

Trajectories of Engagement with a Digital Physical Activity Coach: Secondary Analysis of a Micro-Randomized Trial

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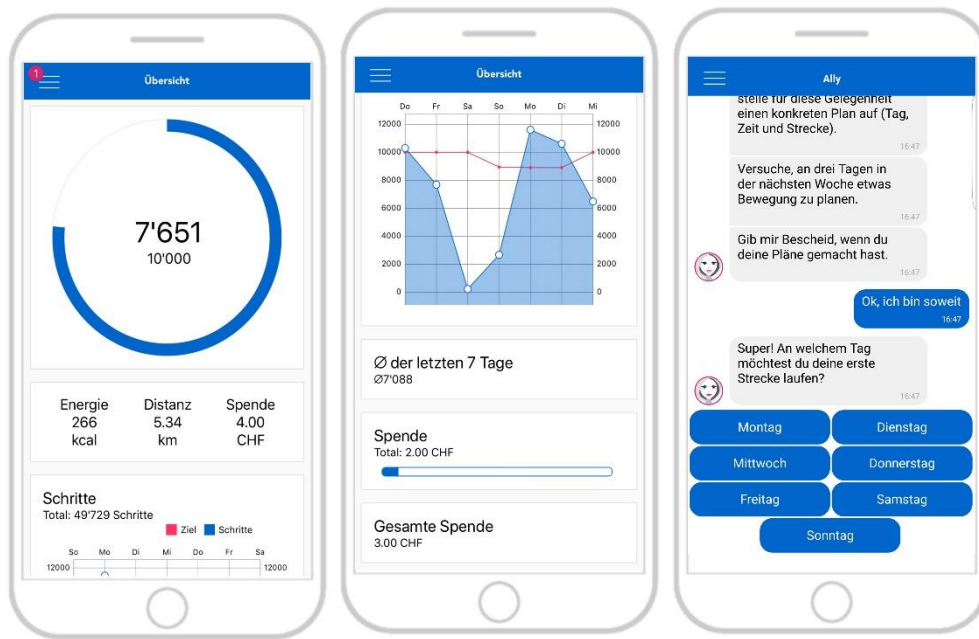
Oral Presentation

Context: Intervention components of a MobileCoach¹ based smartphone app to promote walking were assessed in a seven-week micro-randomized trial ($N = 274$). In order to make a significant contribution to public health, the app must also engage those at higher risk for adverse health outcomes, i.e. elderly, less active or less healthy participants.

Methods: In a secondary analysis, longitudinal trajectories of participants' number of daily app sessions were clustered using the k-means algorithm with an alternating number of clusters². An app session was defined as any interaction between a participant and the app separated by at least five minutes between interactions. The final number of clusters was determined based on five different clustering quality criteria.

Results: Two different clusters emerged: stable high engagement (31.3% of participants, 7.6 ($SD = 2.9$) mean daily app sessions) and stable low engagement (68.7% of participants, 1.5 ($SD = 1.4$) mean daily app sessions). Highly engaged participants were older (45.8 vs. 40.1 years, $p < .001$, $d = 0.43$) and accumulated more steps per day during the study (7373 vs. 5828 steps per day, $p < .001$, $d = 0.57$). Clusters did not differ with regard to participants' baseline physical activity, gender, body mass index, self-reported health status or education.

Conclusions: A chatbot-based walking app engaged participants of a micro-randomized trial over a period of seven weeks independent of their risk for adverse health outcomes. Thus, participants with low risk for adverse health outcomes at baseline do not drive high engagement with the app.



1. Kowatsch T, Volland D, Shih I, et al. Design and Evaluation of a Mobile Chat App for the Open Source Behavioral Health Intervention Platform MobileCoach. Paper presented at: International Conference on Design Science Research in Information Systems; 30 May - 1 June, 2017; Karlsruhe, Germany.
2. Genolini C, Alacoque X, Sentenac M, Arnaud C. kml and kml3d: R Packages to Cluster Longitudinal Data. *Journal of Statistical Software*.65(4):1-32.