

The effects of parental feeding styles, children's self-efficacy and social anxiety on adolescent obesity

Os efeitos dos estilos de alimentação parental e da eficácia social e da ansiedade social da criança na obesidade adolescente

Sema Sal ALTAN¹
Murat BEKTAS¹

ABSTRACT

Objective

To examine the effect of parental feeding styles and children's self-efficacy and social anxiety on adolescent obesity.

Methods

The samples of this descriptive and cross-sectional study were collected by using a simple sampling method. The study group was composed of 649 Turkish secondary schools students and their parents. Three secondary schools were selected from both rural and urban areas of the province. Data of the study were collected with the child-parent socio-demographic data collection form, the parenting feeding style questionnaire, the middle school self-efficacy scale and the social anxiety scale for the adolescent. To analyze the data of the study, we used percentages, mean, correlation, and regression analysis.

Results

The average age of the students was 11.58±1.21 years and percentages of female students 55.0%. The factors that significantly affect male adolescent obesity were fear of social situations in general, interpersonal relations, preventive healthcare self-efficacy, and strict dietary control, respectively. The factors affect male adolescent obesity at the rate of 35.0%. The factors that significantly affect female adolescent obesity were fear of social situations in general, preventive healthcare self-efficacy, emotional feeding, social evasion and distress in new situations, and tolerant dietary control, respectively. These factors affect female adolescent obesity at the rate of 32.8%.

¹ Dokuz Eylul University, Faculty of Nursing, Department of Pediatric Nursing. Inciraltı Mahallesi, 35340, Izmir, Turkey. *Correspondência para/Correspondence to:* SS ALTAN. E-mail: <semasalaltan@gmail.com>.

Conclusion

It is indicated that the obesity of children is affected by self-efficacy levels, social anxiety, and the parental feeding style.

Keywords: Adolescent. Anxiety. Feeding. Obesity. Self-efficacy.

RESUMO

Objetivo

Analisar o efeito dos estilos de alimentação parental e da auto-eficácia das crianças e da ansiedade social na obesidade adolescente.

Métodos

As amostras deste estudo descritivo e transversal foram coletadas usando um método de amostragem simples. O grupo de estudo era composto por 649 estudantes de escolas secundárias turcas e seus pais. Três escolas secundárias foram selecionadas nas áreas rural e urbana da província. Os dados do estudo foram coletados com o formulário de coleta de dados sócio-demográficos filho-pai, o questionário de estilo de alimentação dos pais, a escala de auto-eficácia do ensino médio ea escala de ansiedade social para o adolescente. Para analisar os dados do estudo, utilizamos porcentagens, média, correlação e análise de regressão.

Resultados

A idade média dos alunos foi de 11,58+1,21 anos e percentual de estudantes do sexo feminino 55,0%. Os fatores que afetam significativamente a obesidade do adolescente masculino foram medo de situações sociais em geral, relações interpessoais, auto-eficácia preventiva de saúde e controle dietético rigoroso, respectivamente. Os fatores afetam a obesidade do adolescente masculino na taxa de 35,0%. Os fatores que afetam significativamente a obesidade do adolescente feminino foram o medo de situações sociais em geral, auto-eficácia preventiva da saúde, alimentação emocional, evasão social e angústia em novas situações, e controle dietético tolerante, respectivamente. Esses fatores afetam a obesidade da mulher adulta a uma taxa de 32,8%.

Conclusão

É indicado que a obesidade das crianças é afetada por níveis de auto-eficácia, ansiedade social e estilo de alimentação parental.

Palavras-chave: Adolescente. Ansiedade. Alimentação. Auto-eficácia.

INTRODUCTION

Obesity is defined as an abnormal or excessive fat accumulation that poses a risk for health [1-3]. Storing excess energy as fat can cause many physical, psychological and economic problems for people [4]. Obesity causes these problems and is spreading rapidly at more than two times its former pace [5]. Obesity is not only a problem for adults. It is also predicted that more than 60 million children will be diagnosed as obese by 2020 [6,7]. This rapid increase caused the World Health Organization to recognize obesity as a global epidemic [1,5].

