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ARAŞTIRMA YAZISI / RESEARCH ARTICLE

FAZLA KİLOLU VE OBEZ ÖĞRENCİLERİN BESLENME ÖZ-YETERLİK, BESLENME TUTUM VE DAVRANIŞLARI ARASINDAKİ İLİŞKİNİN İNCELENMESİ

INVESTIGATION OF THE RELATIONSHIP BETWEEN NUTRITIONAL SELF-EFFICACY, ATTITUDE AND BEHAVIOURS OF STUDENTS WITH OVERWEIGHT AND OBESITY

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ÖZET

AMAÇ: Bu çalışmada fazla kilolu ve obez öğrencilerin beslenme özyeterlik, beslenme tutum ve beslenme davranışı arasındaki ilişkinin incelenmesi amaçlanmıştır.

GEREÇ VE YÖNTEM: Bu çalışma beden kitle indeksi persentil değeri 85'in üzerinde olan, 5. 6. ve 7. sınıfta eğitim gören 192 öğrenci ile gerçekleştirilmiştir. Veriler kişisel bilgi formu, çocuk beslenme öz-yeterliği, beslenme tutum ve beslenme davranış ölçeği ile elde edilmiştir.

BULGULAR: Öğrencilerin beslenme öz-yeterliği puan ortalaması 5.58±5.07, beslenme tutum puan ortalaması 12.72±2.52, beslenme davranış puan ortalaması ise 2.92±6.03 bulunmuştur. Cinsiyet ve beden kitle indeksi sınıflamasına göre ölçek puanları arasında anlamlı farklılık olmadığı, ailesinde fazla kilolu birey olmayan öğrencilerin daha olumlu beslenme tutumuna sahip olduğu tespit edilmiştir. Beslenme öz-yeterliği ile beslenme tutum ve beslenme davranışı arasında pozitif ilişki bulunmuştur.

SONUÇ: Fazla kilolu ve obez çocukların beslenme öz-yeterlikleri, beslenme tutumları ve beslenme davranış düzeyleri orta düzeyin üzerindedir. Fazla kilo ve obeziteye yatkınlığı arttıran fastfood yeme alışkanlığı, TV, bilgisayar gibi teknolojik aletlerle geçirilen süre gibi faktörler beslenme öz-yeterliği, beslenme tutumu ve beslenme davranış düzeylerinde etkilidir.

ANAHTAR KELİMELER: Çocukluk çağı obezitesi, Beslenme öz yeterliği, Beslenme tutumu, Beslenme davranışı, Öğrenci.

ABSTRACT

OBJECTIVE: The aim of this study was to investigate the relationship between nutritional self-efficacy, nutritional attitude- and behaviour of students with overweight and obesity.

MATERIAL AND METHODS: This study was carried out with 192 students in 5th, 6th and 7th grades whose body mass index percentile value was over 85. The data were obtained with personal information form, dietary self-efficacy scale, nutrition attitude scale and dietary behaviour scale in this study.

RESULTS: The nutritional self-efficacy mean score of the students was 5.58 ± 5.07, the nutritional attitude was 12.72 ± 2.52, and the nutritional behaviour mean score was 2.92 ± 6.03. There was no significant difference found between scale scores according to gender and body mass index classification, and students without an overweight family member had a more positive nutritional attitude. A positive relationship was found between nutritional self-efficacy and nutritional attitude and nutritional behaviour.

CONCLUSIONS: Nutritional self-efficacy, nutritional attitudes and nutritional behaviour levels of children with overweight and obesity were found to be above the moderate level. Factors such as fast food eating habits and time spent with technological devices such as computers and TV, which increase the susceptibility to overweight and obesity, are effective in the levels of nutritional self-efficacy, nutritional attitude and nutritional behaviour.

KEYWORDS: Childhood obesity, Nutritional self-efficacy, Nutritional attitude, Nutritional behaviours, Student.

