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The evaluation of a personalised nutrition and physical activity tool to facilitate lifestyle changes for adults with poor-quality diets

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Supporting the adoption of a healthy lifestyle is essential to reduce the impact of non-communicable diseases and improve public health. The PROTEIN project[(1)], through advances in computer technology, aimed to create a novel personalised mobile application (app) and support system for healthy living and eating. This study assesses the effectiveness and perceived usefulness of advice provided by the PROTEIN app to facilitate lifestyle changes within two population groups. Eighty participants were recruited from the UK general public into two sub-groups: i) adults with excess weight (OW, *n* 40; BMI: 25–30 kg/m^2) and ii) adults with poor-quality diets (PQD, *n* 40; Hb < 120g/L or adults with low fruit/ vegetable intake, defined as < 3 portions / d). Participants attended the University to provide baseline anthropometric, physical activity and general health data (or self- reported during a virtual appointment). App registration was completed using anthropometric data alongside dietary preferences and dietary 'goals'. Participants were asked to log in to the app and follow the individualised 7-day nutrition and activity plans (NAP) recommended, and to interact with the system, via the meal logging and meal rating systems to 'train' the reasoning-based decision support system (RDSS) within the PROTEIN framework [(1,2)]. After 4 weeks of use, participants were asked to report their current weight and complete two online evaluation questionnaires for system usability and behaviour change. A favourable ethical opinion was received from the Health Research Authority (ID: 294871). Data were checked for normality and are presented as mean (± SD); significance was set at $p < 0.05$.

Mean age for the whole sample was 44.7 ± 16.1 years. There was no significant difference found in BMI between the OW or PQD groups: 27.8 ± 0.3 vs 27.6 ± 7.5 kg/m^2 ($p = 0.431$), respectively. OW participants that completed the 4-week intervention questionnaire reported an average weight loss of -1.4 ± 1.4 kg (*n* 27). Although comments from individuals suggest that the app improved their self-awareness of dietary intake and quality, quantitative data from the usability survey suggests that 57% of users agreed that they found the app "cumbersome".

Previous tests of the app have suggested that it can provide appropriate NAP recommendations to users [(2)]. This preliminary analysis suggests that it can also support individuals to achieve their specific nutritional goals, such as weight loss. However, on the basis of the user feedback received, future personalised nutrition and physical activity apps should focus on adaptability to the users' daily life rather than providing fixed plans on a weekly basis. Future work will analyse the appropriateness, effectiveness and overall user experience of the app within different user groups across the EU.

References

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