



The Relationship Between BMI of Adolescents and Their Parents' Mindful Eating

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Abstract

Objectives: This study aims to investigate the relationship between parents' mindful eating and adolescents' body mass index.

Materials and Methods: This study has a randomized and cross-sectional design. Mothers or fathers (n=224) with children between the ages of 10-19 and living in the same house, who approved the consent forms, were included in the study. Turkish version of the mindful eating questionnaire (MEQ-TR) was applied to parents and the BMI of adolescents was taken.

Results: The average total score of MEQ-TR, disinhibition, emotional eating, control of eating, focusing, eating discipline, mindfulness and interference sub-factors for parents were 3.5±0.5, 3.5±0.8, 3.7±0.9, 3.6±0.7, 3.2±0.4, 3.3±0.8, 3.3±0.6, 3.9±0.7, respectively. there was a negative correlation between adolescents' BMI and the control of eating sub-factor of parents (p<0.05, r = -0.158).

Conclusion: Our study is one of the few researches investigating the relationship between parents' mindful eating and adolescents' BMI. The relationship between parents' eating behaviors and adolescents' obesity is an important research area. Future studies are needed to reveal the relationship.

Keywords: *adolescents, mindful eating, obesity*

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Introduction

Obesity is a medical condition with a multifactorial etiology involving genetics, environment, drug use and energy balance (Goodwin et al., 2017). Behavioral treatment of obesity mostly focuses on improving cognitive skills such as calorie counting, portion control, label reading and menu planning (Daly, 2013). Apart from these approaches, mindful eating (ME) techniques support determining when and how much food will be consumed, the effect of food on the body and the use of sensory organs in food selection by using hunger and satiety cues (Altman et al., 2013). Studies of mindful eating in adult populations have been conducted on eating disorders, type 2 diabetes, and obesity (Goodwin et al., 2017; Hartmann et al., 2012). Increasing mindful eating was associated with correcting some negative eating behaviors (O'Reilly et al., 2014). However, there are not enough studies in the pediatric group (Burke, 2010; Greenberg & Harris, 2012).

It is important to understand the role of family dynamics in the development of eating behaviors in pediatric populations, and family factors influence children's health and behavior (Kitzman-Ulrich et al., 2010). In a recent study, it was reported that there is a relationship between families' and children's mindful eating. However, this result may change when evaluated according to the age group of children. The effect of their parents' eating attitudes, especially on adolescents, may be different (Goodwin et al., 2017).

Mindful eating is defined as the “non-judgmental awareness of physical and emotional sensations while eating or in a food-related environment and comprises making food choices consciously and raising awareness of homeostatic and hedonic hunger (Dalen et al., 2010; Monroe, 2015). Being aware of eating and paying attention to the effects of food are concepts in mindful eating (Hendrickson & Rasmussen, 2013). In addition, mindful eating focuses on an individual's sensual awareness of the food (Nelson, 2017). On the other hand, mindfulness interventions have been shown to reduce body mass (Alberts et al., 2010; Forman et al., 2009; Lillis et al., 2009) and decreased binge eating (Katterman et al., 2014).

Evaluating the relationship between parents' mindful eating and adolescents' body weight status may contribute to adolescents' health. However, to our knowledge, there is no study in the literature examining the relationship between parents' mindful eating and adolescents' BMI. In this study, it was aimed to examine the relationship between anthropometric measurements of adolescents' and parents' mindful eating.

Materials and Methods

Study Design

Participants (n = 224) were recruited from primary care practice at the Health Center of the Presidency of Turkey. Written announcement about the study was made through the online internal system to the individuals who applied to the health center, and consent forms were sent to the interested individuals by e-mail. Mothers or fathers with children between the ages of 10-19 and living in the same house, who approved the consent forms, were included in the study according to inclusion and exclusion criteria. Only the oldest child's data were collected from parents who have more than one adolescent child. Recent weight change (>5%, last three months), chronic disease, genetic and metabolic disease, and medication use (antidepressants, metformin, etc.) affecting food intake were exclusion criteria. An online questionnaire including demographic information, body weight, height and the mindful eating questionnaire was sent to the individuals included in the study by e-mail. If the adolescents had body weight (with TANITA MC-780) and height measurements taken in our clinic in the last 1 month, these measurements were used, if not, they were called to our clinic and body weight (TANITA MC-780) and height were measured.

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the Ethics Committee of Ankara City Hospital (protocol number: E2-21-420).

BMI Calculation

Participants' body weight measurements were taken with a TANITA MC-780 analyzer. Height measurements were measured with a non-stretchable measuring tape. Body mass index was calculated by dividing the weight in kilograms by the square of height in meters. Adolescents' BMI percentiles were calculated using WHO AnthroPlus software. WHO AnthroPlus is a software for the global application of the WHO Reference 2007 for 5-19 years to monitor the growth of school-age children and adolescents (AnthroPlus, 2009).

