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Optimisation of a targeted approach to the delivery of personalised dietary advice

Elaine Hillesheim^{1,2} and Lorraine Brennan^{1,2}

¹Institute of Food and Health, School of Agriculture and Food Science, University College Dublin, Dublin, Ireland and

²Conway Institute of Biomolecular and Biomedical Research, University College Dublin, Dublin, Ireland

Abstract

Targeted nutrition is defined as personalised nutrition tailored to groups of individuals. Such groups can be identified based on metabolic profiles and are named metabotypes. Metabotypes have been identified in a range of populations and offer the potential to deliver personalised nutrition advice. The objective of the current study was to optimise a targeted approach to deliver dietary advice through comparison with an individualised approach. Study participants ($n = 160$) were classified into metabotypes previously defined by four markers (triacylglycerols (TAG), total cholesterol (TC), HDL-c, and glucose) in a cross-sectional study with Irish adults. Targeted advice was designed using a decision tree approach. A personalised approach was achieved through the use of the Food4Me decision trees⁽¹⁾. Agreement between methods was compared and the metabotype approach was optimised to incorporate the most prevalent advice exclusively given by the Food4Me decision trees. The optimised metabotype approach was subsequently tested by comparison with individualised advice manually compiled by a dietitian. Individuals in metabotype-1 had high TC (median 5.0 mmol/L, interquartile range 4.2–5.4 mmol/L); individuals in metabotype-2 had normal concentrations of the four biomarkers; and individuals in metabotype-3 had high TAG (1.8, mmol/L 1.4–2.6 mmol/L) and TC (5.4 mmol/L, 4.8–5.9 mmol/L), with the highest BMI and diastolic blood pressure, and the most unfavourable profile for glycaemia (highest fasting insulin and HOMA-IR). Using the metabotype approach, advice for lowering TC, weight, waist circumference, TAG, and blood pressure was given to 79.4%, 46.9%, 28.1%, 20.6%, and 11.9% of the individuals, respectively. Considering the personalised approach, the most frequent advice was given to improve the intake of saturated fatty acids (56.5%), fibre (56.0%), and folate (55.0%). The total agreement between the methods was 64.0%. The optimised metabotype approach revealed a good total agreement of 80.3% with the individualised manual approach, especially in metabotype-1 (93.8%) and metabotype-3 (94.3%). Agreement was higher in females (84.8% vs. 76.4%, $p = 0.02$) and in older (≥ 45 years old) people (92.5% vs. 78.1%, $p = 0.02$). These results confirm metabotypes as a promising approach to deliver targeted dietary advice. Future work should ascertain if targeted nutrition is effective in changing behaviours that will affect health outcomes.

Conflict of Interest

There is no conflict of interest.

Reference

- Forster H, Walsh MC, O'Donovan CB *et al.* (2016) A Dietary Feedback System for the Delivery of Consistent Personalized Dietary Advice in the Web-Based Multicenter Food4Me Study. *J Med Internet Res* **18**(6), e150.