

## Chapter 5

# PHYSICAL, PSYCHOLOGICAL, AND SOCIAL EFFECTS AND NURSING MANAGEMENT IN PEDIATRIC OBESITY

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### INTRODUCTION

Obesity is a metabolic disease that is characterized by an increase in body fat mass, which negatively affects the quality of life by causing many physical, psychological, and social problems (Berberoğlu & Hocaoğlu, 2021; Türkoğlu Dikmen, 2020). The prevalence of childhood obesity has increased eightfold since 1975 (Weihrauch-Blüher & Wiegand, 2018). Although obesity is seen in all age groups, pediatric obesity is one of the most important global health problems of the twenty-first century for both developed and developing countries due to its increasing prevalence (Lakshman et al., 2012; Yılmaz, 2020). Pediatric obesity development is multifactorial (Türkoğlu Dikmen, 2020). It is stated that pediatric obesity causes difficulty in breathing, hypertension, cardiovascular diseases, insulin resistance, and many psychological problems, as well as increasing obesity in adulthood, disability, and early death (WHO, 2021). Due to the physical and psychosocial effects of pediatric obesity, children diagnosed with obesity are encountered in both child health and mental health services. Since many individuals diagnosed with childhood obesity remain obese until adulthood, and obesity is associated with significantly increased morbidity and mortality later in life, normalization of body weight during childhood and before adolescence has become more important. (Weihrauch-Blüher & Wiegand, 2018). In this section, the etiology, epidemiology, diagnosis, treatment and effects of pediatric obesity on the child are explained in line with the literature, and the role and responsibilities of the nurse in the management of obesity are discussed.

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## **PEDIATRIC OBESITY**

Obesity means fat. It is derived from the Latin word for “obezus”. Obesity is an important health problem that can cause social, psychological, and serious medical problems, which occurs when the energy intake is higher than the energy consumption and the pathological increase of the adipose tissue compared to the body weight (Bal Yılmaz & Bolşık, 2018).

Pediatric obesity is one of the most common chronic diseases in childhood and an important public health problem carried into adulthood (Erdim et al., 2014; Ergül & Kalkım, 2011; Kumar & Kaufman, 2018; Yılmazbaş et al., 2018). It is important to determine the early period risk factors for prevention, especially considering the increase in the prevalence of obesity starting in the preschool period and its relationship with childhood and adulthood (Weihrauch-Blüher & Wiegand, 2018). The pathophysiology of excess weight gain is complicated by the interaction of genetic and biological factors and the environment (Kumar & Kaufman, 2018). Pediatric obesity often moves into adulthood due to both physiological and behavioral factors. Therefore, preventing obesity in this age group is considered important to stop the path to unhealthy adulthood.

