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"CHILDHOOD OBESITY : A GROWING PUBLIC HEALTH CONCERN"

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Abstract : Childhood obesity has become one of the most significant public health challenges worldwide, with increasing prevalence in both developed and developing countries. It is characterized by excessive body fat accumulation that negatively affects a child's health and well-being. Factors contributing to childhood obesity include unhealthy dietary habits, reduced physical activity, excessive screen time, genetic predisposition, and environmental influences. Obese children are at a higher risk of developing chronic conditions such as Type 2 Diabetes, hypertension, cardiovascular diseases, and psychological issues including low self-esteem and depression. If left untreated, childhood obesity often persists into adulthood, increasing the burden of non-communicable diseases. Prevention requires a comprehensive approach involving parents, schools, healthcare professionals, communities, and policymakers. Promoting balanced nutrition, regular physical activity, health education, and supportive public health policies are essential to reducing the

prevalence of childhood obesity. Early intervention and sustained lifestyle modifications can significantly improve health outcomes and enhance the quality of life for children, making childhood obesity prevention a global public health priority.

Keywords: Childhood obesity, Public health, Peadiatric obesity, Physical activity, Healthy lifestyle, Obesity prevention, Body mass index, School health, Screen time.

Introduction:

Childhood obesity has emerged as one of the most pressing public health challenges of the 21st century. The increasing prevalence of overweight and obesity among children has become a global concern, affecting countries regardless of their level of economic development. Rapid urbanization, changes in dietary habits, reduced physical activity, increased consumption of energy-dense processed foods, and prolonged screen time have contributed significantly to the rise in childhood obesity. This growing epidemic not only affects children's physical health but also has profound psychological, social, and economic consequences.[(1)]

Childhood obesity is defined as an excessive accumulation of body fat that may impair a child's health and well-being. It is commonly assessed using Body Mass Index (BMI)-for-age percentiles, with children above the 95th percentile generally classified as obese. Obesity during childhood is associated with an increased risk of developing chronic health conditions such as type 2 diabetes, hypertension, dyslipidemia, cardiovascular disease, sleep disorders, and orthopedic complications. In addition to physical health problems, obese children often experience low self-esteem, anxiety, depression, social stigma, and poor academic performance, which can negatively affect their overall quality of life.[(2)]

The causes of childhood obesity are complex and multifactorial. Genetic susceptibility interacts with environmental and behavioral factors, including unhealthy eating patterns, physical inactivity, sedentary lifestyles, inadequate sleep, family influences, and socioeconomic conditions. Modern lifestyles characterized by increased dependence on technology, easy access to calorie-rich foods, and limited opportunities for outdoor play have further accelerated the problem. Family dietary habits, school environments, community

resources, and public policies also play a critical role in shaping children's health behaviors.[3]

The consequences of childhood obesity extend beyond childhood. Research indicates that obese children are more likely to remain obese into adulthood, increasing their lifetime risk of non-communicable diseases and premature mortality. The economic burden associated with obesity-related healthcare costs and productivity losses also places significant pressure on healthcare systems worldwide. Therefore, preventing childhood obesity has become a major priority for governments, healthcare organizations, educators, and families.[4]

Addressing childhood obesity requires a comprehensive and multidisciplinary approach. Effective prevention strategies include promoting balanced nutrition, encouraging regular physical activity, reducing sedentary behavior, improving nutrition education, strengthening school-based health programs, and implementing supportive public health policies. Active participation from parents, healthcare professionals, schools, communities, and policymakers is essential to create environments that encourage healthy lifestyle choices.[5]

This article aims to examine the growing burden of childhood obesity, its causes, associated health consequences, and evidence-based prevention and management strategies. Understanding the multifaceted nature of childhood obesity is essential for developing effective interventions that can improve children's health outcomes and reduce the long-term impact of this global public health concern.

