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ORIGINAL ARTICLE
ORİJİNAL ARAŞTIRMA

The Effect of Eating Behaviors and Sleeping Habits of Children Aged 6-12 on Obesity

6-12 Yaş Çocukların Yeme Davranışları ve Uyku Alışkanlıklarının Obesite Üzerindeki Etkisi

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ABSTRACT

Aim: The aim of this study was to determine the effects of eating behaviors and sleeping habits of children aged 6-12 years on obesity.

Material and Metod: The data required for the research were collected online between 21 May 2022 and 15 July 2022. The study group of the research consisted of children aged 6-12 years. In data collection, online survey method, socio-demographic data collection form, three-factor eating scale, child sleep habits questionnaire (CHA) were used from 220 children aged 6-12 years who had parental consent, participated voluntarily, and were selected by convenience sampling method, one of the improbable sampling methods. SPSS 26.0 data analysis program was used in the statistical analysis of the data obtained in the study, and t-test and one-way Anova test and regression were used to examine the effects of children's eating behaviors and sleeping habits on obesity.

Result: In the study, it was revealed that children's sleep habits and uncontrolled eating, cognitive restriction, emotional eating behaviors were similar to each other according to age groups, gender, education level, night sleep interval, total sleeping time. It has been stated that children are at risk of obesity depending on the degree of eating behavior and sleeping habits of children.

Conclusion: It is recommended to conduct studies on the effects of eating behaviors and sleeping habits of children aged 6-12 on obesity.

Keywords: Child, eating habits, sleeping habits, obesity

ÖZ

Amaç: Bu çalışmanın amacı, 6-12 yaş arası çocukların yeme davranışları ve uyku alışkanlıklarının obezite üzerindeki etkilerini belirlemektir.

Gereç ve Yöntem: Araştırma için gerekli olan veriler 21 Mayıs 2022 – 15 Temmuz 2022 tarihleri arasında çevrimiçi olarak toplanmıştır. Araştırmanın çalışma grubunu 6-12 yaş arası çocuklar oluşturmaktadır. Veri toplamada, ebeveynleri tarafından gönüllü olarak katılan ve aileleri tarafından seçilen 6-12 yaş arası 220 çocuktan çevrimiçi anket yöntemi, sosyo-demografik veri toplama formu, üç faktörlü yeme ölçeği, çocuk uyku alışkanlıkları anketi (ÇHA) kullanılmıştır. Olasılıksız örnekleme yöntemlerinden biri olan kolayda örnekleme yöntemi. Araştırmada elde edilen verilerin istatistiksel analizinde SPSS 26.0 veri analiz programı kullanılmış olup, çocukların yeme davranışları ve uyku alışkanlıklarının obezite üzerine etkisini incelemek için t-testi ve one-way Anova testi ve regresyon kullanılmıştır.

Bulgular: Araştırmada yaş grupları, cinsiyet, eğitim düzeyi, gece uyku aralığı, toplam uyku süresine göre çocukların uyku alışkanlıkları ile kontrolsüz yeme, bilişsel kısıtlama, duygusal yeme davranışlarının birbirine benzer olduğu saptanmıştır. Çocukların yeme davranışı ve uyku alışkanlıklarının derecesine bağlı olarak çocukların obezite riski altında olduğu belirtilmiştir.

Sonuç: 6-12 yaş arası çocukların yeme davranışları ve uyku alışkanlıklarının obezite üzerine etkilerinin araştırıldığı çalışmaların yapılması önerilmektedir.

Anahtar Kelimeler: Çocuk, yeme alışkanlıkları, uyku alışkanlıkları, obezite

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INTRODUCTION

Obesity and overweight are defined by the World Health Organization (WHO) as excessive fat accumulation in the body at a level that may impair health (1). Obesity is an important public health problem and is increasing day by day in developed and developing countries (2). It has been reported that more than 340 million children and adolescents aged 5-19 years in the world were overweight or obese in 2016 (3). In our country, the prevalence of obesity has increased day by day, while the prevalence of obesity for 15 years and older was 19.6% in 2016, it increased to 21.1% in 2019. It was determined that 24.8% of women were obese, 30.4% were overweight, 17.3% of men were obese, and 39.7% were overweight (4). According to the results of the Turkey Nutrition and Health Survey (2017) (5), 18.6% of women in the 15-18 age group are overweight and 6.6% are obese, 15.7% of men are overweight and 8.4% are obese. In the Turkish Dietary Guidelines (2015) (6), it is recommended that due to the increase in obesity, attention should be paid to the consumption of total and saturated fat, cholesterol, salt and sugar in the diet. The American Heart Association recommends increasing the consumption of fresh vegetables and fruits in children over the age of 2, consuming unsaturated fats such as olive oil in the diet, consuming whole grain bread and cereals, reducing the consumption of sugary foods and beverages, and consuming non-fat dairy products (7), It has been observed that 10.8% of children in Turkey do not have the habit of having breakfast, and 9.1% skip lunch (8).

