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## The Relationship Between Ultra-Processed Food Consumption And Obesity In Adolescent: A Narrative Review

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### Abstract

*The rising global prevalence of obesity is a public health issue, with dietary factors increasingly recognized as root to its development. Ultra-processed foods (UPFs), a common modern diet, are characterized by high industrial processing with high energy density but poor in essential nutrients. This literature review aims to synthesize current evidence regarding the relationship between the consumption of UPFs and the incidence of obesity in adolescents. It investigates the consistency of this association, underlying mechanisms, and variations across populations. A systematic search was conducted using relevant keywords and search terms related to ultra-processed foods, food processing, obesity, weight gain, body mass index, and adolescents. Epidemiological studies employing diverse methodologies, including cohort and cross-sectional designs, consistently suggest a positive association between higher UPF intake and increased risk of overweight and obesity in adults and children. Potential mechanisms underlying this association are the energy density and palatability of UPFs, their impact on appetite and satiety, and their substitution for more nutrient-dense with minimal process. Strong evidence suggests UPF consumption is a significant risk factor for obesity development. Public health strategies should prioritize reducing ultra-processed food consumption via labeling, guidelines, and promotion of minimally processed foods, while further research strengthens causal inference and effective interventions.*

**Keywords:** *Adolescents, Obesity, Ultra-Processed Food, Weight Gain.*

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## INTRODUCTION

Obesity has become one of the most pressing global public health issues of the 21st century, with the prevalence of obesity in children and adolescents aged 5–19 years increasing from 2% in 1990 to 8% in 2022 and continuing to increase across age groups and demographics (WHO, 2025). This condition not only increases the risk of chronic diseases such as type 2 diabetes, cardiovascular disease, and some cancers, but also places a significant burden on health care systems (Mozaffarian, 2016). Among the factors contributing to the obesity epidemic, diet plays a central role. The global dietary shift towards more convenient, cheaper, and ready-to-eat foods has attracted the attention of researchers and policymakers (Baker et al., 2020). One category of foods that is increasingly consumed is ultra-processed foods (UPFs). UPFs are characterized by complex industrial formulations, often containing cheap ingredients such as sugar, salt, unhealthy fats, and food additives, and undergoing intensive industrial processing (Monteiro et al., 2019). Despite offering convenience and long shelf life, UPFs generally have high energy density but low essential nutrient content, making them potential contributors to energy imbalances that lead to weight gain and obesity (Machado-Rodrigues et al., 2024).

Despite the increasing number of studies highlighting the association between diet and obesity, the specific role of UPFs in the obesity epidemic, particularly in adolescents, still requires a comprehensive synthesis of evidence. Numerous studies have investigated the impact of UPFs consumption on health, but these findings are often scattered across different disciplines and populations. Therefore, this narrative review is relevant and crucial to synthesize the existing evidence, identify consistency of associations, explore potential underlying mechanisms, and identify gaps in current research. This review aims to provide a clear and concise overview of the current state of knowledge on the association between UPFs consumption and obesity in adolescents, which can serve as a basis for further research and public health interventions.

This narrative review aims to synthesize the current scientific evidence on the association between UPFs consumption and obesity in adolescents. The review seeks to provide a comprehensive understanding of how UPFs contribute to excess weight gain in this vulnerable age group. Specifically, the scope of this review is limited to epidemiological studies that have examined this association among adolescents aged 10 to 19 years. It includes a variety of observational study designs, such as cohort and cross-sectional studies that were published within the last decade from 2015 to 2025. By focusing on this time frame, the review captures recent developments in dietary patterns, food environments, and public health challenges relevant to adolescent obesity. In addition, this review will explore potential mechanisms underlying the relationship between UPF consumption and obesity, while also considering variations in findings across different populations and contexts. Through this approach, the review intends to highlight critical evidence gaps and inform public health strategies.

