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TITLE

Integrating mobile technology with routine dietetic practice: The case of myPace for weight management

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ABSTRACT

The field of mHealth, which includes mobile phone applications (apps), is growing rapidly and has the potential to transform healthcare by increasing its quality and efficiency. This article focuses particularly on mobile technology for body weight management, including mobile phone apps for weight loss and the available evidence on their effectiveness. Translation of behaviour change theory into weight management strategies, including integration in mobile technology is also discussed. Moreover, the article presents and discusses the *myPace platform* as a case in point. There is little clinical evidence on the effectiveness of currently available mobile phone apps in enabling behaviour change and improving health related outcomes, including sustained body weight loss. Moreover, it is unclear to what extent these apps have been developed in collaboration with health professionals, such as dietitians, and the extent to which apps draw on and operationalise behaviour change techniques has not been explored. Furthermore, current weight management apps are not built for use as part of dietetic practice, or indeed healthcare more widely, where face-to-face engagement is fundamental for instituting the building blocks for sustained lifestyle change. *myPace* is an innovative mobile technology for weight management meant to be embedded into and to enhance dietetic practice. Developed out of systematic, iterative stages of engagement with dietitians and consumers, it is uniquely designed to complement and support the trusted health practitioner-patient relationship. Future mHealth technology would benefit if engagement with health professionals and/or targeted patient groups, and behaviour change theory stood as the basis for technology development. Particularly, integrating technology into routine health care practice, rather than replacing one with the other, could be the way forward.

KEY WORDS

mHealth, mobile phone application/app, weight management, dietetics, energy balance

MAIN ARTICLE

Mobile health for weight management

Mobile health, or “mHealth”, can be defined as “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices.” (1) The field of mHealth is growing rapidly and has the potential to transform healthcare by increasing its quality and efficiency. (2) European health organisations also recognise the potential of mHealth for supporting health care and are seeking to better organise and manage available mobile phone applications (apps) for health and lifestyle, examples being the UK National Health Service (NHS) Health Apps Library (3) and the European Directory of Health Apps (4).

Lifestyle management apps currently form one of the largest segments of the mobile app market (5-7). In weight management specifically there has been an increase in digital interventions to support weight loss. These interventions range from internet-based software providing weight loss information and support to more complex web-based systems designed to help patients manage their energy balance, and to the more recent weight loss apps for mobile phones.

Mobile technology for dietitians: retaining the face-to-face element

Most of the currently available health and weight management apps are focused on individual recording and monitoring (6), and were not built specifically for use as part of medical or dietetic practice. Also, the extent to which expert practitioner input was sought in their development is generally unclear. The face-to-face relationship between patients and their health practitioner plays an important role in patient care. In fact, some medical sociologists and health communication experts have argued that the healthcare process is fundamentally about the interactions that occur within the privacy and trust of the patient-provider relationship (8-10). This relationship has important influences on patient adherence to interventions, patient motivation, perceived quality of care for both the patient and the practitioner, and on overall health outcomes (11-15). Research on weight management in particular has shown that increased patient-provider contact is associated with greater weight loss (16). However, health professionals and policy makers acknowledge that building and sustaining a strong, trusted patient-practitioner relationship takes time, is therefore costly, and is something that is becoming increasingly squeezed within the NHS (17, 18). Most currently

available apps do not provide a direct route to enhancing the face-to-face contact between the healthcare professional and the patient. On-going dialogue and discussion suggests that this is the way forward for technological innovations in healthcare (19-21).

Many ostensible failures of mHealth initiatives are not attributable to failures in technology but rather to a lack of meaningful integration with the systems in which they are embedded. If technology is to have a role in enabling sustained weight loss, it needs to be carefully yet simply embedded into existing healthcare practice (22). For weight management, these systems may concern the day-to-day routines of the patient in relation to food purchase and consumption, movement and exercise. Research into consumer and practitioner use of, and attitudes towards, integrating technology into healthcare suggests that the right application may be positively accepted by both sets of users (23-25). Lieffers, Vance and Hanning (26) in their survey of Canadian dietitians on app use seem to agree. Almost 60% of the responding dietitians reported that they currently use apps in their practice, about 40% recommended them to their patients, and more than 80% of those not using apps presently indicated that they were interested in using them in the future. The authors found that dietitians are indeed excited by the prospects of mobile apps to support their practice and increase efficiency, but also described some challenges with use. The researchers identified three key themes affecting app use and advanced recommendations arising from the data. The first one consists of factors related to the technology, including access to information/tools, the quality of the content, usability, accessibility/compatibility and cost. Respondents indicated that apps enhanced their organisation, allowed them to provide better services (e.g. having direct access to nutrition information), and work more efficiently. The second theme includes personal factors that affected dietitians' use of apps. These included dietitians' knowledge and interest in apps, the suitability of apps for patients, and dietitians' willingness/ability to pay. Many of the respondents not currently using apps reported to have little knowledge about apps or were not very tech-savvy. The same may apply to clients, with younger clients being more open to technology than older ones. Finally, there are physical factors that may prevent app use. These many times relate to the workplace, where clients may not be allowed to use their mobile device (e.g. in hospitals) or may not have access to a Wi-Fi connection. Overall, the researchers found a clear need to build something specifically for dietetic practice, since many apps do not fit the way dietitians work or facilitate the level of privacy necessary to be formally integrated into routine patient care. Some respondents, for example, felt that energy calculations were inaccurate, and that apps currently available on the market focused too much on calories rather than healthy eating.