Along with genetic factors, some environmental factors and habits play a role in the etiology of obesity. Especially, poor quality of eating behaviors and sleeping habits can cause sleepiness and hormonal changes during the day, and it has been determined that it has an effect on obesity in children by negatively affecting body metabolism (9-10). Since childhood is the period in which habits are acquired, more studies on this issue and mechanisms should be reviewed. It is necessary to emphasize the importance of sleep in childhood by indirectly affecting behaviors such as nutrition and physical activity, and to prevent mistakes made (11).

Sleep, a healthy and balanced diet, and eating habits are a crucial factor in efforts to improve health in school-age children, as a fundamental component of physical growth and academic performance (12). It is reported in the literature that sleep problems in childhood are 25-30% (13). In a study, it was reported that sleep problems negatively affect the endocrine system functions and cause changes in the levels of appetite stimulating hormone ghrelin and anorexogenic hormone leptin (14). In a study, it is reported that school-age children need 8.5-10 hours of sleep. It is emphasized that insufficient sleep can lead to poor academic performance by causing irritability and lack of attention in children (15) For this reason, sleep deprivation directly affects weight gain, unbalanced and inadequate nutrition, eating habits, and can significantly increase the risk of overweight and obesity, especially in children between the ages of 6-12. The aim of this study was to determine the effects of eating behaviors and sleeping habits of children aged 6-12 years on obesity.

MATERIAL AND METOD

The study was carried out with the permission of Hakkari University Scientific Research and Publication Ethics Committee (decision no: IRB:2022/54-1) for the research. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. Within the scope of the research, ethical unification was approved with the consent formula for children aged 6-12 and the informed consent formula from the family.

The research population consisted of children between the ages of 6-12. The sample, on the other hand, was selected by convenience sampling method, one of the non-probability sampling methods, between the ages of 6-12, with parental consent, participating voluntarily, and having no obstacle to answering the questions. The study was carried out with 220 children who met the conditions of participation.

Research data were collected with the following data collection forms:

Socio-demographic data collection form: This form; It consists of a total of 3 questions about the age, gender and educational status of the children.

Three-factor eating scale: A three-factor eating questionnaire was developed by Bryant et al. (16) to measure the eating habits of children with three factors. The three-factor eating scale, which was validated and reliable in Turkish by Demir et al. (17) consists of seventeen items, including the behaviors of primary and secondary school students. It is a Likert type and the answers are as follows: 1 = definitely wrong, 2 = mostly wrong, 3 = mostly right 4 = definitely right. It is a four-point Likert type scale form containing 17th item in the questionnaire. At meal times', 'sometimes between meals', 'often between meals' and 'almost always'. Construct validity was evaluated using the exploratory, varimax rotation of the scale. The scale UE shows a three-factor structure referring to EE, with a 0•85 Cronbach α coefficient obtained as a result of the scale's internal consistency analysis. The Cronbach α values of the sub-dimensions are 0•85 (UE), 0•83 (EE) and 0•67 (CR).

Children's Sleep Habits Questionnaire (CSHQ): The Children's Sleep Habits Questionnaire (CSHQ) - Abbreviated Form, developed by Owens et al. (18) to investigate children's sleep habits and sleep-related problems, consists of a total of 33 items. Turkish validity

and reliability study was conducted by Perdahlı Fiş et al. (19); ; In the scale, bedtime resistance (1,3,4,5,6,8 items), delay in falling asleep (2nd item), sleep duration (9,10,11 items), sleep anxiety (5,7,8, 21st items), night awakenings (items 16,24,25), para-somnias (12,13,14,15,17,22,23), impaired breathing during sleep (items 18,19,20) Eight subscales were defined, which can be listed as waking up during the day in the morning/Daytime Sleepiness (items 26,27,28,29,30,31,32,33). The scale is filled in retrospectively by the parents. Parents are asked to evaluate the child's sleep habits over the previous week. Items in the scale are usually coded as (if the specified behavior occurs 5-7 times a week): 3 points, sometimes (if it occurs 2-4 times a week): 2 points, and rarely (if it occurs 0-1 times a week): 1 point; Items 1,2,3,10,11 and 26 are reverse coded (usually: 1 point, sometimes: 2 points, and rarely: 3 points). Items thirty-second and 33 are coded as not sleepy: 0 points, too sleepy: 1 point, falls asleep: 2 points. Children with a total score of 42 and above from the questionnaire are considered to have clinically significant sleep problems. The Cronbach's alpha coefficient was found to be 0.78. The correlation coefficient between test-retest was found to be 0.81.