Childhood obesity can cause many chronic problems such as Diabetes Mellitus,

hypertension, respiratory distress, osteoarthritis and psychological issues [2,3,8]. Moreover, 70–80% of obese children have problems with obesity in adulthood [9]. Therefore, determining the factors that cause obesity in childhood, a period of rapid growth and development, is very important [5,9].

Studies of children who are considered obese have shown that obesity is a multidimensional problem with many different causes. Parental feeding style, children's self-efficacy, and social anxiety are important factors [2,3,10]. Parental feeding style has important effects on childhood obesity because children are influenced by their parents' nutrition styles, through social learning and parents' feeding styles shape

children's eating habits [11,12]. Parents, who use food as a reward or as a way to make their children happy when they are sad, can prevent their children from developing the ability to evaluate their feeling of fullness or hunger [13,14]. As children learn from their parents, they can become prone to eat food or dessert even if they are not hungry. This habit poses a risk for obesity [15]. Furthermore, parents who cannot properly evaluate their children's weight overfeed their children, increasing the risk of becoming overweight or obese [14]. On the other hand, when parents maintain a restrictive attitude towards their children in terms of foods regarded as unhealthy, these foods become more attractive for children, increasing their desire to eat them [16]. Therefore, parents should adopt a feeding style that pays attention to children's hunger or fullness by focusing on their children's well-being. This allows their children to make healthy food choices and reinforce their good eating habits. Children who follow their inner signals learn to eat properly according to their feelings of their hunger or fullness and can be said to have developed nutritional self-efficacy [17,18].

Studies of the relationship between obesity and self-efficacy have shown that people with higher levels of self-efficacy consume healthier foods [19,20], indicating a negative correlation between obesity and self-efficacy. Children with lower levels of self-efficacy experience social anxiety and to cope with this anxiety, they may exhibit negative behaviors such as overeating or emotional eating. Therefore, it is argued that children experiencing higher levels of social anxiety are more tend to be obese [19]. Furthermore, higher levels of social anxiety in children can increase sedentariness, emotional eating behaviors and uncontrollable eating behaviors, all of which can have important effects on the development of obesity [21,22].

However, in the relevant studies, these factors are analyzed one by one [13,14,19]. No studies have examined how parental feeding

style, self-efficacy, and social anxiety affect adolescents obesity together. The purpose of this study was to examine how parental feeding styles, children's self-efficacy, and social anxiety affect adolescents obesity.

METHODS

This descriptive, comparative, correlational and cross-sectional study was performed to examine the effect of parental feeding styles, children's self-efficacy and social anxiety on adolescent obesity.

The population of the study comprised 1,963 students and their parents. They were fifth, sixth, seventh, and eighth-grade students in three middle schools under the Provincial National Education Directorate of Izmir, who were selected using simple random sampling. In the data collection process, the researchers reached 1,300 students and their parents, the parents of 649 students filled out a Consent Form, and the study sample included 649 students and their parents. Of the students contacted, 49.9% joined the sample.

This study collected data using the Child-Parent Socio-Demographic Data Collection Form, the Social Anxiety Questionnaire for Adolescents, the Middle School Self-efficacy Scale and the Parental Feeding Style Questionnaire.

The Child-Parent Socio-Demographic Data Collection Form: This form has two parts for families and children. The family introductory information form has questions about the parents' age, educational status, job and economic status, number of children, weight, height and opinions about their height and weight. The children's introductory information form has questions about the children's age, gender, birth order, body weight, and height. This form also asked how parents assess their children's body weight and height by their age and whether the child eats a balanced and sufficient diet.

The Parental Feeding Style Questionnaire (PFSQ): Ozcetin, Yilmaz, Erkorkmaz, and Esmersoy adapted this questionnaire to Turkish in 2010. The original Parental Feeding Style Questionnaire has four subdimensions, and the Turkish version has five: emotional feeding, encouraging feeding, instrumental feeding, tolerant dietary control and strict dietary control. Questions are graded on a 5 point scale (1=never, 5=always). The minimum score on the scale is 27, and the maximum is 135. Higher scores on each sub-scale indicate a tendency toward that feeding style. The Cronbach's alpha coefficients of the original study varied between instrumental feeding 0.67, encouraging feeding 0.74, control over eating 0.81 and emotional feeding 0.83. The Cronbach's alpha coefficients of the Turkish version were found 0.83, 0.74, 0.64, 0.69 and 0.54 for emotional feeding, encouraging feeding, instrumental feeding, strict dietary control and tolerant dietary control, respectively [23]. The Cronbach's alpha coefficients of this study were found 0.86, 0.79, 0.71, 0.74 and 0.70 for emotional feeding, encouraging feeding, instrumental feeding, strict dietary control and tolerant dietary control, respectively.

