Mobile phone app designed to boost physical activity in women shows promise in trial

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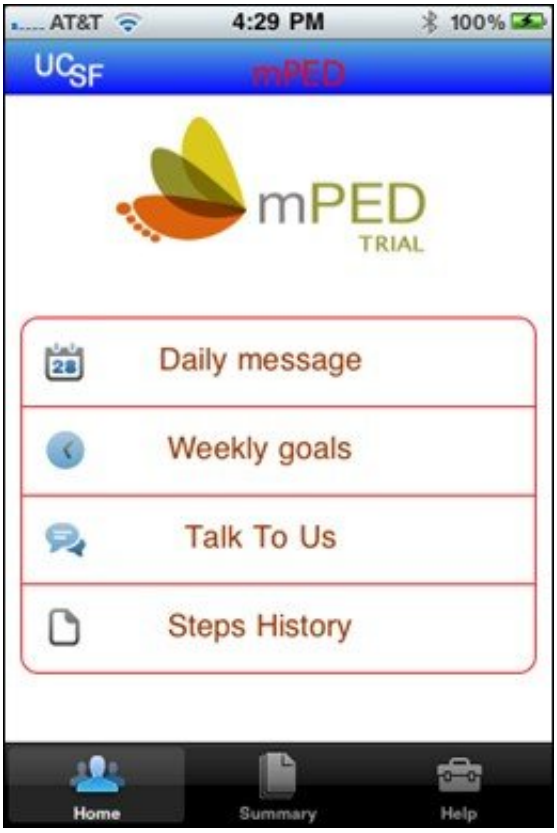

This mobile phone screenshot from the mPED trial app shows a home page including a daily message menu used by women in the study intervention, including the regular and plus groups. A pre-programmed interactive daily message or video clip automatically show ups at a predetermined time. Credit: University of California, San Francisco.

Activity trackers and mobile phone apps are all the rage, but do they

really help users increase and maintain physical activity? A new study has found that one mobile phone app designed for inactive women did help when combined with an activity tracker and personal counseling.

Researchers said the findings offer important clues about how to make such app-based interventions successful—motivational messages and interactive feedback were notable features in this case. But they also highlight their limitations, as the app did not appear to be key in helping the women stay motivated past the first three months. Understanding what did, the researchers said, could eventually help the development of more effective technologies that can get people active and keep them active.

Funded by the National Heart, Lung, and Blood Institute (NHLBI), part of the National Institutes of Health, the study is one of the first to examine how an app-based program can help increase and maintain objectively measured daily physical activity. It was published online on May 24 in *JAMA Network Open*, a peer-reviewed online-only journal.

"We showed that if you design an activity app using an evidence-based approach, it will be more effective," said study leader Yoshimi Fukuoka, Ph.D., R.N., a professor in the Department of Physiological Nursing at the University of California, San Francisco. "Our findings could go a long way to get more people to move, particularly women."

Regular physical activity has long been shown to reduce the risk of obesity, heart disease, stroke, high blood pressure, diabetes and other chronic conditions. However, according to the 2018 Physical Activity Guidelines for Americans, nearly 80% of adults are not meeting the recommended activity level. Women across all age groups are less likely to be physically active than men. While apps and physical activity trackers have become extremely popular way to break some of those barriers, their long-term effectiveness remains unclear.

Previous activity app trials have been frequently short, and their sample sizes small, and most did not monitor activity objectively and continually. The current study, which lasted nine months, was called the mobile phone based physical activity education (mPED) trial. Fukuoka's research group designed their app specifically for physically inactive women, incorporating behavioral change strategies known to work well for this group, such as personalized goal setting, self-monitoring, social support, and feedback. It was critical, the researchers said, that the women were able to engage with the program at home.

The app, which was developed exclusively for the study and is not commercially available, had three main functions, including a pre-programed interactive daily message or video that reinforced what was learned during a beginning counseling session, and a daily activity diary to record progress. The app automatically increased the participants' activity goals by 20 percent each week to 10,000 steps daily. To improve adherence, participants received an automated message if the app had not been used for three consecutive days.

The trial involved 210 physically inactive women, ages 25 and 65. They were equally divided into three groups—a control that had no intervention but used a tracking device for the nine months of the trial; a "regular" group that got counseling and used the tracker and the app for three months, then used only the tracker for the remaining six months; and a "plus" group that got counseling and used the tracker and the app for the entire nine months. Unlike most other studies, the researchers measured women's activity every 60 seconds, every day for nine months, instead of relying on self-reported activity or intermittent activity measured by the tracker.

During the first three months, the tracker showed that, compared to the control group, the women in the regular and plus groups logged about 2,000 steps more per day, equivalent to approximately 1 mile or 20

minutes of walking. They also increased their moderate to vigorous physical activity by 18 minutes a day.

In the following six-month maintenance period, however, the regular and plus groups logged about 1,400 steps more than the control group and got in eight more minutes of moderate to vigorous physical activity. Researchers said these findings show that the women were able to sustain an impressive level of activity above their starting point.

However, continued use of the app by the plus group did not add any extra benefit to help maintain this increased activity, compared to the regular group, which had stopped using the app after the first three months.

"Sustaining any behavior change is difficult in general, and in particular, sustaining the increased physical activity that resulted after the intervention," Fukuoka said. "Still, it is encouraging to see that 97.6% of women in our trial completed a nine-month visit and kept up part of their increased activity."

The researchers' next goal is to refine maintenance strategies that can help maintain those increased levels of activity over a longer period.

According to the study, the intervention appeared to be equally effective, no matter the user's age, race and ethnicity, body mass index, education, and household income, but the researchers cautioned that the findings might not be generalizable to men.

The research is part of a larger NIH effort to explore better ways to improve cardiovascular health.

"Exercise is just one pillar in a heart-healthy lifestyle and should complement other heart-healthy changes, such as choosing a healthy

diet, aiming for a healthy weight, managing stress, getting sufficient sleep, and quitting smoking," said Josephine Boyington, Ph.D., the NHLBI project officer for the study. "People should talk to their doctors about what changes are best for optimizing their individual heart-health plans."

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