Leveraging Mobile Technology: A systematic review of mHealth with Cannabis Users

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Introduction

Cannabis is commonly used by teens and young adults, including the college population. Current survey data suggests that 25% of university students use cannabis monthly or greater and that 6% use daily (Schulenberg et al., 2019). These rates are even higher (38-39%) in college students who reside in states with legal recreational cannabis use (i.e., Colorado and Washington; Pearson et al., 2017).

Transitional years can be crucial as young adults (18-25 years old) tend to have the highest rates (5%; 1.8 million in the U.S.) of Cannabis Use Disorder (CUD; SAMHSA, 2016). When considering problem use, Caldeira and colleagues (2008) found that sizeable numbers (25%) of first-year college students who used cannabis in the past year met criteria for a cannabis disorder.

Burgeoning research has shown chronic, heavy cannabis use to be associated with a host of negative consequences, including symptoms/diagnosis of CUD, as well as anxiety, depression, and psychosis, cognitive functioning (e.g., working memory, executive function), among other health issues (Arseneault et al., 2002; Buckner et al., 2010; Degenhardt et al., 2003; Midanik, Tam, & Weisner, 2007; Simons et al., 2010; Solowij & Pesa, 2010).

With the number of young adults diagnosed with CUD at 5% annually and also a growing number with frequent-heavy cannabis use without a CUD diagnoses, there is an ever growing need for intervention strategies. Yet, rates of individuals seeking formal treatment for cannabis use has been low (Prince et al., 2020).

With widespread access, it has become easier to employ mobile technology for health interventions and growing opportunities to deliver innovative interventions for substance use and chronic diseases has ensued (Kumar et al., 2013).

Study Goal

- The overall objective of this systematic review was to explore:
  - the utilization of different mobile health (mHealth) interventions for cannabis users,
  - different types and ways these interventions are implemented,
  - targeted outcomes for mHealth interventions,
  - along with reviewing the types of studies being conducted for mHealth interventions (e.g., RCT, feasibility, interviews, usability, etc.)

Methods

A search of PsycInfo and PubMed was conducted for relevant peer-reviewed articles published between 2000 and 2020 focused on mobile health interventions.

Eligibility Criteria:

- Peer-reviewed original research in English
- Location: Global
- Published between 2000-2020
- Qualitative, quantitative, and mixed methods studies were all included
- Included a Mobile (mHealth) intervention
  - Utilized in daily life (or the goal once developed)
  - Targeted cannabis use; could be part of poly-substance use
  - Study provided data on at least one outcome (e.g., reduced craving, frequency of cannabis use, increased strategy use)
    - OR
  - Feasibility/usability/acceptability of intervention

Figure 1. *PRISMA Flowchart n = 9)*

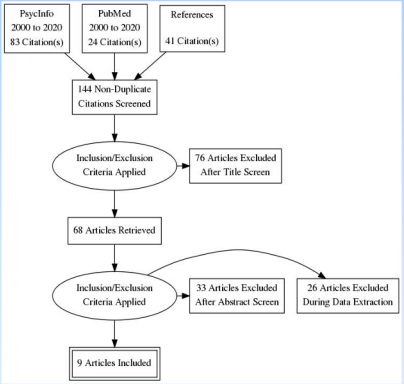


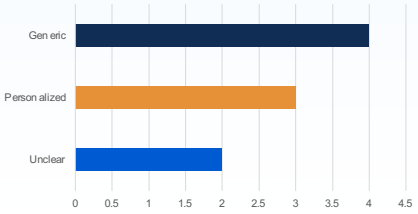
Table 1. *Systematic Review Search Terms*

Search Terms
mHealth
web-based
Internet based
telehealth
in the moment
mobile
smartphone
JITAI
EMI
ecological momentary
Just in Time Adaptive
wearable devices
AND
Cannabis
Marijuana
AND
Intervention

Results

- The findings for this systematic review are still preliminary. As a full review of references are needed along with a Google Scholar search. With that in mind, we have been able to identify 9 articles that fully met criteria for our systematic review.
- The few mHealth studies conducted with cannabis users that have been more pilot-oriented randomized control trials (RCTs; Mason et al., 2018; Mason, 2020; Prince et al., 2020; Shrier et al., 2014) while others focus solely on the usability and acceptability of the mobile delivery mechanism (e.g., the smartphone app used; Gray et al., 2017; Monney et al., 2015).
- Out of the 9 articles meeting criteria, 78% (n = 7) had some element related to feasibility, usability, or acceptability regarding the implementation of the mobile intervention.

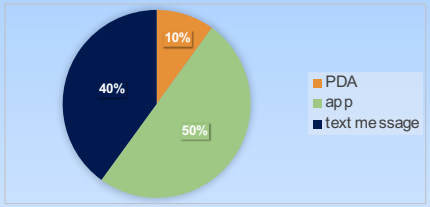
Figure 2. *Type of mHealth Intervention Delivered (n = 9)*



- Six of the 9 interventions were meant to be administered solo, where the other 3 were paired with face-2-face counseling.
- Most of the studies were conducted in the U.S. (n = 6; 67%), 1 in Australia, 1 in Hungary, and 1 throughout Europe
- Majority (n=8) focused on young adults (18-25 years of age)
- All used self report of marijuana use and 3 additionaly utilized urine screens (all were RCTs)

Results

Figure 3. *Modality of mHealth Intervention (n = 10)*



Note. One intervention utilized both an app and text messaging.

- Four articles focused on intervention targets not directly related to feasibility, use and acceptability of the mobile intervention. All 4 of these articles used randomized control trials to examine intervention efficacy and with smaller samples for piloting the interventions (participant n's = 27, 30, 37, 101).
- Target Outcomes: Reduction in cannabis use, craving, and factors related to cannabis use and intervention efficacy (i.e., moderation of depressive symptoms)

Conclusions

There is a need for the development of more mobile intervention for cannabis users and further research, most of the studies were feasibility or pilot-oriented in nature.

Some of the targets for the mHealth interventions included: increasing protective behavioral strategy use, physical activity, identifying triggers for use, craving, reduction of use within a day, over the intervention, and at follow-ups, increasing % of days of abstinence

More detail is needed when publishing mHealth studies for the outline of the intervention and methods section.

References in Review

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