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Yadap Prasad Timsina
M.Sc. Nutrition and Dietetics, Department of Food Technology and Nutrition, Lovely Professional University, Phagwara, Punjab, India

Corresponding Author:
Yadap Prasad Timsina
M.Sc. Nutrition and Dietetics, Department of Food Technology and Nutrition, Lovely Professional University, Phagwara, Punjab, India

Dietary factors and childhood obesity: A comprehensive review

Yadap Prasad Timsina

Abstract
Background: This literature review examined the complex factors that contribute to childhood and adolescent obesity, focusing on the biological, cultural, and environmental influences on eating habits. The global obesity prevalence is projected to reach alarming levels by 2030, with sex and regional disparities.
Method: We extensively gathered relevant research papers and articles from reputable sources, including PubMed, Google Scholar, and other scientific websites. Our objective was to review the latest research findings and comprehensively understand this subject.
Discussion: Different dietary factors contributing to childhood obesity were considered. Sweetened beverages have been associated with weight gain and obesity-related diseases. Portion size influences energy intake and weight gain, with larger portions of energy-dense foods leading to overeating. Eating in front of the television negatively affects food habits and diet quality. Eating without hunger or emotional factors contributes to unhealthy dietary patterns. Frequent eating out and binge eating were identified as risk factors, along with snacking patterns involving high-energy, low-nutrient snacks.
Conclusion: This review emphasizes the importance of comprehensive approaches to prevent and address childhood obesity. Primary prevention strategies should focus on educating children and their families and promoting healthy diets. Secondary prevention efforts aimed at reducing childhood obesity and preventing unhealthy habits are crucial. Combining both approaches yielded the best results for tackling childhood obesity.

Keywords: Childhood obesity, dietary factors, eating without hunger, sedentary behavior, dietary factors, sugar-sweetened beverages

1. Introduction
The complex interplay between biological, cultural, and environmental factors causes obesity in children (Kansra *et al*., 2021) [24]. By 2030, projections indicate that the global prevalence of obesity (BMI ≥30kg/m2) will reach 1 in 5 women and 1 in 7 men, accounting for over 1 billion individuals worldwide (Barata Cavalcanti *et al*., 2022) [6]. Similarly, the fourth round of the WHO European Childhood Obesity Surveillance Initiative (COSI) conducted from 2015 to 2017 revealed geographic differences in body weight among over 203,000 children aged 6-9 in 36 countries. Northern European children were the tallest, Southern Europeans were the heaviest, and Central Asian were the lightest and shortest. The study found that approximately 28.7% of boys and 26.5% of girls were overweight or obese, while 2.5% of boys and 1.9% of girls were thin, indicating an ongoing concern about unhealthy weight status in the WHO European Region (Spinelli *et al*., 2021) [57].
Children who are overweight or obese face a greater likelihood of psychosocial difficulties, and these challenges are intensified by obesity-related stigma, teasing, and bullying, leading to adverse effects on their emotional well-being, physical health, and overall performance, with potentially long-lasting consequences from childhood to adulthood (Rankin *et al*., 2016). Rising global obesity rates, particularly in children, impose health and financial burdens, increase mortality and increase the risks of diabetes, heart disease, dementia, and cancer. Approximately 14% of children are obese, and obesity damages multiple organs through fat accumulation and related factors, leading to impaired glucose tolerance and alarming progression to type 2 diabetes (Bass & Eneli, 2015) [8] (Weiss & Caprio, 2005) [58].
Childhood obesity is a threat to the physical and mental health of both children and adolescents. Psychosocial issues are prevalent among groups such as adolescent females, clinically obese individuals, and those with severe and chronic obesity (Sagar & Gupta, 2018) [51]. Obesity can be reduced by educating children and families by promoting a healthy diet. Similarly, in secondary prevention, efforts to reduce childhood obesity to prevent children

from developing unhealthy habits play an essential role. Consequently, a combination of both produced the best results (Sanyaolu *et al*., 2019) [52]. Addressing the obesity epidemic requires comprehensive approaches as no single intervention can solve this problem (Haegele *et al*., 2018) [19].