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INTRODUCTION

Overweight and obesity is a condition characterized by an excess of adipose tissue or body fat. It usually occurs when the energy intake is greater than the energy consumption. In recent years, overweight and obesity in childhood have been increasing all over the world. Being overweight and obese among children and adolescents is considered an important public health problem due to its contribution to the development of chronic diseases in adulthood (1, 2). According to data from the World Health Organization, while more than 340 million children and adolescents were overweight or obese in 2016, there were 38 million children under the age of 5 and overweight or obese in 2019 (3). In our country, 9.9% of children were obese and 14.6% overweight according to the findings of the Childhood Obesity Survey conducted by the Ministry of Health (4). The condition of overweight and obesity in childhood is carried over to adulthood and it increases the likelihood of the occurrence of cardiovascular disease, type 2 diabetes and diabetes-related retinal and kidney complications, nonalcoholic fatty liver, hypercholesterolemia, systemic hypertension, obstructive sleep apnea, cancer and other obesity-related pathological conditions (5, 6). Fighting overweight and obesity in the childhood period, therefore, becomes important. The nutritional self-efficacy, attitude and behaviour of the child are effective factors in this fight. There is a need for self-efficacy beliefs in order for individuals to overcome the obstacles to adopting and maintaining healthy lifestyle habits such as healthy nutrition (7). Self-regulatory skills such as behavioural change related to self-efficacy for initiating and maintaining healthy nutrition, goal setting and self-monitoring are important elements of behaviour change (8). Social cognitive self-regulation theories suggest that people with high self-efficacy and positive outcome expectations tend to self-regulate their behaviour successfully in a particular area. Therefore, nutritional self-efficacy is effective in nutritional attitudes and behaviours (9).

Positive nutritional behaviours were found to be high in a study conducted to determine the nutritional behaviour levels of secondary school students (10). In another study (11), primary and secondary school students were found to have high self-efficacy in nutrition and more than half of the students demonstrated healthy nutritional behaviours. In a study conducted by Keskin et al., the nutritional behaviours of children between the ages of 12-14 were found to be at moderate levels (12). In another study (13), the nutritional self-efficacy levels of children with overweight and obesity and children with normal weight were found to be similar. In a study evaluating the relationship between nutritional self-efficacy, nutritional attitude and behaviour (14), healthy nutritional habits were found to increase with the increase in nutritional self-efficacy and nutritional attitude. Nutritional self-efficacy, attitude and behaviour levels of children have been shown in studies. But these studies have mostly determined levels of self-efficacy, attitude and behaviour without distinguishing body mass index (BMI), and the relationship between these three variables has not been evaluated together. The number of studies where the nutritional self-efficacy, attitude and behaviour levels of children with overweight and obesity have been evaluated together and the relationship between them has been revealed is limited. Knowing the levels of these variables and their relationship with each other will reveal on the one hand the level of nutrition self-efficacy, attitude and behaviour of the students, on the other hand, the effects of these three variables on each other. This information can contribute as a guide to programs to fight overweight and obesity, especially within the scope of school health. Therefore, this study aimed to investigate the relationship between nutrition self-efficacy, nutrition attitude and nutritional behaviour of students with overweight and obesity, and the levels of these elements according to some variables.

MATERIAL AND METHODS

Procedure

The study was carried out in the fall term of the 2019 - 2020 academic year in three secondary schools in a city in Türkiye with 192 students who accepted to participate in the study from the 5th, 6th and 7th grades. Students' BMI percentile value was over 85 out of 1841 students and their height and weight were recorded. Weight measurements of the students were performed with school uniforms and clothes, while cardigans and vests that would increase the weight were removed before the measure-

ment. A digital weighing (Mesilife BY-810[R]) scale was used for the weight measurement. For height measurements of the students, the shoes were removed, the feet were flat together and the heels and the back were leaning against the wall. In this position, the measurement was taken using the height gauge mounted to the wall. In line with the measurements of height and weight of the children, their BMIs were calculated by using the Child Body Mass Index calculator of the Ministry of Health, General Directorate of Public Health. Students were taken to the meeting rooms and empty classrooms to complete the scales. It took an average of 15 minutes for the students to complete them.