The Middle School Self-efficacy Scale: This scale was adapted to Turkish by Yardimci and Basbakkal [24]. It has 37 items in four subdimensions: interpersonal relations, academic success, preventive health care and substance addiction. The participants were asked to give every item a score between 1–5 in reply to the question, "How appropriate is it for you to do the following things?". Scoring is as follows: 1 (not appropriate at all), 3 (a little appropriate), 5 (quite appropriate). The minimum score on the scale is 37, and the maximum is 185. Higher scores indicate higher self-efficacy level. The Cronbach's alpha coefficient of the original scale was between 0.73 and 0.89. The Cronbach's alpha coefficient of the Turkish scale and test-retest coefficient were found to be 0.86 and 0.66, respectively [24]. The Cronbach's alpha coefficients of this study were found 0.87, 0.85, 0.79, and 0.92 for interpersonal relations,

academic success, preventive health care and substance addiction, respectively.

The Social Anxiety Scale for Adolescent: This 22-item scale was adapted to Turkish by Aydin and Sütçü [25]. It has three subdimensions: fear of negative evaluation, social evasion and distress in social situations in general, and social evasion and distress in new situations. Items are graded between (1) never and (5) always. The minimum score on the scale is 22, and the maximum is 110. Higher scores indicate higher levels of continuous anxiety. The Cronbach's alpha coefficient of the scale were found to be 0.88 and 0.85, respectively [25]. The Cronbach's alpha coefficients of this study were found 0.86, 0.79, and 0.71 for fear of negative evaluation, social evasion and distress in social situations in general, and social evasion and distress in new situations.

The researchers performed anthropometric measurements in the students' classrooms. The researchers took children's body size measurements using an electronic scale that was sensitive to ± 100 grams, after its accuracy was tested by comparing it with a standard scale. The participants were measured in a standing position without shoes and wearing light clothes. The measurements were recorded in kilograms.

Before measuring the height, children were asked to remove their shoes and any removable hair accessories such as hair clips or hairbands. A wall-mounted measuring tape was used to measure height, and the children were asked to stand upright with their feet together, leaning their heads, backs and gluteal regions against the wall.

According to the obtained height and weight data, Body Mass Index (BMI) was calculated dividing weight by the square of height. The weight status of the participants was determined by BMI values. Assessment of BMI was carried out by converting BMI values to percentile values and using BMI-for-age charts, published by Centers for Disease Control and Prevention

in 2016, for boys and girls of 5 to 19 years of age [26]. Percentile values less than 5, between 6–84, between 85–94 and greater than 95 were considered thin, normal, overweight and obese, respectively.

The researchers went to the selected schools and handed out consent forms, which explained the study, and the Parental Feeding Style Questionnaire, which would be filled out by parents, to students to give their parents and receive parents' approvals. The following day, the height and weight measurements of students, who submitted the consent form and the Parental Feeding style Questionnaire back, were written on the questionnaire form. Also, students were asked to fill out the Self-efficacy Scale for Secondary School Students and Social Anxiety Scale for Adolescents. In the data collection process, the researchers reached 1,300 children and their parents, the parents of 649 students filled out the consent form, and the study sample included 649 children and their parents.

Permissions were obtained by e-mail from the owners of all the scales used. Written permissions to initiate the study were obtained from Dokuz Eylul University Non-Invasive Clinical Research Ethic Committee (Institutional Review Board approval number: 2304-GOA-2015/26-24) and Izmir's Provincial Directorate of National Education. After the participating students and parents were informed about the aim of the study, children who voluntarily agreed to participate and whose parents gave written consent and their parents were included in the study.