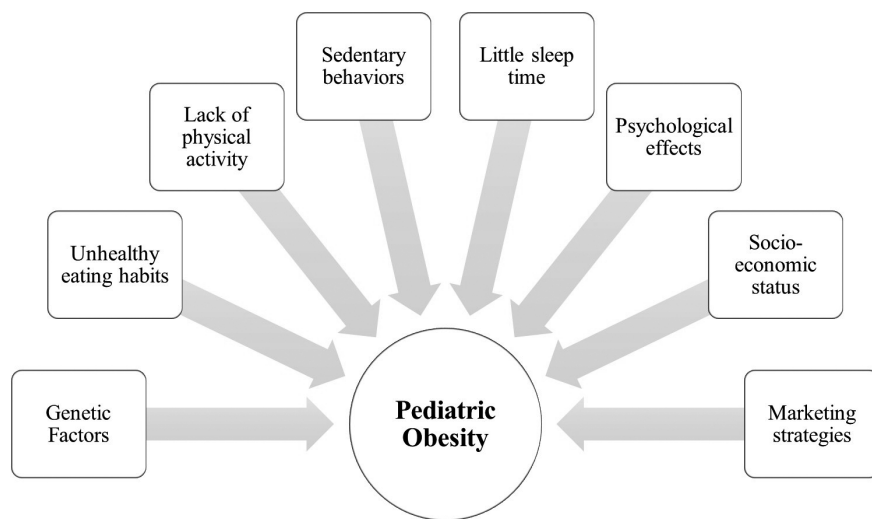
## **EPIDEMIOLOGY**

The prevalence of obesity is increasing in every age group (Türkoğlu Dikmen, 2020). According to the data from the World Health Organization (WHO), it is stated that approximately 39 million children under the age of five and more than 340 million children between the ages of 5-19 are overweight or obese in 2020 (WHO, 2021). In the Monitoring of Growth in School Age Children (6-9 years old) study in Turkey, childhood obesity was 6.5%; It was stated that the rate of overweight was 14.3% (T.R. Ministry of Health, 2011). In Turkey Childhood (7-8 Years) Obesity study, it was reported that the rate of obesity and overweight is 21.6% in girls and 23.3% in boys (T.R. Ministry of Health, 2013). It is stated that 34.5% of young people between the ages of 12-19 meet the criteria for overweight or obesity. In terms of gender, it was found that it was seen at a rate of 33.8% in girls and 35.1% in boys (Özaslan, 2020). When compared according to gender, it was determined that the prevalence of obesity is higher in boys than girls in all age groups (M. Yılmaz, Ağartıoğlu Kundakçı, et al., 2019). In a study conducted with children of primary school age, it was stated that the prevalence of obesity increased as the age group increased (Altuğ Özsoy et al., 2020).

## **ETIOLOGY**

The main cause of obesity and overweight is the imbalance between calories consumed and calories expended (WHO, 2021). The factors that cause an increase in individual body weight are complex. Biological, psychological, social, and cultural factors are responsible for the obesity epidemic (Camacho et al., 2019; Türkoğlu Dikmen, 2020; Weihrauch-Blüher & Wiegand, 2018). Heredity, intrauterine factors, diet, culture level, environmental factors, and psychological factors play a role in the development of obesity (Bal Yılmaz & Bolışık, 2018). The etiology of obesity is divided into two endogenous and exogenous. It may develop due to genetic syndromes such as endogenous obesity, Turner syndrome, Down syndrome, endocrine causes such as Cushing's syndrome, hyperinsulinism, and the use of some drugs such as glucocorticoids and lithium. Exogenous obesity occurs due to the imbalance between the amount of energy consumed and the amount of energy consumed, and may be accompanied by genetic factors, age, gender, dietary habits, physical activity, socio-economic and cultural level, and many psychological etiological factors. Childhood obesity is mostly of exogenous origin (Battal, 2018; Esen & Ökdemir, 2018; Yeşilfidan & Adana, 2019; Yılmazbaş et al., 2018). Etiological factors in the formation of exogenous childhood obesity are shown in Figure 1.

Although genetic factors were examined and the heritability of obesity was seen between 40-75% in twin studies, it was found insufficient to explain obesity. It is stated that obesity can also occur due to neuroendocrine diseases (Türkoğlu Dikmen, 2020). Children whose parents are obese are at high risk for obesity (Battal, 2018). It is stated that the risk of developing obesity increases in infants of diabetic mothers, those with high birth weight, and those who gain weight rapidly in infancy (Esen & Ökdemir, 2018). It was determined that 55% of obese children were also obese during adolescence, and 80% of obese adolescents were also obese in adulthood. It was also stated that 70% of obese adults were not obese in childhood (Türkoğlu Dikmen, 2020).



**Figure 1.** Etiological factors in childhood obesity

Weihrauch-Blüher, S., & Wiegand, S. (2018). Risk Factors and Implications of Childhood Obesity. *Current Obesity Report*, 7, 254–259.

