	72.7	76.1	.141

**c. Physical Activity Situation**

	PRE TEST	POSTTEST	p*		PRE TEST	POST TEST	p*		PRE TEST	POSTTEST	p*
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I cycled yesterday				I exercised yesterday				I played basketball yesterday			
Sufficient	8.6	16.9	p<0.001	Sufficient	17.8	29.8	p<0.001	Sufficient	10.0	26.1	p<0.001
I ran yesterday				I play basketball in general				I cycle in general			
Sufficient	29.2	45.3	p<0.001	Sufficient	11.8	27.3	p<0.001	Sufficient	9.8	17.3	p<0.001
I play football in general				I play volleyball in general				I exercise in general			
Sufficient	19.0	31.4		Sufficient	9.6	29.6		Sufficient	19.6	30.2	
I walk in general				I run in general							
Sufficient	58.6	65.7		Sufficient	34.9	47.3					

d. Entertainment and Other Activities											
PRE TEST				POSTTEST				p*			
I watched TV yesterday				I played computer/video games yesterday				I did arts and crafts yesterday			
None/less than 30 minutes	42.2	48.8	p<0.05	None/less than 30 minutes	61.0	62.0	.731	None/less than 30 minutes	91.6	89.6	.253
I played board games yesterday				I listened to music/played an instrument yesterday				I talked on the phone/was with friends yesterday			
None/less than 30 minutes	90.8	89.6	.556	None/less than 30 minutes	45.7	46.5	.767	None/less than 30 minutes	42.7	44.7	.465

\*Chi-Square calculation was made between Pre-Test-Post-Test groups

In addition, within the scope of the research, how often the students did entertainment, and some other activities the day before were examined. After the intervention, the percentage of those who did not watch television the day before or watched for less than 30 minutes increased from 42.2% to 48.8% (p<0.05). In other activities, a statistically significant difference (p> 0.05) was not determined before and after the intervention (Table 5).

## DISCUSSION

Misperceiving a person's weight is also a

common problem in adolescence (Sutin and Terracciano, 2015). Underperceiving weight can also lead to inappropriate weight control behaviors and unhealthy dietary habits (Yan et al., 2018). The early establishment of healthy body image perceptions can prevent unhealthy behaviors in children and adolescents and reduce the body-weight that can be gained in the future (Ya-Wen et al., 2016). In the study conducted, 27.1% of the female students think that they are overweight than normal, it is seen that, before the intervention, the perceptions of the students about their body image change according to their gender (p<0.001), and the female students



tend to perceive their weight more (Table 2). In addition, the BMI values of the students were compared with their perceptions of body structure, and a statistically significant relationship was found in both female students ( $F=96.354$ ,  $p<0.001$ ) and male students ( $F=91.335$ ,  $p<0.001$ ), in both genders students were found to have body perceptions applicable to their BMI values (Figure 1). Similarly, in the study conducted by Kantanista et al. (2015) with 1702 females and 1547 males between the ages of 14-16, and in the study conducted by Griffiths et al. (2017) conducted with adolescent females ( $n = 1.135$ ) and males ( $n = 531$ ) between the ages of 12-18, body dissatisfaction was observed in higher rates in female participants compared to male participants. In the study conducted by Yan et al. (2018) with middle and high school students ( $n = 2641$ ) in Wuhan, China, it was determined that more than half of the students could not assess their weight status correctly and most of them were female participants. In the study of Sutin et al. (2015), where they analyzed the data of the National Adolescent Health Survey ( $n = 6.523$ ), it was found in the 12-year follow-up period that adolescents who perceived themselves as overweight were more likely to be obese than adolescents who perceived their weight correctly, while at the same time, it was determined that male participants were more likely to perceive their weight incorrectly compared

to female participants. Similar to the other examined studies, in the conducted study, it is seen that the negative body perception is higher in females, and when examined generally, more than half of the students tend to perceive themselves as at standard weight. These results obtained differ from the results of the study conducted by Yan et al.

Within the scope of the conducted study, the percentage of those who stated that they always pay attention to healthy dietary rules and the percentage of those who stated that they generally had healthy dietary habits have increased after the intervention (Figure 2), and an increase was observed in healthy nutrition ( $p<0.001$ ). Similarly, after the intervention, there was an increase in the ratio of eating breakfast ( $p<0.05$ ) and lunch ( $p<0.05$ ) (Table 5), as well as in the consumption of raw vegetables ( $p<0.05$ ), and eggs ( $p<0.05$ ) within the past 4 weeks (Table 5). Similar to the study we conducted, in a study conducted by Carfora et al. (2016) with 1,065 adolescents between the ages of 14-19 in Southern Italy, a message was sent to students every day for a period of 2 weeks, and it was determined that these messages significantly increased their fruit and vegetable intake and that text messages have encouraged a positive change in health behaviors. In the research conducted by Neumark-Sztainer et al. (2010) with the participation of 356 adolescent females wit-

