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A Review of Effect of High Sugar Consumption in Children

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ABSTRACT

High sugar consumption in the diet of children has become a serious issue due to its effect on eating habits, obesity and tooth decay. During the period from the 1990s to 2018, a significant increase of 23% in obesity was seen due to the consumption of sugar-sweetened beverages or drinks. Highly processed products, which include highly added sugar in their composition are linked with an increase in BMI and waist circumference. The eating habits of their parents mostly influence dietary choices in children. Thus, an inclusive approach is needed to look into all aspects of lifestyle and nutrition, which may have a better long-term outcome. Dietary guidelines, educational campaigns, high taxes induced on sugar-filled beverages, policy changes, and public health initiatives are all important for sugar consumption decline and minimalizing harmful health effects.

INTRODUCTION

Children consuming sugar should be addressed due to its effects on health, surrounding obesity, dental caries, and eating habits. The rising intake of sugar amid children is concerning, as research reveals a 23% increase in sugar-sweetened beverage intake from 1990 to 2018, and an overlapping rise in obesity rates has been seen from 8% to 20% during the same time period (Colombo & Paglia, 2024). Consuming high amount of sugar from ultra-processed foods is correlated with higher BMI and weight-related issues in children (Barreto *et al.,* 2022). Regular sugar intake generally boosts the prevalence of dental caries, with youngsters eating a sugar-rich diet being 1.5 times more likely to develop cavities (Dewi *et al.,* 2024). Maternal education & household income are linked to sugar intake levels, emphasizing the need for health education adapted to various backgrounds (Reis *et al.,* 2022). While tackling sugar consumption is crucial, only focusing on sugar may neglect other nutritional elements, which contribute to obesity in children and health difficulties. By considering all aspects of nutrition & lifestyle, a holistic approach may offer superior long-term effects.

Types of Sugar

It is essential to distinguish between added sugars and natural sugars to understand their effects on health. Added sugars are those that are added during food processing, including sucrose and high-fructose corn syrup. High sugar consumption is associated with obesity, type 2 diabetes, and heart diseases (Moore & Fielding, 2022; Dutta *et al.,* 2024). It is commonly present in sugary beverages, snacks, and processed foods, which leads to a poor quality of diet (Ricciuto *et al.,* 2024; Ricciuto *et al.,* 2023).

Natural sugars are those which are found in complete foods like fruits and dairy. These sugars are less hazardous due to their presence within a food matrix that includes fibre, which delays digestion and decreases glycaemic response (Moore & Fielding, 2022). Fruits, vegetables, and dairy products, which give necessary nutrients alongside sugars, are the sources for natural sugars.

While added sugars represent substantial health hazards, natural sugars can be part of a healthy diet. However, the issue remains in regulating overall sugar intake, particularly from processed sources, to limit health hazards associated with excessive consumption.

Historical Patterns in the Consumption of Sugar among Children Over the Decades

Historical patterns in the consumption of sugar among children have shown substantial changes over the decades, affected by several variables including public health campaigns and dietary standards. Notably, whereas intake of sugar among youngsters in the United States witnessed a substantial increase until the early 2000s, recent years have shown a drop, particularly in added sugars from sweetened beverages. This overview will cover major changes in sugar intake, focusing on different areas and age groups.

Sugar Consumption Patterns in the United States

Average weekly consumption of sugar-sweetened drinks among the children aged 3 to 19 years rose by 0.68 servings, or 22.9%, between 1990 and 2018. This demonstrates a growing usage of sugary drinks over the decade (Lara-Castor *et al.,* 2024). In the U.S., the added sugar consumption fell from 15.6% to 12.6% of total calories consumed by children (ages 2–8) and from 18.4% to 14.3% by teenagers (ages 9–18) between 2001 and 2018. The drop is mostly related to lower use of sugar-sweetened liquids, which remained the primary source of added sugars ("Trends in Added Sugars Intake and Sources Among US Children, Adolescents, and Teens Using NHANES 2001–2018", 2022).