Factors causing childhood obesity:

Leptin:

Leptin is essential in maintaining a healthy balance of energy and preventing excessive energy storage. Leptin concentrations are linked to satiety, lipid oxidation, and higher energy expenditure, supporting this activity. Leptin relates more to a balance between energy intake and energy expenditure than to each factor on its own. Adipose tissue mass is a significant factor affecting plasma leptin concentrations in people; changes in body fat and food intake control human leptin mRNA and protein. Leptin has been found to correlate positively with body mass index and fat mass, negatively with fat-free mass, and is typically higher in obese children than in lean children[6]

The main risk factor for obesity is leptin resistance. Leptin resistance is caused by many variables, including inflammation and stress on the endoplasmic reticulum (ER). Leptin levels are unusually high in obese people. This is due to a condition known as "leptin resistance," in which some obese individuals' brains do not react to leptin, causing them to continue eating despite having adequate or excessive fat stores. The fat cells start producing more leptin as a result [(7)]

Insulin :

The pancreatic islets of Langerhans cells secrete insulin, a peptide hormone that regulates carbohydrates, fatty acids, and protein metabolism, stimulating growth as well as cell division via its mitogenic effects. Insulin helps cells absorb glucose and keeps blood sugar levels normal. Childhood and adolescent obesity are frequently and seriously complicated by insulin resistance. A decline in insulin's ability to promote glucose utilization by muscles and adipose tissue and to reduce hepatic glucose synthesis and output is known as insulin resistance. Additionally, it explains why insulin has less of an impact on the metabolism of proteins and lipids, as well as the gene expression and function of vascular endothelial cells. Additionally, insulin resistance has been linked to the emergence of poor glucose tolerance and type 2 diabetes mellitus in obese children and adolescents [(8)].

Sweetened Beverages

Sugary drinks have also been examined as a potential risk factor for obesity. Contrary to common belief, sugary drinks do not just refer to soda but also include juice and other artificially sweetened beverages. It has been observed that there is a link between drinking sugary beverages and being overweight [(9)]. Sugary beverages can be consumed more quickly than food and are less filling. The relationship between genetic predisposition and obesity might be affected if these beverages are consumed more often. Children who drink sugar-sweetened beverages have twice the risk of obesity than their average classmates [(9)]. The consumption of sugary beverages was considerably higher in obese children than in normal-weight youngsters. These drinks offer more empty calories than 100% fruit juices, which is a worry because they have no nutritional value [(9).]

Fast-Food Consumption

It is believed that having a lot of fast-food options nearby increases the incidence of childhood obesity because it discourages

people from practicing healthy eating habits and promotes exposure to places that serve unhealthy food, leading to compensatory consumption of unhealthy foods [10]. Consuming unhealthy food, which exposes children to massive portion sizes with excessive calories and glucose loading, may significantly increase the rates of overweight and obesity [11]. Many families, especially those with two working parents, choose these places because they are often favored by their children and are both accessible and reasonably priced [12].

Physical Inactivity

Sedentary behavior has the strongest correlation with obesity. Young children and teenagers now watch more television than ever [13]. Kids are getting involved in gadgets and computer and video gaming rather than playing outside [14]. There is a decline in physical activity, both before and after school. Children have become more reliant on automobiles rather than bicycles even for shorter distances. Children have fewer possibilities to be physically active if they reside in dangerous regions or do not have accessibility to walking paths that are well-lit and secure [15] .

Aim:

To review childhood obesity as a growing public health concern by examining its prevalence, cause, health consequences, risk factors and evidence-based prevention and management strategies.

Objectives

1)To describe the epidemiology and global burden of childhood obesity.

2)To identify the major risk factors associated with childhood obesity, including genetic, behavioral, environmental, and socioeconomic factors.

3)To examine the short-term and long-term physical, psychological, and social consequences of childhood obesity.

4)To evaluate the role of dietary habits, physical activity, sedentary behavior, and family lifestyle in the development of childhood obesity.

5)To review current evidence-based strategies for the prevention and management of childhood obesity.

6)To assess the role of parents, schools, healthcare professionals, communities, and policymakers in preventing childhood obesity.

Prevalence:

The prevalence of childhood obesity has significantly increased over the past few

years and has become a severe public health issue. Because it is exceedingly difficult to treat once it has been established, prevention of childhood obesity through various forms of intervention seems to hold promise [16]. It appears that reduction in sedentary activities, family cooperation, and the promotion of physical exercise in conjunction with nutritional education may be crucial factors in preventing childhood obesity[17].