Percentages and averages were used to evaluate the sociodemographic data. The normal distribution of the data was evaluated using the Shapiro-Wilk test. Correlation analysis was used to analyze the relationships between scale scores. The fact that parental feeding style and adolescents' social anxiety and self-efficacy levels predict obesity was determined using regression analysis, and whether scale

scores were included in the regression model was determined using multicollinearity analysis. The scale scores with a Variance Inflation Factor value lower than 10 and a tolerance value was greater than 0.2 were included the model. The threshold for significance level was 0.05.

RESULTS

The study found the average age of participating children's mothers to be 38.30 ± 5.37 years. Of the mothers, 45.0% were primary school graduate, and 63.8% were housewives. The average age of the fathers was 43.20 ± 5.74 years, and 38.4% had completed primary school. Of the parents, 87.1% were employed, 62.7% had equal income and expenditures. Of the parents, 70.9%, 22.5% and 6.6% regarded their weight status as normal, fat and thin, respectively. Of the parents, 71.7%, 10.9%, and 17.4% regarded perceived their children weight status as normal, fat and thin, respectively. Of the parents, 65.8% thought their children's diet was sufficient and balanced. This study determined the average age of participating adolescents to be 11.58 ± 1.21 years. By percentile, 11.1%, 66.8%, 11.9% and 10.2% of adolescents were found to be thin, normal, overweight and obese, respectively. The Parental feeding style questionnaire and subscale average score of adolescents are 72.37 ± 16.39 , 10.66 ± 5.21 , 26.67 ± 7.19 , 7.52 ± 3.43 , 12.06 ± 4.40 and 11.92 ± 4.00 , respectively. The self-efficacy scale and subscale average score of adolescents are 164.06 ± 21.11 , 57.56 ± 8.90 , 45.76 ± 5.80 , 51.64 ± 7.49 and 9.08 ± 2.29 , respectively. The social anxiety scale and subscale average score of adolescents are 44.23 ± 15.90 , 14.69 ± 6.70 , 17.85 ± 5.74 and 11.68 ± 5.76 (Table 1). The skewness and kurtosis values of the scales means are between -2 and +2. The values for skewness and kurtosis between -2 and +2 are considered acceptable to prove normal univariate distribution.

Table 1. Scales and sub-scales point distributions.

Scales and sub-scales	Mean	Standard Deviation
Parental feeding style questionnaire total score	72.37	16.39
Emotional feeding total score	10.66	5.21
Encouraging feeding total score	26.67	7.19
Instrumental feeding total score	7.52	3.43
Strict dietary control total score	12.06	4.40
Tolerant dietary control total score	11.92	4.00
Self efficacy total score	164.06	21.11
Interpersonal relations total score	57.56	8.90
Academic success total score	45.76	5.80
Preventive health care total score	51.64	7.49
Substance addiction total score	9.08	2.29
Social anxiety total score	44.23	15.90
Fear of negative evaluation total score	14.69	6.70
Social evasion and distress in new situations total score	17.85	5.74
Social evasion and distress in social situations in general total score	11.68	5.76

Table 2. The predictive status of parental feeding style, self-efficacy and social anxiety sub-scale of childhood obesity by sex.

Scales	Sub-scales	Male adolescent	Female adolescent
		β	β
Parental Feeding Style	Emotional feeding	-0.089	-0.164*
	Encouraging feeding	-0.057	0.003
	Instrumental feeding	-0.011	0.004
	Strict dietary control	0.154*	0.053
	Tolerant dietary control	-0.0009	0.114**
Self Efficacy	Interpersonal relations	-0.200**	0.136
	Academic success	-0.039	-0.920
	Preventive health care	-0.177**	-0.236*
	Substance addiction	0.020	-0.054
Social Anxiety	Fear of negative evaluation	-0.055	-0.016
	Social evasion and distress in new situations	0.118	0.156*
	Social evasion and distress in social situations in general	0.305*	0.368*
	<i>R</i>	0.591	0.573
	<i>R</i> ²	0.350	0.328
	<i>F</i>	11.688	13.496
	<i>p</i>	0.000	0.000
	<i>dw</i> (1.5–2.5)	1.973	2.117

Note: *Significant at $p < 0.01$ level; **Significant at $p < 0.05$ level.

