

A novel mobile app prototype for personalised guidance on food choices leveraging persuasive technology - Extended Abstract

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1. Abstract

The emergence of persuasive technology offers a promising avenue to provide an ongoing supportive environment for persuading users to adhere to healthy eating at scale. However, using a ‘one-size-fits-all’ approach in present digital tools hinders user engagement and retention in digital dietary interventions, thereby compromising their effectiveness. The aim of the study was to explore the usability of a newly developed mobile app prototype for personalised food choices leveraging persuasive technology used by adults in Australia. A co-design approach was used by a team of researchers in Information Technology and Computer Science as well as an Accredited Practising Dietitian, with the latter taking the lead. The food layer of the Nutrition Care Process, the strategies from cognitive behavioural theory, the Australian Dietary Guidelines, a gain-framed approach, and the design principles of the Persuasive Systems Design (PSD) model were applied guided by the design science paradigm. A cross-modal recipe retrieval algorithm under the Apache-2.0 license was deployed to automatically recognise the food items in a food photo. The prominent features of the prototype included automatic retrieval of food items from a photo, a traffic light system for recipes, personal goal setting for food choices and gamification for tracking food choices. The design principles of primary task support, dialogue support and system credibility in the PSD model were applied. A survey using the Mobile Application Rating Scale and semi-structured in-depth interviews were performed to examine the usability of the prototype through convenience sampling including adults living in Australia (n=12) and Accredited Practising Dietitian (n=3). The overall prototype quality score was acceptable, with a median of 3.46 (IQR 2.78-3.81) out of 5 points. The median score of the perceived impact of the prototype on healthy eating was 3.83 (IQR 2.75-4.08) out of 5 points. In-depth interviews identified the use of gamification for tracking food choices and innovation in the image-based dietary assessment as the main drivers of the positive user experience of using the prototype. However, high-level personalisation is required to change attitudes and eating behaviour towards healthy eating. The outcomes of the evaluations were translated into the feature of user-driven, rule-based reminders guided by the design principles of dialog support to enhance personalisation. The findings of the study have demonstrated that applying the design principles of PSD model to the prototype design makes the complex tasks and goals involved in a digital dietary intervention more engaging and enjoyable. The elaborations on user experience of using the prototype have provided an in-depth understanding of the roles of the design principles of the PSD model and its potential impact on eating behaviour change. The use of persuasive technology has the potential to empower individuals to make positive eating behaviour changes towards healthy eating.

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