Measures

The data were obtained with personal information form, dietary self-efficacy scale, nutrition attitude scale and dietary behaviour scale in this study, in which the descriptive findings of a doctoral dissertation were given. The scales were applied between 15-30 September 2019.

Personal Information Form

Questions related to age, gender, grade, presence of an overweight member in the family, frequency of meals, fast food eating habits, snacking habits and frequency of physical activity and included in this form were prepared by the researchers.

Child Dietary Self-efficacy Scale

The scale was developed within the scope of Child and Adolescent Trial for Cardiovascular Health (CATCH), a research project aimed at improving the cardiovascular health of children and adolescents and reducing the risk of cardiovascular diseases in the United States (15, 16). CATCH was a school-based, interventional project involving over 6000 children and teenagers from a total of 96 schools in four states (California, Louisiana, Minnesota and Texas). The Child Dietary Self-Efficacy Scale measures self-efficacy ensuring children eat low-fat and low-salt food items. Scale items were formed from various food items containing fat and salt. The food items in the scale were selected among the frequently consumed food items by this age group of children. The scale measures the self-efficacy of children, which enables them to choose food items with less fat and salt despite the choices with more fat and salt. The scale, a 3-point Likert type, has a single factor structure consisting of 15 items. The scale items are scored in the -1, +1 point range (-1: not sure, 0: somewhat sure, +1: very sure) and the total score ranges from -15 to +15. A high total score on the scale indicates a high level of self-efficacy. Cronbach alpha value of the scale was 0.84 and test-retest reliability (r): 0.63. The Turkish validity and reliability study of the scale has been performed and shown that it can be used on Turkish children by Öztürk Haney and Erdoğan (17). The Cronbach alpha value of the scale in this study was 0.75.

Nutrition Attitude Scale

It is the sub-scale of "The Children's Cardiovascular Health Promotion Attitude Scale." The Children's Cardiovascular Health Promotion Attitude Scale, which was developed by Arvidson (18) to evaluate children's attitudes towards improving cardiovascular health, and consists of 16 items, was adapted to Turkish society by Öztürk Haney and Bahar (19). The scale consists of four subscales: (1) Physical Activity- 4 items; (2) Nutrition- 4 items; (3) Smoking- 4 items (4) Stress Management- 4 items. The internal consistency reliability coefficient of the scale was calculated as 0.75 and the internal consistency reliability coefficient of the nutrition sub-scale was 0.67. The nutrition subscale measures a child's attitude towards activities that reduce fat intake, increase healthy food consumption, and the way of nutrition that improves cardiovascular health. The scale items are scored in the 1 to 4 point range (1- strongly disagree, 2- disagree, 3- agree, 4- strongly agree) and the total score ranges from 4 to 16. A high total score on the scale indicates a high level of positive attitude. The Cronbach alpha value of the scale in this study was found to be 0.71.

Dietary Behaviour Scale

The scale was developed within the scope of Child and Adolescent Trial for Cardiovascular Health (CATCH), a research project aimed at improving the cardiovascular health of children and adolescents and reducing the risk of cardiovascular diseases in the United States (15,

16). The scale consists of 14 illustrated items with low-fat/salty and high-fat/salty food choices to determine the nutrient consumption of children. Children were shown comparable foods and asked which of the two food items they eat more. The scale items have a score of -1 for unhealthy food and +1 for healthy food, and the total score ranges from -14 to +14. A high total score on the scale indicates a healthy nutritional habit. Cronbach alpha value of the scale was 0.76 and test-retest reliability (r): 0.58. The Turkish validity and reliability study of the scale has been performed and shown that it can be used on Turkish children by Öztürk Haney and Erdoğan (17). The Cronbach alpha value of the scale in this study was found to be 0.71.

