

The complexity of childhood obesity: Factors, impacts and solutions

Felipe Torres Pereira, Soraya Correa Domingues and Maria Gisele dos Santos *

Department of Physical Education, Federal University of Paraná.

World Journal of Biology Pharmacy and Health Sciences, 2024, 19(01), 466–472

Publication history: Received on 07 June 2024; revised on 23 July 2024; accepted on 25 July 2024

Article DOI: <https://doi.org/10.30574/wjbphs.2024.19.1.0424>

Abstract

Identify the main contributing factors to childhood obesity, focusing on genetic, behavioral, and environmental factors. Explore the consequences of childhood obesity, both in terms of physical health and psychological and social impact. Genetic predisposition plays a significant role in childhood obesity. Studies have shown that children of obese parents are more likely to become obese, indicating genetic inheritance as an important factor. Specific genes that regulate appetite, metabolism, and fat storage can influence a child's tendency to gain weight. In addition, biological factors such as hormonal dysfunctions and metabolic changes can also contribute to the development of obesity. The socioeconomic status of a family has a significant impact on the prevalence of childhood obesity. Low-income households often have limited access to healthy foods and are more likely to consume ultra-processed foods, which are cheaper and more accessible. Studies show that food insecurity is associated with increased risk of obesity, as families may opt for foods of low nutritional quality that are more cost-effective.

Keywords: Childhood; Obesity; Physical Inactivity; Genetic; Technology

1. Introduction

Childhood obesity has become a growing concern around the world, being recognized as a global epidemic by the World Health Organization (WHO). This phenomenon is particularly alarming in developing countries, where rapid urbanization and changes in dietary patterns contribute significantly to the increased prevalence of obesity among children and adolescents. In Brazil, childhood obesity affects millions of children, configuring itself as a public health problem that demands urgent and effective actions.

The relevance of this topic is due to the negative impact of childhood obesity on various aspects of children's lives, including their physical health, emotional well-being, and social development. In addition, childhood obesity is a strong predictor of obesity in adulthood, increasing the risk of chronic diseases and reducing quality of life.

Objectives of the Work

This work has the following main objectives:

- Identify the main contributing factors to childhood obesity, focusing on genetic, behavioral, and environmental factors.
- Explore the consequences of childhood obesity, both in terms of physical health and psychological and social impact.
- Propose possible solutions and interventions that can be implemented by families, schools, communities and public policies to mitigate this problem.

* Corresponding author: Maria Gisele dos Santos

2. Contributing factors to childhood obesity

2.1. Genetic and Biological Factors

Genetic predisposition plays a significant role in childhood obesity. Studies have shown that children of obese parents are more likely to become obese, indicating genetic inheritance as an important factor. Specific genes that regulate appetite, metabolism, and fat storage can influence a child's tendency to gain weight. In addition, biological factors such as hormonal dysfunctions and metabolic changes can also contribute to the development of obesity.

Genetic studies have identified several genes associated with obesity, including the fat mass and obesity-associated gene (FTO), which has been consistently linked to increased body mass index (BMI) and obesity risk. Other genes, such as MC4R (melanocortin 4 receptor gene), also play critical roles in regulating appetite and body weight.

However, the presence of genetic predispositions does not inevitably determine obesity, indicating that environmental and behavioral factors play crucial roles in the development of the disease.

3. Available food

3.1. Breastfeeding and Early Years

Feeding in the first years of life has a lasting impact on children's health. Breastfeeding, for example, is widely recognized for its protective benefits against childhood obesity. Studies suggest that children who are breastfed for longer have a lower risk of becoming obese compared to those who have been fed infant formula. This is due, in part, to the unique composition of breast milk, which provides essential nutrients and promotes the development of a healthy metabolism.

A study conducted by Amaral and Basso (2010) analyzed 77 children aged two to six months and found that, of the 23 obese children identified, 21 were breastfed for less than six months. This data underlines the importance of prolonged breastfeeding in the prevention of childhood obesity.