Statistical Analysis

SPSS (Statistical Package for Social Sciences) 26.0 package program was used in the analysis of the data. Percentage distribution, mean and total scores were used for descriptive statistics in the study. T-test and one-way Anova test and regression were used to analyze the effects of children's socio-demographic characteristics, eating behaviors and sleeping habits on obesity.

RESULTS

Of the children aged 6-12 years, 65.9% of the participants in the study were boys and 34.1% were girls. When analyzed according to age groups, 24.1% are 12 years old, 25.9% are 10-11 years old, 26.4% are 8-9 years old and 23.6% are 6-7 years old. 20.9% of the children study in kindergarten, 51.4% in primary school and 27.7% in secondary school (**Table 1**).

Table 1. Socio-demographic Findings

		n	%
Gender	Male	145	65.9
	Female	75	34.1
Age group	12 age	53	24.1
	10-11 age	57	25.9
	8-9 age	58	26.4
	6-7 age	52	23.6
Educational status	Kindergarten	46	20.9
	Primary education	113	51.4
	Secondary education	61	27.7
	Total	220	100.0

It is seen that the F value obtained as a result of the multiple regression analysis is significant (F (3, 2016)= 8.043; p<0.05). This result shows that the regression model of the relationship between children's sleep habits variable and uncontrolled eating, cognitive restriction and emotional eating behaviors is statistically significant. There is a significant relationship between children's sleep habits and cognitive restriction and emotional eating behaviors (p<0.05) (**Table 2**).

Table 2. Eating Behaviors and Sleep Habits Results

	B	Standard deviation	β	t	p	R2
Still	91.921	3.078		29.865	.000	0.10
Uncontrolled eating	-.173	.124	-.091	-1.390	.166	
Cognitive restriction	-.542	.210	-.168	-2.585	.010	
Emotional eating	-.399	.121	-.217	-3.306	.001	
F (3. 216)= 8.043 p=0.000						
Dependent variable: Children's sleeping habits						

As a result of the analysis, it was determined that the eating behavior averages according to age groups were similar to each other and there was no difference between the averages (p>0.05). As the age level increased, it was revealed that there was no difference between the average sleep habits of the children according to the age groups in which the sleep habits of the children were impaired (p>0.05) (**Table 3**).

As a result of the research, it was determined that girls' "uncontrolled and emotional eating" behaviors were higher than boys. On the other hand, it was determined that the "cognitive restriction" behaviors of girls, one of their eating behaviors, were higher than that of boys. It was determined that there was no difference between the mean eating behaviors of the children according to their gender (p>0.05) (**Tablo 4**).

As a result of the analysis, it is seen that the uncontrolled and emotional eating behaviors of primary and secondary school students are higher than kindergarten students. It was determined that there was no difference between the averages of uncontrolled and emotional eating behaviors according to the level of education (F=1.514; p>0.05: F=.631; p>0.05). It is seen that the cognitive restriction behavior of children studying in kindergarten is higher than that of primary and secondary school students. It was determined that there was no difference between the averages of cognitive restraint behavior according to the level of education (F=1.462; p>0.05) (**Tablo 5**).

Table 3. Results on eating behaviors and sleeping habits by age groups

Age groups	n	Average	Standard deviation	Total point	F	p
Uncontrolled Eating					1.108	.347
12 age	53	2.40	0.62	19.17		
10-11 age	57	2.58	0.56	20.63		
8-9 age	58	2.51	0.69	20.09		
6-7 age	52	2.41	0.58	19.25		
Total	220	2.48	0.62	19.81		
Cognitive restriction					.978	.404
12 age	53	2.16	0.91	6.49		
10-11 age	57	2.38	0.97	7.14		
8-9 age	58	2.33	0.96	6.98		
6-7 age	52	2.48	1.05	7.44		
Total	220	2.34	0.97	7.01		
Emotional eating					.097	.961
12 age	53	2.36	0.73	14.17		
10-11 age	57	2.41	0.81	14.44		
8-9 age	58	2.41	0.97	14.43		
6-7 age	52	2.45	0.88	14.71		
Total	220	2.41	0.85	14.44		
Total eating behaviors					.760	.518
12 age	53	2.34	0.42	39.83		
10-11 age	57	2.48	0.47	42.21		
8-9 age	58	2.44	0.58	41.50		
6-7 age	52	2.44	0.50	41.40		
Total	220	2.43	0.50	41.26		
Total sleep habit					.996	.396
12 age	53	2.44	0.26	80.53		
10-11age	57	2.41	0.27	79.42		
8-9 age	58	2.36	0.33	77.79		
6-7 age	52	2.37	0.27	78.06		
Total	220	2.39	0.28	78.94		