Ethical Committee

Ethics committee permission was obtained from the Osmangazi University Clinical Research Ethics committee (Date / Number: June 27, 2019/12) and informed consent was obtained from the parents and students before starting the study.

Statistical Analysis

The data obtained were analyzed in the SPSS 20.0 package program. The data were evaluated using descriptive statistics such as mean, percentage and frequency. The suitability of the data to normal distribution was checked with the Kolmogorov-Smirnov Test. Since the data did not show a normal distribution, Spearman's correlation test to evaluate the relationship between the three variables, Mann Whitney U test, and Kruskal Wallis were used. The statistical significance value was accepted as $p < 0.05$.

RESULTS

Of the students participating in the study, 46.3% were girls and 53.7% were boys. The mean age of the participants was 10.8 years. The minimum age was 9 and the maximum age was 12. While 42.7% of the students were in grade 5, 25.5% were in grade 6, and 31.8% were in grade 7. The nutritional self-efficacy mean score of the students was 5.58±5.07, the nutritional attitude mean score was 12.72±2.52, and the nutritional behaviour mean score was 2.92±6.03. There was no significant difference between scale scores according to gender and BMI classification. Grade 5 students had higher nutritional self-efficacy (KW=6.874, p=0.032), nutritional attitude (KW=14.669, p=0.001) and nutritional behaviour (KW=18.175, p<0.001) scores than Grade 7 students. Nutritional attitude scores of students who did not have overweight family members were found to be higher and statistically significant than those who had an overweight family member **(Table 1**; Z=-2.326, p=0.020**)**.

Table 1: Distribution of some sociodemographic characteristics of students according to Nutrition Self-efficacy, Attitude and Behavior Scales

Socio-demographic characteristics	N	Nutrition self-efficacy	Nutrition attitude	Nutrition behavior
		Median (min-max)	Median (min-max)	Median (min-max)
Gender				
Female	89	6.0 (-10.0-15.0)	13.0 (4.0-16.0)	4.0 (-10.0-14.0)
Male	103	6.0 (-13.0-14.0)	13.0 (4.0-16.0)	2.0 (-12.0-14.0)
Test value		z= -1.135*	z= -1.485*	z= -1.286*
z/KW;p		p= 0.256	p= 0.138	p= 0.198
Class				
5	82	7.0 (-13.0-15.0)[a]	14.0 (6.0-16.0)[a]	6.0 (-10.0-14.0)[a]
6	49	6.0 (-10.0-14.0)[b]	13.0 (4.0-16.0)[b]	2.0 (-8.0-12.0)[b]
7	61	5.0 (-9.0-11.0)[c]	12.0 (4.0-16.0)[c]	0.0 (-12.0-12.0)[c]
Test value		KW= 6.874**	KW= 14.669**	KW= 18.175**
z/KW;p		**p= 0.032**	**p= 0.001**	**p=0.000**
Post hoc		**a>c**	**a>c**	**a>c**
BMI classification				
Owerweight	96	6.5 (-13.0-14.0)	13.0 (4.0-16.0)	4.0 (-10.0-14.0)
With obesity	96	6.0 (-10.0-15.0)	13.0 (4.0-16.0)	2.0 (-12.0-14.0)
Test value		z= -0.638*	z= -1.207*	z= -1.238*
z/KW;p		p= 0.523	p= 0.228	p= 0.216
Presence of overweight members in the family				
Yes	76	6.0 (-9.0-13.0)	12.0 (4-16)	2.0 (-10.0-14.0)
No	107	6.0 (-13.0-15.0)	13.0 (4-16)	4.0 (-12.0-14.0)
Test value		Z= -0.608	Z= -2.326	Z= -1.937
z/KW;p		p= 0.543	**p= 0.020**	p= 0.053

* Mann Whitney U; **Kruskall-Wallis

The nutritional behaviour score of students with a daily meal frequency of 1-2 was higher than those with a daily meal frequency of 3-5 **(Table 2**; z=-4.204, p<0.001**)**.