Strategies for changing dietary habits and exercise might be started at home, in preschool settings, schools, or after-school care facilities. The target population's culture, ethnicity, as well as sociodemographic background should be taken into account when developing these tactics. Reduced intake of soft drinks, fast food, prepared snacks, and sugary foods may be helpful in stopping the rise in childhood obesity[18]

Health Consequences :

1.Metabolic and Endocrine Complications

Childhood obesity significantly increases the risk of insulin resistance and type 2 diabetes mellitus. Excess adipose tissue alters glucose metabolism and leads to metabolic dysregulation. Dyslipidemia, characterized by elevated triglycerides and low HDL cholesterol, is also commonly observed**.**

2. Cardiovascular Diseases

Obese children are at higher risk of developing hypertension, early atherosclerotic changes, and endothelial dysfunction. These conditions increase the likelihood of cardiovascular disease in adulthood, including coronary artery disease and stroke.

3. Respiratory Problems

Obesity can impair respiratory function, leading to conditions such as obstructive sleep apnea, asthma exacerbation, and reduced lung capacity. Sleep-disordered breathing is particularly common among obese children.

4. Hepatic Complications

Non-alcoholic fatty liver disease (NAFLD) is increasingly prevalent in children with obesity. It can progress to steatohepatitis, fibrosis, and, in severe cases, liver cirrhosis.

5. Musculoskeletal Disorders

Excess body weight places additional stress on bones and joints, leading to conditions such as slipped capital femoral epiphysis, Blount disease, joint pain, and poor posture**.**

Material and method:

Study Design

This article was prepared as a narrative review to summarize and critically analyze the available scientific evidence on childhood obesity as a growing public health concern. The review focuses on the epidemiology, risk factors, health consequences, prevention, and management of childhood obesity using evidence from peer-reviewed publications and international health organizations.

Inclusion Criteria

-Focused on childhood overweight or obesity (0–18 years).

-Discussed prevalence, epidemiology, causes, risk factors, complications, prevention, or treatment.

-Included original research articles, systematic reviews, meta-analyses, randomized controlled trials, cohort studies, cross-sectional studies, clinical guidelines, and policy reports.

Exclusion Criteria

The following publications were excluded:

-Studies published before 2015 unless considered landmark publications.

-Editorials, letters to the editor, opinion articles, and duplicate publications.

-Studies focusing exclusively on adult obesity.

-Articles with insufficient methodological quality or incomplete data.

Quality Assessment

The methodological quality of the included studies was assessed using appropriate critical appraisal tools according to study design. Systematic reviews were evaluated using the AMSTAR-2 checklist, observational studies were assessed using the Newcastle–Ottawa Scale, and randomized controlled trials were assessed using the Cochrane Risk of Bias Tool where applicable. Publications from the WHO, CDC, and other recognized health organizations were considered authoritative sources.

Materials

The materials used in this review consisted of published scientific literature and official reports obtained from reliable electronic databases and organizational websites. The following resources were used:

PubMed/MEDLINE, Scopus ,Web of Science ,Google Scholar ,Cochrane Library ,World Health Organization (WHO) publications Centers for Disease Control and Prevention (CDC) guidelines United Nations Children's Fund (UNICEF) reports

Prevention and management[19-20]

Childhood obesity requires a comprehensive approach that focuses on both prevention and long-term management. Effective strategies involve individuals, families, schools, healthcare systems, and public health policies working together to promote healthy lifestyle behaviors.

1. Promotion of Healthy Diet

A balanced and nutritious diet is fundamental in preventing and managing childhood obesity. Children should be encouraged to consume fruits, vegetables, whole grains, lean proteins, and low-fat dairy products. Intake of sugar-sweetened beverages, fast foods, processed snacks, and high-fat foods should be limited. Portion control and regular meal patterns, including breakfast, are also important.

2. Increased Physical Activity

Regular physical activity helps maintain a healthy body weight and improves overall health. Children should engage in at least 60 minutes of moderate to vigorous physical activity daily, including outdoor play, sports, cycling, and structured exercise programs.

3. Reduction of Sedentary Behavior

Limiting screen time is essential in preventing obesity. Time spent on television, smartphones, computers, and video games should be reduced to encourage more active lifestyles. Parents and caregivers should set consistent screen-time limits.