Table 4. Eating Behaviors and Sleeping Habits by Gender

Gender	n	Average	Standard deviation	Total point	t	p
Uncontrolled eating					-1.570	.118
Male	145	2.43	0.61	19.43		
Female	75	2.57	0.62	20.53		
Cognitive restriction					.585	.559
Male	145	2.37	0.96	7.10		
Female	75	2.28	1.00	6.85		
İmpressive eating					-1.801	.073
Male	145	2.33	0.79	13.99		
Female	75	2.55	0.95	15.29		
Total cost of eating					-1.797	.074
Male	145	2.38	0.45	40.52		
Female	75	2.51	0.57	42.68		
Total sleep habit					2.786	.006
Male	145	2.43	0.24	80.19		
Female	75	2.32	0.34	76.52		

Table 5. Results on Eating Behaviors and Sleeping Habits by Education Level

Educational status	n	Average	Standard deviation	Total point	F	p
Uncontrolled eating					1.514	.222
Kindergarten	46	2.36	0.58	18.89		
Primary education	113	2.54	0.63	20.33		
Secondary education	61	2.44	0.62	19.54		
Total	220	2.48	0.62	19.81		
Cognitive restriction					.241	.786
Kindergarten	46	2.39	0.99	7.17		
Primary education	113	2.35	1.01	7.06		
Secondary education	61	2.27	0.90	6.80		
Total	220	2.34	0.97	7.01		
Emotional eating					.631	.533
Kindergarten	46	2.31	0.81	13.87		
Primary education	113	2.47	0.93	14.80		
Secondary education	61	2.37	0.73	14.20		
Total	220	2.41	0.85	14.44		
Total eating behaviors					1.462	.234
Kindergarten	46	2.35	0.44	39.93		
Primary education	113	2.48	0.54	42.19		
Secondary education	61	2.38	0.46	40.54		
Total	220	2.43	0.50	41.26		
Total sleep habit					1.013	.365
Kindergarten	46	2.42	0.22	79.98		
Primary education	113	2.37	0.31	78.06		
Secondary education	61	2.42	0.28	79.77		
Total	220	2.39	0.28	78.94		

As a result of the analysis, it was revealed that the children with low uncontrolled eating behavior had high sleep habits, but there was no difference between their averages (t=1,276; p>0.05). It was determined that children with low cognitive restriction behavior had high sleep habits and those with high cognitive restriction eating behavior had low sleep habits, and there was a difference between the averages (t=5.219; p<0.05). It is seen that the rate of children (n=55) who deliberately restrict their food intake (cognitive restriction) in order to keep their body weight constant, to prevent weight gain or to lose weight (n=55) is low (25%). Based on this finding, the low level of conscious restriction indicates that it may be an important factor that increases the risk of obesity (**Tablo 6**).

Table 6. Results on the Effects of Eating Behaviors and Sleep Habits on Obesity

	n	Average	Standard deviation	Total point	t	p
Sleep habits						
Uncontrolled Eating					1.276	0.203
Low	180	2.40	0.26	79.32		
High	40	2.34	0.38	77.23		
Cognitive Restriction					5.219	0.000
Low	165	2.45	0.24	80.7394		
High	55	2.23	0.34	73.5273		
Emotional Eating					3.798	0.000
Low	158	2.44	0.24	80.40		
High	62	2.28	0.35	75.21		
Total eating behaviors					6.257	0.000
Low	191	2.44	0.24	80.36		
High	29	2.11	0.39	69.55		

