A Usability Study of a Physical Activity Mobile Health Application Prototype Informed by the Multi-Process Action Control Framework: Part 1

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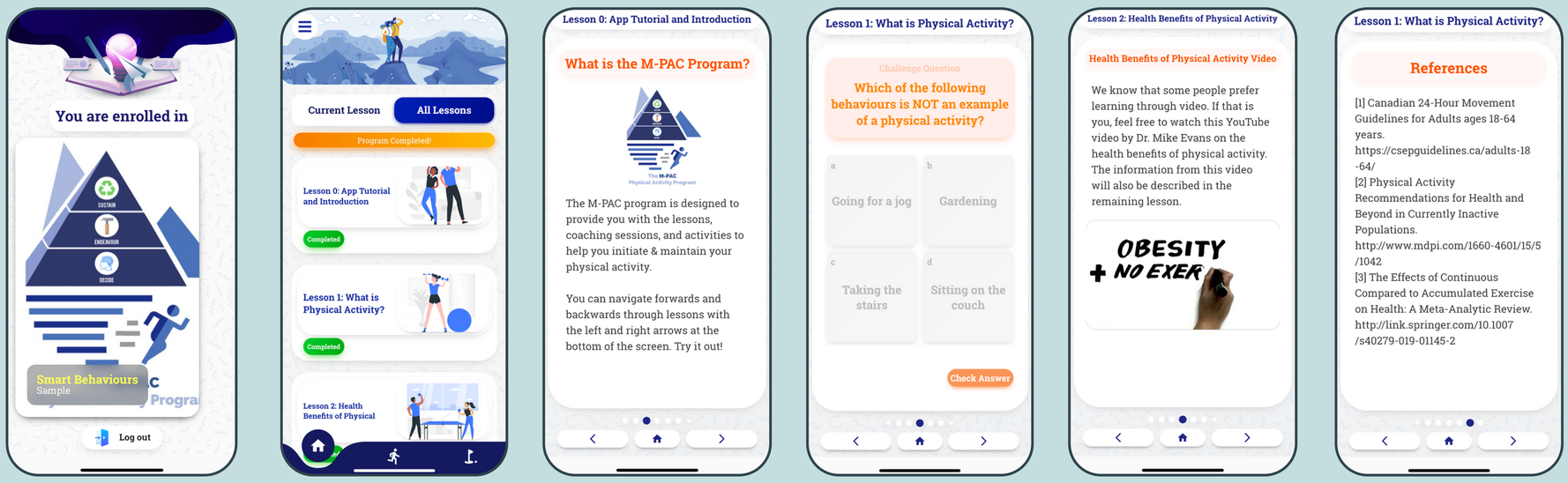
BACKGROUND: Mobile health applications (mHealth apps) offer scalable opportunities to reverse the widespread inactivity burden.[1] Physical activity (PA) mHealth apps have demonstrated significant short-term effects on PA behaviour, however effect sizes diminish long term.[2] The multi-process action control (M-PAC) framework promotes longer term PA behaviour by combining regulatory (e.g., self-monitoring, emotion regulation) and reflexive constructs (e.g., exercise identity, habits) with reflective constructs (e.g., attitudes).[3]

Objective:
To gather user feedback of the first M-PAC app prototype.

Methods: We conducted three workshop / focus groups with adult participants to gather the first impressions, usability and acceptability of the M-PAC app. The focus groups were recorded, transcribed and analysed with content analysis informed by Nielsen's usability heuristics.[4]

M-PAC App



M-PAC Framework

Pathverse App Platform

Results

We conducted three focus groups of five participants each. Participants were primarily women (87%) with a mean age 30.4 (SD = 9.49) years. Most had at least a college or university degree (93%), self-reported having above average abilities to use the functions of their smartphone (73%), and just under half had previously downloaded a mobile app to help increase their PA (47%) (e.g., Down Dog, Fitbit, Health, Nike Training Club app, Endomondo, Sweat app). The most common brand of smartphone was Apple iPhone (n = 9), followed by Samsung (n = 4), and Google Pixel (n = 2).

Layout and Information. The app was attractive and had straightforward icons; participants enjoyed the card content. However, there were limited options to switch lessons; participants asked for multiple depths of content for people with various physical literacy levels.

Appropriateness of Language. Appropriate use of lay terms resulted in appropriate and understandable language for general audience. PA-literate individuals might find the language too simple; definitions of some terms (e.g., self-efficacy) were needed.

Backing out or Undoing an Action. Backing out from pages was easy. Participants disliked needing to restart the lesson upon returning to homepage, couldn't edit or delete self-monitoring measures; and completed goals could accidentally become uncompleted.

Consistency in Language and Features. The app's language and features were consistent. Participants reported inconsistency in wording and icons across different platforms.

Errors and Mistakes. The app couldn't connect to Fitbits. Some images glitched (e.g., showed up too small) or would not load. Participants also stated that they could not reset the password for the app. Another error was that external links led to blank pages for Android users.

Forgetting Acronyms. Sometimes the lessons introduced acronyms (e.g., MVPA, CSEP, FITT, and PAR-Q) without providing definitions.

Efficiency of Interface and Navigation. Participants liked swiping through the app when navigating. However, they reported that some tabs could only be clicked on, whereas others could be swiped through and clicked on. Participants also thought the swipe left button was too small, making clicking difficult.

Visual Design. Participants liked the images and illustrations and enjoyed the colour scheme, visual representation, and design of the tabs. They suggested bolding for key terms and to reduce text on some of the cards.

Ease in Diagnosing and Resolving Errors. The participants reported that the app did not provide information about the password requirements when creating a password for login. The "help" button was hard to find, they needed to go through the entire set of slides to find a solution to their problems.

Help and Documentation. Participants thought the app needed more information on how to connect to Fitbit, the "Help" cards were not accessible (e.g., the "Help" cards did not include a "Home" button, users could not skip to the card they wanted), and the lack of the ability to send error reports on specific cards.

Additional Suggestions on Features. Participants suggested a progress bar in the lessons, a sound effect when finishing a lesson, a toolbox for important or favourite cards, a "home" button on each page, hyperlinks to reference articles, the ability to bookmark specific pages, and the option to input different PA metrics (e.g., distance walked).

Conclusion: The feedback informed modifications to the content, layout, and functions of the first M-PAC app prototype and will be followed by a second round of user feedback.

References

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