The Public Health Potential of the Current Health Apps for Increasing Physical Activity

Extended Abstract

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I consider my PhD as having 2 distinctive parts: A) to ascertain the quality of physical activity (PA) applications (apps) on the market in terms of safety, effectiveness, and user experience (Studies 1, 2); B) to assess the efficacy of selected PA apps with potential, physically inactive, users (Studies 3, 4). I am finalising part A of the PhD and I am writing the protocols for part B. It would be valuable to gain the views of experts to make sure I am considering the topic from both behaviour change discipline and user experience research.

CCS CONCEPTS

• **Human-centered computing~Smartphones** • *Applied computing~Life and medical sciences* • *Applied computing~Consumer health*

KEYWORDS

mhealth, health application, physical activity

1 INTRODUCTION

57% of people in England are considered inactive [1]. The commercial market is saturated with apps that aim to increase PA. Despite the wide distribution and popularity of PA apps, there are limited data on their effectiveness, safety of personal data, and user experience.

The aim of this PhD is to explore the public health potential of currently available health applications for increasing PA.

Table 1: Summary of the thesis objectives and methods

Thesis objectives	Methods	State
To assess the quality of currently available PA apps (Study 1)	A review and content analysis	Completed
To assess the relationship between user ratings and determinants of quality in current PA apps (Study 2)	Regression models	In progress
To explore the efficacy and usability of selected PA apps (Study 3)	Latin square design	Planning phase
To explore the experiences of using selected PA apps (Study 4)	Data-prompted interviews	Planning phase

2 SUMMARY OF METHODS FOR STUDY 1 & 2

The top-ranked 400 free and paid apps from the Health & Fitness categories of iTunes and Google Play stores were screened for the inclusion in the study. The apps were downloaded on mobile phones and assessed by two reviewers against the following quality indicators:

Quality indicator	Applying the indicator to health apps
Safety	Security and privacy of data (privacy policy assessment)
Likelihood of effectiveness	Behaviour Change Techniques (BCTs) [2] Organisational affiliation, expert and user involvement; presence of any peer-reviewed studies,
User experience	User ratings System Usability Scale [3]

The association between the user ratings and the quality indicators was assessed using logistic regression.

3 SUMMARY RESULTS FOR STUDY 1 & 2

156 apps met the inclusion criteria and 65 apps were randomly selected and assessed. The privacy policy was not available for 29.2% of the sample. Most of the apps collected Personally Identifiable Information and shared users' data with 3rd party. Every app contained at least 1 BCT, with an average number of 7, and a maximum of 13 BCTs. The median usability score was "excellent": 86.3 of out 100 possible.

There was no relationship between the number of BCTs and user ratings. However, users in iTunes and Google Play differ in how they assign user ratings. The effect of the total number of BCTs was not consistent across stores: for each additional BCT, there was a 15% increase in the likelihood of assigning higher user ratings in iTunes (OR 1.15, 95% CI 1.06-1.25, p<0.001). There was no effect of BCTs on user ratings in Google Play users.

In the next 2 section I outline the rationale and design plans for the Study 3 and 4.

4 THE EFFICACY OF SELECTED PA APPS IN INCREASING PA LEVELS (STUDY 3)

Building on the findings of the Study 1 and 2, PA apps with high number of BCTs and high usability score that are targeted at users with low PA levels, will be selected to be assessed with potential users. This study will use accelerometers to measure PA objectively. Ecological Momentary Assessment (EMA) and diaries will be used to assess what features of apps were used and liked.

5 EXPLORING THE EXPERIENCES OF USING SELECTED PA APPS (STUDY 4)

This study will seek to gain better understanding of the experiences of using PA apps. Participants who will take part in Study 3 will be asked to take part in an interview to explore how users adopted the PA apps, what features, if any, where the most helpful, and what are the barriers/facilitators of using apps to increase PA. Semi-structured, data-prompted interviews will be conducted after the completion of the Study 2. The accelerometer and EMA data of the patterns of engagement in PA will be used to aid memory and gain insights into the experiences of using PA apps.

6 DISCUSSION

The quality of the PA apps on the market could be improved. The relationship between the number of BCTs (effectiveness) and user ratings (user satisfaction) is complex. More studies are needed to assess the efficacy and user experience of current PA apps.

7 CONTRIBUTION TO KNOWLEDGE

Within the public health research area this thesis will contribute to addressing the public health concern of physical inactivity by advancing the understanding of behaviour change using PA apps.

To the field of user experience this thesis will shed light on how users adopt current PA apps and shed light on the facilitators/barriers of utilising PA apps to increase PA levels.

I declare that I have no significant competing financial, professional or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

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