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The obesogenic environment has a very important place in the development of obesity. The obesogenic environment is defined as the environment that facilitates abnormal weight gain and causes obesity (Gauthier & Krajicek, 2013). Obesogenic environments contribute to promoting increased energy intake, decreased physical activity, and consumption of energy-dense foods and large portions (Corsica & Hood, 2011). Children are exposed to environments in which they have minimal control over many issues. The fact that the environments provided by the parents and the school are obesogenic poses a risk for the development of obesity (Gauthier & Krajicek, 2013). In particular, parents affect the frequency and content of children's eating with the accessibility of food, the content of food, adult nutrition modeling, and parenting attitudes about nutrition (Yılmaz, 2020). Bad eating habits are among the main reasons for the development of obesity. Skipping meals, eating too fast, eating fast food frequently, and consuming high-calorie drinks are examples of bad eating habits (Türkoğlu Dikmen, 2020). Nutrition in infancy is important in the development of nutritional habits. It is stated that feeding with breast milk especially during infancy is protective against obesity (Battal, 2018; Yılmaz et al., 2016). Formula-fed babies are more prone to overfeeding and as a result, there is an increase in fat cells (Yılmaz, 2020). Consumption of energy-dense and sugary foods starting from infancy and childhood is an important risk factor (Weihrauch-Blüher & Wiegand, 2018). In a meta-analysis study examining the

behavioral factors affecting pediatric obesity, it was found that daily breakfast and regular physical activity reduce the risk of developing obesity, watching television more than 1-2 hours a day, insufficient sleep, consumption of sugary/sweetened beverages more than four times a week and more than four months. It has been determined that factors such as breastfeeding for a short time increase the risk of obesity (Poorolajal et al., 2020). Regular physical activity helps to maintain energy balance and prevent weight gain. Today, children spend most of their time in front of the screen, such as watching television and playing computer games, compared to physical activity. Current evidence shows that it causes obesity due to increased eating while in front of the screen in children (Yılmaz, 2020). Factors such as transportation methods and daily living habits due to the nature of urbanization reinforce the sedentary lifestyle and increase the risk of obesity (Esen & Ökdemir, 2018). Although its mechanism has not been fully determined yet, it is stated that there is a relationship between reduced sleep duration and the development of obesity (Battal, 2018). In childhood, factors such as negative family relationships, negative peer relationships, and academic failure affect the child psychologically negatively, and it is stated that there is a change in eating behaviors, especially when under stress. It is also stated that excessive eating behavior may occur in response to emotional stimuli (Babaoğlu & Hatun, 2002; Battal, 2018; Ergül & Kalkım, 2011). Psychological factors such as stress and anxiety can cause obesity by affecting mental health (Berberoğlu & Hocaoğlu, 2021). Especially during childhood, emotional regulation deficiencies and the presence of mental illnesses are considered as risk factors for obesity (Smith et al., 2020). While obesity used to be considered a problem of high-income countries, it has recently increased in low- and middle-income countries (WHO, 2021). Obesity occurs more frequently in low socioeconomic levels in developed countries, and in those with high socioeconomic levels in developing countries (Babaoğlu & Hatun, 2002). In terms of marketing strategies for high energy-dense foods, it is seen that children are often targeted. Almost all of the advertisements watched by children consist of foods such as candy, fast-food and sugary drinks (Corsica & Hood, 2011).

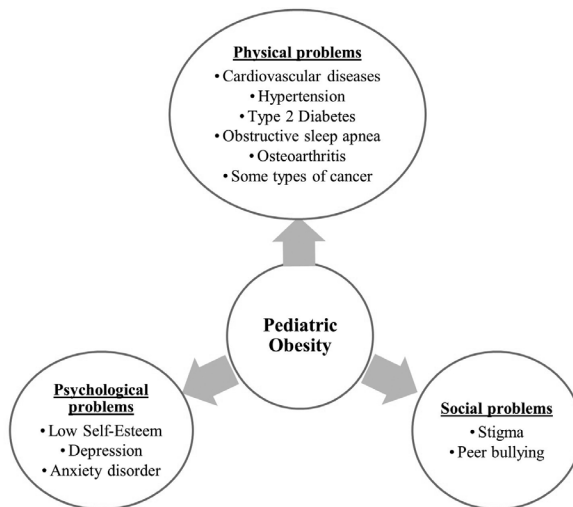
### **PHYSICAL, PSYCHOLOGICAL, AND SOCIAL EFFECTS OF PEDIATRIC OBESITY**

Pediatric obesity has many negative physical, psychological, social, academic, and societal effects. Knowing these problems is important for the fight against obesity (Ergül & Kalkım, 2011). Pediatric obesity affects growth and development in children. It is known that obese children are taller and have a greater bone age,

and in adolescence, they are shorter than their non-obese peers due to the earlier closure of the epiphyses. In addition, early menarche can be seen in obese girls (Yeşilfidan & Adana, 2019). The physical, psychological, and social effects of pediatric obesity are shown in Figure 2.

