

Development and Evaluation of a Cognitive Behavioural Therapy Based Smartphone App for Low Moods and Anxiety

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Abstract : Smartphone apps hold immense potential as mental health and wellbeing tools. Support can be made easily accessible and can be used in real-time while users are experiencing distress. Furthermore, data can be collected to enable machine learning and automated tailoring of support to users. While many apps have been developed for mental health purposes, few have adhered to evidence-based recommendations and even fewer have pursued experimental validation. This paper details the development and experimental evaluation of an app, MoodMission, that aims to provide support for low moods and anxiety, help prevent clinical depression and anxiety disorders, and serve as an adjunct to professional clinical supports. MoodMission was designed to deliver cognitive behavioural therapy for specifically reported problems in real-time, momentary interactions. Users report their low moods or anxious feelings to the app along with a subjective units of distress scale (SUDS) rating. MoodMission then provides a choice of 5-10 short, evidence-based mental health strategies called Missions. Users choose a Mission, complete it, and report their distress again. Automated tailoring, gamification, and in-built data collection for analysis of effectiveness was also included in the app's design. The development process involved construction of an evidence-based behavioural plan, designing of the app, building and testing procedures, feedback-informed changes, and a public launch. A randomized controlled trial (RCT) was conducted comparing MoodMission to two other apps and a waitlist control condition. Participants completed measures of anxiety, depression, well-being, emotional self-awareness, coping self-efficacy and mental health literacy at the start of their app use and 30 days later. At the time of submission (November 2016) over 300 participants have participated in the RCT. Data analysis will begin in January 2017. At the time of this submission, MoodMission has over 4000 users. A repeated-measures ANOVA of 1390 completed Missions reveals that SUDS (0-10) ratings were significantly reduced between pre-Mission ratings ($M=6.20$, $SD=2.39$) and post-Mission ratings ($M=4.93$, $SD=2.25$), $F(1,1389)=585.86$, $p < .001$, $\eta^2=.30$. This effect was consistent across both low moods and anxiety. Preliminary analyses of the data from the outcome measures surveys reveal improvements across mental health and wellbeing measures as a result of using the app over 30 days. This includes a significant increase in coping self-efficacy, $F(1,22)=5.91$, $p=.024$, $\eta^2=.21$. Complete results from the RCT in which MoodMission was evaluated will be presented. Results will also be presented from the continuous outcome data being recorded by MoodMission. MoodMission was successfully developed and launched, and preliminary analysis suggest that it is an effective mental health and wellbeing tool. In addition to the clinical applications of MoodMission, the app holds promise as a research tool to conduct component analysis of psychological therapies and overcome restraints of laboratory based studies. The support provided by the app is discrete, tailored, evidence-based, and transcends barriers of stigma, geographic isolation, financial limitations, and low health literacy.

Keywords : anxiety, app, CBT, cognitive behavioural therapy, depression, eHealth, mission, mobile, mood, MoodMission

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