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ALCOHOL & DRUG FINDINGS *Research analysis*

This entry is our analysis of a study added to the Effectiveness Bank. The original study was not published by Findings; click Title to order a copy. Free reprints may be available from the authors – click prepared e-mail. The summary conveys the findings and views expressed in the study. Below is a commentary from Drug and Alcohol Findings.

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▶ A smartphone app intervention for adult cannabis users wanting to quit or reduce their use: a pilot evaluation.

Albertella L., Gibson L., Rooke S. et al.
Journal of Cannabis Research: 2019, 1, article 9.

Unable to obtain a copy by clicking title? Try asking the author for a reprint by adapting this prepared e-mail or by writing to Dr Albertella at lucy.albertella@monash.edu.

For people motivated to reduce or quit their use of cannabis – the most widely used illicit drug in Europe – could a smartphone app provide a promising alternative to face-to-face treatments or public health interventions?

SUMMARY Most people own a mobile phone and carry it everywhere they go, providing new opportunities for delivering treatment and public health interventions. There are now more than 300,000 medical or health-related applications (apps) available for download onto mobile devices (1 2), but the number that offer evidence-based strategies to change addiction-related behaviour is considerably smaller.

The featured study, set in Australia, examined the feasibility and acceptability of an app called Assess, Plan, Track, and Tips (APTT) for helping people who wish to reduce or quit their use of cannabis. APTT used cognitive-behavioural and motivation enhancement principles previously shown to be effective in face-to-face and online (1 2) settings, and was developed with feedback from cannabis users.

The authors hypothesised that APTT participants would show significant reductions in their cannabis use, problems, and dependence severity, and increased confidence to resist cannabis. Additionally, the study explored whether participants' stage of change (ie, level of commitment to changing their behaviour) influenced app engagement, perceived usefulness, and cannabis use outcomes.

Components of the app

APTT was password protected and allowed users to email themselves personalised content such as feedback reports. The app comprised **four modules**, which users could be guided through using either a male or female avatar (or no avatar):

> **Key points**
> **From summary and commentary**
>
> Smartphone apps offer a promising way of reaching people motivated to reduce or quit their cannabis use, but perhaps reluctant to seek face-to-face treatment.
>
> The featured study evaluated the feasibility and acceptability of the Assess, Plan, Track, and Tips (APTT) app, based on cognitive-behavioural and motivational principles.
>
> Over 40% of participants used the app more than 20 times over the course of a month. Participants showed a reduction in cannabis use, dependence and cannabis-related problems, and their level of commitment to changing their behaviour predicted changes in cannabis use.

1. The **assess** module assessed current levels of cannabis use, reasons for use, and perceived consequences, and provided feedback on cannabis use and cannabis-related problems, which could be saved for later viewing as well as forwarded to the app user's email address. The feedback report included: information comparing the participant's cannabis use to the general Australian population (matched to their age and gender); how much money they would save in a week/year/20 years if they stopped smoking; the number of symptoms of cannabis use problems and dependence they exhibited; and their views of the pros and cons of cannabis use, reasons for using the drug, and negative consequences of use. After reading through the feedback, participants were prompted to create a plan for reducing or quitting their use of cannabis.

2. The **plan** module helped users choose a goal and create a plan to quit or reduce their cannabis use. Participants who used cannabis daily and opted to quit were provided with additional information on managing withdrawal and offered a reduction schedule to minimise symptoms of withdrawal (ie, reduce daily by one-third each day for seven days). Strategies to achieve goals were provided based on participants' chosen reasons for use (eg, to be liked/not feel left out; to feel good/get high; to relax/sleep/forget problems; to boost awareness/creativity; to be sociable/more confident).

3. To monitor progress towards goals, the **track** module was designed for participants to record their cannabis use or non-use each day, the money they spent on cannabis, and their reasons for use. To encourage users to track their use, a daily prompt was provided, which could be switched off for those who preferred no reminders. Tracking information could be viewed in graphs and infographic formats and participants received a certificate of achievement (optional, via email) when they reached their goal.

Sample screenshots of the Assess, Plan, Track, and Tips (APTT) app

4. The **tips** module contained a comprehensive list of strategies to help participants cope when faced with triggers or situations that might lead them to using cannabis. Participants could refer to these strategies at any time and could select or deselect their preferred strategies for prominent display in the app.

