

FOOD INSECURITY AND CHILDHOOD OBESITY: A SYSTEMATIC REVIEW

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Abstract

Background: Food security for children is a public health issue. Childhood food insecurity is a major public health issue in low-income and developing nations. The 2011–2012 prevalence of childhood obesity was 16.9%, despite a plateau. The link between the two is crucial for proper management.

Objective: this systematic review will further discuss the relationship between food insecurity and the occurrence of obesity in childhood.

Methods: This systematic review used PRISMA guideline, the database used is PubMed, Web of Science, dan Science Direct. ((Food) AND (Insecurity) AND (Relation) OR (influence) AND (Pediatric) OR (Children) AND (Obesity) OR (Fat) OR (Nutritional status)) are used as keywords. Additionally, manual searches are conducted to obtain articles that satisfy the specified criteria. Discrepancies are resolved through consensus with the third author.

Results: There were a total of 12,574 cases included in the study. With ages ranging from five to eighteen. Ethiopia, Canada, the U.S., and Atlanta are among the origins of the research. With investigation years spanning from 2014 to 2022. Children's lack of physical exercise, irregular intake patterns, excessive consumption out of fear of food deterioration, and occasional fruit and vegetable consumption contribute to obesity in food-insecure groups. Majority of population has poor socioeconomic conditions.

Conclusion: Food insecurity is linked to obesity in families. This depends on several things. Childhood obesity management emphasises education and self-efficacy to eat well.

Keywords: Food insecurity; Obesity; Childern

INTRODUCTION

Food security in children is becoming a public health issue.¹ The 1996 World Food Summit defined household food security as having constant access to sufficient, secure, and nutritious food on both a physical and economic level. Contrariwise, food insecurity is defined as "limited or uncertain availability or capacity to obtain and access nutritious and safe food" An estimated 1.9 billion people worldwide (or 25% of the world's population) were food insecure in 2019.² Due to a lack of household funds and other resources, children with food insecurity have limited access to adequate food, resulting in diminished food quality, decreased food intake, and dietary disruptions. Children from low-income and minority families are more likely to be food insecure.³

Children's obesity is a persistent public health issue with both immediate and long-term consequences. Despite the fact that the prevalence of paediatric obesity appears to have stabilised, it increased from 2011 to 2012, from 16.9% to 16.9%. Short-term effects of childhood obesity include increased blood pressure and lipid levels, abnormal glucose tolerance, and psychosocial problems. Childhood obesity persists into adulthood over time. Food insecurity can increase the likelihood of adolescent obesity due to shifting dietary options and non-uniform consumption patterns.⁴

According to the findings of a nationally representative cohort study of children, a significant association between obesity and food insecurity was found among children aged 6 to 11 years old, but not among children aged 2 to 5 years old. On the other hand, there was no correlation between nutritional insecurity and obesity in children ages 2 to 5 years old or 6 to 11 years old.⁵

A review of studies examining the relationship between food insecurity and childhood overweight and/or childhood obesity reveals that the prevalence of being overweight is relatively higher among food-insecure children than among food-secure children.⁶

Childhood food insecurity is a substantial public health concern that exhibits higher prevalence rates in households with low socioeconomic status and in developing countries. Research has demonstrated that food insecurity has detrimental effects on the health of individuals during their childhood and adolescence. Specifically, children hailing from homes facing food insecurity exhibit a higher likelihood of encountering adverse alterations in their physical and mental well-being, such as asthma, anaemia, hypercholesterolemia, diabetes, and obesity. In contrast, the prevalence of children obesity is widely acknowledged as a global epidemic, stemming in part from limited availability of nutritious and wholesome food in many geographical areas. This phenomenon has been associated with detrimental consequences for both childhood and adult well-being.⁷