Dietary factors of childhood obesity

Sugar-sweetened beverages

Consumption of sugar-sweetened beverages (SSB) promotes weight gain and obesity-related diseases. SSB intake increases cardiometabolic risk. Limiting SSB consumption in children and teenagers significantly reduces obesity prevalence and metabolic risk (Calcaterra *et al*., 2023) [12]. SSB is directly correlated with weight gain, being overweight, and obesity in both children and adolescents. However, several recent and well-conducted meta-analyses have disputed these findings (Keller & Bucher Della Torre, 2015) [25]. Calorically sweetened beverages are associated with weight gain and an increased risk of obesity (Olsen & Heitmann, 2009) [44]. A higher intake of sweetened beverages is associated with higher energy intake, subsequently accounting for one-fifth of the weight gain between 1977 and 2007 in the US population. Therefore, sweetened beverages account for the obesity epidemic (Woodward-Lopez *et al*., 2011) [59].

Sugar-sweetened beverages (SSB) show more association than other sweetened carbonated beverages and fruit drinks with added sugars; however, the strength of its association with weight gain is difficult to analyze (Pereira, 2014) [47]. Globally SSB intake has increased significantly in recent decades, contributing to various comorbidities, reduced quality of life, and financial burdens. furthermore, with weight gain, SSB leads to an elevated risk of T2DM and cardiovascular disease (Malik *et al*., 2010) [34]. SSB is associated with the etiology of weight gain and cardiometabolic diseases, which are clinically related to cardiometabolic risk factors. SSB consumption is high in low and middle-income countries. With urbanization and economic growth, consumption patterns have increased (Malik & Hu, 2022) [33]. Therefore, more effort is needed to intensify the policy-making process concerning SSB intake to reduce the global burden of obesity and chronic diseases.

Portion size

Portion size plays a significant role in determining energy intake and can contribute to weight gain if the portions are larger than appropriate. Numerous well-controlled laboratory studies and evidence from real-life settings have consistently shown that portion size directly influences the amount of food consumed. It is crucial to note that instances of overeating associated with larger portion sizes were sustained and not followed by a compensatory reduction in energy intake. This effect was observed across various types of foods and beverages, with a more pronounced impact on energy-dense foods (Livingstone & Pourshahidi, 2014) [30].

When children were provided with food photographs specifically depicting portion sizes suitable for their age, their accuracy in estimating portion sizes significantly improved compared to those using photographs intended for adults (Foster *et al*., 2006) [16]. As the food portion size increased, total energy intake increased under various conditions. Although the effect of portion size on total intake varied depending on the food and satiety responsiveness. Furthermore, children with poor appetite control are more susceptible to other children in an obesogenic dietary environment with large food portions (Mooreville *et al*., 2015) [35]. Large portions of high-energy foods fuel the obesity pandemic (Barbara J. Rolls, 2003) [7]. Kids are unable to regulate portion size once their dietary patterns and eating habits are altered (Smethers *et al*., 2019) [55]. Thus, portion size has a positive effect on children's energy intake, and adults' ability to correctly predict portion size improved after education/training (Small *et al*., 2013) [54].

The portion size effect is a phenomenon where rising portion size results in greater food intake in both adults and children (English *et al*., 2015) [15]. When parents provided smaller portion sizes of food compared to the kid's choices, the child was likely to be obese. Hence, proper guidance and education from parents on proper portion sizes can reduce the risk of obesity in children (Potter *et al*., 2018) [48]. Portion size strongly influences the dietary habits of children and adolescents. Educating parents about appropriate portion sizes can mitigate the risk of obesity in children and adolescents by promoting smaller portions and fostering healthier eating habits.

Eating in front of the television

Eating in front of the television negatively affects food habits and diet quality, leading to increased consumption of soft drinks, sugar, fat, and snacks. This contributes to weight gain, and overweight is independently associated with watching television and eating while watching (Liang *et al*., 2009) [29]. Watching television is not only related to increased caloric intake; depending on their previous eating habits, kids may eat differently while watching TV. Therefore, to encourage children to self-regulate their energy intake, parents and caregivers should closely monitor and discourage them from watching TV while having meals (Francis & Birch, 2006) [17]. Those who are in private schools, from joint families, and have a family history of overweight/obesity and non-communicable diseases (NCDs) are more likely to be obese compared with their peers. Moreover, excessive television viewing, consumption of junk food/fast food, and a lack of physical activity were identified as significant risk factors contributing to overweight/obesity in the studied population. The number of meals taken gets increases while watching television (Jensen *et al*., 2022) [23].

