



# The effect of childrens' eating behaviors and parental feeding style on childhood obesity



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## ABSTRACT

In is important to determine the factors that affect obesity in childhood, in order to raise generations of healthy children. This study aims to determine the effect of primary school students' eating behaviors and parental feeding styles on obesity in childhood. This descriptive cross-sectional study was conducted with 1201 children and their parents between September 2014 and March 2015. The data were collected using the socio-demographic data collection form for children and parents, the Children's Eating Behavior Questionnaire and the Parental Feeding Style Questionnaire. The data were analyzed using percentage calculators, mean, Spearman's correlation analysis, Pearson's correlation analysis and multiple regression analysis. Of the children, 16.9% were found to be obese. Three models were created considering the relationships between the variables in this study and the occurrence of obesity. In the first model, the factors that affect childhood obesity were found to be enjoyment of food, emotional overeating, food responsiveness, satiety responsiveness and food fussiness. In the second model, the factors were prompting/encouragement and control over eating. Enjoyment of food, emotional overeating, food responsiveness, satiety responsiveness, emotional feeding and food fussiness were also found to be the factors in the third model ( $p < 0.05$ ). This study showed that children's eating behaviors and parental feeding style affect the occurrence of obesity in childhood.

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## 1. Introduction

Obesity, defined as “abnormal or excessive fat accumulation that presents a risk to health” by the World Health Organization (WHO), is one of the most significant health problems in developed and developing countries (World Health Organization, 2000). Today it is accepted as a chronic and progressive disease with high mortality and morbidity due to the likelihood of comorbidities, social problems and poor quality of life (Ergül & Kalkım, 2011).

In recent years, the prevalence of obesity has rapidly increased among children. The current data show that about 25% to 30% of children are overweight or obese around the world (Batch & Baur, 2005; Maffeis, 2000).

Lots of factors affect the occurrence of obesity (Faith, Scanlon, Birch, Francis, & Sherry, 2004). The two of them are children's eating behaviors and parental feeding styles (Faith et al., 2004; Birch & Ventura, 2009; El-Behadli, Sharp, Hughes, Obasi, & Nicklas, 2015). Parental feeding styles have a key role in the adoption of obesity-triggering eating habits

by children (Birch & Davison, 2001; Birch & Fisher, 1998; Faith et al., 2004; Sleddens, Kremers, De Vries, & Thijs, 2010; Yiğit, 2011).

Studies show that parental feeding styles affect the children's eating behaviors, and childhood obesity affected by the children's eating behaviors (Birch & Davison, 2001; Birch & Fisher, 1998; Erkorkmaz et al., 2013; Yiğit, 2011).

However, no studies were found which analyzed the effects on obesity of both parental feeding styles and children's eating behaviors concurrently. A limited number of studies have separately addressed these two subjects (Birch & Davison, 2001; Birch & Fisher, 1998; Özçetin, Yılmaz, Erkorkmaz, & Esmeray, 2010; Yiğit, 2011). This study aims to determine how both children's eating behaviors and parental feeding styles affect obesity in childhood.

## 2. Materials and methods

This descriptive, correlative and cross-sectional study aims to determine how the eating behaviors of primary school students and parental feeding styles affect obesity in childhood.

This study was conducted in primary schools selected from the lower, middle and upper socio-economic groups, using the simple random sampling method. One school for each group was selected from the

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primary schools affiliated with İzmir Provincial Directorate for National Education, between September 15, 2014, and March 31, 2015.

The study population consisted of 1274 first, second, third and fourth grade students in three public schools affiliated with İzmir Provincial Directorate for National Education, as well as their parents.

The required sample size was found to be 154 children and their parents with Type I error of 0.01, and Type II error of 0.01 (according to 99% power) in the GPOWER statistical analysis program, based on the mean scores in the studies of *Yılmaz, Esmeray, and Erkorkmaz (2011)*. In addition, the required sample size was found to be 246, based on three socio-economic groups at medium effect size with Type I error of 0.05 and Type II error of 0.20 (according to 80% power) in the GPOWER statistical analysis program. The sample size was determined to consist of 246 students and their parents. However, all children and their parents who volunteered to participate in the study, and who met the inclusion criteria, were included in the study to more clearly indicate the relationships between the variables. The study was completed with 1201 students and their parents who completely filled out the forms and volunteered to participate in the study. The rate of participation in the study was 94.2%.

The data were collected using the socio-demographic data collection form for Children and Parents, the Children's Eating Behavior Questionnaire and the Parental Feeding Style Questionnaire. The researcher went to the selected schools between September 2014 and March 2015. The researcher distributed the consent forms that explained the study and the questionnaires to the children, and asked them to deliver the forms and questionnaires to their parents. The children who returned the consent forms and the questionnaires were measured for height and weight. These measurements were noted on the questionnaire forms.

**Socio-demographic data collection form:** This form had two sections: socio-demographic data collection form for parents and another for children. The socio-demographic data collection form for parents included questions on the parents' age, education level, employment and economic status, number of children, parents' weight and height, whether or not parents consulted a dietitian for their weight, and whether or not they received education on child nutrition from a healthcare organization. The socio-demographic data collection form for children included questions on the children's age, gender, birth order, body weight, height, how their parents evaluate their body weight and height according to their age, and whether or not the children have enough food, and eat healthy foods. The form also asked if the children were given vitamin and/or mineral supplements, and what the supplements were, if any were used.