3.2. Feeding in Different Environments

Children's nutrition is influenced by a variety of environments, including school, home, and social events. In schools, the quality of meals offered can vary significantly, impacting children's nutrition. School feeding programs that prioritize fresh and healthy foods can contribute to the prevention of obesity.

At home, eating habits are shaped by family practices. Parents and caregivers play a crucial role in shaping children's food preferences, often without realizing the impact of their own food choices. The availability of healthy foods at home and the practice of family meals are factors that promote positive eating habits.

Social events and leisure environments also influence children's diet. Birthday parties and other celebrations often offer foods high in sugar and fat, contributing to excessive calorie consumption. It is important to create a balance between participating in these events and maintaining a healthy diet.

3.3. Consumption of Ultra-Processed Foods

Ultra-processed foods are those that have undergone various industrial processes and contain artificial ingredients such as preservatives, flavorings, and sweeteners. These foods are generally high in calories, sugars, saturated fats, and sodium, but low in essential nutrients. Common examples include sodas, snack foods, stuffed cookies, and instant noodles.

Studies indicate that regular consumption of ultra-processed foods is strongly associated with increased risk of childhood obesity. Data from ENANI-2019 show that 93% of children aged 24 to 59 months and 80.5% of children aged 6 to 23 months in Brazil consume these products regularly. The consumption of sweetened beverages is equally concerning, with 24.5% of children aged 6 to 23 months, 37.7% of those aged 18 to 23 months, and 50.3% of children aged 24 to 59 months consuming these beverages.

Advertising for ultra-processed foods, often aimed at children, exacerbates this problem. Marketing campaigns use cartoon characters and gifts to attract children, encouraging the consumption of unhealthy products. This leads to the formation of inappropriate food preferences from an early age, making it difficult to adopt a healthy diet in the future.

4. Sedentary lifestyle in current times

4.1. Technological Advances and Sedentary Habits

Physical inactivity is one of the main factors that contribute to childhood obesity. With the advancement of technology, children spend more time in sedentary activities, such as watching television, playing video games, and using smartphones and tablets. These activities replace time that could be spent on outdoor play and physical activities.

The excessive use of technology not only reduces energy expenditure, but is also associated with increased consumption of unhealthy foods. Many studies show that children who spend more time in front of screens tend to consume more snacks and sugary drinks, further contributing to weight gain.

However, technology can also be used in a positive way to encourage physical activity. Fitness apps and games that require movement, such as those that use motion sensors on video game consoles, can promote physical activity and help combat a sedentary lifestyle.

5. Physical education and school activities

Physical education in schools plays a crucial role in promoting an active lifestyle among children. However, many schools face challenges in offering quality physical education classes. Studies show that dissatisfaction with physical education classes is a significant factor that contributes to children's sedentary lifestyle.

A survey conducted by Orti and Carrara (2012) revealed that class "A" had the highest rate of sedentary children (68.7%) and dissatisfaction with physical education classes. This indicates the need to redesign lessons to make them more engaging and inclusive. Physical education programs that incorporate a variety of activities, from traditional sports to new forms of physical exercise, can increase children's participation and interest.

Additionally, schools can promote extracurricular activities that encourage physical activity, such as sports clubs, dance groups, and yoga classes. These activities not only help to increase the level of physical activity but also promote the social and emotional well-being of children.

6. Media influence and advertising

Media and advertising have a significant influence on children's eating and physical activity habits. Advertising aimed at children often promotes foods high in sugars, fats, and sodium. Studies show that exposure to advertising of unhealthy foods is associated with increased consumption of these products among children.

The regulation of food advertising aimed at children is an important step in combating childhood obesity. Countries such as the United Kingdom and Sweden have implemented policies to restrict advertising of unhealthy foods during times when children are more likely to watch television. In Brazil, Anvisa (National Health Surveillance Agency) has also adopted measures to regulate the advertising of food and beverages to children.

In addition, media literacy programs can help children develop critical skills to evaluate advertising and make healthier food choices. Teaching children about the tricks used in advertising can empower them to resist the influence of marketing campaigns and make informed decisions about their eating.

