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# Dietary patterns and risk of childhood overweight/obesity or metabolically unhealthy childhood obesity: A systematic review and meta-analysis

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Childhood overweight/obesity (Ov/Ob) and its combination with metabolic complications, known as metabolically unhealthy obesity (MUO), is a major public health problem<sup>1</sup>. Diet is one of the most important modifiable determinants of weight status and health, but the relationship between dietary patterns and Ov/Ob or MUO in children and adolescents remains poorly studied<sup>2,3</sup>. The aim of this study was to explore associations between adherence to dietary patterns and the risk of childhood Ov/Ob or MUO.

A literature search was performed following PRISMA guidelines<sup>4</sup> in Scopus and Medline databases to identify longitudinal prospective studies, and randomized controlled clinical trials (RCTs) with ≥12-month follow-up, in children and adolescents (age: 2-19 years; regions: Europe, USA, Canada or Oceania, in English language, publication period: January 2013-June 2023). Studies' quality was also evaluated with the ROBINS-E and RoB-2 tools.

From the 2603 references initially identified, 29 prospective studies were included in this systematic review and meta-analysis. All studies reported on Ov/Ob risk. Dietary patterns were assessed with a-priori method in 15 studies and with a-posteriori method in 14 studies. Conceptually, dietary patterns were characterized as “healthy” (HDP) or “unhealthy” (UDP), however there were inherent differences in the way dietary patterns were defined/ extracted, the items loading high in each extracted pattern and the scoring system applied for the degree of adherence to each pattern. Limited evidence suggests that adherence to patterns during childhood, which are lower in fruits, vegetables, and whole grains, while higher in sweets, refined grains, fast foods, and processed meats are associated with higher BMI later in adolescence. Eighteen studies were included in meta-analysis. Adherence to a HDP was associated with lower odds of Ov/Ob [odds ratio (OR): 0.85 (95% confidence interval (CI): 0.80; 0.91) for the adjusted model] compared to non-adherence, while adherence to UDP was associated with higher odds of Ov/Ob [OR: 1.34 (95%CI: 1.17; 1.53) for the adjusted model] compared to non-adherence. Higher adherence to a HDP was associated with lower BMI [beta: -0.02 (95%CI: -0.04; -0.01) kg/m<sup>2</sup> for the adjusted model] and lower increase in BMI over time [beta: -0.11 (95%CI: -0.18; -0.04) kg/m<sup>2</sup> for the adjusted model], compared to lower adherence. No significant associations were found between adherence to a HDP and z-BMI, while a marginally significant association was revealed between adherence to UDP and z-BMI [beta: 0.04 (95%CI: -0.00; 0.08) kg/m<sup>2</sup> for the adjusted model].

Higher adherence to HDP exhibits preventive effect against Ov/Ob in children and adolescents. Results should be interpreted cautiously because of the heterogeneity in defining “exposure” and should be confirmed through future research both in prospective cohorts and RCTs.

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## References

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