How Do College Students Choose Mobile Health/Wellness Applications?

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ABSTRACT
This poster reports on the findings from interviews with fifty college students regarding what mobile health and wellness applications students used and how they choose those applications. In terms of application types, calorie and daily activity counters, such as MyFitnessPal and Lose It!, were most popular for the participants in the study, followed by running trackers, such as Nike+ Running and MapMyRun, and exercise/workout trackers, such as Fitness Buddy and Ab Workouts. Students seemed to prefer free applications and they evaluated and chose applications both indirectly (i.e., based on third party information and recommendations) and directly (i.e., through use).

Keywords
Mobile applications, mobile apps, quality, wellness, health

INTRODUCTION
For younger adults, mobile devices seem to be one of the common channels to look for health and wellness information online. A survey reported that 42% of cell phone owners who were 18 to 29 years old as of January 2013 used their phones to look for health-related information, such as specific diseases or medical problems and certain medical treatments or procedures, as well as information about how to lose weight or control weight (Fox & Duggan, 2013). In particular, with the increased smartphone ownership among the younger age group of 18- to 24-years-old (79% as of June 2013), mobile applications gained ground as channels for tailored health and wellness information distribution and as tools used to monitor, log, quantify, manage, and interact with in their health and wellness activities (Smith, 2013). Recent studies on online health information have shown that the use of Web health information systems and mobile applications may increase knowledge on the health topics and lead positive health outcomes and more proactive health behavior (Mamykina, Mynatt, & Kaufman, 2006).

In the mobile application stores (e.g., Apple App Store, Google Play), hundreds of thousands of mobile health and wellness applications are available for download. However, it is not always clear whether or not those applications are grounded in high quality medical and kinesiology research and/or perform according to the specifications from their descriptions. With multiple choices available for the same type of product from different providers, the discovery, selection, and/or recommendation of a ‘right’ product become a challenge for both consumers and intermediaries such as search engines, application stores, and health portals. Thus, it is important to study how consumers select a certain application over other alternatives; how they perceive the usefulness and quality of mobile health/wellness applications and stick with the downloaded applications; whether the consumer-perceived quality corresponds to the actual quality of the application; and whether the models, constructs and heuristics of quality evaluation identified for web health/wellness information resources are applicable to mobile applications. This research attempts to bridge these gaps by exploring users’ mobile application selection criteria.

RELATED RESEARCH
There is a significant body of literature on conceptualization of individual information quality criteria, general frameworks, and context specific models of information product and service quality (Fallis & Frické, 2002; Stvilia, Gasser, Twidale, & Smith, 2007; Sundar, Knobloch-Westerwick, & Hastall, 2007; Wand & Wang, 1996; Wang & Strong, 1996). In addition, there have been studies of consumer use of different heuristics to make quality and credibility judgments (Fogg et al., 2003; Rieh, 2002; Sundar et al., 2007; Yi, Stvilia, & Mon, 2012), as well as the investigations of the effects of using specific system components on the efficacy of different types of websites.

The dimensions of quality can be both intrinsic and relational, and quality can be assessed both directly and indirectly (Stvilia et al., 2007). For instance, reputation or credibility of the application maker can influence the consumer perception of the application quality. This process of indirect quality assessment can also be conceptualized as sense-making around the quality of the
application by using various cues or “scents” (Pirolli & Card, 1999; Russell, Stefik, Pirolli, & Card, 1993). When there are multiple alternatives for the same type of product or service, the quality-based selection of an application becomes a search optimization task in a multidimensional search space where the dimensions are quality criteria and cost (Lesser et al., 1998). Visualization is often used to make sense of data and support decision-making (Chi & Card, 1999).

Users to use social cues and annotations in predicting the quality or interestingness of information, first, they should be able to notice and interpret them as relevant to their product selection decision-making (Fernquist & Chi, 2013; Fogg, 2003). In addition, different types of social cues may convey different levels of importance or persuasion value to the user, and therefore influence their decision-making differently (Stvilia, Mon, & Yi, 2009). Kulkarni and Chi (2013) found that annotations from friends were more persuasive to users in their selection of news articles than annotations made by the people they did not know.

Similar to the quality of other products, most of the time, the users of mobile applications may not have access to or an ability to evaluate the source code of the application, and can only assess its quality either directly through the use of the application or indirectly by using cues in the summary description of the application and social cues, including other users’ evaluations and quality incident reports (Gallardo-Valencia & Sim, 2011). The preceding studies provide valuable insights into the different aspects and relationships that can affect a consumer’s decision to select a particular product or service. However, more research is needed on how to support consumer seeking and evaluations of mobile applications in general, and wellness applications in particular.

