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Children's perception on healthy snacks using a card sorting exercise in Aberdeenshire nursery and primary schools

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Children's knowledge and understanding of a healthy diet is often limited, and the health consequences of eating unhealthy foods appear to be of low priority for children. Most children prefer snacks with high energy density and low nutritional value which may contribute to the rise in obesity during childhood^(1,2). This cross-sectional study aimed to 1) examine children's snack preferences and their perception of how healthy snacks are analyzed by age and gender and 2) determine the relationship between children's snacks preference (using the nutritional composition of energy, fat, sugar and salt content of the 18 snacks) and their health parameters.

Children of nursery and primary schools aged 3–12 years old (212 boys and 260 girls) were interviewed at their schools and performed snack card sorting exercises in which they were presented with 18 various types of coloured snack images which counted as one portion in size. A series of ranking questions (most to least) were asked. These included three main snack perception questions, 1) children's snack preferences; 2) children's perception of their parents snack preferences for them; 3) children's perception of the snacks healthiness. Health parameters of height, weight, body fat, waist circumference and hip circumference were also measured on the day of the interview. The ranked snacks were replaced by the computed nutritional composition of energy, fat, sugar and salt content of the 18 snacks. The mean of the nutritional composition of the five top and bottom snacks chosen by children was used in the analysis.

There was no significant relationship between children's age and snack preference (linear regression: $F_{(1,469)} = 2.758$, $p = 0.097$, $r^2 = 0.006$) and no gender preferences of all types of snacks (independent t-test: $t_{(469)} = 0.293$, $p = 0.77$). The perception of snack healthiness increased with age ($F_{(1,457)} = 80.53$, $p < 0.001$, $r^2 = 0.15$) but there was no gender differences ($t_{(457)} = 0.552$, $p = 0.58$). When children were asked about their parent's snack choices for them, they chose the snacks that they also perceived to be healthiest (linear regression: $F_{(1,16)} = 980.61$, $p < 0.001$, $r^2 = 0.98$). The highest proportion of children brought fruit and vegetables into school as their snack (34%). Children's with high/low BMI-percentile did not show a specific preference for any snacks however, snacks high in fat and sugar content were preferred by children with higher body fat. Snacks high in energy and fat content was preferred by heavier children and snack high in fat alone was preferred by those with higher in waist circumferences and waist to hip ratio respectively (Multiple regression; adjusted for age, sex and schools, $p < 0.001$).

In conclusion, despite Scottish, nursery and primary age children correctly perceiving what counts as a healthy snack, this perception was not translated into their snacking behaviours. Further nutrition education about healthy eating practices is required, specifically at school.

1. Kim NH *et al.* (2015) *Food Qual Preference* **42**, 139–145.
2. Heard AM *et al.* (2016) *Appetite* **96**, 260–267.