Mindful Eating Questionnaire (MEQ)

The original Mindful Eating Questionnaire (MEQ-28) consists of 28 questions and 5 sub-structures and was developed by Framson et al. in 2009. The Cronbach alpha value of MEQ-23 was 0.64 (Framson et al., 2009). Turkish adaptation of the questionnaire and validity and reliability study was done by Köse et al. (2018). They replaced some items and added new ones. As a result of the validity and reliability study of MEQ-TR, the Cronbach alpha value of the scale was 0.733. MEQ-TR is a Likert-type questionnaire consisting of 30 items and 7 subscales (Disinhibition, emotional eating, control of eating, focusing, eating discipline,

mindfulness and interference). MEQ-TR is answered with a five-item Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). There are 20 reverse items on the scale. Questions 1, 7, 9, 11, 13, 15, 18, 24, 25 and 27 are scored straight. The remaining questions are scored in reverse {Reverse Scoring (1=5, 2=4, 3=3, 4=2, 5=1)}. Scores range from 1 to 5, and the total and sub-scores are calculated from the arithmetic mean of the total and sub-scores. A score of 3 and above from each subscale of the scale indicates that the individual has the characteristic evaluated by the relevant subscale (Köse et al., 2018).

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 20) at a significance level of 0.05. We performed the normal distribution analysis of the data using a histogram, a variation coefficient rate, Skewness, Kurtosis, and Kolmogorov– Smirnov tests. Spearman’s rank correlation test was used to analyze the relationship between the sets of data. Values are presented as the mean \pm standard deviation. A power analysis was performed using the Gpower 3.1.9.2 package program, with the Mindful Eating Questionnaire total score as the primary outcome. This power calculation showed that a sample size of 118 subjects would have a power of 95% with 0.292 effect size and type I error of 0.05. A total of 224 people was included in this study.

Results

The mean age of the parents and adolescents was 44.1 ± 5.5 and 14.8 ± 2.2 years respectively. Of the study group; 74.6% of the parents and 60.3% of the adolescents were female, 25.4% of the parents and 39.7% of the adolescents were male. The mean BMI of the parents was 26.4 ± 4.2 kg/m² and the mean BMI of adolescents was 57.2 \pm 32.2 percentile (Table 1).

Table 1: Characteristics of the parents and adolescents.

Characteristics	Parents			Adolescents		
	n	%	Mean \pm SD	n	%	Mean \pm SD
Gender						
Female	167	74.6		135	60.3	
Male	57	25.4		89	39.7	
Age (year)			44.1 \pm 5.5			14.8 \pm 2.2
BMI (kg/m²)			26.4 \pm 4.2			57.2 \pm 32.2
BMI classification						
Underweight	2	0.9		14	6.3	
Normal weight	91	40.6		150	67	
Overweight	93	41.5		51	23	
Obese	38	17		9	4	

BMI: Body mass index, kg: kilogram, m: meter, SD: Standard deviation

The average total score of MEQ-TR, disinhibition, emotional eating, control of eating, focusing, eating discipline, mindfulness and interference sub-factors for parents were 3.5 ± 0.5 , 3.5 ± 0.8 , 3.7 ± 0.9 , 3.6 ± 0.7 , 3.2 ± 0.4 , 3.3 ± 0.8 , 3.3 ± 0.6 , 3.9 ± 0.7 , respectively (Table 2).

Table 2: MEQ-TR scores of parents.

MEQ-TR factor	Mean±SD
Disinhibition	3.5±0.8
Emotional eating	3.7±0.9
Control of eating	3.6±0.7
Focusing	3.2±0.4
Eating discipline	3.3±0.8
Mindfulness	3.3±0.6
Interference	3.9±0.7
MEQ-TR total score	3.5±0.5

MEQ-TR: Mindful Eating Questionnaire-Turkish, SD: Standard deviation.

Table 3 shows correlations between the MEQ-TR scores of parents and other outcomes. While there was a negative correlation between adolescents' BMI and the control of eating sub-factor of parents ($p<0.05$, $r = -0.158$), no significant relationship was observed between adolescents' BMI and MEQ-TR total scores of parents according to Spearman's correlation test ($p>0.05$, $r = -0.109$). On the other hand, there was a statistically significant negative correlation between parents' BMI and parents' MEQ-TR total score ($p>0.01$, $r = -0.292$) and the correlation between parents' BMI and sub-factors disinhibition, emotional eating, control of eating, eating discipline and mindfulness were statistically significant ($p<0.05$). There was a positive and statistically significant correlation between parents' age and eating discipline and mindfulness sub-factors ($p<0.05$).

Table 3: Correlations between MEQ-TR scores of parents and other parameters.

