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Original Article

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Is there a correlation between body mass index in children and body mass index in parents?

Abstract

Aim: The aim of the study was to investigate the relationship between body mass index (BMI) and physical activity among pediatric individuals and their parents.
Materials and Methods: The study was conducted on 434 pediatric individuals aged 3-16 years and their parents. The weight, height, BMI and weekly physical activity of pediatric individuals without insulin resistance were recorded. In addition, parent' attitudes towards sugary and processed foods for children were evaluated.
Results: As a result of the study, it was found that 230 of 434 pediatric individuals were underweight, 146 were normal, 46 were mildly obese, and 12 were obese according to BMI classification. It was found that 190 of the mothers were obese and 110 of the fathers were obese. BMI and weekly physical activity numbers were compared between pediatric individuals and their parents and a significant difference was found ($p<0.05$). It was found that 112 of the mothers did not pay attention to their children's consumption of sugary and processed foods.
Conclusion: As a result of the study, it was found that there was a relationship between pediatric individuals and their parents in terms of BMI and number of weekly physical activities. In this respect, this study revealed that parents should pay maximum attention to prevent obesity in children.

Keywords: Parent, obesity, parent-child relationship, body mass index, pediatric

INTRODUCTION

Today, obesity is among the most important health problems especially in developed countries. According to recent studies in the literature, obesity has become one of the most important public health problems in the last two decades. It is defined as a serious threat to society due to its rapidly increasing prevalence (1,2). The prevalence of obesity has increased 1.5-fold since 2000, and its approximate prevalence in children aged 5 to 19 years has more than doubled by 2016 (from 2.9% to 6.8%) (3). The prevalence of obesity has been reported between 9% and 27% in regional studies conducted in our country (4).

Obesity is an increase in body fat mass that results in a body weight that exceeds the required body weight for height (5). A body mass index (BMI) between 25 kg/m² and less than 30 kg/m² is generally considered overweight, while a BMI of 30 kg/m² or greater is classified as obesity (6). Adipose tissue accounts for 15-18% of body weight in adult men and 20-25% in women. When this ratio exceeds 25% in men and 30% in women, it constitutes obesity (7).

Although the factors that cause obesity are not fully explained, excessive and improper nutrition and lack of physical activity are recognized as the most important causes of obesity (7). If the daily energy intake is higher than the energy expended, the unspent energy is stored as fat in the body and causes obesity. Many genetic and environmental factors such as heredity, gender, ethnicity, sedentary lifestyle and lack of physical activity are responsible for obesity (8,9). In particular, the shift in eating

habits to ready-to-eat food and excessive consumption of foods such as fast food, which are eaten on the go, have a great impact on the development of obesity (10). Studies have shown that the incidence of obesity is significantly lower in breastfed children than in non-breastfed children (11).

Obesity should not be considered as a single disease due to the secondary problems it causes (12). There are many secondary diseases caused by obesity. These include psychiatric problems, metabolic syndrome, insulin resistance, hyperinsulinemia, hypertension, breathing difficulties, coronary artery disease, hyperlipidemia, excessive hair growth, some types of cancer, osteoarthritis, stroke, sleep apnea, fatty liver, menstrual irregularities, increased risk of surgery, social incompatibilities, musculoskeletal problems (13).

It is possible to evaluate obesity under two different headings: simple obesity and secondary obesity (14). The condition where only calorie intake is more than calories burned and there is no disease that can cause obesity is called simple obesity; the condition where genetic and hormonal factors are also effective and there are diseases that can cause obesity is called secondary obesity (15).

In this study, we planned to investigate the extent to which parental BMI is associated with child BMI, the role of parental sports habits in promoting sports habits in the child, and whether these relationships depend on the gender and age of the child.