## RESEARCH METHODS

### Description of the Literature Review Search Strategy

The literature search for this narrative review was conducted systematically to identify relevant scientific articles examining the relationship between UPFs consumption and obesity in adolescents. Electronic databases including PubMed, Scopus, and Google Scholar were used to locate peer-reviewed studies published between 2015 and 2025. The search strategy involved the use of specific keywords and Boolean operators such as “ultra-processed food” OR “UPF” AND “adolescent” AND “obesity” OR “overweight” OR “BMI” OR “body mass index”.

### Inclusion and Exclusion Criteria

The inclusion criteria for selected studies were published in English, involved adolescent populations aged 10–19 years, and investigated the association between UPF intake and obesity or related anthropometric indicators. Studies were excluded if they focused exclusively on adult populations, did not specifically assess UPF consumption, or were not available in full text. Preference was given to observational epidemiological designs, such as cohort and cross-sectional studies, to capture a wide range of evidence regarding patterns of UPF consumption and their possible health impacts in adolescents.

Although this is a narrative review and not a systematic review, a PRISMA-style flow diagram was adapted and used to visually represent the process of article selection. This diagram illustrates the number of records identified, screened, assessed for eligibility, and final article included in the synthesis. The inclusion of the flow diagram aims to enhance transparency and clarity in reporting the literature selection process.

## RESULTS AND DISCUSSION

### Study Selection and Characteristics

The process of study identification and selection for this narrative review is illustrated in the flowchart (Figure 1). An initial search through databases identified a total of 204 potential articles. After the removal of duplicates and preliminary irrelevant studies, 187 records were excluded, leaving 17 records for screening. From this screening process, 10 studies were excluded due to irrelevant titles or abstracts. Seven reports were then assessed for full eligibility. At this stage, 3 further studies were excluded for not being in line with the main aim of the review. Finally, four studies met the inclusion criteria and were included in the analysis and synthesis within this review. These included studies provide the evidence base for the following thematic discussion regarding the relationship between UPFs consumption and the incidence of obesity in adolescents.