**Children's Eating Behavior Questionnaire—CEBQ:** This questionnaire was developed by *Wardle, Guthrie, Sanderson, and Rapoport (2001)* to determine eight types of eating behaviors: food responsiveness (FR), emotional overeating (EOE), enjoyment of food (EOF), desire to drink (DD), satiety responsiveness (SR), slowness in eating (SE), emotional undereating (EUE) and food fussiness (FF) (*Wardle et al., 2001*). FR measures whether people consume more than normal under the effects of external stimuli (taste, smell, appearance, etc.) or because of eating cues (*Sleddens, Kremers, & Thijs, 2008*). EOF includes hunger, desire to eat, and taking pleasure in eating. It indicates a general interest in all foods. Consumption of sugar-sweetened beverages is among the behaviors that trigger obesity. DD specifically includes the increased desire for sweetened beverages (*Wardle et al., 2001*). SR represents children's ability to reduce food intake after eating. It regulates their energy intake and prevents over-intake of energy, as well as ensuring that energy intake is used more efficiently and reflecting this during follow-ups. It provides the child with cues on the more sensitive internal response to satiety (*Sleddens et al., 2008*). SE indicates a substantially low interest in eating. Fussiness is defined as a child's refusal to eat significant amounts of foods generally served by parents, and to consume an insufficient amount of certain foods (*Dovey, Staples, Gibson, & Halford, 2008*). Emotional overeating and undereating can be regarded as an

increase or a decrease in eating in response to negative feelings such as anger and anxiety (*Sleddens et al., 2008*).

The Likert-type questionnaire which was answered by parents included eight subscales with a total of 35 items that assess children's eating behaviors over five points (1 = never, 5 = always). During the development of the original questionnaire, a factor structure emerged with eight subscales, and these eight subscales were found to explain the total variance by 50% to 80%. The Cronbach's Alpha coefficients of these eight subscales were between 0.74 and 0.91 (*Wardle et al., 2001*).

The scale was adapted in Turkish by *Yılmaz et al. (2011)*. The five point likert type (always-never) scale consists of 35 items and eight subscales. The internal consistency coefficients of the scale are as follows according to the subscales: 0.69 for the FR subscale, 0.61 for the EOE subscale, 0.84 for the EOF subscale, 0.79 for the DD subscale, 0.76 for the SR subscale, 0.75 for the SE subscale, 0.67 for the EUE subscale, and 0.74 for the Fussiness subscale. The CEBQ was assessed by factor and reliability analyses. The descriptive factor analysis showed that these eight subscales explained 58.2% of the total variance. The confirmatory factor analysis found the RMSEA index to be 0.049 and this showed the appropriateness of the scale for the Turkish society. A statistically significant relationship was found between the subscales. The results were very similar to that of the original questionnaire in terms of construct validity, internal consistency and subscale relationships (*Erkorkmaz et al., 2013; Yılmaz et al., 2011*). Eating behaviors are assessed through 35 questions in the questionnaire. Questions 12, 14, 19, 20, and 28 assess food responsiveness; questions 2, 13, 15, and 27 assess emotional overeating; questions 1, 3, 4, 5, and 22 assess enjoyment of food; questions 6, 29, and 31 assess desire to drink; questions 7, 17, 21, 24, 26, 30, and 33 assess satiety responsiveness; questions 8, 18, 34, and 35 assess slowness in eating; questions 9, 11, 23, and 25 assess emotional undereating; and questions 10, 16, and 32 assess food fussiness (*Yılmaz et al., 2011*).

**Parental Feeding Style Questionnaire—PFSQ:** This questionnaire was developed by *Wardle, Sanderson, Guthrie, Rapoport, and Plominet (2002)* to determine four types of feeding styles: Emotional feeding (EF), control over eating (COE), instrumental feeding (IF) and prompting/encouragement to eat (PEE) (*Wardle et al., 2002*). Giving foods to children in response to feelings such as uneasiness and boredom constitutes emotional feeding; instrumental feeding means rewarding children with foods if they show an intended behavior in order to prevent bad behavior, or to ensure healthy eating and consumption of less-loved healthy foods; encouraging children to eat means prompting/encouragement to eat; and control over eating is when parents control the quality and quantity of the foods that their children consume (*Dovey et al., 2008*).

This Likert-type questionnaire answered by parents included four subscales with a total of 27 items that assess parents' feeding styles using 5 points (1 = never, 5 = always). During the development of the original questionnaire, a factor structure emerged with four subscales, and the Cronbach's Alpha coefficients of these four subscales varied between 0.67 and 0.83. Based on these results, the PFSQ was determined to be valid and reliable in the assessment of parental feeding styles and was adapted into Turkish (*Wardle et al., 2002*).

The scale was adapted into Turkish by (*Özçetin et al., 2010*). The five point likert type (always-never) scale consists of 27 items and five (four in fact) subscales. The internal consistency coefficients of the scale are as follows according to the subscales: 0.83 for the Emotional Feeding subscale, 0.64 for the Instrumental Feeding subscale, 0.74 for the Prompting/Encouragement to Eat subscale, 0.69 for the Strictly Controlled Feeding (SCF) subscale, and 0.54 for the Tolerant Controlled Feeding (TCF) subscale. Questions 5, 17, 20, and 26 assess the strictly controlled feeding; and questions 1, 11, 14, 16, and 23 assess the tolerant controlled feeding. Questions 1, 11, 16, and 23 are reversely scored. The Emotional Feeding subscale consists of the questions 2, 13, 15, 21 and 25. The Prompting/Encouragement to Eat subscale consists of the questions 3, 4, 6, 8, 10, 12, 19 and 27. The Instrumental Feeding subscale

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