Limiting TV time and other sedentary activities is a crucial strategy to prevent obesity. Each additional hour of TV per day corresponds to a 13% increase in obesity risk (Zhang *et al*., 2016) [61]. Almost 18% of girls and more than 25% of boys reported eating in front of the television daily. Similarly, boys eating habits are generally less healthy compared with girls. As they ate in front of the television more frequently, their overall food preference deteriorated (Marquis, 2005) [35]. Watching obesogenic food promoted on television entices the child to request it, thereby indirectly increasing the risk of obesity in some children (Zimmerman & Bell, 2010) [63]. Following extensive research, it was discovered that social media influenced children to purchase them. The use of media and marketing tactics changed children's dietary preferences (Boyland & Halford, 2013) [11]. Therefore, eating in front of the television is harmful to children's health as it leads to distracted eating, resulting in overeating and poor food choices. It has a negative impact on the development of social eating habits, as family mealtimes are replaced by solitary TV dinners, resulting in the development of sedentary behavior,

which can increase the risk of obesity and other health problems.

Eating without hunger

Hunger recognition ability is developed through proper training, which facilitates achieving energy balance without the need for restrictive dieting (Ciampolini *et al*., 2013) [13]. Improvement in energy balance mechanisms, in turn, enhances insulin sensitivity and immune activity (Ciampolini *et al*., 2013) [13]. However, digital food advertisements featuring enticing images can significantly impact cognitive, psychological, and physiological functions concerning food consumption (Spence *et al*., 2016) [56]. Eating in the Absence of Hunger (EAH): EAH, eating beyond satiety, is associated with childhood obesity and binge eating (Hohman *et al*., 2022) [21].

Emotional eating (EE) in children leads to unhealthy dietary patterns, although the consequences such as excessive weight gain and obesity often manifest later in life (Jalo *et al*., 2019) [22]. Interventions focusing on enhancing emotional well-being, teaching emotion regulation skills, and promoting distress tolerance strategies benefited individuals prone to emotional eating (Konttinen, 2020) [28]. Eating in the absence of hunger (EAH) is caused by individual and familial factors. Boys tend to exhibit higher rates of EAH, which are associated with increased adiposity, while restrictive feeding practices by parents contribute to EAH in girls. Further research is needed to identify EAH determinants and develop interventions, particularly targeting high-risk groups early on and involving familial components (Savard *et al*., 2022) [53].

A study examining the relationship between childhood EAH and later binge eating behavior revealed that elevated EAH during childhood predicted a greater likelihood of developing binge eating tendencies. This risk was particularly evident in girls with a higher body mass index, negative affect, and maladaptive eating- and weight-related thoughts (Balantekin *et al*., 2017) [5]. Furthermore, the study found that both the persistence and onset of EAH were associated with a sedentary lifestyle. Thus, adopting an active lifestyle may serve as a potential strategy for moderating EAH (Arnold *et al*., 2015) [4].

In summary, eating without hunger can harm children's and adults' health, contributing to overeating, obesity, and related cardiovascular burdens. Additionally, it can disrupt natural hunger and satiety cues, leading to poor dietary habits.

Eating out

Out-of-home eating was found to be associated with overweight and obesity in men, whereas having sit-down meals away from home was protective against obesity in women, indicating that women tend to make healthier food choices when eating outside the home (Bezerra & Sichieri, 2009) [9]. Consuming food away from home (FAFH) frequently was linked to a higher likelihood of obesity (36.22%), while FAFH consumption 1-7 times a week was associated with lower BMI and reduced risk of obesity compared to home-consumed meals. The ideal consumption standard for FAFH was found to be 5-7 times per week. Therefore, avoiding frequent FAFH consumption is recommended to achieve a balanced nutritional intake (D. Kim & Ahn, 2020) [26].

Younger children from urban backgrounds with low family incomes were more likely to eat outside the home, highlighting the need for dietary and nutritional education interventions. Eating out three times per week or more was significantly associated with a higher prevalence of overweight and obesity among boys (Y. Ma *et al*., 2021) [32]. Out-of-home eating was found to be more common among men, younger individuals, and educated respondents, although it was weakly associated with total energy intake. Males who ate at restaurants and similar establishments had a higher BMI and were more susceptible to weight gain (Naska *et al*., 2011) [40]. Boys showed a preference for Western-style food, but those who were overweight or obese at baseline were less likely to consume such food during follow-up (Zheng *et al*., 2021) [62]. Notably, South Korean women, but not men, exhibited unfavorable associations between the daily eating-out rate and obesity and overweight status, emphasizing the need for education on healthy eating practices (H. J. Kim *et al*., 2019) [28].