Table 2: Distribution of students' nutritional characteristics according to Nutrition Self-Efficacy, Attitude and Behavior Scales

Nutrition characteristics	N	Nutrition self-efficacy	Nutrition attitude	Nutrition behavior
		Median (min-max)	Median (min-max)	Median (min-max)
Meal frequency per day				
1-2	96	6.0 (-13.0-15.0)	13.0 (4.0-16.0)	6.0 (-10.0-14.0)
3-5	96	6.0 (-7.0-14.0)	13.0 (4.0-16.0)	0.0 (-12.0-14.0)
Test value		z= -0.512*	z= -0.677*	z= -4.204*
z/KW;p		p= 0.609	p= 0.499	**p=0.000**
Fast food eating habit				
3-4 per week	17	4.0 (-7.0-14.0)[a]	12.0 (4.0-16.0)[a]	-2.0 (-12.0-12.0)
1-2 per week	54	5.0 (-6.0-14.0)[b]	13.0 (9.0-16.0)[b]	2.0 (-12.0-14.0)
1-2 per month	109	7.0 (-13.0-15.0)[c]	13.0 (5.0-16.0)[c]	4.0 (-10.0-14.0)
Test value		KW= 12.100**	KW= 6.401**	KW= 4.633**
z/KW;p		**p= 0.002**	**p= 0.041**	P=0.099
Post hoc		**c>b;c>a**	**c>a**	
Habit of snacking after dinner				
Yes	32	5.0 (-7.0-14.0)	13.0 (4-16)[a]	0.0 (-12.0-12.0)[a]
No	27	6.0 (-9.0-15.0)	14.0 (4-16)[b]	6.0 (-4.0-14.0)[b]
Sometimes	131	7.0 (-13-14)	13.0 (4.0-16.0)[c]	2.0 (-10.0-14.0)[c]
Test value		KW= 0.735**	KW= 6.178**	KW= 8.815**
z/KW;p		p= 0.692	**p= 0.046**	**p= 0.012**
Post hoc			**b>a**	**b>a;b>c**
Habit of waking up and eating				
Yes	11	5.0 (-9.0-13.0)	14.0 (10.0-16.0)	0.0 (-12.0-12.0)[a]
No	164	7.0 (-13.0-15.0)	13.0 (4.0-16.0)	4.0 (-10.0-14.0)[b]
Sometimes	17	4.0 (-6.0-14.0)	13.0 (7.0-15.0)	0.0 (-12.0-6.0)[c]
Test value		KW= 5.169**	KW= 0.345**	KW= 9.698**
z/KW;p		p= 0.075	p= 0.842	**p= 0.008**
Post hoc				**b>c**

* Mann Whitney U; **Kruskall-Wallis

The nutritional self-efficacy scores of the students who consume fast food products 1-2 times a month were found to be higher than those who consume 1-2 or 3-4 times a week (KW=12.100, p=0.002), while the nutritional attitude scores of the students who consume fast food products 1-2 times a month were higher

than the students consuming 3-4 times a week (KW=6.401, p=0.041). The nutritional attitude scores of the students who do not snack after dinner were found to be higher than those snacking after dinner (Table 2; KW=6.178, p=0.046), while nutritional behaviour scores of them (KW=8.815, p=0.012) were higher than students who snack regularly after dinner and those who snack from time to time. The nutritional behaviour scores of the students without the habit of waking up from sleep to eat were higher than those who sometimes woke up from sleep to eat something (Table 2; KW=9.698, p=0.008).