Childhood obesity causes many physical problems. Obesity has negative effects such as rapid growth, early menstruation, an increase in blood lipids, an increase in heart rate and heart volume, fatty liver, an increase in liver enzymes, and deterioration in glucose metabolism in children (Yiğit & Üğücü, 2020). Obesity causes many chronic diseases not only in older ages but also in childhood. Childhood obesity causes an increase in cardiovascular diseases, hypertension, diabetes, sleep apnea, orthopedic problems, cyst formation in the ovaries, and some types of cancer (Weihrauch-Blüher & Wiegand, 2018).

High body mass index (BMI) has been associated with adverse changes in childhood such as lipid and lipoprotein levels, blood pressure, insulin resistance, increase in inflammatory markers, increased arterial stiffness, and endothelial dysfunction. Most importantly, childhood obesity has been associated with early atherosclerosis. Arrhythmia emerges as another cardiac problem associated with obesity (Yılmaz, 2020). Childhood obesity is reflected in older ages and paves the way for the development of problems such as hypertension and cardiovascular diseases (Törner & Büyükgöncü, 2017).



**Figure 2.** Physical, psychological, and social effects of pediatric obesity  
Weihrauch-Blüher, S., & Wiegand, S. (2018). Risk Factors and Implications of Childhood Obesity. *Current Obesity Report*, 7, 254–259.

The figure was created by the authors.

Hypertension is closely related to childhood obesity and its prevalence is increasing in parallel with the global increase in obesity prevalence (Wühl, 2019). Impaired glucose tolerance, which is frequently encountered in childhood obesity, is an important indicator for the development of type 2 diabetes (Yılmaz, 2020). It has been reported that approximately 25% of obese children and adolescents have insulin resistance and 4% have silent type 2 diabetes (Törüner & Büyükgönenç, 2017).

Children diagnosed with obesity experience significant psycho-social problems that affect their quality of life and well-being (Ergül & Kalkım, 2011; Sagar & Gupta, 2018). In a study conducted in Turkey, it is stated that 66% of adolescents diagnosed with obesity are diagnosed with at least one psychiatric disorder (Özaslan, 2020). The self-esteem of children and adolescents diagnosed with obesity is negatively affected. It is stated that children diagnosed with obesity feel lonely, are not satisfied with their bodies, and have a low quality of life and self-esteem (Türkoğlu Dikmen, 2020). It is stated that depression and anxiety disorders are more common in children diagnosed with obesity compared to those who are not obese, and this rate is higher, especially in girls (Özaslan, 2020; Türkoğlu Dikmen, 2020). Adolescents diagnosed with obesity have higher rates of emotional deprivation, social isolation, embarrassment, failure, addiction, and submissiveness than those who are not obese (Türkoğlu Dikmen, 2020). In a study, it was determined that female adolescents diagnosed with obesity have more emotional problems, feel more hopeless, and attempt suicide more than their normal-weight peers (Falkner et al., 2012). Attention deficit hyperactivity disorder and social and generalized anxiety disorder are more common in overweight or obese adolescents compared to normal-weight adolescents (Özaslan, 2020). Stigma in obesity occurs in all age groups and negatively affects the individual psychologically and socially. Obese children and adolescents are frequently exposed to peer bullying. In a study, it was determined that 36% of obese boys and 34% of obese girls were bullied (Türkoğlu Dikmen, 2020).

In addition to the physical, psychological, and social effects of obesity on children, it is stated that children also encounter academic and social problems. It was determined that children with obesity diagnosis had lower reading skills and poor school performance compared to normal-weight children. From a social point of view, it is stated that health expenditures for the fight against obesity negatively affect economic and social development as well as health care services (Ergül & Kalkım, 2011).