Effectiveness of mobile technology for weight management

There seems to be little evidence concerning the effectiveness of weight management apps in enabling weight management. Scientific reviews are beginning to surface in this area and some recent publications have compared effectiveness, self-monitoring and adherence between traditional and digital technology (27-29). Others have focused on the effectiveness of mobile technology for weight loss using randomised controlled trials (RCT) (30, 31). However, important questions remain as to the outcomes that should be measured and the time frames over which they should be assessed. There are also important questions around when, and for whom, mobile technologies are likely to be most effective (32).

Behaviour change theory in mobile technology for weight management

Changing established habits is deeply connected to social and cognitive processes: how people feel and think, the messages they are receiving from others, and their on-going motivation to change, impact how successful they are at achieving sustained positive outcomes(33). Behavioural therapy aims to help patients foster the necessary skills to achieve sustained weight loss (34-36). Nutrition counselling embraces several behaviour change techniques. These strategies are drawn from a number of behavioural change theories including cognitive behavioural theory, social cognitive theory/social learning theory and the transtheoretical model. The behaviour change strategies used by dietitians may not fall into only one of these theoretical approaches but most often overlap across the categories (34, 37). Many of these strategies are geared towards increasing patients' motivation, adherence to weight loss behaviours and self-efficacy (38, 39).

One of the problems in applying behaviour change theory in health and lifestyle intervention has been translating theory into practical and relevant strategies to effect change. As Michie et al (40) argue, the problem is in selecting the most appropriate intervention for a selected problem and to match a specific context and population. Michie and her colleagues, experts in the field of behaviour change for health research, overviewed the relevant literature and developed the behaviour change wheel to characterise and design behaviour change interventions. However, there exists a gap in the translation of such new perspectives in behaviour change theory into weight management strategies, including mobile technology.

myPace for weight management

Developed specifically to be embedded into and to support dietetic practice, a platform, called myPace (<http://mypaceapp.com/>), was created out of systematic, iterative stages of engagement with dietitians and consumers. In short, the platform complements and supports the trusted health practitioner-patient relationship. It incorporates a web-based “portal” for dietitians and a mobile application for patients. All the functions are fully customisable and it flexibly fits in with patients’ different motivational levels, while progressively encouraging patient independence from that relationship over time. Through the mobile application clients can report on their progress, which is tracked over time. Patients’ progress will provide an evidence-base for discussion in the upcoming consultation, and facilitate more targeted advice and action. Importantly, the aims on how to use myPace are always agreed jointly by the client and dietitian. The platform supports an integrative, ‘small steps’ approach to weight loss, incorporating automated but personalised monitoring and motivation features, allowing dietitians to speedily respond to patients’ progress between consultations if desired. myPace embeds advanced motivation features so that dietitians can quickly and easily schedule automated but personalised motivational messages for their clients. myPace is built upon strategies dietitians use in their everyday practice, and incorporates relevant tenets of behaviour change theory into its functionality making it both practical and evidence-based. The process of creation was based on research data feeding into technology design and development and, at the same time, using the tool provides data as well, making myPace both an app for weight management as well as a research tool.

Evaluating myPace

If a novel technology is to be embedded into and to support dietetic practice, close collaboration with dietitians is key. The myPace prototype was evaluated with dietitians in the United Kingdom at two stages and the findings from these tests have gone into refining the software to better reflect actual practice and wider dietitian preferences.

In order to investigate the effectiveness of myPace in clinical settings, exploratory evaluations of the way the intervention works is foreseen for end 2014/start 2015. These studies will evaluate the impact myPace has (if any) on:

1. efficiencies in the health system (efficiency)
2. patient weight loss (effectiveness)
3. patient self-reported weight loss adherence, self-efficacy and motivation
4. patient satisfaction with their weight loss and the weight loss process

They will also investigate whether patient and dietitian engagement with the tool itself has any effect on efficiency, effectiveness, self-reported self-efficacy, adherence and motivation, and patient and dietitian satisfaction with the weight loss process. These studies will help to develop an evidence base for the tool. At this proof of concept stage it is not appropriate to extend the evaluations more broadly within Europe, not least as due consideration would have to be given to the health care settings within different countries which in many cases are very different from the UK NHS.

Behaviour change theory for myPace

Our research shows that there is a need to articulate new and emerging perspectives in behaviour change theory and consider their applications to the design of digital technologies to support weight management. This is vital in order to develop technology that matches and is relevant to dietetic requirements and the routine practices of the dietitian-patient consultation.

Future of mHealth

Even though there seems to be great potential with regard to mHealth in curbing health care costs in the European Union, or around the world, more evidence of its clinical and economic benefits is needed. Moreover, the extent to which health and lifestyle apps draw on and operationalise behaviour change theory and techniques needs to be better understood. The many apps currently entering the market lack an evidence-base and future mHealth technology would benefit from engagement with health professionals and/or targeted patient groups during development. Not simply a statement about whether or not the technology is effective when measured against a control group, but a full teasing out of the circumstances where the intervention seems to be effective (or not) and for whom.

Mobile technology specifically developed to be integrated into healthcare systems is distinctive in the current mobile app market. This may be the way forward for health apps as such an approach supports the work of health professionals and does not replace the fundamental face-to-face relationship between health professionals and patients, which is seen as a valuable contributor to patients' health outcomes as well as their satisfaction with the health process.

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CONFLICTS OF INTEREST

None.

AUTHORSHIP

M. H. is the project researcher and co-author of the paper. R. G. is collaborator in the project and co-author of the paper. L. F. is collaborator in the project, presented the project at the Nutrition Society Irish Section Meeting 2014, and provided input to the paper. D. F. is the lead developer of the myPace technology. A. L. is a collaborator in the project and representative of European Federation of the Associations of Dietitians. J. W. is the project coordinator and provided input to the paper. J. B. is the principal investigator on the project.

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