Nutritional self-efficacy scores of students who spend less than one hour a day with technological devices such as TV, computer, telephone, 1-2 hours or spending no time at all were found to higher than those spending more than 3 hours **(**Table 3; KW=11.761, p=0.019**)**, while the nutritional attitude scores of those who spend 1-2 hours a day (Table 3; KW=20.441, p<0.001) and the nutritional behaviour scores of those who spend 1-2 hours a day (Table 3; KW=9.995, p=0.041) were found to be higher than those spending more than three hours a day with technological devices. Nutritional self-efficacy scores of students performing physical activity 3-4 times a week were higher than those not performing a physical activity at all; and nutritional self-efficacy scores of students performing physical activity every day were higher than those not performing at all and those performing physical activities 1-2 times per week **(Table 3**; KW=8.642, p=0.034**)**.

Table 3: Distribution of students' physical activity characteristics according to Nutrition Self-Efficacy, Attitude and Behavior Scales

Physical activity characteristics	N	Nutrition self-efficacy	Nutrition attitude	Nutrition behavior
		Median (min-max)	Median (min-max)	Median (min-max)
TV., smartphone, tablet, etc. time spent				
Never	12	8.0 (1.0-15.0)[a]	14.5 (7.0-16.0)[a]	6.0 (-8.0-14.0)[a]
1-2 hours a day	117	7.0 (-10.0-14.0)[b]	13.0 (4.0-16.0)[b]	4.0 (-12.0-14.0)[b]
3 hours or more per day	43	4.0 (-9.0-13.0)[c]	12.0 (4.0-16.0)[c]	0.0 (-10.0-12.0)[c]
less than 1 hour per day	5	11.0 (5.0-14.0)[d]	14.0 (11.0-16.0)[d]	4.0 (-10.0-14.0)[d]
Only the weekend	7	5.0 (-13.0-13.0)[e]	13.0 (9.0-16.0)[e]	-2.0 (-6.0-12.0)[e]
Test value		KW= 11.761**	KW= 20.441**	KW= 9.995**
z/KW;p		**p= 0.019**	**p=0.000**	**p=0.041**
Post hoc		**a>c;b>c;d>c**	**a>c;b>c**	**b>c**
Frequency of physical activity				
I never do	19	5.0 (-9.0-11.0)[a]	13.0 (6.0-16.0)	-2.0 (-10.0-12.0)
1-2 per week	89	6.0 (-13.0-15.0)[b]	13.0 (5.0-16.0)	2.0 (-12.0-14.0)
3-4 per week	72	6.5 (-6.0-14.0)[c]	14.0 (4.0-16.0)	4.0 (-12.0-14.0)
Everyday	7	11.0 (0.0-14.0)[d]	14.0 (12.0-16.0)	4.0 (-2.0-12.0)
Test value		KW= 8.642**	KW= 5.676**	KW= 7.334**
z/KW;p		**p= 0.034**	p= 0.128	P=0.062
Post hoc		**c>a;d>a;d>b**		

*: Mann Whitney U; **:Kruskall-Wallis

There was a positive moderate level of correlation between nutritional self-efficacy and nutritional attitude (r=0.429), a positive moderate level of correlation between nutritional self-efficacy and nutritional behaviour (r=0.468), and a positive weak level of correlation between nutritional attitude and nutritional behaviour (r=0.311). All of these correlations were statistically significant (p<0.001; **Table 4**).

Table 4: Results of Spearman Correlation analysis between Nutrition Self-efficacy, Attitude and Behavior Scales

Spearman Correlation	Nutrition self-efficacy	Nutrition attitude	Nutrition behavior
Nutrition self-efficacy	1000	0.429*	0.468*
Nutrition attitude	0.429*	1000	0.311*
Nutrition behavior	0.468*	0.311*	1000