**RESEARCH QUESTIONS**

RQ1: What mobile health/wellness applications do students use, and what are the purposes of using those applications?

RQ2: How do students select mobile health/wellness applications?

**METHODS**

This poster reports the findings from the dataset of interviews with fifty students, which is part of a larger research project consisting of content analysis, surveys, and interviews; the overall research design was introduced in our previous poster (Choi & Stvilia, 2013).

The survey and interview instruments were developed based on the theoretical frameworks of perceived quality of health information websites (Stvilia et al., 2009) and the typologies of software quality problem types and quality cues found in the literature (Fenton & Pfleeger, 1991; Gallardo-Valencia & Sim, 2011). Details of the information quality (IQ) and software quality (SQ) criteria that guided the research instrument development are provided in the previous poster (Choi & Stvilia, 2013).

The researchers used the Facebook page of the University’s student fitness and wellness center and two undergraduate classes as recruitment sites. To be eligible for participation, students had to own a smartphone and use at least one health or wellness mobile application. Participants who completed a survey and an interview were emailed a $30 Amazon.com gift card.

The interview transcripts were open coded for a) the types of sources used to learn about mobile health/wellness applications, b) main purposes of using the mobile applications, and c) reasons for choosing and using a certain application over other similar alternatives.

**FINDINGS**

52% (26 out of 50) were female and 48% (24 out of 50) were male. The majority of the participants were White Caucasians (37 out of 50; 74%), followed by Hispanic or Latino (5 out of 50; 10%), African Americans (3 out of 50; 6%), and Asians (2 out of 50; 4%). Three (6%) defined themselves as multiracial. In regard to education level (status), most of the participants were undergraduates (46 out of 50; 92%) and 4% (2 out of 50) were graduate students. Two (4%) were pursuing a non-degree certificate.

**Application Types by Main Uses**

The most commonly used mobile application by the participants was MyFitnessPal (30%), followed by Nike+ Running (18%), MapMyRun (14%), Lose It! (12%), S-Health (50; 6%), WebMD (6%), etc.

Categorizing the application types based on the reported uses by participants, not by the sets of available functionalities, calorie and daily activity counters, such as MyFitnessPal and Lose It!, were the most popular application type for the participants in the current study (54%). The main purposes of using these applications were setting a goal weight; counting calories they have eaten and burned on that day; tracking daily activities and exercises; and checking nutrition facts of the food they ate.

The second most frequently used application type was running trackers (42%). The main uses for this type of application, such as Nike+ Running and MapMyRun, were setting goal distance and lap time; recording running pace, distance, and speed; and planning and tracking running routes using GPS (mapping).

Other application types included exercise/workout trackers, such as Fitness Buddy and Alpha Trainer, used to set-up fitness plans and record progress (16%); health information databases, such as WebMD and Nutrition Fact, which provide health information regarding symptoms of disease, medicine, nutrition facts, etc. (8%); and sleep pattern trackers, such as Sleep Cycle and Sleep Bot, which monitor the quantity (e.g., total sleeping time) and quality of sleep (e.g., percentage of deep sleep versus light sleep) (8%). Some female participants used menstruation cycle trackers,
As mentioned above, ‘free of charge’ was one of the crucial factors that make students download a mobile application to their smartphones. Thus, they simply uninstall the downloaded application without any cost or penalty, as they are not satisfied with the application. Obviously, usability-related characteristics, such as easy-to-use and simplicity of navigation, were frequently mentioned reasons to keep using the downloaded mobile applications.

“I think that the primary reason of it is because it’s really easy to use on my phone and it was easy to explore and navigate around. So, it’s kind of nature to stay with it” (i13).

In addition, many students seemed to prefer to be provided with diverse functionalities and in-depth information that met their expectations.

“This app, even though it’s free version that I’m using, it still has a lot of functions” (i17).

“I like the fact that it gives you so much information about your run … it can give you statistics about all the runs together, you can look at individual ones and save them all” (i3).

Other reasons for continued use of the downloaded applications were: customizability/flexibility; accuracy and no errors, etc.

**DISCUSSION AND FUTURE RESEARCH**

Based on our exploratory investigation, calorie and daily activity trackers were the most popular type of mobile health and wellness applications for college students. Many students were interested in counting, recording, and quantifying daily activities in terms of calories (i.e., how much they had and burned each day) to manage their weight. In terms of exercise type, running was overwhelmingly popular for students over other sports, such as cycling, swimming, and workouts. Other types of applications such as health information databases and sleep pattern trackers accounted for a relatively smaller portion of students’ mobile application use.

