Original Paper

Examining Responsiveness to an Incentive-Based Mobile Health App: Longitudinal Observational Study

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Abstract

Background: The Carrot Rewards app was developed as part of a public-private partnership to reward Canadians with loyalty points for downloading the app, referring friends, completing educational health quizzes, and health-related behaviors with long-term objectives of increasing health knowledge and encouraging healthy behaviors. During the first 3 months after program rollout in British Columbia, a number of program design elements were adjusted, creating observed differences between groups of users with respect to the potential impact of program features on user engagement levels.

Objective: This study examines the impact of reducing reward size over time and explored the influence of other program features such as quiz timing, health intervention content, and type of reward program on user engagement with a mobile health (mHealth) app.

Methods: Participants in this longitudinal, nonexperimental observational study included British Columbia citizens who downloaded the app between March and July 2016. A regression methodology was used to examine the impact of changes to several program design features on quiz offer acceptance and engagement with this mHealth app.

Results: Our results, based on the longitudinal app use of 54,917 users (mean age 35, SD 13.2 years; 65.03% [35,647/54,917] female), indicated that the key drivers of the likelihood of continued user engagement, in order of greatest to least impact, were (1) type of rewards earned by users (eg, movies [+355%; P<.001], air travel [+210%; P<.001], and grocery [+140%; P<.001] relative to gas), (2) time delay between early offers (−64%; P<.001), (3) the content of the health intervention (eg, healthy eating [−10%; P<.001] vs exercise [+20%, P<.001] relative to health risk assessments), and (4) changes in the number of points offered. Our results demonstrate that reducing the number of points associated with a particular quiz by 10% only led to a 1% decrease in the likelihood of offer response (P<.001) and that each of the other design features had larger impacts on participant retention than did changes in the number of points.

Conclusions: The results of this study demonstrate that this program, built around the principles of behavioral economics in the form of the ongoing awarding of a small number of reward points instantly following the completion of health interventions, was able to drive significantly higher engagement levels than those demonstrated in previous literature exploring the intersection of mHealth apps and financial incentives. Previous studies have demonstrated the presence of incentive matters to user engagement; however, our results indicate that the number of points offered for these reward point–based health interventions is less important than other program design features such as the type of reward points being offered, the timing of intervention and reward offers, and the content of the health interventions in driving continued engagement by users.

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KEYWORDS

mHealth; behavioral economics; public health; incentives; mobile apps; mobile phone

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