## DIAGNOSIS, TREATMENT, AND NURSING APPROACH IN PEDIATRIC OBESITY

Diagnosis and treatment are important due to the high rate of obesity, mortality and morbidity (Türkoğlu Dikmen, 2020). Obezite tanılamasında, vücuttaki yağın direkt ölçümü, boy uzunluğu ve vücut ağırlığı, deri kıvrım kalınlığı, vücut kitle indeksi, bel/kalça oranı gibi farklı yöntemler kullanılmaktadır (Battal, 2018).

A child's body weight status is different from adult BMI categories. Children's body compositions change as they grow and differ between boys and girls. Therefore, BMI levels among children and youth need to be expressed relative to other children of the same age and sex (CDC, 2021). Age is taken into account when diagnosing overweight and obesity in childhood. Using the BMI percentile curves prepared according to age and gender in children, children with the 85th percentile and above are classified as a risky group (over/overweight), and children with the 95th percentile and above are classified as obese (Babaoğlu & Hatun, 2002). According to the WHO, Child Growth Standards, the diagnosis is made by calculating the weight for height value for children under the age of five, and the BMI for age for children aged 5-19 years (WHO, 2021; (CDC, 2021).  $BMI = \text{Weight (kg)} / \text{Height}^2 (\text{m}^2)$  is calculated by the process. Classification according to BMI is shown in Figure 3.

Weight Status Category	Percentile Range
Underweight	Less than the 5 <sup>th</sup> percentile
Healthy Weight	5 <sup>th</sup> percentile to less than the 85 <sup>th</sup> percentile
Overweight	85 <sup>th</sup> to less than the 95 <sup>th</sup> percentile
Obesity	95 <sup>th</sup> percentile or greater

**Figure 3.** BMI-for-age weight status categories  
CDC. Centers for Disease Control and Prevention. Defining Childhood Weight Status.

Although childhood obesity is easy to diagnose, it is seen as one of the most difficult diseases to treat. In treatment, with a multidisciplinary approach; the physician, nurse, dietitian, clinical psychologist, physiotherapist, and the child's family should be in contact (Battal, 2018).

Current treatment methods for childhood obesity include diet, physical exercise, behavior change treatment, pharmacological treatment, and bariatric sur-



gery (Türkoğlu Dikmen, 2020). Weight reduction and improvement in obesity-related complications are indicators of effective obesity treatment (Özaslan, 2020).

- In the diet, the child and his family are informed about the harms of obesity. By determining the percentile or BMI that should be according to the age of the child, the diet is arranged in such a way as to stop excess calorie intake, reduce fat intake, and create a balanced and adequate diet (Yeşilfidan & Adana, 2019).
- Exercises such as walking and swimming suitable for the age, conditions, and physical structure of the child are recommended. Physical exercise has important benefits in terms of increasing weight loss, maintaining a lean weight, and regulating blood pressure and cholesterol (Yeşilfidan & Adana, 2019). Depending on the child's health status, age, and activity level, walking exercises of at least 30 minutes at a suitable intensity and regularly are recommended at least 4 or 5 days a week (Oral & Cerit, 2019).
- The treatment of behavior change is aimed at positively changing the eating habits, activities, and ways of thinking of obese individuals (Ergül & Kalkım, 2011). When an important thing is achieved, simple practices such as not giving unhealthy foods such as candy and chocolate as a reward, and not eating or snacking while in front of the TV or computer are recommended to families in the treatment of behavior change (Tam & Çakır, 2012). In this context, it is important to reduce the time spent in front of the screen and to ensure sleep patterns (Battal, 2018).
- Drug treatment is rarely used in childhood obesity due to its side effects (Battal, 2018). Drug treatment is not recommended for children under 12 years of age diagnosed with obesity. However, it is planned to be tested in children who are morbidly obese and do not respond to all treatment options and should be followed closely (Ergül & Kalkım, 2011).
- In cases where all the methods used in the treatment of obesity are insufficient, surgical treatment is considered the last method. Bariatric surgical treatment aims to reduce the absorption of nutrients in the gastrointestinal tract (Ergül & Kalkım, 2011). Bariatric surgery can be performed in adolescents diagnosed with obesity if they cannot lose weight as expected despite efforts to lose weight effectively for at least six months if their BMI is above the 95% percentile and bone development is complete (Özaslan, 2020).