7. Living conditions

7.1. Socioeconomic Influence

The socioeconomic status of a family has a significant impact on the prevalence of childhood obesity. Low-income households often have limited access to healthy foods and are more likely to consume ultra-processed foods, which are cheaper and more accessible. Studies show that food insecurity is associated with increased risk of obesity, as families may opt for foods of low nutritional quality that are more cost-effective.

Government food assistance programs, such as the Bolsa Família Program in Brazil, can help alleviate food insecurity and promote healthier eating. Additionally, policies that subsidize healthy foods, such as fruits and vegetables, can make these foods more affordable for low-income families.

7.2. Family Time and Quality of Life

The time that parents can devote to their children is also an important factor in preventing childhood obesity. Long working hours and commuting time limit parents' ability to supervise their children's feeding and encourage them to engage in physical activity. In many cases, parents turn to quick, ready-to-eat meals to save time, which can lead to a high-calorie, nutrient-poor diet.

Compared to countries such as the United States and Switzerland, where the working day is about 8 hours a day, many Brazilians work up to 12 hours a day. Considering the commuting time, there is little time left for leisure and family interaction. Work-life balance policies, such as flexible working hours and the possibility of remote work, can help parents spend more time with their children and promote healthy habits.

7.3. Public Policies and Community Interventions

Community interventions and public policies are essential to combat childhood obesity effectively. Government programs that promote nutrition education and physical activity in schools can have a significant impact on children's health. In addition, community initiatives, such as the creation of urban gardens and farmers' markets, can increase access to healthy food.

Examples of successful interventions include the "Healthy School" program in the United Kingdom, which promotes healthy eating and physical activity in schools, and the "Let's Move!" program in the United States, launched by former first lady Michelle Obama, which aims to address the problem of childhood obesity through a comprehensive approach that includes the promotion of healthy diets and physical activity.

In Brazil, the National School Feeding Program (PNAE) is a public policy that seeks to ensure that all students in the public school system have access to healthy food. The PNAE establishes nutritional guidelines for school meals and encourages the purchase of fresh and local foods.

8. Consequences of childhood obesity

8.1. Physical Health Problems

Childhood obesity is associated with a number of physical health problems that can persist into adulthood. Among the most common conditions are high cholesterol, type 2 diabetes, respiratory problems, hypertension and cardiovascular problems. These conditions not only reduce quality of life, but also increase the risk of early mortality.

Studies show that obese children are more likely to develop insulin resistance, a precursor to type 2 diabetes. In addition, obesity can lead to orthopedic problems, such as joint pain and bone deformities, due to the excess weight that the body has to bear. Respiratory problems, such as sleep apnea, are more prevalent among obese children, affecting sleep quality and, consequently, cognitive development and school performance.

8.2. Psychological and Social Impact

In addition to physical health problems, childhood obesity also has a significant impact on children's psychological and social well-being. Obese children are often the target of bullying and discrimination, which can lead to emotional problems such as low self-esteem, depression, and anxiety. These problems can negatively affect school performance and social development, creating a vicious cycle that is difficult to break.

Studies show that weight-related bullying is one of the most common forms of bullying in schools. Children who are bullied because of their weight are more likely to develop eating disorders, such as binge eating, and avoidance behaviors, such as skipping school to avoid confrontation.

Psychological interventions, such as cognitive-behavioral therapies, can help children cope with the emotional effects of obesity and bullying. Additionally, school programs that promote inclusion and combat bullying can create a safer and more welcoming environment for all children.

8.3. Persistence of Obesity in Adulthood

Childhood obesity is a strong predictor of obesity in adulthood. Studies show that obese children are more likely to become obese adults, which increases the risk of developing chronic diseases throughout their lives. The persistence of

obesity into adulthood is associated with a number of health complications, including cardiovascular disease, type 2 diabetes, and certain cancers.