The relationship between the factors is examined so that the regression analysis can be performed. The correlations of these factors vary

between 0.20 and 0.50. Factors are included in the model because the relationship between the factors is sufficient.

The model included the predictive status for adolescents obesity of emotional feeding, encouraging feeding, instrumental feeding, strict dietary control, tolerant dietary control, interpersonal relations, academic success, preventive healthcare, substance addiction, fear of negative evaluation, fear of new social situations and fear of social situations in general by sex (Table 2). These twelve factors affect together male adolescent obesity at the rate of 35.0%. Of them, fear of social situations in general ($\beta=0.305$) and strict dietary control ($\beta=0.154$) were positively significantly affected male adolescent obesity, and interpersonal relations ($\beta=-0.200$) and preventive healthcare self-efficacy ($\beta=-0.177$) were negatively significantly affected male adolescent obesity (Table 2). This study determined that the other factors did not significantly affect adolescents obesity ($p=0.05$). These twelve factors affect together female adolescent obesity at the rate of 32.8%. Of them, the fear of social situations in general ($\beta=0.368$), tolerant dietary control ($\beta=0.114$), and Social evasion and distress in new situations ($\beta=0.156$) were positively significantly affected female adolescent obesity. Preventive healthcare self-efficacy ($\beta=-0.236$) and emotional feeding ($\beta=-0.164$) were negatively significantly affected female adolescent obesity (Table 2). This study determined that the other factors did not significantly affect female adolescents obesity ($p>0.05$).

DISCUSSION

This study determined that of the participating children, 11.1%, 66.8%, 11.9% and 10.2% of adolescents were found to be thin, normal, overweight and obese, respectively. The United States National Health and Nutrition Examination Survey (2011–2014) determined obesity rates in children aged 2–19 years was 16.9% [27]. The Turkiye Childhood Obesity Investigation 2013 report found that 14.2% and 8.35% of children across Turkey were overweight

and obese [28]. The Turkey Nourishment and Health Survey, which was conducted by the Ministry of Health in 2010, found that 14.3% and 8.2% of 2,248 children between 6 and 18 years of age were overweight or obese, respectively [29]. In studies in different cities, the obesity rate varied from 7.5% and 16.9% [30]. Comparison of study findings showed that this study's results are compatible and relevant to the literature. It was determined that the score distributions of the scales were normal (Table 1).

The regression model was determined according to both literature knowledge and the relationship between variables and obesity. These twelve factors affect together male adolescent obesity at the rate of 35.0% and female adolescent obesity at the rate of 32.8% (Table 2). This study found that the factor that affects male and female adolescents obesity most was the fear of social situations sub-scale in general (Table 2). Studies argue that as social anxiety increases, face-to-face communication decreases and the amount of time spent in front of a computer or television, sedentary life behavior and consuming junk food increases [31–34]. Since children are afraid of social situations, they can experience social withdrawal, fewer out of the house and spend more time in front of a computer or television. This situation is thought that to be a factor for obesity by causing children to eat more and move less.

This study determined that preventive health care self-efficacy is the second most influential factor in female adolescents obesity and the third most influential factor in male (Table 2). This term is associated with healthy behaviors such as healthy nutrition, adequate nutrition, regular exercise and avoiding substance addiction [35]. This study found a statistically significant negative relationship between preventive healthcare self-efficacy and obesity, and this result resembles those in the literature. Individuals with high self-efficacy control their negative health behaviors. When children have

healthier lifestyle behaviors, their preventive health care self-efficacy also increases, and children control excess eating food, control their weight by not consuming excessive calories, and decrease adolescent obesity.

This study determined that emotional feeding is the third most influential factor in female adolescent obesity. In the literature, parents with emotional feeding habits give more food to their children when they or their children are under stress [14,36,37]. It has been argued that this also increases junk food consumption [37,14]. On the other hand, parents with the tendency to eat less when they are under emotional stress may give less food to their children when they or their children are under stress [35]. Children also have an aversion to food when they are under stress. Thus, it was determined that emotional feeding could both cause obesity and prevent obesity. This study result also showed that as emotional feeding increases, obesity decreases. It is thought that this is because mothers tend to eat less when they are under emotional stress and thus give less food to their children at such times. Similarly, the fact that children do not want to consume food when they are under stress can cause a negative relationship between emotional feeding and obesity. This variable did not affect male obesity seen in adolescence.