*: p<0.001

DISCUSSION

In this study, we aimed to investigate the relationship between nutritional self-efficacy, nutritional attitude and nutritional behaviour of students with overweight and obesity, and the levels of these elements according to some variables. Nutritional self-efficacy, nutritional attitude and nutritional behaviour are important for the individual to adopt and maintain healthy lifestyle habits such as healthy nutrition. The findings of this study confirm that behaviours that increase susceptibility to overweight or obesity such as fast food eating habits, time spent with technological tools such as TV, telephone, computer, frequency of physical activity, and the habit of snacking after dinner might affect nutritional self-efficacy, nutritional attitudes and nutritional behaviour levels. Since studies on the nutritional self-efficacy, nutritional attitude and nutritional behaviour levels of students with overweight and obesity are limited, discussion of our findings was performed in line with the findings, which do not have any distinction between overweight and obesity, presented in the literature. Self-efficacy refers to one's confidence in the ability to initiate and maintain a certain behaviour and is especially important in achieving weight control in

individuals with obesity (20). In this study, the nutritional self-efficacy scores of the students were above the moderate level. Similarly, it was found above moderate levels in two different studies (13, 14).

Attitude is the individual's positive or negative evaluation of behaviour. The attitude-behaviour relationship is noted to increase with the strength of the attitude. It has been emphasized that attitude should be considered an independent predictor of behaviour (21). Therefore, a positive nutrition attitude becomes important in terms of the emergence of positive nutritional behaviour. In line with this, it can be said that students have a positive nutritional attitude since their nutritional attitude scores are above the moderate level. In a study conducted by Haney and Bahar, in parallel with this study, nutritional attitude scores were found to be above the moderate level (19).

There is an important relationship between nutritional behaviours and weight gain. Changes in nutritional behaviour (such as increasing snack intake, reducing fruit and vegetable intake) have been shown to contribute significantly to weight gain during the transition from adolescence to young adulthood (22). Accordingly, positive nutritional behaviour can be considered as one of the key factors in achieving weight control. In this study, the nutritional behaviour mean score of the students was determined to be above the moderate level. In two other studies, nutritional behaviour scores were found to be above the moderate level in parallel with this study (12, 23).

Childhood obesity has been reported to be less common in girls due to biological differences such as changes in body composition and leptin levels at birth and cultural differences such as emphasis on being thin and maintaining physical appearance (24). In line with this information, female students' nutritional self-efficacy, attitudes and behaviours were expected to be more positive than male students. However, the nutrition self-efficacy, nutritional attitude and nutritional behaviour scores were determined not to show statistically significant differences in terms of gender and BMI classification ($p>0.05$). In the study of Karacabey and Angın, there was no significant difference found in nutritional self-efficacy in terms of gender and BMI classification of students of the same age group (13). This study is parallel to our study in terms of nutritional self-efficacy results.

Parents' nutritional habits and attitudes affect their children as well (25). A nutritional attitude providing weight control in the family is naturally expected to ensure that the child has a more positive nutritional attitude. In parallel with this information, in this study, students who did not have an overweight family member were found to have a more positive nutritional attitude.

The results of this study revealed that grade 5 students had higher self-efficacy, more positive nutritional attitudes and healthier nutritional habits compared to grade 7 students. In the study in which Yılmaz and Kocataş evaluated the nutritional behaviour of the students, the nutritional behaviour scores of the students between the ages of 10-12 were found to be higher than the students between the ages of 13-15. Although this finding was not the result of children with overweight and obesity, it is similar to our study in terms of nutritional behaviour (10). A decrease in the influence of parental control with an increase in age in students, and children showing more behaviours according to their peer environment can be cited as the reason for this result.

Meal frequency has been shown to be negatively correlated with childhood obesity in some studies and that high meal frequency can prevent obesity (26, 27). In this study, it was found that students with a meal frequency of 1-2 were found to show healthier nutritional behaviours than students with a meal frequency of 3-5. An increase in the frequency of meals has been reported to have beneficial effects such as improvement in serum insulin level and sensitivity, and weight reduction (28). In line with this information, having a higher frequency of meals appears as healthy eating behaviour. However, in our study, on the contrary, children with overweight obesity showed healthier nutritional habits with a decrease in their frequency of meals. This condition may be related to the content of the increased frequency of meals. The frequency of meals of the participants in our study may have increased with unhealthy nutritional contents such as junk food and fast food.