Food insecurity can increase the risk of malnutrition and obesity in children, as a result of adverse socioeconomic conditions that result in food scarcity, poor diet quality, and unhealthy lifestyle behaviours.^{8,9} The coexistence of food insecurity and obesity is referred to as the paradox of food insecurity or the paradox of starvation and obesity. Many studies in developed countries have found a positive relationship between food insecurity and adolescent obesity, while others have found no association, and some have even found an inverse relationship.² In a study conducted in Madrid, it was discovered that low parental levels of education, challenging working conditions, low family purchasing power, and parental migrant status are factors that contribute to food insecurity. Similar to the findings of several studies indicating a higher prevalence of food insecurity among children aged 6 and older, the prevalence of food insecurity is higher in households with children aged 5 and older. Another study found that children from food-insecure families developed the propensity of sitting more and engaging in less physical activity, which is a contributor to obesity.^{2,10} Thus, this systematic review will further discuss the relationship between food insecurity and the occurrence of obesity in childhood.

METHODS

1. Eligibility criteria

The following are the inclusion criteria for this study:

- Published in English and accessible in its entirety.
- Article between January 20, 2013 and 2023.
- The studies employed are cohort, cross-sectional, and randomized controlled trials (RCTs).
- The research examines the food insecurity and childhood obesity

2. Guideline

In this investigation, we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. As depicted in the flowchart in Figure 1, we included five corresponding studies in our review.

3. Search strategy

Following PRISMA guidelines, we independently conducted a search for relevant articles in multiple databases (PubMed, ScienceDirect, and Web of Science) on August 20, 2023. ((Food) AND (Insecurity) AND (Relation) OR (influence) AND (Pediatric) OR (Children) AND (Obesity) OR (Fat) OR (Nutritional status)) are used as keywords. Additionally, manual searches are conducted to obtain articles that satisfy the specified criteria. Discrepancies are resolved through consensus with the third author.

4. Data extraction

Based on the author, year, study design, sample size, results, and discussion, data were extracted. Relationship between food insecurity and childhood obesity.

RESULT

Study characteristics

In this systematic review, we found a total of five studies, with two types of cohort studies and three cross sectional studies. A total of 12.574 cases were involved in the study. With an age range from five until 18 years old. Studies come from various countries including Ethiopia, Canada, US, and Atlanta. With a range of research years, from 2014-2022. All studies addressed the relationship between food insecurity and childhood obesity. Detail of study in Table 1.

Food Insecurity and Childhood Obesity

Four of the five studies examine the link between food insecurity and childhood obesity. Another study (Biadigliain et al.) found no correlation between the two. The occurrence of obesity in food-insecure groups is influenced by children's lack of physical activity, irregular consumption patterns, excessive consumption of food out of fear of food spoilage, and infrequent consumption of fruits and vegetables. The majority of this population has inadequate socioeconomic conditions.