Eating out of the home is often linked to a higher risk of obesity in children and young adults, primarily due to larger portion sizes, higher calorie and fat content, and lower nutritional quality of the food consumed. Consequently, this can lead to weight gain, poor dietary habits, and an increased risk of obesity-related health issues.

Binge eating

Binge-eating disorder (BED) is characterized by recurrent episodes of excessive eating, even when not hungry, consuming food rapidly until uncomfortably full, and often in isolation, accompanied by feelings of shame and disgust after eating. Unlike other eating disorders, BED does not involve compensatory behavior (Ratković *et al*., 2023) [50]. Binge eating and lack of control eating are prevalent among approximately one-quarter of overweight or obese children and adolescents (He *et al*., 2017) [20]. Teenage binge eating is significantly associated with BMI-related genes, particularly the fat mass and obesity-related transcript (FTO) gene (Micali *et al*., 2015) [37].

Furthermore, BED is associated with several medical conditions in women, including diabetes, hypertension, dyslipidemia, sleep disorder, type 2 diabetes, metabolic syndromes, asthma, gastrointestinal symptoms, menstrual dysfunction, pregnancy complications, intracranial hypertension, and polycystic ovary syndrome (Olguin *et al*., 2017) [43]. Adverse life experiences account for up to 85% of adult obesity causes, with traumatic experiences and post-traumatic stress disorder (PTSD) showing significant associations with obesity (Palmisano *et al*., 2016) [45]. Dysfunctional parental styles, such as affectionless control, also contribute to various health risks for children, with affectionless control exhibited by both parents associated with a ninefold increased risk of obesity (Amianto *et al*., 2021) [2]. Additionally, the prevalence of food addiction is higher in binge eating disorders than in other eating disorders, excluding bulimia nervosa. It is worth noting that food addiction is an independent diagnostic entity that can be observed in individuals without mental illness and in the general population (di Giacomo *et al*., 2022) [14]. Considering its impact on prognosis, addressing food addiction is crucial for enhancing treatment effectiveness and promoting patient recovery.

Therefore, binge eating and lack of control eating are prevalent among overweight and obese children and adolescents and are linked to BMI-related genes, as well as

various medical conditions. Adverse life experiences and dysfunctional parental styles, such as affectionless control, contribute to the development of binge eating disorders and an increased risk of obesity. Early intervention and support are crucial in mitigating these risks and promoting healthy habits and lifestyles.

Snacking

Snacking among children is consistently correlated with restrictive feeding practices and household access to unhealthy food items (Blaine *et al*., 2017) [10]. Consuming snacks with high energy density but low nutrient value is associated with an increased risk of childhood and adolescent obesity. Lack of healthy eating habits due to time constraints and stress among students in schools and universities is a concern, emphasizing the need for raising awareness among the younger generation (Almoraie *et al*., 2021) [1]. Snacking patterns and the type of snacks consumed indicate the diet quality of children and their role in the body mass index (BMI). Larger portions and higher frequencies of snacking are associated with a higher risk of obesity. However, snacking also has a positive impact on diet quality (Pandve & Giri, 2015) [45]. Nevertheless, snacking contributes to a positive energy balance, promotes overweight/obesity, and increases the risk of related conditions (Mattes, 2018) [36].

A study conducted in Greece revealed a higher prevalence of central obesity in boys than girls among school-aged children. Obese children exhibited poorer dietary habits and low levels of physical activity. Urgent efforts are needed to create a healthier environment for children, with a focus on promoting regular meal consumption and reducing sedentary behavior (Grigorakis *et al*., 2016) [18]. While snacking can have poor diet quality, larger portions and higher frequencies of snacking contribute to overweight/obesity, emphasizing the need for healthier habits. Thus, promoting regular meals and reducing sedentary behavior for children's health is crucial.

