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Experiences and Perceptions of Adults Accessing Publicly Available Nutrition Behavior-Change Mobile Apps for Weight Management

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ABSTRACT

Background Nutrition mobile apps have become accessible and popular weight-management tools available to the general public. To date, much of the research has focused on quantitative outcomes with these tools (eg, weight loss); little is known about user experiences and perceptions of these tools when used outside of a research trial environment.

Objective Our aim was to understand the experiences and perceptions of adult volunteers who have used publicly available mobile apps to support nutrition behavior change for weight management.

Design We conducted one-on-one semi-structured interviews with individuals who reported using nutrition mobile apps for weight management outside of a research setting.

Participants/setting Twenty-four healthy adults (n=19 females, n=5 males) who had used publicly available nutrition mobile apps for weight management for ≥1 week within the past 3 to 4 months were recruited from the community in southern Ontario and Edmonton, Canada, using different methods (eg, social media, posters, and word of mouth).

Qualitative data analysis Interviews were audiorecorded, transcribed verbatim, and transcripts were verified against recordings. Data were coded inductively and organized into categories using NVivo, version 10 (QSR International).

Results Participants used nutrition apps for various amounts of time (mean= approximately 14 months). Varied nutrition apps were used; however, MyFitnessPal was the most common. In the interviews, the following four categories of experiences with nutrition apps became apparent: food data entry (database, data entry methods, portion size, and complex foods); accountability, feedback, and progress (goal setting, accountability, monitoring, and feedback); technical and app-related factors; and personal factors (self-motivation, privacy, knowledge, and obsession). Most participants used apps without professional or dietitian support.

Conclusions This work reveals that numerous factors affect use and ongoing adherence to use of nutrition mobile apps. These data are relevant to professionals looking to better assist individuals using these tools, as well as developers looking to develop new and improved apps.

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MOBILE DEVICES (EG, SMARTPHONES, TABLETS) have increased in popularity over the past several years. According to the International Telecommunications Union, the number of active mobile broadband subscriptions in the developed world rose from 225 million in 2007 to 1,140 million in 2016.[1] Of particular relevance to dietitians is the increase in availability and popularity of nutrition software applications for mobile devices (or "apps") to support weight management. For example, as of April 2017, the Google Play Store (Google Inc) reported 50 to 100 million installs of MyFitnessPal (MyFitnessPal), a nutrition and physical activity self-monitoring app. Dietitians are also seeing clients asking about or using publicly available apps for weight management in their practice,[2,3] which is not surprising, given the high prevalence of excess body weight in the general population.[4,5] Moreover, apps have many attractive features: they are familiar, are generally low or no cost, are accessible, can provide different types of support (eg, behavior self-monitoring, social support), and app-based supports are available anytime users have their device.[6]

To date, research in this area has focused mainly on understanding the effectiveness of apps (eg, whether weight loss is higher when using apps vs usual care) often using researcher-developed apps that are usually not publicly

available.[7,8] This work has been summarized in review articles that have examined both current- and previous-generation mobile devices and apps.[9-11] In general, these studies have found that app use for self-monitoring can result in better outcomes (eg, weight loss) compared to other methods; however, not all studies have found more beneficial outcomes with use,[12] and self-monitoring adherence can be problematic (eg, low adherence, decreases over time)[13-15] despite mobile device portability. Qualitative research on the experiences of actual users of these tools has the potential to help explain some of these mixed findings; a recent review article has summarized qualitative research on text messaging and app use for weight management.[16] However, to date, existing qualitative research has been limited by methodological concerns (eg, not sampling until data saturation), has sometimes focused on participants who may not represent the general population (eg, undergraduate students taking a health class),[17] has sometimes combined results for different electronic behavior-change approaches,[18] and has sometimes had participants use the app for the purpose of research, which may not represent normal use.[17,19] There have been a few previous qualitative studies that have examined user experiences with nutrition and activity mobile technologies used outside of a research trial setting; for example, Fritz and colleagues[20] examined user experiences with wearable activity trackers (eg, Fitbit; Fitbit Inc) for activity behavior change, and Gowin and colleagues[21] examined use of health and fitness apps by college students. However, to our knowledge, there has been no thorough exploration of user experiences with nutrition apps for weight management when used outside of a research trial setting by adults of any age. Such qualitative data would help professionals to better support users with the apps they actually use and inform future app development. Recent articles have also highlighted the benefits of studying publicly available apps, the need for researchers to use study designs that focus on outcomes beyond effectiveness in research trial settings, and the importance of studies that examine real-world use.[7,8]