hin the scope of the school-based program, in the 9-month follow-up; It has been determined that, in terms of the period of change, regularly having breakfast and fruit and vegetable intake have improved, portion control behaviors have increased, and unhealthy weight control behaviors have decreased. In another study conducted by Philippi et al. (2015) as part of a school-based obesity prevention program targeting Brazilian adolescent female students (n = 253), the intervention that was applied resulted in significant changes in the consumption of sugar-rich foods and intake of fruits and vegetables. In the study conducted by Holubcikova et al. (2016) with 2765 adolescents between the ages of 13-15, it was revealed that unhealthy dietary habits, skipping breakfast on weekends, and not consuming enough vegetables were common among adolescents. In the study conducted by Kye et al. (2016) which examined the relationship between happiness and lifestyle characteristics by using a web-based questionnaire, it was found that the possibility of consuming fruits on a daily basis of female participants who stated they were happy was higher while the possibility of them leading a sedentary lifestyle was less likely. In the same study, it was determined that adolescents, regardless of gender, who have breakfast and consume fruits and vegetables daily perceived themselves as happier. In the study conducted, similar to the other examined in-

tervention studies, the positive effects of the applied education intervention on the dietary habits of adolescents can be seen. However, it is clear that unhealthy foods are an important risk in terms of consumption and that their consumption is still a common problem.

Within the scope of the conducted study, the students were examined based on the level of physical activities, such as cycling, exercising, basketball, playing football, playing volleyball, walking, and running, they did the day before and in general, and an increase in the rate of sufficient physical activity was seen in all of the physical activity groups ( $p<0.001$ ), however, when evaluated generally, it was revealed that the physical activity level of adolescents was not at the desired levels (Table 5). Similar to the study we conducted, in a study conducted by NeumarkSztainer et al. (2010) within the scope of the school-based program and with the participation of 356 adolescent females, it was determined that approximately half of the female students were overweight or obese, in the 9-month follow-up, it was discovered that the sedentary behaviors and unhealthy weight control behaviors of the female students in the intervention group have decreased and their satisfaction on their body images have increased, while in a different study conducted by Wang et al. (2015) that monitored 67 adults for 6 weeks and investigated the ef-

fect of text messages on the activity level of overweight and obese individuals, it was discovered that the applied intervention led to a small increase in moderate to vigorous physical activity (MVPA), however, the text messages were found to be insufficient in increasing the physical activity for more than one week. In the controlled clinical study conducted by Straker et al. (2014) in Western Australia, adolescents (n = 69) and their parents received telephone and text message support for 12-months after completing an 8-week intervention. In their study, during the 8-week intensive intervention, while sedentary life habits had decreased, the level of physical activity had increased. At the end of the study, it was reported that participating in the Activity, Food, and Attitudes Program of Curtin University had a positive effect on the physical activity, sedentary lifestyle, and healthy behaviors of overweight and obese adolescents, many of these changes were able to be preserved during the one year after the intensive intervention. In the study conducted by Kye et al. (2016), which examined the relationship between happiness and lifestyle characteristics by using a web-based questionnaire, approximately one-third of adolescents were discovered to have participated in physical activities for more than three days a week for at least 60 minutes, and it was determined that being physically active for at least 60 minutes a day and avoiding sedentary be-

haviors were effective on the happiness levels of adolescents. As seen in both the study conducted and other studies that were examined, the applied interventions can increase the rate of physical activity while reducing sedentary lifestyle habits. However, generally speaking, it should not be forgotten that physical activity is not sufficient among students and there is a need for additional activity to increase the activity levels of students, and the inclusion of these measures in the school curriculum can increase physical activity levels, as well as providing continuity.

## CONCLUSION

Adolescence is a sensitive and important period that brings many risks and determines the quality of life and health level in the future. While healthy habits gained can bring a long and healthy life with them, unhealthy habits can cause many health problems, especially chronic diseases. The positive body image of adolescents appears to be an important factor that may affect their health or sickness. When evaluated generally, it is seen that the study conducted is particularly effective for healthy nutrition and physical activity. Based on the study conducted, it can be said that increasing the number of intervention studies targeting adolescents will be effective in obtaining positive results. Thus, it can contribute to the decrease of the negative body image and false dietary and nutritional habits in adolescence

period, while contributing to the increase of healthy nutrition and physical activity and spending entertainment and other leisure time activities with projects that will contribute to the development and health of adolescents. Additionally, large-scale intervention studies at the national or international level can be effective in helping adolescents acquire and maintain healthy habits. Considering that the rural areas, specifically, are disadvantageous in many aspects and that the implementation of these programs and activities is important in the health development of adolescents living in these regions, it is recommended that the number of studies that will be planned should be increased and comprehensive and full-scaled school-based intervention studies should be conducted.

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