	Disinhibition		Emotional eating		Control of eating		Focusing		Eating discipline		Mindfulness		Interference		MEQ-TR Total score	
	r	p	r	p	r	p	r	p	r	p	r	p	r	p	r	p
Adolescents' BMI	-0.059	0.382	-0.034	0.616	-0.158	0.018	-0.033	0.622	-0.092	0.169	-0.001	0.983	0.033	0.628	-0.109	0.103
Parents' BMI	-0.216	0.001	-0.179	0.007	-0.217	0.001	-0.033	0.625	-0.154	0.021	-0.301	0.000	-0.087	0.192	-0.292	0.000
Parents' age	0.062	0.359	-0.026	0.698	-0.045	0.503	0.005	0.942	0.193	0.004	0.153	0.022	0.023	0.727	0.086	0.201

MEQ-TR: Mindful Eating Questionnaire-Turkish, BMI: Body mass index

P-values calculated using Spearman's correlation. Significant results= $p < 0.05$

Discussion and Conclusion

The role of mindful eating in establishing good eating habits is attracting attention and the effectiveness of mindful eating in weight control is a research area (Warren et al., 2017). Many studies have been conducted investigating the effects of mindful eating on food choice, eating behavior or obesity in adolescents (Daly, 2013; Daly et al., 2016; Hendrickson & Rasmussen, 2017; Mantzios et al., 2018). However, studies investigating the relationship between adolescents' BMI and parents' mindful eating are scarce. A pilot randomized intervention study reported feasibility and acceptability in adolescents with obesity by the family-based mindful eating intervention (Kumar et al., 2018). In our study, we aimed to investigate the relationship between parents' mindful eating and adolescents' BMI and the results of our study showed that adolescents' BMI was correlated negatively with parents' MEQ-TR sub-factor control of eating scores. According to the family system theory, family factors are effective in the development of children's behaviors that affect their health. In this context, individuals in the family, especially parents, have an important place in the development of adolescents' eating behaviors (Kitzman-Ulrich et al., 2010). The limited number of studies examining the effects of parental dynamics on the child's weight status emphasizes that parental behavior may have positive effects on the child's weight status (Golan, 2006; Israel et al., 1985). Impaired weight status in adolescence is related with psychosocial distress and lifestyle interventions including behavioral purposes can be useful in this regard (Daly et al., 2016; Steinbeck et al., 2018). In a parent-oriented intervention study focusing on family lifestyle changes, a decrease in sugar-added beverage consumption was observed compared to the control group (Beech et al., 2003). In contrast, some studies investigating parent-focused improvement of the child's weight status have reported similar results compared to the control (Coates et al., 1982; Golley et al., 2007). In our study, we observed a statistically significant correlation between parents' control of eating sub-factor score and adolescents' BMI, but not in the MEQ total score. Control of eating sub-factor interrogates the eating speed and retaining of an individual's eating function. There are expressions like "People around me say I ate too fast" and "I swallow my bites without chewing" in MEQ-TR for determining control of eating sub-factor score (Köse et al., 2018). In a recent meta-analysis, an association between eating speed and obesity was reported (Kolay et al., 2021). One study reported eating faster in children with obesity in the presence of their mother compared to when alone. Czaja et al. showed an influence by the appearance of the mother but our study reveals an association between parents' control of eating and adolescents' BMI (Czaja et al., 2011). Therefore, it can be said that not only the mother's presence, but also the parent's mindfulness of eating may

affect adolescent nutrition. One of the few studies evaluating the relationship between parents' and adolescents' MEQ scores showed a correlation between these outcomes, but the relationship between parents' MEQ scores and adolescents' BMI was not evaluated in this study (Goodwin et al., 2017). Parental mindful eating may have effects on the weight status of adolescents, but more comprehensive studies with large sample sizes should be planned and this relationship should be demonstrated. Revealing the relationship between parental mindful eating and adolescent weight status could guide the development of medical nutrition therapy strategies for obesity in adolescents.

The strength of our study is that it investigates the relationship between parental mindful eating and adolescents' BMI. However, several limitations that may warrant attention in future research. Due to the nature of our cross-sectional study, the expression of the results is limited but it seems that an increase in the parents' self-control of eating means a decrease in adolescents' BMI. On the other hand, the mindful eating questionnaire could be applied to adolescents to observe the relationship between parents' and adolescents' mindful eating. In addition, it is thought that the evaluation of mindful eating of parents of different gender (mothers and fathers) may be considered a confounding factor. Another point is that the nutritional habits, energy and nutrient intakes of both parents and adolescents could be evaluated with a large sample.

In conclusion, our study is one of the few researches investigating the relationship between parents' mindful eating and adolescents' BMI. The relationship between parents' eating behaviors and adolescents' weight status is an important research area. Future studies are needed to reveal the relationship and develop new strategies to be used in the medical nutrition treatment of adolescent obesity.

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Conflict of interest

The authors declare no conflict of interest.

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