Skipping breakfast

Skipping breakfast is associated with an increased risk of being overweight/obese and unfavorable metabolic effects, such as elevated blood pressure, insulin resistance, and metabolic syndromes (X. Ma *et al*., 2020) [31] (Monzani *et al*., 2019) [38]. A study involving 43,663 children found that parental breakfast omission increases the likelihood of children skipping breakfast and raises the risk of childhood obesity by 18-116%, with the strongest association observed when both parents skip breakfast (Okada *et al*., 2018) [42]. Skipping dinner is also linked to an increased risk of weight gain and being overweight/obese (Yamamoto *et al*., 2021) [60]. The risk of developing obesity is 43% higher in children and adolescents who regularly skip breakfast than those who regularly take it (Ardeshirlarijani *et al*., 2019) [3]. Poor diet quality and reduced physical activity contribute to the association between breakfast skipping and obesity, with breakfast skippers consuming less potassium and dietary fiber and exhibiting lower engagement in physical activities (Nutr & Aging, 2016) [41]. Therefore, skipping breakfast is associated with an increased risk of being overweight/obese and unfavorable metabolic effects, while parental breakfast omission raises the risk of childhood obesity. Additionally, skipping dinner is linked to weight gain and being overweight/obese.

Diagram below represents, the review summarizing various factors into cause consequences and management.

Table 1: Cause consequence and management of childhood obesity.

Dietary factors	Observation from the literature.			Reference
	Cause	Consequence	Management	
1. Sugar-sweetened beverage.	Sweet sweetened beverages and food products, with added sugar, can cause overweight and also gastrointestinal problems.	Cause overweight and obesity. Harms gut microbiota. Alter eating behavior.	Limit the consumption of SSB. Create awareness. Regulatory actions on unhealthy marketing. Develop healthier eating habits and coping mechanisms.	(Calcaterra *et al*., 2023) [12].
		Cause obesity, elevates the risk of cardiovascular disease and type 2 diabetes	Must bring better policies in place, reduce intake of SSB and reduce the global burden due to various ailments	(Malik & Hu, 2022) [3].
2. Portion size	Larger portion size and lavish eating, parents believe that the child needs more. When larger portions were served, they took 10-15% more than the usual intake.	Overweight, obesity	Awareness among parents, parents to monitor the amount of food a child takes.	(Potter *et al*., 2018) [48].
		Overweight, obesity, higher enjoyment of food.	Educating and advising both parents and children is crucial. Monitoring the portion size.	(Smethers *et al*., 2019) [55].
3. Eating in front of a television	Having a meal in front of the television, uncontrolled and lavish eating. Sedentary Behavior, Unhealthy Food Choices: median of 9-13.5 weekly hours of TV viewing, suggesting prolonged periods of inactivity.	14 cross-sectional studies were included in the meta-analysis with 106169 respondents which indicated, the consequences of increased risk of obesity.	Restricting children from watching the television. 13% increase in obesity risk for each additional hour of TV-watching per day. For which other strategies to engage are recommendable.	(Zhang *et al*., 2016) [61]
		Excessive calorie intake and poor dietary habits. The calories contributed by eating during screen use accounted for 34.7% and 42.3% of daily energy intake in children and adolescents, respectively.	Limit Screen Time, Promote Healthy Eating Habits: Encouraging mindful eating and discouraging screen use during meals can improve diet quality and support weight management in children. Providing education on healthy food choices and the impact of TV viewing while eating.	(Jensen *et al*., 2022) [23]
4. Eating without hunger	Age and gender, increase with age in childhood and is more common in boys. genetic factors also contribute.	Increased Adiposity: EAH is positively associated with adiposity, indicating a potential link to excess body weight and the development of obesity.	Promoting a supportive and balanced feeding environment that respects hunger cues and avoids restrictive practices. More studies are suggested to better	(Savard *et al*., 2022) [53]