Interview data showed that students used both indirect and direct ways of choosing mobile applications. In indirect

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**Table 1. Mobile application types by reported uses.**

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<th>Apps type (%)</th>
<th>Apps Used (%)</th>
<th>Reported use</th>
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| Calorie & Daily Activity Counters (54%) | MyFitnessPal (30%), Lose It! (12%), S-Health (6%), Fitbit (4%), Calorie Counter (2%), Fooducate (2%), MyPlate Calorie Tracker (2%), Weight Watchers (2%) | • Setting a goal weight  
• Counting daily calorie intake and consumption  
• Tracking daily activities and exercises  
• Checking nutrition facts |
| Running Trackers (42%) | Nike+ Running (18%), MapMyRun 14%, Couch C5K & C25K (6%), Run Keeper (6%), Runtastic Pro (4%), Charity Miles (2%) | • Setting a goal distance and/or lap time  
• Recording running pace, distance, and speed  
• Planning and tracking running routes using GPS |
| Exercise / Workout trackers (16%) | Fitness Buddy (4%), 7 Minute Workout (2%), AB Workouts (2%), Alpha Trainer (2%), Record My Swim (2%), Virtual Gym (2%), Workout Trainer (2%) | • Setting-up and track fitness plans  
• Recording exercises (e.g., biking, swimming, workout)  
• Having instructions for exercises (e.g., how to workout specific muscle groups, etc.) |
| Health information databases (8%) | WebMD (6%), Nutrition Fact (2%) | • Consulting health information regarding symptoms of disease, medicine, nutrition facts, etc. |
| Sleep pattern trackers (8%) | Sleep Cycle (4%), Sleep Bot (2%), Sleep Maker (2%) | • Recording the total sleeping time  
• Monitoring the sleep quality, such as proportions of deep sleep versus light sleep over the night |
| Women’s health (4%) | Menstruation and Ovulation Calendar (2%), Period Tracker (2%) | • Keeping track of menstruation and ovulation  
• Recording the period dates |
| Miscellaneous (4%) | Heart Rate (2%), Quit Start (2%) | • Monitoring heart rate  
• Planning and recording the plan for quitting smoking |

such as Menstruation and Ovulation Calendar and Period Tracker (4%). Table 1 above shows the types of mobile health/wellness applications by the reported uses.

**Choosing Mobile Application**

The analysis of interviews showed that students who reviewed prior user comments tended to rely more on positive comments than on negative ones in order to make a decision of whether or not to download the application under review.

“The reason why I chose the Nike+ app was, first and foremost, when I was comparing to other apps, it was one of the highest rated apps on that site, and also app stores” (i24).

“Before I’m going to download the app, I make sure it’s enough highly rating and then read the user feedback” (i28).

In addition, it seemed that students were very sensitive to the cost of the application. Many of them mentioned that they decided to download a specific application because it was free.

“I remember the reason why I chose it was because, first of all, it’s free” (i3).

Some other mentioned reasons for choosing certain mobile application(s) over other alternatives included: design; listed on the top in the search results page; no ads; maker’s credibility, etc.

As mentioned above, ‘free of charge’ was one of the crucial factors that make students download a mobile application to their smartphones. Thus, they simply uninstall the downloaded application without any cost or penalty, as they are not satisfied with the application. Obviously, usability-related characteristics, such as easy-to-use and simplicity of
evaluations they tended to rely on application summaries, evaluations and comments from prior users, and popularity cues generated by application stores such as “trending” or “featured” applications. By providing free versions of mobile applications, many developers encouraged direct evaluations. As students in general tend to be relatively “time rich” by “money poor,” many of them invested time in downloading and evaluating applications directly through use before making a decision. Easiness and simplicity seems to be considered the most crucial factors that make them stick with the downloaded mobile health/wellness application. Also, students preferred the applications having various functionalities and providing in-depth information of what they focus on. Being able to customize what to do or what to record with the application (e.g., sets of lifts, miles to run, songs to play while running, etc.) and accuracy of the information recorded by the application were also considered important mobile application characteristics that make people keep using the applications. Overall, the IQ (Stvilia et al., 2009) and SQ criteria (Fenton & Pfleeger, 1991) seemed to be employed in the phase of use in which people judge the quality of the application, rather than in the phase of choice.

The researchers will analyze and combine the survey data with the interview data discussed in the current poster to have further insights into how students select and use mobile health/wellness applications.

REFERENCES


