

## Abstract

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# Diet pattern high in refined food, sugar, sodium and fat is associated with child excess adiposity at 4.5 years within a contemporary New Zealand birth cohort

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New Zealand ranks among the highest globally for childhood obesity<sup>(1)</sup>. One of the main platforms to maximize the prevention of child excess adiposity is the establishment of healthy diets in early life<sup>(2,3)</sup>. Despite this recommendation, Aotearoa has limited information on children's whole diet quality and its associations with child healthy weight. This study explored the associations between dietary patterns and indicators of excess adiposity among 4.5-year-olds within the *Growing Up in New Zealand* birth cohort study (n= 6,048, 98.2% of the children who took part of the 4.5-year data collection wave). At 4.5 years, two dietary patterns were previously derived and described: “*Refined, high in sugar, sodium and fat*” and “*Fruit and vegetables*”<sup>(4)</sup>. The indicators of excess adiposity examined at 4.5 years were body-mass-index-for-age (BMI/A) (>+2 z-score) and waist-to-height ratio (WtHR) > 90th percentile. Information on child and maternal sociodemographic and maternal health behaviour characteristics was sourced from the antenatal and the 4.5-year-interviews. Children's scores in both dietary patterns were ranked in tertiles. Multiple Poisson regressions with robust variance were performed to examine the associations between the dependent variables (BMI/A z-score >+2 and WtHR >90th percentile) and the independent variables (dietary patterns), adjusted by child and mother characteristics (IBM SPSS software). Sensitivity analyses excluding children with outliers for BMI/A (<-5 z-score or >+5 z-score) was also performed. Findings were reported as adjusted risk ratio (RR) and 95% confidence intervals (CIs). Children in the highest tertile of the “*Refined high in sugar, salt and fat*” dietary pattern were more likely to be overweight/obese (BMI/A) compared to children in the lowest tertile (RR:1.51; 95% CI: 1.20-1.90; p<0.001). This significant association was confirmed in the sensitivity analyses (RR:1.49; 95% CI: 1.18-1.89; p <0.001). There were no significant associations between this dietary pattern and WtHR > 90th percentile nor between the “*Fruit and vegetables*” dietary pattern and the indicators of child excess adiposity. This study provided nationally generalizable information that poor diet quality in early life is associated with child excess adiposity. National strategies to prevent childhood obesity need to encompass approaches to reduce the availability and intake of refined foods and those high in sodium, sugar and unhealthy fats in children.

**Keywords:** dietary patterns; childhood obesity; whole diet quality

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