The purpose of this study was to use one-on-one semi-structured interviews to understand the experiences and perceptions of adult volunteers free from diabetes, cancer, and cardiovascular and renal disease who have used publicly available mobile apps to support nutrition behavior change for weight management.

MATERIALS AND METHODS

The University of Waterloo Office of Research Ethics provided approval. All participants provided written informed consent. The Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist[22] guided study reporting. Recruitment and interviews occurred from February to November 2015.

Convenience sampling was used. Individuals were eligible if they were ≥18 years of age; had used a publicly available nutrition mobile app for ≥1 week within the previous 3 to 4 months for weight management; self-reported being free of diabetes, cancer, and cardiovascular and renal disease; had not undergone bariatric surgery; and could speak, read, and write in English. Body weight status was not used as part of the eligibility criteria. Information on body weight status, dieting/eating disorder history, education level, income, and race were not collected from participants.

Participants were recruited in southern Ontario and Edmonton, Alberta, Canada, using community-based advertising; recruitment posters were placed in public locations (eg, library), and on social media and online classified websites. Study information was also disseminated via the Waterloo Region dietitians listserv and through various University of Waterloo channels (eg, posters, Facebook). Word-of-mouth advertising was also used.

Interested individuals were e-mailed the study information letter and screening questions. If eligible and still interested, an interview was scheduled at a mutually agreed upon time and location. Most interviews occurred in public locations (eg, coffee shops); no one else was present for the purpose of the interview. Participants were asked to bring their mobile device with the nutrition apps used to the interview.

All participants were interviewed one on one and face to face using a semi-structured interview protocol[23,24] (Figure 1, available online at www.jandonline.org) with open-ended questions designed to address study objectives. The Diffusion of Innovations[25] framework and, in particular, the Innovation-Decision Process, also informed the protocol; however, the protocol was not solely based on this framework. The Innovation-Decision Process outlines five steps (Knowledge, Persuasion, Decision, Implementation, Confirmation) that individuals pass through from gaining knowledge about the innovation, to forming an attitude, to implementation, and confirming whether they wish to continue or discontinue use of the innovation. When developing the interview protocol, questions were included to address all aspects of this process. Clarifying and elaborating probes were used to gather additional data.[24] At the end of the interview, a checklist was used to ask about additional aspects of user experiences and perceptions with nutrition apps; this checklist was informed by the Diffusion of Innovations framework[25] and a Technology Acceptance Model review.[26] The interview protocol was reviewed by the project advisory team (academics, Dietitians of Canada staff member), and was then pilot-tested with two volunteers; these interviews were included in the analysis because no protocol changes were made at this stage.

All interviews were conducted by the first author (J. R. L. L.), a female MSc dietitian PhD student with previous qualitative research training (ie, graduate-level qualitative methods course) and experience (ie, experience conducting two previous qualitative nutrition research studies), who had avoided using any nutrition apps to control for potential bias. She did, however, have research interests in nutrition apps, had served on advisory committees for Dietitians of Canada's eaTracker electronic nutrition and physical activity self-monitoring tool, and had been a coauthor on peer-reviewed papers in this area. Participants knew the researcher was a dietitian and PhD student who was interested in obtaining information about their experiences and perceptions with the nutrition apps they had used for weight management. The researchers had no conflicts of interest with participants.

All interviews were audiorecorded and notes were taken during the interview on an interview protocol form; no repeat interviews were conducted. Descriptive and reflective field notes were taken immediately after interviews, as is standard practice.[24,27] All interviews were transcribed