MATERIALS AND METHODS

Study Population and Sample

The study was conducted on 434 pediatric individuals aged 3-16 years and their parents. Height, weight, BMI, weekly physical activity (brisk walking, jogging, sports) of both pediatric individuals and their parents were recorded. Additionally, parent' attitudes towards sugary and processed food consumption towards pediatric individuals were evaluated. Children were divided into 4 age groups in order to understand in which age range the weight and activity status of the parents were in parallel with the weight and activity status of the parents. The study was carried out in the Pediatrics Department of İzmir Bakırçay University Çiğli Training and Research Hospital, with the permission of the local Non-Interventional Ethics Committee of İzmir Bakırçay University, decision number 1232. Diabetic pediatric individuals and diabetic parents were excluded from the study. Written informed consent was obtained from the parents before data collection. BMI<18.5 was classified as underweight, 18.5-24.99 as normal, ≥25 as overweight, and ≥30 as obese in children and parents.

Statistical Analysis

SPSS 21 and Excel programs were used for statistical analysis. $p<0.05$ was considered statistically significant. Mann Whitney U test was used for pairwise comparisons.

RESULTS

Of the pediatric individuals in the study, 103 were between the ages of 3-5 years, 110 were between the ages of 6-8 years, 114 were between the ages of 9-12 years, and 107 were between the ages of 13-16 years (Figure 1).

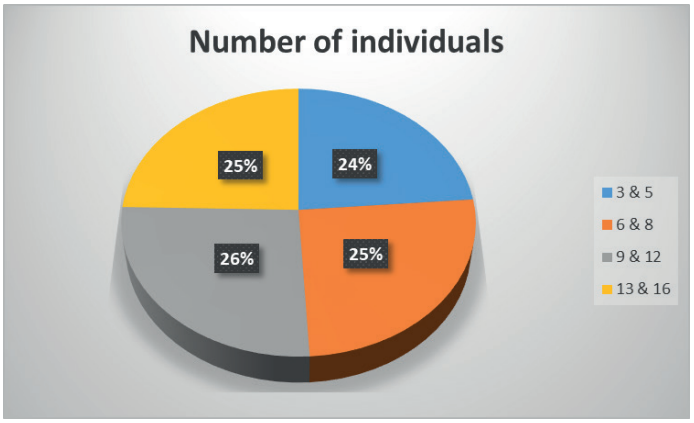

Figure 1. Age distribution of pediatric subjects

The heights of pediatric individuals in the 3-5 age group were 87-125 cm, 85-150 cm in the 6-8 age group, 107-178 cm in the 9-12 age group, and 140-192 cm in the 13-16 age group. The weights of pediatric individuals in the 3-5 age group were 11.5-40 kg, 12-79 kg in the 6-8 age group, 20-95 kg in the 9-12 age group, and 27-124 kg in the 13-16 age group.

According to BMI score, 230 of the pediatric individuals were classified as underweight, 146 as normal, 46 as overweight and 12 as obese. Of the mothers, 17 were underweight, 168 were normal, 140 were overweight and 190 were obese. Of the fathers, 2 were underweight, 95 were normal, 227 were overweight and 110 were obese (Figure 2).

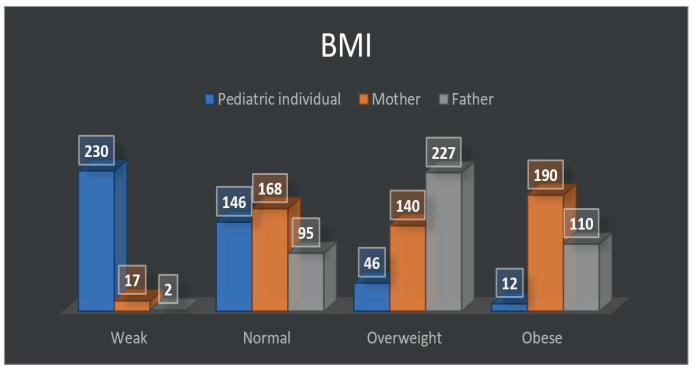

Figure 2. BMI classification

Of 103 pediatric individuals aged 3-5 years, 86 were underweight, 13 were normal, 4 were overweight, of 110 individuals aged 6-8 years, 81 were underweight, 25 were normal, 3 were overweight, 1 was obese, of 114 individuals aged 9-12 years, 41 were underweight, 50 were normal, 22 were overweight, 1 was obese,

of 107 individuals aged 13-16 years, 22 were underweight, 58 were normal, 17 were overweight, 10 were obese (Figure 3).