	Eating in the Absence of Hunger (EAH): EAH, eating beyond satiety, is associated with childhood obesity and binge eating.		understand this aspect.	
		EAH has been associated with childhood obesity, suggesting a potential causal relationship between eating beyond satiety and excess body weight in children.	Assessing EAH in a group classroom setting can be a feasible and efficient alternative to the traditional individually administered paradigm conducted in a research laboratory.	(Hohman *et al*., 2022)
5. Eating out	About 80.1% of children eat once a week out, 46.7% and 70.9% of children chose Western- and Chinese-style food. Boys are more likely to choose Western-style food than girls. Changes in demographic and socioeconomic characteristics Consumers' demand for higher quality food.	29.8% of the children were overweight or obese. 12.7% of the children were obese. 20.1% of the children had central obesity.	encouraging healthier food, educating children and parents on balance diets, promoting physical activity, and healthier cooking habits.	(Zheng *et al*., 2021) [21]
		Unbalanced nutrition intakes, obesity. High-frequency consumers of Food Away from Home (FAFH) have an elevated chance of being obese (36.22%).	Encourage balanced dietary excessive FAFH consumption. Encourage individuals to limit FAFH consumption to 1-7 times per week to decrease the chance of obesity. Identify the optimal level of FAFH consumption and act. emphasis on a balanced diet	D. Kim & Ahn, 2020) [2]
6. Binge eating	Binge eating and food addiction. Binge eating disorder (BED) is associated with a higher prevalence of food addiction compared to other eating disorders, except for bulimia nervosa. Food addiction can be detected in individuals without mental illness and the general population.	body shape, weight, depressive symptoms, and brooding rumination. FA can be categorized into substance addiction and behavioral addiction, with criteria including hunger, taste, pleasure, the function of food, loss of social connections, weight concerns, and awareness about the disorder.	Recognize and diagnose BED and FA understanding of symptoms and behaviors. Provide psychological and behavioral interventions for individuals with BED, such as cognitive-behavioral therapy (CBT) and interpersonal psychotherapy (IPT). Implement strategies to address emotional regulation, improve body image, and promote healthy eating habits	. (Ratković *et al*., 2023) [50]
		Food addiction may have prognostic value in comorbidities and can impact treatment efficacy and patient recovery. Food addiction could worsen a comorbid eating disorder.	Evaluate food addiction in patients and treat. Address all the components that may influence a patient's response to treatment and outcome. cognitive-behavioral therapy (CBT) or medication, treatment plans.	(di Giacomo *et al*., 2022) [14].
7. Snacking	high-energy, low-nutrient foods, increasing obesity risk. University stress and lack of time hinder healthy snacking habits. Snacking, when practiced in an unhealthy manner, contributes to positive energy balance and promotes overweight/obesity. Snacking is associated with greater energy intake.	Unhealthy snacks, high in energy, sugar, and salt, and low in nutrients, negatively impact health. Consumption of unhealthy snacks is associated with oral health issues, high blood pressure, obesity, and diabetes.	Educate individuals, particularly children, and adolescents, about the importance of consuming healthy snacks that are high in nutrients. Promote the planning and preparation of nutritious snacks to replace unhealthy snacking habits. Raise awareness among university students about the benefits of healthy snacking despite study-related challenges.	(Almoraie *et al*., 2021) [1].
		The link between snacking and body weight is not entirely clear due to limitations in measurement tools and research designs. However, evidence suggests that snacking plays a role in the high prevalence of overweight/obesity, supported by plausible mechanisms.	Efforts should be made to better understand snacking and utilize it to improve overall diet quality. Promote healthful snacking practices that focus on nutrient-dense options. Encourage portion control and mindful eating during snacking. give education and awareness.	(Mattes, 2018) [36]
8. Skipping breakfast	Skipping meals is identified as a significant predictor of weight gain in university students. Limited evidence suggests that skipping breakfast and lunch may not have the same impact on weight gain. skipping breakfast in children and adolescents. Associations between skipping breakfast and cardiovascular outcomes have been reported in adults.	The study found that skipping meals was associated with an increased incidence of weight gain and overweight/obesity in both male and female university students. Within the observation period, a significant number of students experienced weight gain of 10% or more.	Encourage regular and balanced meals, including dinner, to prevent weight gain and overweight/obesity. Promote the importance of a nutritious dinner in overall dietary patterns. Provide education on the potential consequences of skipping meals, particularly dinner, on weight management.	(Yamamoto *et al*., 2021) [60].
		Skipping breakfast causes overweight and obesity in the pediatric population, with a range of 10-30%, and an increasing trend in adolescents, particularly girls. Skipping breakfast is also linked to worse lipid profiles, blood pressure levels, insulin resistance, metabolic syndrome, and lower-quality dietary intake.	Educate children, adolescents, and parents about the importance of breakfast and its impact on weight and metabolic health. Encourage the regular consumption of a nutritious breakfast. Conduct intervention studies to assess the effectiveness of standardized indicators for assessing the risk of overweight/obesity.	(Monzani *et al*., 2019) [38]