This study determined that fear of new social situations is the fourth most influential factor in female adolescents obesity. It has been argued that this factor causes anxiety in children and children can limit their relationships because they are afraid that their anxiety becomes apparent [31,38]. Therefore, children start to spend more time at home and use devices such as telephones, TVs, and computers more. Sedentary behavior and junk food consumption also increase as a result of anxiety [31-34]. This study found a statistically significant positive relationship between fear of new social situations and obesity. This result is in line with the literature [31-34,39]. Fear of new social

situations increase sedentary behaviors and caloric intake and reduce calorie burning by causing people to spend more time at home. Obesity will thus be caused by this energy imbalance. This variable did not affect male obesity seen in adolescence.

This study determined that strict dietary control is the fourth most influential factor in male adolescents obesity. This factor increases the desire of children for restricted foods and may lead them to eat that food excessively even when they are full [40,41]. Parents who insist that their children eat healthy foods can cause exterior oriented nutrition in their children [42]. This study also found a statistically significant positive relationship between strict dietary control and obesity. This may be because children have the excessive desire for a restricted food and eat that food even if they are full. It is thought that children may be exteriorly oriented due to predicting their hunger-fullness situation. In either case, children consume excessive more than enough calories and obesity is observed [40,41-47]. This variable did not affect female obesity seen in adolescence.

This study determined that fear of tolerant dietary control is the fifth most influential factor in female adolescents obesity. In the literature, tolerant controlled feeding style positively affected the children's status of being obese [48,49]. This variable did not affect male obesity seen in adolescence. The reason of this inconcompliant finding may be the result of the low number of underweight and overweight children in the present study, and the majority of mothers' perception of their adolescent's weight as normal and thin. On the other hand, the sub-scale "tolerant dietary control" presented a modest Cronbach alpha coefficient in Turkish version. The alpha value found is 0.70 in this study. The fact that the reliability value is lower than the limit value is an important limitation of this study.

This study did not determine a correlation between fear of negative evaluation and obesity

($p > 0.05$). Studies have argued that as children who fear of negative evaluation become more withdrawn and spend more time at home, causing high levels of obesity [33,34]. However, this study was conducted in a place where there are strong neighborhood relationships, children spend more time together and know each other for a longer time. Thus, it may be that the children accept each other as they are. Moreover, the neighborhood's low economic status, the children's low junk food consumption and lower levels of internet and telephone use may have affected this study's results.

This study did not find a significant correlation between instrumental feeding, encouraging feeding, and obesity ($p > 0.05$). In the literature, there are studies that show encouraging feeding makes children more prone to eat junk food [14,16]. However, it is also said that there is no correlation between encouraging feeding and obesity [45]. Similarly, there are also studies showing instrumental feeding increases junk food consumption [14,16], and it has also been observed that attention to food regarded as a reward decreases [46]. Studies show that tolerant dietary control has a positive effect on childhood obesity [16,47].

Despite all its strengths, there are a few limitations to this work. The first limitation is that there is no clinically diagnosed obese group in the sample. The second limitation is that only volunteer adolescents and parents participate in the study. The final limitation is that the Cronbach alpha value of the tolerant dietary control sub-scale is 0.70.

CONCLUSION

These twelve factors affect male adolescent obesity at the rate of 35.0%. Of them, the factors that significantly affect male adolescent obesity were fear of social situations in general, interpersonal relations, preventive healthcare self-efficacy, and strict dietary control. Twelve factors affect female adolescent obesity at

the rate of 32.8%. Of them, the factors that significantly affect female adolescent obesity were fear of social situations in general, preventive healthcare self-efficacy, emotional feeding, social evasion and distress in new situations, and tolerant dietary control.

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CONTRIBUTORS

SS ALTAN and M BEKTAS conceptualized and designed the study, acquired, analyzed and interpreted the data, and drafted the manuscript. M BEKTAS and SS ALTAN designed the study and revised the manuscript. All authors read and approved the final manuscript.

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