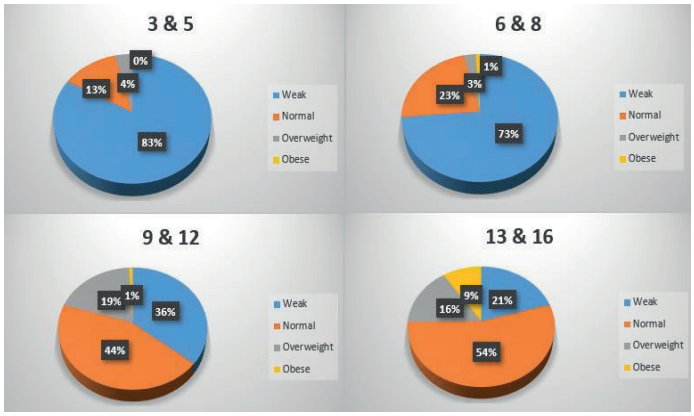

Figure 3. BMI by age groups

The BMI of pediatric subjects was compared with the BMI of their parents and a significant relationship was found between both maternal BMI and paternal BMI ($p<0.05$).

The number of weekly physical activities of children was analyzed and it was found that 116 children did not do any physical activity, 137 did it 1-2 days a week, 111 did it 3-4 days a week, and 70 did it 5 days or more. The number of weekly physical activities of mothers was examined and it was found that 262 of them did not do any physical activity, 93 of them did it 1-2 days, 52 of them did it 3-4 days, and 27 of them did it 5 days or more. It was found that 289 of the fathers did not do any physical activity, 78 of them did it 1-2 days a week, 42 of them did it 3-4 days a week, and 25 of them did it 5 days or more (Figure 4).

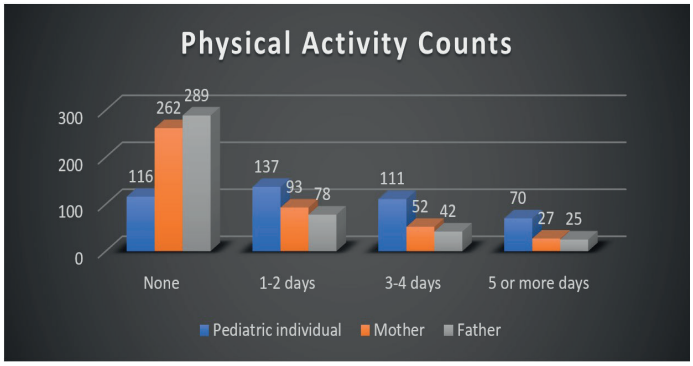

Figure 4. Number of physical activities

The physical activity of pediatric individuals was compared with the physical activity of their parents and a significant difference was found when compared with both mother and father ($p<0.05$).

It was evaluated whether parent gave sugary, processed foods to pediatric individuals and 112 of the mothers stated that they did not pay attention at all, 128 stated that they gave 3-4 times a week, 152 stated that they gave 1-2 times a week and 42 stated that they did not feed them at all (Figure 5).

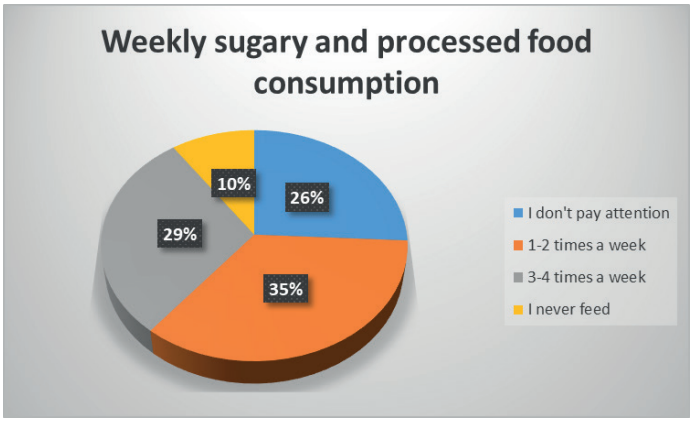

Figure 5. Parent' attitudes towards weekly sugar and processed food consumption of pediatric individuals

Of 112 pediatric individuals who did not pay attention to sugary and processed food consumption, 46 were underweight, 42 were normal, 19 were overweight, and 5 were obese; of 128 individuals in the 3-4 times a week group, 89 were underweight, 48 were normal, 13 were overweight, and 3 were obese; of 152 individuals in the 1-2 times a week group, 70 were underweight, 43 were normal, 12 were overweight, and 3 were obese; of 42 individuals in the never-feeding group, 25 were underweight, 14 were normal, 2 were overweight, and 1 was obese (Figure 6).