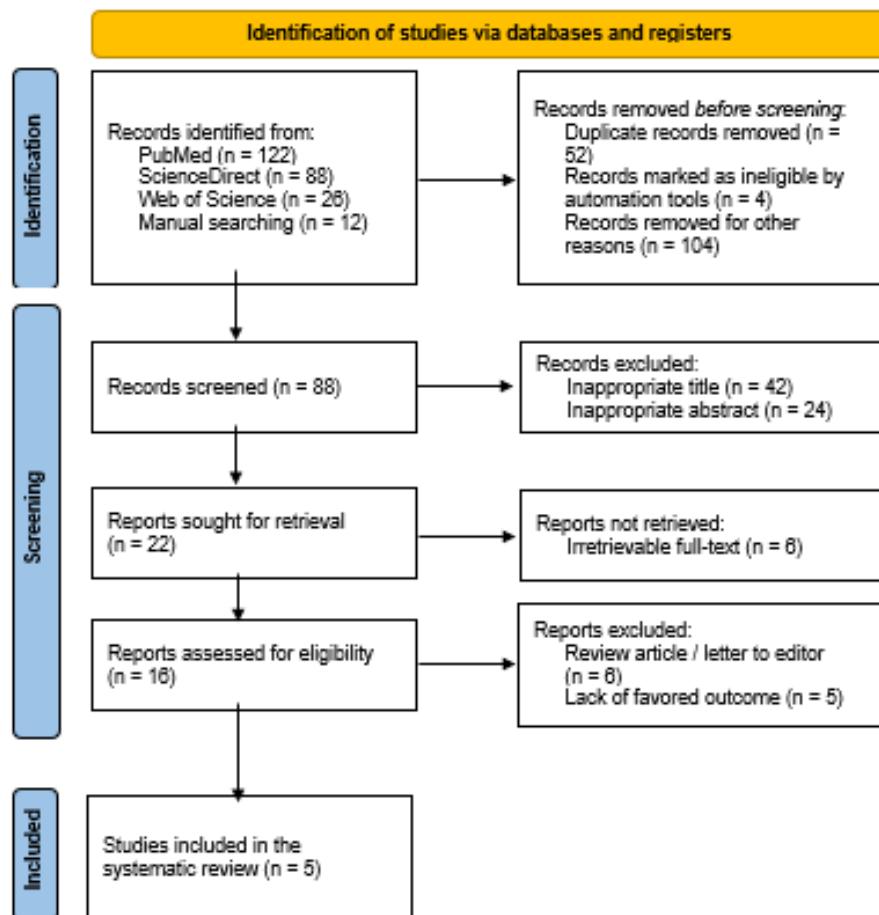


Figure 1. PRISMA flow diagram

Table 1. Characteristic Studies

No	Author	Study Design	Sample size	Age	Results	Discussion
1.	Biadgiligin, et al., 2021 ¹¹	Cross-sectional	632	5-18 years old	Approximately 29.4% of those living in food-secure households were overweight or obese, compared to 25% of those living in food-insecure households. Similarly, 29.8% of children who were food secure were overweight or obese, compared to 22% of children who were food insecure.	This study sought to determine the relationship between household and child food insecurity and child and adolescent overweight/obesity in urban Ethiopia. In the study population, there was no correlation between household and child-specific food insecurity and childhood overweight/obesity.
2	Dussault, et al., 2022 ¹²	Cross-sectional	253	11.4 (10.8-12.0)	102 people (40.3%) lived in households with moderate (n=89; 35.2%) or severe (n=13; 5.0%)	Forty percent of the children who were treated for obesity at this paediatric clinic lived in

No	Author	Study Design	Sample size	Age	Results	Discussion
					<p>food insecurity. Food insecurity was more prevalent in households with children who were immigrants of the first or second generation (48.3% versus 30.1%; P=0.03) compared to those of the third generation or more. However, the difference was not statistically significant (39.6% versus 45.1%; P=0.65).</p>	<p>households where there was a lack of food. Although there is a possibility that this prevalence increased during the first year of the COVID-19 pandemic, there was not enough statistical power to corroborate that finding.</p>
3.	Kaur, et al., 2015 ⁵	Cohort	9.701	2-11 years old	<p>For children aged 6 to 11 years, obesity was substantially linked with personal food insecurity (odds ratio: 1.41.81; 95% confidence interval: 1.33 to 2.48), whereas this association was not found in children aged 2 to 5 years (odds ratio: 1.40.88; 95% confidence interval: 0.51 to 1.51). There was no correlation between food insecurity and obesity in children aged 2 to 5 years old or in children aged 6 to 11 years old.</p>	<p>Only children between the ages of 6 and 11 years old have an elevated risk of becoming overweight when personal food hardship is present. It's possible that individual assessments of food insecurity in children will produce different outcomes than aggregate measures of food insecurity.</p>
4.	Kral, et al., 2014 ¹³	Cohort	50	8-10 years old	<p>The number of children who lived in families where they were certain they would always have access to food was substantially higher (45.9% as opposed to 15.4%), while the percentage of children who lived in households where there was no food was significantly higher (15.4% as opposed to 0%; p =.02).</p>	<p>This study supports the link between food insecurity and childhood obesity. It suggests that food-insecure children may consume more calories due to changes in eating habits, snacking, and mother-child feeding. Health care practitioners should check children who aren't assured their next meal for harmful eating and feeding habits.</p>
5.	Morrison, et al., 2022 ¹⁴	Cross-sectional	1938	2-14	<p>Children from homes with household food insecurity (HFI) had higher rates of overweight (33.1%) and obesity (28.4%), with lower diet quality and longer screen time compared to those from food-secure households (21.0% and 11.5%, respectively). The relative risk ratio for overweight children in HFI homes was 2.41 (95% CI: 1.5–4.0) and for obesity, it was 1.99 (95% CI: 1.2–3.4) compared to those in food-secure households.</p>	<p>The quality of diet was found to be worse, and there was a higher prevalence of overweight and obese children when HFI was present.</p>