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Global Viewpoints

A systematic assessment demonstrated that whereas U.S. children saw a large drop in sugar intake post-2000, other nations exhibited relatively minor modifications over 3 decades (Corte *et al.,* 2021). In Germany, sugar intake patterns demonstrated an increase from 1985 to 2005, followed by a considerable decline since 2010, refuting the presumption of growing consumption of sugar (Perrar *et al.,* 2020). Other studies have shown that during the years 1990 and 2016, the sugar consumption among German children and teenagers reduced dramatically, as demonstrated by decreasing urine fructose and sucrose excretion; however, intake levels remained surpassed health recommendations (Perrar *et al.,* 2020). In Wales, a study indicated that daily intake of sugar-sweetened liquids in teenagers declined from 57% to 18% between 1998 and 2017, however, differences remained based on socioeconomic level, with lower-income groups having greater consumption rates (Morgan *et al.,* 2021).

Despite these declines, sugar intake among youngsters remained above recommended levels, indicating a need for continuous monitoring and intervention efforts. Conversely, some research implies that global sugar consumption among youngsters has increased, highlighting the complexity of dietary trends across different regions (Anderer, 2024).

Health Impacts Of Excessive Sugar Consumption

Overconsumption of sugar has been connected to a number of chronic illnesses and health issues, making it a serious public health concern.

Obesity

Obesity, a significant risk factor for many chronic diseases, is closely linked to excessive sugar intake. Because sugar-sweetened beverages (SSBs) have a high calorie content and poor satiety-inducing qualities, they are a major contributor to weight gain. According to studies, people who regularly consume sugar-sweetened beverages (SSBs) are more likely to gain their weight and become obese than people who don't (Malik & Hu, 2022; Yusuf, 2024).

There are multiple factors that contribute to the association between sugar consumption and obesity:

Elevated Energy Density

Sugary meals and beverages typically possess a high caloric content while being deficient in vital nutrients, resulting in excessive intake without inducing satiety (Haouimi, 2022; Haque *et al.,* 2020).

Liquid Calories

Beverages with added sugars are associated with weight gain due to lower satiety in liquid calories compared to solid foods, which leads to the consumption of excessive quantities (Malik & Hu, 2022; Manolis & Manolis, 2019).

Metabolic Consequences

Diets which are high in sugar interfere with metabolic functions, resulting in storage of and insulin resistance, which are important factors in obesity Fisher *et al.,* 2024; Alam *et al.,* 2022).

Dental problems

Dental cavities and several oral health issues are among the most thoroughly established repercussions of excessive sugar intake. Sugars act as a principal energy source for detrimental oral bacteria, which generate acids that demineralise tooth enamel and result in cavities (Cui, 2023; Haouimi, 2022).

Essential aspects about sugar consumption and oral health:

Tooth Decay

Dental caries is directly related to the frequency and quantity of sugar consumption. Research indicates that decreasing sugar consumption markedly diminishes the likelihood of dental caries caries (Haouimi, 2022; Yusuf, 2024).

Oral Microbiome

Excess intake of sugar can disturb the balance of the oral microbiome, which promotes the proliferation of harmful bacteria that lead to periodontic ailments (Shanmugasundaram & Karmakar, 2024; Heilmann *et al.,* 2020).

Metabolic Diseases

Excessive consumption of increases the risk of metabolic disorders, including type 2 diabetes, cardiovascular disease, and non-alcoholic fatty liver disease (NAFLD). The processes underlying these illnesses lead to insulin resistance, inflammation, and affected lipid metabolism (Fisher *et al.,* 2024; Alam *et al.,* 2022).

Insulin Resistance

Insulin resistance is associated with high sugar diets, a key factor in the onset of type II diabetes (Fisher *et al.,* 2024; Alam *et al.,* 2022).

Damage in Liver

NAFLD and other metabolic disorders are sometimes the outcome of consuming too much sugar and fructose, which can lead to buildup of fat in the liver (Pamungkas *et al.,* 2023; Shi *et al.,* 2021).

Cardiovascular Diseases

Dyslipidaemia and high blood pressure are linked with sugar-rich diets and poor dietary habits (Baumann *et al.,* 2022; Agarwal *et al.,* 2024).

Behavioural Effects

Addiction

The brain's reward system gets activated by the sugar, which results in cravings and addictive behaviours similar to those observed in substance use disorders (Witek *et al.,* 2022; Ferreira-Junior *et al.,* 2023).

Mood Disorders

Depression, anxiety, stress and other mood disorders are also linked with sugar-rich diets (Ferreira-Junior *et al.,* 2023; Prada *et al.,* 2022).

