

Prospective associations of four nutrient profiling systems with weight gain, overweight and obesity risk

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Background: Nutrient Profiling Systems (NPSs), including the UK Food Standards Agency NPS and its variants are used to classify foods according to their nutritional composition for nutrition policies. The prospective validity of these NPSs requires however further investigation. The study investigates the associations of the original Food Standards Agency (FSA)-NPS and three variants – the Food Standards Australia New Zealand Nutrient Profiling Scoring Criterion (NPSC), the Health Star Rating (HSR) system NPS and the French NPS (HCSP-NPS) –, which are used as a basis for nutrition policies, with weight status.

Methods: Dietary indices based on each of the four investigated NPSs applied at the food level were computed at the individual level to characterize the diet quality of 71,178 French individuals from the NutriNet-Santé cohort. Associations of these Dietary Indices (DIs) (as tertiles) with weight gain were assessed using multivariable mixed models, and with overweight and obesity risks using multivariable Cox models.

Results: For the four NPSs, participants with a lower diet nutritional quality were more likely to have an increase in body mass index over time (median follow-up of 3.14 ± 2.76 years, beta coefficients positive, all $p \leq 0.0001$), and an increased risk of overweight ($HR_{T3vs.T1} = 1.27$ [1.17-1.37] for the HCSP-DI, followed by the original FSA-DI with $HR_{T3vs.T1} = 1.18$ [1.09-1.28], the NPSC-DI with $HR_{T3vs.T1} = 1.14$ [1.06-1.24] and the HSR-DI, $HR_{T3vs.T1} = 1.12$ [1.04-1.21]). Whilst differences were small, the HCSP-DI appeared to show significantly greater association with risk of overweight compared to other NPS.

Conclusions: Less healthy diets defined using the Food Standards Agency-NPS and related systems were all associated with weight gain and overweight risk. Demonstrating this association with health outcomes is an important indicator of one validity dimension of NPSs and supports their use in public policies for the prevention of diet-related chronic diseases.

Main message: Nutrient profile models of foods and beverages allow capturing the nutritional quality of diets and are prospectively associated with weight gain and obesity.