# Applying Push Notifications with Behavioral Change Strategies in Fitness Applications: A Survey of User's Perception Based on Consumer Engagement

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**Abstract :** Background: Fitness applications (apps) are one of the most popular mobile health (mHealth) apps. These apps can help prevent/control health issues such as obesity, which is one of the most serious public health challenges in the developed world in recent decades. Compared with the traditional intervention like face-to-face treatment, it is cheaper and more convenient to use fitness apps to interfere with physical activities and healthy behaviors. Nevertheless, fitness applications apps tend to have high abandonment rates and low levels of user engagement. Therefore, maintaining the endurance of users' usage is challenging. In fact, previous research shows a variety of strategies -goal-setting, self-monitoring, coaching, etc.- for promoting fitness and health behavior change. These strategies can influence the users' perseverance and self-monitoring of the program as well as favoring their adherence to routines that involve a long-term behavioral change. However, commercial fitness apps rarely incorporate these strategies into their design, thus leading to a lack of engagement with the apps. Most of today's mobile services and brands engage their users proactively via push notifications. Push notifications. These notifications are visual or auditory alerts to inform mobile users about a wide range of topics that entails an effective and personal mean of communication between the app and the user. One of the research purposes of this article is to implement the application of behavior change strategies through push notifications. Proposes: This study aims to better understand the influence that effective use of push notifications combined with the behavioral change strategies will have on users' engagement with the fitness app. And the secondary objectives are 1) to discuss the sociodemographic differences in utilization of push notifications of fitness apps; 2) to determine the impact of each strategy in customer engagement. Methods: The study uses a combination of the Consumer Engagement Theory and UTAUT2 based model to conduct an online survey among current users of fitness apps. The questionnaire assessed attitudes to each behavioral change strategy, and sociodemographic variables. Findings: Results show the positive effect of push notifications in the generation of consumer engagement and the different impacts of each strategy among different groups of population in customer engagement. Conclusions: Fitness apps with behavior change strategies have a positive impact on increasing users' usage time and customer engagement. Theoretical experts can participate in designing fitness applications, along with technical designers.
**Keywords :** behavioral change, customer engagement, fitness app, push notification, UTAUT2
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