Cognitive Impairments

Eating too much sugar might impair cognitive function, especially in areas like memory and judgment (Agarwal *et al.,* 2024).

Unnecessary consumption of sugar can lead to several health problems, like obesity, dental health issues, metabolic abnormalities, and behavioural consequences (Fisher *et al.,* 2024). High-sugar diets can generate chronic inflammation, which can lead to obesity. General health and well-being can be improved if effective measures are taken.

Socioeconomic and Environmental Factors

Influence of Marketing and Advertising on Children's Food Choices

Direct marketing targeting youngsters greatly affects their selections for sugary foods, contributing to detrimental dietary patterns and obesity. Children's cognitive capacities and social competencies render them vulnerable to food advertising, intensified by widespread marketing tactics. Children possess insufficient inhibitory control to withstand persuasive marketing, resulting in heightened cravings for sweet foods (Naderer, 2021). Research has shown that exposure to sugary beverage advertising and brand preference among adolescents suggests that marketing significantly influences their decisions (Remedios *et al.,* 2024; Remedios *et al.,* 2023). Marketing frequently suggests health advantages, deceiving youngsters and parents regarding the nutritional worth of sugary products (Harris & Jensen, 2024).

Access to Healthy Food Options VS. Sugary Products

Socioeconomic characteristics strongly impact children's access to nutritious foods, with better socioeconomic backgrounds ingesting more fruits and vegetables, while lower socioeconomic statuses (SES) have diets high in sugary items. Highly educated parents are associated with higher fruit and vegetable consumption among children by setting an example of healthy eating habits and providing better food options at home (Vepsäläinen *et al.,* 2023). Research has shown that in Portugal, children who had highly educated parents consumed more fruits and vegetables, signifying that parental education is a reliable asset to dietary quality (Vilela *et al.* 2020). Children from higher income backgrounds have greater access to nutritious foods, while those from lower income backgrounds often have less access to fresh vegetables and are more exposed to sugary foods (Fismen *et al.,* 2021). A study done in 2025 shows that in Australia, children with high Socioeconomic status were shown to consume 84% more fruits and vegetables and 19% fewer sugary beverages compared to their less-privileged peers (Gautam *et al.,* 2025).

Role of Schools in Nutrition Education and Food Offerings

By encouraging healthy eating practices and socioemotional abilities through nutrition instruction and thoughtful food offerings, schools can lower sugar intake. Implementing structured educational programs like Comprehensive Community Intervention for Children in Nutritious and Healthy Environments (INCAI, due to its acronym in Spanish) can drastically reduce added sugar consumption, as proven in research in Mexico, boosting healthy food and physical exercise among schoolchildren (Morales-Ruán *et al.,* 2025). An intervention was done in Chinese schools for reducing sugar-sweetened beverage intake, which shows a notable decline in consumption among younger children (Zhu *et al.,* 2021). But still, there is a need to develop such nutritional educational programs and policies for school-going children to help reduce the consumption of sugars.

Dietary Guidelines

According to WHO, the total calorie intake from sugars should be less than 10%, mostly aiming for less than 5%. The suggested daily allowance for children is roughly 30–40 grammes, or 120–160 calories (Dietary Sugars and NCDs, 2023).

Interventions

Engaging children in interactive sessions can improve their awareness of healthy eating and lead to better dietary choices, as demonstrated by programs such as "Sugar Shenanigans" (Krazl & Mailow, 2022). To provide a supportive atmosphere for healthy choices, initiatives such as the "Are You Too Sweet?" campaign highlight the significance of informing parents and kids on dietary standards. Parents should also be included in these interventions as they are the main force behind kids choosing healthy eating habits (Bestle *et al.,* 2020). Dietary adjustments are more effective when programs incorporate parental assignments and educational materials (Lambrinou *et al.,* 2020). While it's crucial to note that not all dietary interventions or policies result in positive outcomes but with monitoring and screening, positive outcomes can still be achieved.

CONCLUSION

Excessive sugar intake in children affects their physical, emotional and mental well-being. Excessive sugar consumption can also increase the risk of metabolic diseases. To address this issue, a diverse strategy is needed to be applied, like implementing nutrition education programmes especially in schools, changes in policies and socioeconomic actions to provide fair access to healthful foods. Practical plans and effective strategies can be created to safeguard children's health and their future well-being by understanding the processes and long-term impacts of sugar consumption.

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