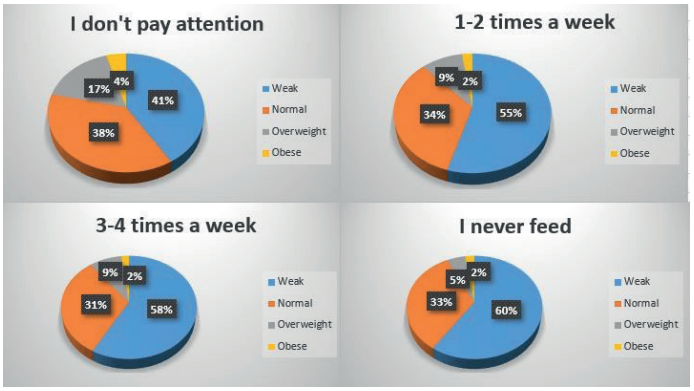

Figure 6. BMI related to consumption of sugary and processed foods

DISCUSSION

In this study in which BMI and weekly physical activity numbers of children and their parents were examined, a significant difference was found in terms of both BMI and weekly physical activity numbers ($p<0.05$).

In the United States, about one-third of children aged 2 to 19 years are overweight or obese (16). A 2017 study in the United States includes a prediction that up to 60 percent of American children will be obese by the age of 35 (17).

Some studies in the literature have found that only warnings to parents are more effective on child weight than recommendations to the child (18,19). However, some studies have reported that child education is more effective than family education (20). In our study, there were 10 individuals with BMI above 30

especially in the 13-16 age group, while there were no patients with BMI above 30 in the 3-5 age group.

The risk of obesity in children is less in the younger age group when the control of nutrition is mostly in the family. However, there is a significant increase in the number of obese children during adolescence. Especially the easy access of adolescents to ready-to-eat food, snacks, fast food and processed food is thought to be a major evidence of increasing obesity in adolescents. This can be explained by the fact that as children grow older, they become independent from their parents and the influence of parents on children's behaviors decreases (21). The fact that obesity characteristics were found in the 13-16 age range in our study supports this information. In addition, the behaviors and obesity status of older children may be influenced by school programs and peer behaviors (22,23).

There are studies reporting a strong association between parental and child BMI (16,24,25). In a study conducted by Savaşhan et al. on 3963 children and parents, it was concluded that child and parent BMIs were directly proportional (26). Some studies claim that the direct correlation between child and parental BMI is due to genetic influences (27,28). In a study conducted on 1024 children aged 9-11 years in İzmir, the prevalence of obesity was found to be higher in regions with higher socioeconomic status than in less developed regions (1.7% and 0.5%, respectively) (29). The prevalence of obesity was found to be 8.4% and overweight children 26.7% in 299 children aged 6-15 years in a private primary school with a high socioeconomic level in Bakırköy, İstanbul (30). In a study conducted in 1499 children aged 6-13 years in Poland, it was reported that the age group with the highest prevalence of obesity was 9 and 10 years in boys and 9 years in girls living in urban areas, while it was 12 years in boys and 7 years in girls in rural areas (31). In our study, 22 of 434 pediatric subjects were obese and 46 were overweight. In addition, obesity was found especially in the age range of 13-16 years in our study.

CONCLUSION

As a result of the study, a relationship was found between children's BMI, parents' BMI and the number of weekly physical activities. In this respect, the study revealed that obesity prevention is associated with both the child and the parent.

The limitation of the study is that the calculation of BMI values of the parents is based on the height and weight declaration of the individuals.

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Conflict of Interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that they have received no financial support for the study.

Ethical Approval
İzmir Bakırçay University Local Ethical Committee Approval Number: 2023/1232.

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