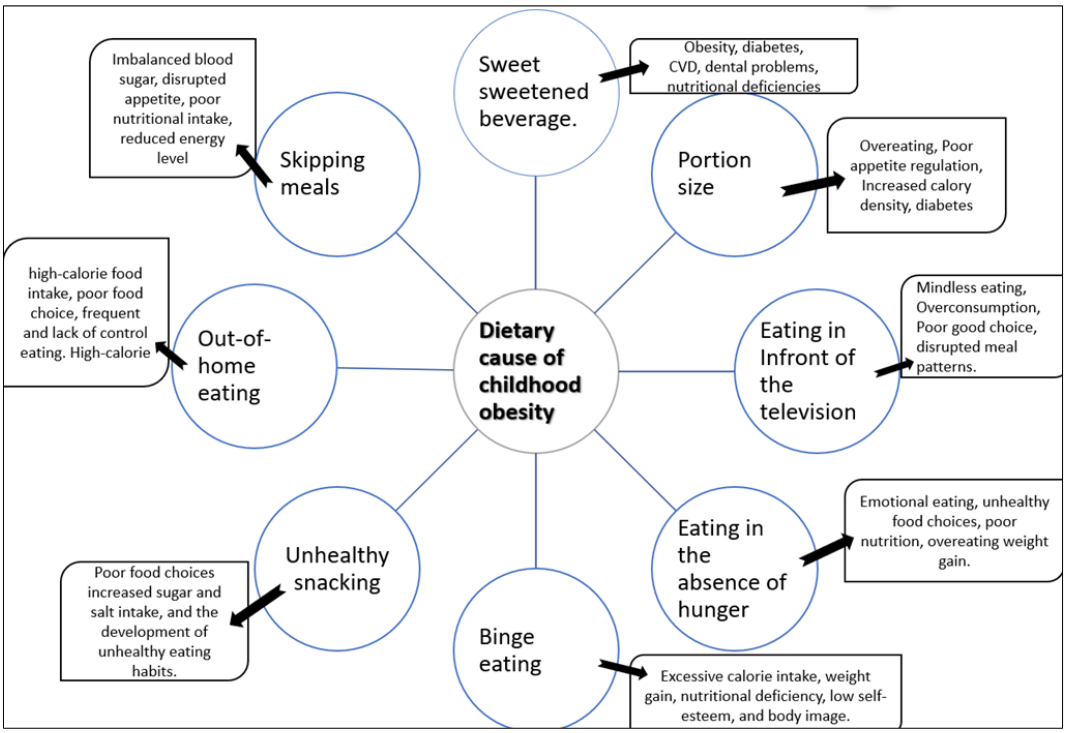

Fig 1: Dietary causes of childhood obesity.

Summary
Dietary factors contribute significantly to childhood obesity. Excessive consumption of SSB causes weight gain obesity and metabolic risks. Portion size affects energy intake and weight gain. Eating in front of the television leads to overconsumption and poor food choices. Eating without hunger disrupts natural cues and promotes overeating. Similarly, eating out elevates the risk of obesity due to larger portions and lower nutritional quality. Furthermore, binge eating and lack of control eating cause obesity risk in children and are associated with various medical conditions. Snacking on high-energy, low-nutrient foods increase obesity risk. Skipping breakfast is linked to weight gain and metabolic issues. Promoting healthier habits and regular meals can help combat childhood obesity.

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Declarations

Ethical approval
This article does not contain any studies with human participants or animals performed by any of the authors.

Competing interest
The authors declare that they have no conflicts of interest.

Authors' contributions
Yadap Prasad Timisina and Imdadul Hoque Mondal carried out the initial conceptualization and design study. Yadav Prasad Timisina conducted the investigation and data analysis under the supervision of Imdadul Hoque Mondal. Yadav Prasad Timisina prepared the initial draft of the manuscript, which was subsequently reviewed and edited by Imdadul Hoque Mondal. Finally, Yadap Prasad Timisina and Imdadul Hoque Mondal prepared the final draft of the manuscript.

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