

**Purpose:** Previous studies suggest that self-monitoring might be a promising behavior change technique to reduce older adults' sedentary behavior (SB). However, little is known about self-monitoring interventions aimed at the reduction of older adults' SB. The aim of this study is to evaluate engagement with, and efficacy of a self-monitoring-based mHealth intervention developed to reduce older adults' SB.

**Methods:** A mixed methods study was performed among 28 community-dwelling older adults living in Belgium. The 3-week self-monitoring intervention consisted of general SB information as well as visual and tactile feedback (ie vibrations) on participants' SB. Semi-structured interviews were conducted, and system usage data were recorded, to explore engagement with the intervention. Accelerometer data from the self-monitoring device and from the ActiPal accelerometer were analyzed to assess the intervention's efficacy. Qualitative data were thematically analyzed and presented using pen profiles; quantitative data were analyzed using descriptive statistics, and generalized estimating equations.

**Results/findings:** Participants mainly reported positive feelings regarding the intervention, referring to it as motivating, surprising, and interesting. They commonly reported that the intervention changed their thinking, but not their actual behavior. The intervention was considered easy to use, and the design was described as clear. Some problems were noticed regarding attaching and wearing the self-monitoring device. System usage data showed that the median frequency of consulting the app widely differed among participants. A total of 2601 vibrations were provided to the participants during the intervention period. Fourteen, twenty-one, and twenty-eight percent of the vibrations resulted in a sedentary behavior break respectively within one, three and five minutes. The percentage of sedentary behavior breaks was significantly higher if haptic feedback was provided in the afternoon, compared to the morning. No significant reductions were found in total sitting time after the intervention.

**Conclusions:** Although the intervention was well perceived by the majority of older adults, the number of SB breaks was limited, and total sitting time did not reduce. Possible explanations for the lack of reductions might be the short intervention duration or the fact that only bringing the habitual SB into conscious awareness might not be sufficient to achieve behavior change.