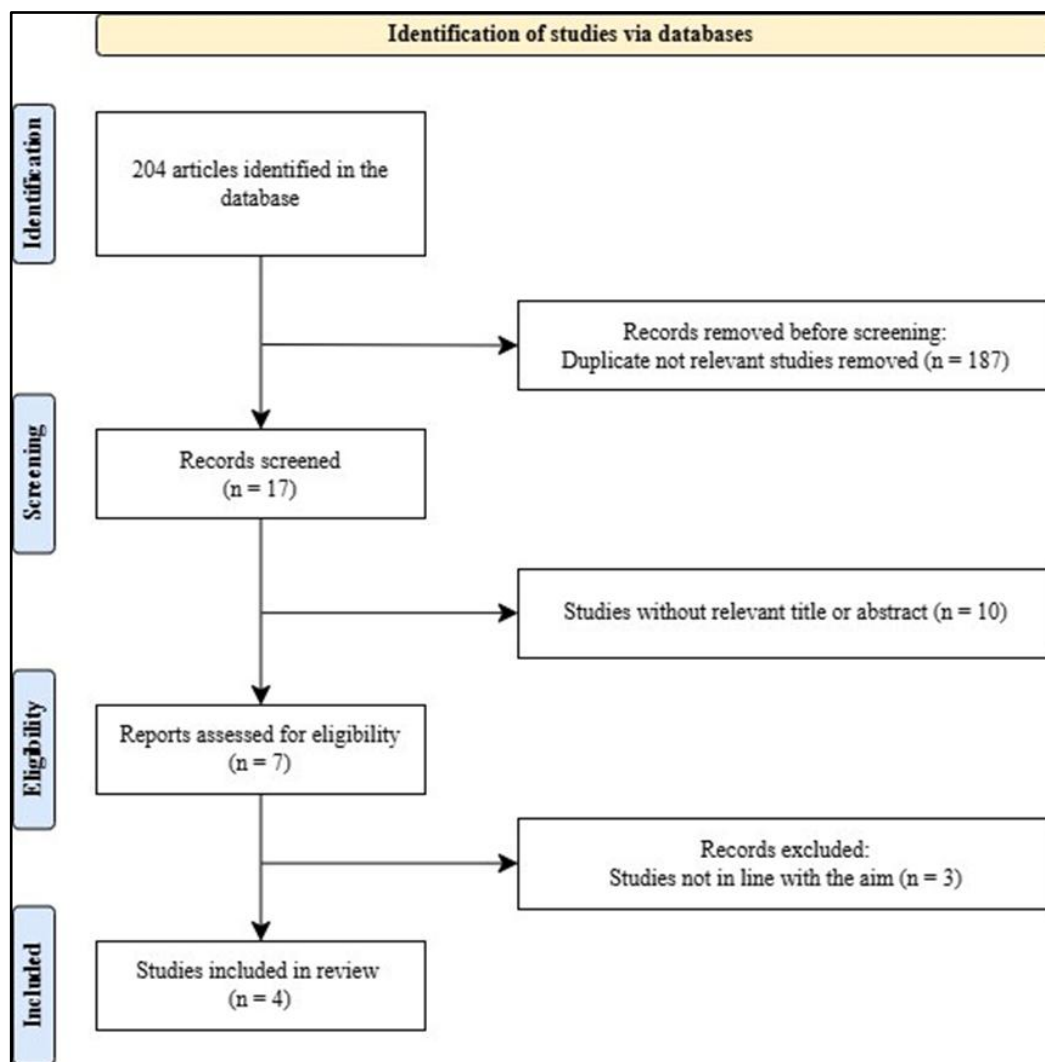


Figure 1. Study selection flowchart.

Table 1 describes the main characteristics of the observational studies included in this review. The main indicators and results related to the relationship between ultra-processed food consumption and the incidence of obesity in adolescents were identified and addressed.

**Table 1. Characteristics of studies on ultraprocessed food consumption and the occurrence of obesity in adolescence**

| Study                 | Study Design    | Participants  | Objective   | Main Results  | Conclusions   |
|-----------------------|-----------------|---|---|---|---|
| Louzada et al. (2015) | Cross Sectional | 7534 Brazilian adolescents aged 10 to 19 years, whose data were collected in 2008/2009. | To assess the association between ultraprocessed food (UPF) consumption and obesity indicators among adolescents in Brazil. | Adolescents who consumed the most UPF (top fifth group) had significantly higher mean BMI and were more likely to be overweight (adjusted OR = 1.52) and obese (adjusted OR = 2.74) compared to those who consumed the least UPF. | The findings of this study strongly support the role of ultra-processed foods in exacerbating the ongoing obesity epidemic in Brazil. |

| Study               | Study Design    | Participants  | Objective  | Main Results   | Conclusions  |
|---------------------|-----------------|---|--|--|--|
| Melo et al. (2017)  | Cross Sectional | 249 Brazilian adolescents aged 14 to 19 years, living in a city with low per capita income. | To examine the consumption patterns of minimally processed, processed, and ultra-processed foods in adolescents, and to examine their associations with anthropometric measures (such as body weight) and high blood pressure. | Ultra-processed food consumption did not show significant associations with the anthropometric or blood pressure outcomes examined in this study. In contrast, minimally processed food consumption was found to be inversely associated with being overweight in adolescents. | The greater the consumption of minimally processed foods, the lower the risk of overweight in adolescents. This study underscores the importance of investing in nutrition education to prevent chronic diseases associated with processed food consumption. |
| Cunha et al. (2018) | Cohort          | 1035 Brazilian adolescents who started high school between 2010 and 2012.                   | To assess how a diet that included ultra-processed foods (UPF) affected changes in body weight (BMI) and body fat percentage (%BF) in adolescents over a three-year period.  | There was no significant association between the amount of UPF consumed and changes in BMI or body fat percentage in participants.   | This study concluded that although high UPF intake is a sign of an unhealthy diet, it does not prove a direct association with rapid increases in BMI in adolescents, even after accounting for their physical activity levels.                              |
| Choy et al. (2021)  | Cross Sectional | 561 children from Singapore aged 6 to 12 years who were studied in 2016.                    | To analyze the children's dietary habits, estimate their nutrient intakes, and see how these patterns are associated with BMI and demographic characteristics.   | Three main dietary patterns were identified from the children's dietary data. One of these patterns was characterized by high consumption of processed foods and low fiber intake.   | The three dietary patterns identified generally provided an imbalance in nutrition, and none of them were considered healthy food choices.   |