In pediatric obesity, the factors that will facilitate compliance in the treatment process should not be limited to diet and physical activity, but psychological support should be provided to the child (Bülbül, 2020). In particular, in the treatment

of pediatric obesity, families must be included in the treatment process (Ahmad et al., 2010).

Being overweight and obesity are largely preventable diseases (WHO, 2021). In the fight against obesity, the number of children diagnosed with obesity cannot be reduced, and the number of children diagnosed with obesity is increasing rapidly (Yayan & Çelebioğlu, 2018). Due to the increase in the incidence of pediatric obesity, interventions aimed at protecting the population from obesity have gained importance rather than treatment. Health workers, especially those working in primary health care services, have important responsibilities (Ergül & Kalkım, 2011). Healthier food choices and increased physical activity are the first steps in preventing obesity. Limiting energy intake from fat and sugar, increasing the consumption of fruits, vegetables, legumes, grains, and nuts, and regular physical activity for 60 minutes a day in children play a key role in preventing childhood obesity (WHO, 2021). In childhood life periods, in addition to monitoring weight gain in every period, in infancy; Supporting breast milk intake for the first six months, providing education on supplementary foods after the sixth month, in the pre-school period; ensuring the formation of healthy food preferences, evaluating the nutritional habits of parents and correcting mistakes, nutrition education, in childhood; preventing excessive development of prepubertal adipose tissue, supporting physical exercise and in adolescence; Prevention from excessive weight gain that may occur in a developmental attack is considered among the interventions aimed at preventing obesity (Ergül & Kalkım, 2011). It is thought that awareness training for families is important in the prevention of pediatric obesity (Yılmaz et al., 2019). Especially the school period has an important place in the prevention of obesity. In school health services, screening should be done, programs should be developed and maintained for the development of healthy nutrition education and physical activity (Altuğ Özsoy et al., 2020; Weihrauch-Blüher & Wiegand, 2018; M. Yılmaz, Kundakçı Ağartıoğlu, et al., 2019). Initiatives for overweight and obese students in school-based prevention programs may pose a risk in terms of stigma. To avoid stigma, initiatives need to be well-designed (Arslan & Ardış, 2020). It is stated that children diagnosed with obesity use the term “overweight” instead of “obese” and feel more comfortable socially (Ahmad et al., 2010). In addition to individual and environmental interventions, community-based measures such as prohibiting unhealthy food advertisements, taxing unhealthy foods, supporting local production of healthy foods and promoting healthy food options are also needed (Weihrauch-Blüher & Wiegand, 2018; Yılmazbaş et al., 2018).

Nurses have important responsibilities in the fight against pediatric obesity and preventive, curative, and rehabilitative health care services. Nurses should provide counseling on the protective effect of breast milk from obesity in preventing obesity, especially in newborns and infancy, on healthy nutrition, physical activity, and limitation of the obesogenic environment to include the child and family according to age periods (Erdim et al., 2014). Especially, nurses working with adolescents have responsibilities such as preventing obesity, recognizing developmentally ambivalent emotions and supporting them in coping with them, researching the foundations of the adolescent's concerns, and supporting their autonomy (Ceylan & Kılınçarslan Törüner, 2020). Nursing interventions such as education, care management, and support for pediatric obesity are thought to be important in the creation, implementation, and evaluation of the necessary strategies for the solution of obesity. Nurses have a significant impact on the protection and development of the health of the individuals they care for through health education (Erdim et al., 2014).

## **CONCLUSION**

In pediatric obesity, nurses have important responsibilities in the preventive, therapeutic, and rehabilitative stages of health care services. Pediatric obesity is an important, preventable public health problem that is caused by many factors, has many negative effects on the development of the child, physically, psychologically, and socially, and its prevalence is increasing. Since obesity treatment is difficult, determining risk factors and developing and implementing preventive interventions should be the first step. By adopting a multidisciplinary approach to treatment, cooperation with family and school should be established, and community-based policies should be developed to increase balanced nutrition and physical activity. It is recommended to provide holistic care in the follow-up of children diagnosed with obesity, taking into account the physical, mental and social effects experienced by the children.

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