A longitudinal study conducted in the United States followed obese children into adulthood and found that 77% of obese individuals in childhood maintained excessive weight in adulthood. This data underlines the importance of early interventions to prevent obesity and promote healthy habits from an early age.

8.4. Nutrition education

Nutrition education is a powerful tool in the prevention of childhood obesity. Dietary education programs in schools can teach children about the importance of a balanced diet and the negative effects of ultra-processed foods. Involving parents in nutrition education is also crucial, as they play a key role in shaping their children's eating habits.

Studies show that nutrition education programs that include hands-on activities, such as cooking and gardening classes, are more effective at promoting behavior change. These programs help children develop practical skills that can be applied at home, encouraging healthier eating.

8.5. Promotion of Healthy Diets

Promoting healthy diets involves more than just educating about nutrition; It is necessary to ensure that children have access to healthy foods and that these foods are attractive and tasty. Programs that encourage the consumption of fresh fruits and vegetables, whole grains, and lean proteins can help create positive eating habits.

Examples of successful initiatives include implementing healthy snacks in schools and creating food environments that encourage healthy choices. In many schools, replacing vending machines offering unhealthy snacks with more nutritious options has shown positive results in improving children's diets.

9. Increased physical activity

9.1. Incentive to Sport and Physical Activities

Encouraging sports and physical activities is essential to combat a sedentary lifestyle and promote an active lifestyle. Creating safe spaces for physical activity, such as parks, playgrounds, and sports courts, can make it easier for children to exercise.

Extracurricular programs that offer a variety of sports and physical activities, from soccer and basketball to dance and yoga, can appeal to different interests and abilities, increasing children's participation. In addition, the support of parents and the community is essential to encourage the regular practice of physical activities.

9.2. Positive Use of Technology

Technology can be an ally in promoting physical activity if used in a positive way. Fitness apps, interactive games that require movement, and online exercise programs can make physical activity more fun and accessible for children.

Studies show that the use of interactive technologies can significantly increase physical activity levels among children. For example, dance games and other games that utilize motion sensors have been shown to be effective in increasing physical activity and reducing sedentary behavior.

10. Improvements in living conditions

10.1. Work-Family Balance Policies

Work-life balance policies are essential to allow parents more time to devote to caring for and educating their children. Reducing working hours, offering flexible hours, and enabling remote work are some of the measures that can help parents balance their work and family responsibilities.

Examples of successful policies in other countries, such as extended parental leave and reduced working hours in Sweden, show that these measures can have a positive impact on the health and well-being of families. In Brazil, the implementation of similar policies can contribute to the prevention of childhood obesity by allowing parents to dedicate more time to promoting healthy habits at home.

10.2. Access to Healthy Food

Ensuring access to healthy food is a challenge, especially in low-income urban areas. Grant programs for healthy foods, such as fruits and vegetables, can make these foods more affordable for all families. Community initiatives, such as urban gardens and farmers' markets, can also increase the availability of fresh, nutritious food.

Studies show that creating community gardens can improve the diet of participating families by increasing their consumption of fresh fruits and vegetables. In addition, these gardens promote nutritional education and strengthen the sense of community, encouraging healthier eating habits.

11. Conclusion

11.1. Summary of Key Points

Childhood obesity is a multifaceted problem that requires integrated approaches to be adequately tackled. Genetic, behavioral, and environmental factors contribute to the development of obesity, and their consequences are wide-ranging, affecting children's physical, emotional, and social health. The prevention and treatment of childhood obesity should involve changes in eating habits, increased physical activity, and improvements in living conditions.

11.2. Final Recommendations

To effectively combat childhood obesity, it is necessary to implement comprehensive public policies that promote healthy eating and physical activity, both in schools and in communities. Additionally, it is crucial to involve families in promoting healthy habits and creating an environment that supports nutritious food choices and an active lifestyle.

Nutritional education, the encouragement of sports, the regulation of advertising of unhealthy foods and the creation of work-family balance policies are fundamental steps for the prevention of childhood obesity. With coordinated efforts across governments, schools, communities, and families, it is possible to create a healthier future for children.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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