DISCUSSION

According to the results of the National Nutrition and Health Survey in the United States (NHANES 2011-2012), there is no difference between the children in the 8-12 age group according to their age groups, and Aksoy et al. (20), the approach of parents with obese children to obesity and their children is consistent with our findings. Bozkurt et al. (21) in his study named the relationship between the nutritional status of school-age children and some biochemical parameters. According to TOÇBİ (22) research report; It has been determined that 14.3% of the children aged 6-10 years in Turkey are overweight and 6.5% are obese. In the Turkey Nutrition and Health Survey (TBSA) conducted by the Ministry of Health in 2010, it was determined that 14.3% of 2248 children aged 6-18 were overweight and 8.2% were obese. In a study conducted with 5026 children and adolescents in Isparta, 11.6% were found to be obese and 12.2% to be overweight (23). In the study conducted by Savaşhan et al. in 71 primary schools in 2015, the prevalence of obesity was 7.5% and the rate of overweight was 11.1% in 3963 children aged 6-11 years. İt was concluded that the longer the total sleep habits and the higher the age, the more positive the eating behaviors of the children. According to the results of this research; It was concluded that as total sleep habits increase and age increases, children's eating behaviors are more positive. It shows parallelism with our research findings.

In studies in which anthropometric measurements of children aged 3-6 years were made, it was stated that uncontrolled and eating behaviors were frequently observed in males (24-25). Remmers et al. (26) results of his study and Carnell and Wardle (27) based on obesity in children, and Weber et al.(28). According to the results of the United States National Health Screening, the prevalence of obesity in boys and girls in the 6-11 age group was 10.8% and 10.7%, respectively (Styne 2001). In a study conducted in Muğla, it was shown that 7.6% of female students and 9.1% of male students out of a total of 4260 (2040 female, 2220 male) children aged 6-15 were overweight or obese (30). The results of this study support the effect of nutrition and sleep habits on obesity in men.

Önal and Adal (31) In his study on childhood obesity, it was found that as the education level of children increases, their eating habits become irregular, while in the study of Den Wittenboer (12) the sleep habits of children are similar. A large-scale study of 2,241 Estonian and Swedish children found no link between sleep duration and eating behaviors and sleep habits (32) Our study supports these results. It was determined that as the level of education increased, there were irregularities in nutrition and sleep levels and the frequency of obesity (33%) was higher in adolescents who evaluated their school success as poor or moderate. Although not statistically significant in the study of Hermassi et al., (33), it was found in a study conducted with primary school children that normal-weight children had a higher risk of obesity as their education level in all academic fields increased Moon (34).

Kutluk et al. (35) in his study titled "An important nutritional problem in infants and children: anorexia; irregular eating habits increase the risk of obesity; concluded. In the study of Camcı (36) to determine the validity and reliability of the Child Feeding Questionnaire (CFQ) and to apply to Turkish parents, it was determined that children's eating habits affect the risk of obesity. Ek et al. (37) and our research findings are similar to the findings of his study. In studies conducted in China, Iran, and the Netherlands, A relationship was found between sleep duration and childhood obesity (38-39-40). This result is in parallel with our study. In the National Health and Nutrition Examination Survey, children who reported short (5-6 hours) and long (> 9 hours) sleep in the compared groups had greater food variety and lower energy intake in the group reporting 7 to 8 hours of sleep, not being able to eat healthy but to ready-made foods. It has been concluded that because they tend towards obesity, it affects the risk of obesity (41). In the study of Crispim et al.,(15) with 52 participants, it was revealed that consuming a high-calorie and carbohydrate-rich meal 30-60 minutes before bedtime causes late sleep. In addition to the amount of carbohydrates, it is argued that the glycemic index may also have a significant effect on sleep patterns and may be an obesity risk. As a result, the effects of the eating behaviors and sleep habits of children aged 6-12 years on obesity are in parallel with the studies and our research findings.

Study Limitations

Children between the ages of 6 and 12 were included in the study. Research results can only be generalized to the sample group in the study.

CONCLUSION

When the results of the research were evaluated in general, it was revealed that the relative importance of children's sleep habits was in the form of emotional eating and cognitive restriction. Sociodemographic, eating and sleeping habits variables were found to be significant predictors of obesity. Depending on the degree of eating behavior, it has been determined that children with a strong desire for food consumption without considering the consequences and losing control as a result of losing control have a high tendency to overeat and children who tend to eat are at risk of obesity.

In line with the results; the right steps should be taken and the right goals should be planned. Especially in children between the ages of 6-12, proper nutrition and sleep

habits should be gained. Proper nutrition and eating habits should not be given, and sleep training should be emphasized in the fight against obesity in children. It is recommended to carry out researches in order to prevent the risks and understand the importance of the mentioned areas in this field.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Hakkari University Scientific Research and Publication Ethics Committee (decision no: IRB:2022/54-1).

Informed Consent: Within the scope of the research, ethical unification was approved with the consent formula for children aged 6-12 and the informed consent formula from the family.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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