**Consistency of the Association between UPFs Consumption and Obesity in Adolescents**

The reviewed studies present a mixed picture regarding the consistency of the relationship between UPF consumption and obesity in adolescents. Louzada et al. (2015) conducted a large cross-sectional study in Brazil and found strong support for the role of UPFs in the obesity epidemic among Brazilian adolescents. This study reported that adolescents with the highest UPF consumption had a higher average BMI and a greater chance of being overweight or obese compared to those in the lowest quintile of consumption. These findings are consistent with the hypothesis that high UPF intake contributes to excessive weight gain.

However, other studies offer differing perspectives. Cunha et al. (2018), in a cohort study also in Brazil, while confirming that higher UPF intake is a marker of an unhealthy diet, did not find a significant association between UPF consumption and the trajectories of BMI and percentage of body fat over three years of follow-up. This suggests that while UPFs may be part of an unhealthy dietary pattern, their direct influence on the long-term rate of BMI change may not always be significant in every context. Similarly, Melo et al. (2017), in another cross-sectional study in Brazil, reported that the consumption of UPF was not directly associated with the studied anthropometric outcomes, although they did find an inverse relationship between minimally-processed foods and excess weight in adolescents. Choy et al. (2021) in their cross-sectional study in Singapore, through cluster analysis, identified dietary patterns high in bakery products, local desserts, snacks, sweetened beverages, and processed foods as unbalanced, supporting the definition of unhealthy UPF-rich diets, though not directly measuring a statistical association with BMI in the main results presented.

These variations in findings may reflect differences in study design, population characteristics, and methodologies for measuring UPF intake and obesity. Cross-sectional studies like Louzada et al. (2015) and Choy et al. (2021) show correlations at a single point in time, whereas cohort studies like Cunha et al. (2018) attempt to observe changes over time.

**Potential Mechanisms Underlying the Relationship between UPFs and Obesity**

Although the table does not explicitly discuss mechanisms, the findings from Louzada et al. (2015) showing higher BMI and greater odds of obesity in high UPF consumers implicitly support the hypothesis that UPF can facilitate overconsumption and weight gain due to their characteristics such as high in calories, energy-dense, low in fiber, and highly palatable. The unbalanced dietary patterns identified by Choy et al. (2021), which were characterized by bakery products, desserts, and sweetened beverages, also indicate that these types of foods can displace more balanced nutrient intake and promote caloric excess. Melo et al. (2017) found that minimally-processed foods were inversely associated with excess weight further supports the idea that the displacement of healthier foods by UPFs could be a key mechanism.

**Cross-Population Variation and Implications**

The majority of the reviewed studies focused on adolescents in Brazil, while Choy et al. (2021) involved children from Singapore. The consistency of findings within the Brazilian context suggests that specific population factors or methodologies might play a role. The presence of a study from Singapore highlights that unhealthy dietary patterns including UPFs are a global concern across diverse cultural and demographic backgrounds. However, the limited number of studies from varied geographical and socioeconomic regions restricts the generalizability of the findings.

## CONCLUSION

Despite mixed findings across limited studies, evidence suggests that UPF consumption is associated with obesity in adolescents, consistent with the unhealthy dietary characteristics of UPF. While acknowledging the limitations of the study, these findings underscore the need for public health action. Recommendations for public health action include prioritizing efforts to reduce UPF consumption, perhaps through clearer labeling, updated dietary guidelines, and marketing regulations, in addition to promoting healthy food environments. Future research should focus on robust longitudinal studies and intervention trials to strengthen causal inferences and explore underlying mechanisms across populations.

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