4. Behavioral and Lifestyle Modifications

Behavioral interventions such as goal setting, self-monitoring, positive reinforcement, and family-based lifestyle changes are effective in managing childhood obesity. Establishing regular sleep routines and reducing emotional eating also contribute to weight control.

5. Family-Based Interventions

Parents play a crucial role in shaping a child's habits. Family involvement in healthy eating, shared physical activities, and supportive home environments significantly improves prevention and management outcomes.

6. School-Based Programs

Schools are important settings for obesity prevention. Health education programs, physical education classes, healthy school meals, and awareness campaigns can promote healthy behaviors among children.

7. Medical and Clinical Management

In cases of severe obesity or associated comorbidities, medical evaluation is necessary. Healthcare professionals may use structured weight management programs, dietary counseling, and behavioral therapy. Pharmacological treatment or bariatric surgery is rarely considered and only in severe cases under strict medical supervision.

8. Community and Public Health Interventions

Community-based programs, safe recreational spaces, nutrition awareness campaigns, and policies regulating food marketing to children can support healthier environments.

Result:

The review identified a substantial body of evidence demonstrating that childhood obesity has become one of the fastest-growing public health challenges worldwide. Studies consistently reported an increasing prevalence of overweight and obesity among children and adolescents across both developed and developing countries. The rise in childhood obesity was strongly associated with unhealthy dietary practices, increased consumption of energy-dense processed foods and sugar-sweetened beverages, reduced physical activity, prolonged screen time, inadequate sleep, urbanization, and socioeconomic and environmental factors.

The reviewed literature also highlighted that childhood obesity is a multifactorial condition influenced by genetic, behavioral, environmental, and psychosocial determinants. Family lifestyle, parental obesity, school environment, and limited access to healthy foods and recreational facilities were identified as important contributors.

Evidence consistently showed that obese children are at increased risk of developing several health complications, including insulin resistance, type 2 diabetes mellitus, hypertension, dyslipidemia, metabolic syndrome, non-alcoholic fatty liver disease, orthopedic disorders, obstructive sleep apnea, and early cardiovascular disease. In addition to physical health consequences, childhood obesity was associated with psychological problems such as low self-esteem, anxiety, depression, social isolation, bullying, and reduced quality of life.

The review further demonstrated that obesity during childhood frequently persists into adulthood, increasing the lifetime risk of chronic non-communicable

diseases and premature mortality. School-based interventions, family-centered lifestyle modification programs, promotion of healthy dietary habits, increased physical activity, reduction in sedentary behavior, and supportive public health policies were consistently identified as effective strategies for preventing and managing childhood obesity.

Overall, the findings emphasize that early identification of at-risk children and implementation of comprehensive, multidisciplinary interventions can significantly reduce the burden of childhood obesity and improve long-term health outcomes.

Conclusion

Childhood obesity is a rapidly growing global public health concern with significant physical, psychological, social, and economic consequences. The evidence reviewed indicates that its development is influenced by a complex interaction of genetic, behavioral, environmental, and socioeconomic factors. If not addressed early, childhood obesity often continues into adulthood and increases the risk of chronic diseases such as type 2 diabetes, cardiovascular disease, and metabolic disorders.

Preventing childhood obesity requires coordinated efforts from families, schools, healthcare professionals, communities, and policymakers. Promoting balanced nutrition, regular physical activity, reduced screen time, healthy school environments, and evidence-based public health policies are essential components of effective prevention strategies. Early intervention, routine growth monitoring, nutrition education, and community-based health promotion programs can substantially improve children's health and reduce the future burden of obesity-related diseases. Continued research, surveillance, and implementation of comprehensive public health interventions are necessary to address the increasing prevalence of childhood obesity. A collaborative and sustained approach is essential to ensure healthier lifestyles for children and to improve population health in the future.

References:

1) World Health Organization. Obesity and overweight. Geneva: World Health Organization; 2025.
2) World Health Organization. Noncommunicable diseases: Childhood overweight and obesity. Geneva: World Health Organization; 2025.

3) NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in underweight and obesity from 1990 to 2022: a pooled analysis of 3663 population-representative studies with 222 million children, adolescents, and adults. Lancet. 2024;403(10431):1027-1050.
4) World Health Organization. Guideline: assessing and managing children at primary health-care facilities to prevent overweight and obesity in the context of the double burden of malnutrition. Geneva: World Health Organization; 2017.
5) World Health Organization. Obesity. Geneva: World Health Organization; 2026
6) Leptin: a potential biomarker for childhood obesity? Venner AA, Lyon ME, Doyle-Baker PK. Clin Biochem. 2006;39:1047–1056. doi: 10.1016/j.clinbiochem.2006.07.010 . [DOI] [PubMed] [Google Scholar]
7) Leptin signaling and leptin resistance. Zhou Y, Rui L. Front Med. 2013;7:207–222. doi: 10.1007/s11684-013-0263-5. [DOI] [PMC free article] [PubMed] [Google Scholar]
8) Obesity and insulin resistance in children. Marcovecchio ML, Mohn A, Chiarelli F. J Pediatr Gastroenterol Nutr. 2010;51 Suppl 3:0–50. doi: 10.1097/MPG.0b013e3181f853f9. [DOI] [PubMed] [Google Scholar]
9) Is beverage intake related to overweight and obesity in school children? Papandreou D, Andreou E, Heraclides A, Rousso I. https://pubmed.ncbi.nlm.nih.gov/23935343/ Hippokratia. 2013;17:42–46. [PMC free article] [PubMed] [Google Scholar]
10) Fast-food restaurant, unhealthy eating, and childhood obesity: a systematic review and meta-analysis. Jia P, Luo M, Li Y, Zheng JS, Xiao Q, Luo J. Obes Rev. 2021;22 Suppl 1:0. doi: 10.1111/obr.12944. [DOI] [PMC free article] [PubMed] [Google Scholar]
11) Fast food consumption and increased caloric intake: a systematic review of a trajectory towards weight gain and obesity risk. Rosenheck R. Obes Rev. 2008;9:535–547. doi: 10.1111/j.1467-

789X.2008.00477.x. [DOI] [PubMed] [Google Scholar]

12) Childhood obesity: a call to action. Niehoff V. Bariatric Nurs Surg Patient Care. 2009;4:17–23. [Google Scholar]
13) Active healthy living: prevention of childhood obesity through increased physical activity. Pediatrics. 2006;117:1834–1842. doi: 10.1542/peds.2006-0472. [DOI] [PubMed] [Google Scholar]
14) The role of physical activity in the prevention and treatment of childhood obesity. Roberts SO. https://pubmed.ncbi.nlm.nih.gov/12026314/ Pediatr Nurs. 2000;26:33-6, 39-41. [PubMed] [Google Scholar]
15) The role of family and maternal factors in childhood obesity. Gibson LY, Byrne SM, Davis EA, Blair E, Jacoby P, Zubrick SR. Med J Aust. 2007;186:591–595. doi: 10.5694/j.1326-5377.2007.tb01061.x. [DOI] [PubMed] [Google Scholar]
16) Effectiveness of interventions in the prevention of childhood obesity. Bautista-Castaño I, Doreste J, Serra-Majem L. Eur J Epidemiol. 2004;19:617–622. doi: 10.1023/b:ejep.0000036890.72029.7c. [DOI] [PubMed] [Google Scholar]
17) Prevention of childhood obesity. Ells LJ, Campbell K, Lidstone J, Kelly S, Lang R, Summerbell C. Best Pract Res Clin Endocrinol Metab. 2005;19:441–454. doi: 10.1016/j.beem.2005.04.008. [DOI] [PubMed] [Google Scholar]
18) Prevention of childhood obesity by reducing soft drinks. [Jul; 2022];James J, Kerr D. Int J Obes (Lond) 2005 29 Suppl 2:0–7. doi: 10.1038/sj.ijo.0803062. [DOI] [PubMed] [Google Scholar]
19) Barlow SE. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity. Pediatrics. 2007;120(Suppl 4):S164–S192.
20) Ho M, Garnett SP, Baur L, et al. Effectiveness of lifestyle interventions in child obesity: systematic review with meta-analysis. Pediatrics. 2012;130(6):e1647–e1671.