The reason for the low nutritional behaviour scores of the students with a higher frequency of meals can be attributed to this situation. Snacking with high calories after dinner appears as a nutritional behaviour that causes obesity (29). The nutritional behaviour score of the students not snacking after dinner in parallel with the meal frequency was higher. This result shows that students who do not snack have healthier nutritional habits.

Due to its high-calorie values, fast food consumption is a factor that increases susceptibility to overweight and obesity (10) and is a nutritional behaviour that children with overweight and obesity should avoid. Maintaining an unhealthy eating behaviour by turning it into a healthy behaviour is expressed as self-efficacy (20). The frequency of unhealthy behaviour becomes important in maintaining healthy behaviour. In other words, it is a necessity to reduce the frequency of unhealthy behaviour in order to maintain healthy behaviour. In our study, students who consume fast food products 1-2 times a month were found to have higher self-efficacy than those who consume 1-2 times a week and a higher nutritional attitude than those consuming fast food 3-4 times a week. Students with high nutritional self-efficacy and attitude can be said to have less frequency of unhealthy nutritional behaviours.

A sedentary lifestyle and frequency of physical activity have an important role in the emergence of overweight and obesity. As the time children spent with technological devices such as TV, telephone and computer increases, their physical activities decrease (30). Nutritional self-efficacy, nutritional attitude and behaviour of children change with the time they spent with technological devices such as TV, telephone and computer. Students spending less than an hour a day with these technological devices had higher nutritional self-efficacy, students not spending time at all had more positive nutritional attitudes, and students spending 1-2 hours a day had healthier nutritional habits. Students performing physical activity 3-4 times a week or every day demonstrated a high nutritional self-efficacy. In another study, an improvement in nutritional behaviour was determined with an increase in the physical activity frequency (10). In another study, a positive relationship was found between students' nutritional behaviours and physical activity status (12). Although these are not the results of students with overweight and obesity, they are similar to our study in terms of positive nutritional behaviour change depending on the frequency of physical activity.

A positive relationship was revealed between nutritional self-efficacy and nutritional attitude and nutritional behaviour. According to this result, an increase in nutritional self-efficacy may lead to a positive nutritional attitude and an improvement in healthy nutritional habits. In another study in which the relationship between these three variables was investigated, as nutritional self-efficacy and nutritional attitude increased, healthy nutritional habits were found to increase (14). This result is in parallel with our study.

According to the results of this study, the nutritional self-efficacy, nutritional attitudes and nutritional behaviour levels of children with overweight and obesity were found to be above the moderate level. The frequency of meals, the habit of fast food eating, the habit of snacking after dinner, the time spent with devices such as TV, phone and computer, the frequency of physical activity are effective in nutritional self-efficacy, nutritional attitude and nutritional behaviour levels. Nutritional self-efficacy, nutritional attitude and nutritional behaviour of students are positively correlated.

In conclusion, positive nutrition attitude scores and healthy nutritional behaviour scores increase, as the nutritional self-efficacy scores of students with overweight and obesity increase. Students, who were in fifth grade, did not have any overweight members in their family, did not snack after dinner, had fast food 1-2 times a month, never spent time with technological devices and had more positive nutritional attitudes than other students. Students, who were in fifth grade, had fast food 1-2 times a month, spent less than an hour per day with technological devices, and engaged in physical activity every day demonstrated higher nutritional self-efficacy. Students, who were in fifth grade, had a meal frequency of 1-2, did not snack after dinner, woke up from sleep for eating, and

never spent time with technological devices and had healthier nutritional behaviours than other students. As a complementary part of preventive health services, studies should be carried out in school health services to increase and improve the levels of nutritional self-efficacy, nutritional attitude and nutritional behaviour of students with overweight and obesity.

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