DICUSSION

In this systematic review, we can know that 4 out of 5 studies identified state that food insecurity is actually at risk for obesity in children. This is because, children in families who experience food insecurity have habits that are less active, such as more sitting and less time doing physical activity. This is a major contributing factor to overweight.^{2,10}

In this systematic review, we can know that 4 out of 5 studies identified state that food insecurity is actually at risk for obesity in children. This is because, children in families who experience food insecurity have habits that are less active, such as more sitting and less time doing physical activity. This is a major contributing factor to overweight. such as participation in food aid and the Supplemental Nutrition Assistance Program can reduce food insecurity. Unequal access to nutrient-rich foods and the financial potential to buy (fruits and vegetables) can be considered major drivers of chronic diseases, health problems and obesity among low-income populations.¹⁵

When compared to children who are raised in houses with more adequate financial means, it has been found that children who are brought up in households with less financial resources have a higher incidence of being overweight. In order to effectively combat the interrelated problems of obesity and food poverty, it is necessary to direct one's attention specifically in the form of an intervention approach. The provision of food resources or direct food aid is required in order to address food insecurity, but the modification of both the type and quantity of food consumed is required in order to address obesity as a health concern. Therefore, in order to maximise their effectiveness, obesity prevention and treatment strategies must take into account multiple aspects of food insecurity. Similarly, food assistance programmes such as supplemental nutrition assistance programmes influence the dietary patterns of resource-poor populations, which can contribute to obesity. Strategies that address food insecurity while concentrating on healthy eating behaviours in children and adolescents will promote the best health outcomes over the course of an individual's lifetime.

According to the findings of another systematic review that analysed data from 16 different research on children who lacked adequate access to food, it was probable that children in food-insecure households ingested less fresh fruit than their peers. It is established that environmental stressors, such as poverty, traumatic experiences, and physical violence, can have a deleterious impact on the health of children through stress pathways known as chronic stress pathways. A growing corpus of research is also exposing the connection between children's experiences of chronic stress and the lack of food security in their households. As a consequence of this, certain components of the toxic stress paradigm may be useful in conceptualising the connection between food insecurity and diet-related consequences in children from low-income families, such as obesity. For instance, families who struggle to put food on the table have a higher risk of having children who are overweight.

Child health checkups are highly suited for screening socioeconomic determinants of health because of the high number of touchpoints they generate due to the administration of immunisations and the provision of anticipatory guidance at every developmental phase. The screening procedures for ensuring food safety will vary depending on the context. Screening patients in clinical settings to determine their level of food insecurity has led in a variety of approaches to addressing the important socioeconomic factors that are determinants of health. Food stamps, food distribution in clinics, passive referral to food sources, and active referral to food sources are the four kinds of techniques that were identified in a recent systematic evaluation of interventions to alleviate food poverty in healthcare settings that included a total of 23 research. In addition to providing support for addressing food insecurity in health care settings, the literature review identifies several significant voids in the evidence needed to inform practise. Regarding food insecurity in the context of obesity prevention and management, lifestyle counselling is a constant pillar of outpatient medical care. Providers of paediatric care, whether in primary care or in settings specialising in weight management, all offer nutritional advice to patients and their families.¹⁶

CONCLUSION

Food insecurity is linked to obesity in families. This depends on several things. Childhood obesity management emphasises education and self-efficacy to eat well.

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