Of the 123 who completed an online screening test, 12 were excluded – six due to high levels of psychological distress, one due to not wanting to quit or reduce their cannabis use, and five due to not having an iPhone (a requirement for downloading the app).

Assessments were conducted online prior to the use of APTT (111 participants), after four weeks' use of APTT (93), and finally one month after the app use period had ended (75).

Main findings

Most participants were classified as dependent on cannabis (75%), scoring three or above on the severity of dependence scale, and had reported making previous attempts to quit their cannabis use (76%), though just 11% had sought professional help.

Two thirds (69%) of participants signed up to the app with the goal of reducing their cannabis use, and the remaining third (31%) wanted to quit. Their stage of change was split roughly the same – 66% in the contemplation stage and 34% in the action stage. However, there was no association between participants' goals and their readiness to change.

Over 40% of participants reported using the app more than 20 times during the month (48% contemplation stage; 32% action stage), with only two participants (2%) not using the app at all (0% contemplation stage; 6% action stage).

The study found statistically significant reductions over time for:
• **Cannabis use**: Days using cannabis in the past month reduced from a midpoint of 29 days at baseline, to 21 days at post-intervention, and 20 days at the one-month follow-up.

At post-intervention, participants who scored as being in the action stage of change used cannabis on fewer days than those in the contemplation stage of change, but this difference was no longer present at follow-up.

• **Cannabis use problems**: The average score on the cannabis problems questionnaire reduced from 7.1 at baseline to 4.8 post-intervention, and 5.0 at the follow-up.

• **Cannabis dependence**: Scores on the severity of dependence scale reduced from a midpoint score of six at baseline to four post-intervention, and three at the follow-up. There was a significant association between stage of change and dependence scores, with participants in the action stage having lower dependence overall. Furthermore, participants wanting to quit (versus reduce) showed greater dependence overall.

There was no significant change over time in confidence to resist cannabis use. However, there was a significant association between stage of change and confidence to resist cannabis, such that those in the action stage had higher levels of confidence overall.

Participants in the action stage found APTT more motivating in terms of helping them manage their cannabis use, but there was no difference between participants in the contemplation and action stages with regard to the six other measures of satisfaction with using the app.

The authors' conclusions

Based on the featured pilot study, the authors concluded that the APTT app would be a feasible and acceptable intervention for people wishing to reduce or quit their use of cannabis. On the main outcomes, the app was associated with reductions in cannabis use, problems, and dependence severity, but not associated with increased confidence to resist cannabis over time.

Lack of a control or comparison group means factors other than using the app could explain the findings. For example, it is common for people to show improvements over time, particularly among people motivated to seek treatment or support as in this study. Without a more rigorous trial, it cannot be known whether the changes seen in cannabis use or problems were a result of the intervention itself or some other unrelated factor.

FINDINGS **COMMENTARY** The featured pilot study provided preliminary support for use of a smartphone app by people motivated to reduce or quit their cannabis intake. While as a single study the findings are not directly transferable to practice, there is likely to be interest in interventions of the type tested, particularly given that cannabis is the most widely used illicit drug in Europe, and although many seemingly enjoy cannabis without it leading to any significant negative social or health effects, numbers entering treatment for cannabis use problems have been on the rise. Indeed, most participants were classified as dependent on cannabis (75%) and had reported making previous attempts to quit their cannabis use (76%), but only a small minority (11%) had sought professional help, suggesting that there could be a gap for a low-threshold intervention with no requirement for disclosure to a professional. Important questions raised include whether a digital intervention is appropriate and effective for people further up the severity and complexity scale, and whether digital interventions offer promising alternatives to more traditional forms of treatment/support or should be seen only as a conduit to an eventual discussion between practitioners and people with substance use problems.

The aim of the study was to determine the feasibility and acceptability of the Assess, Plan, Track, and Tips (APTT) app. While the assessments and analyses centred on the *impact* of the app on cannabis use outcomes, the authors could only draw conclusions about findings being consistent with the app's effectiveness, they could not show it actually was.

Statistically significant reductions were observed in cannabis use, cannabis use

problems, and cannabis dependence. However, the lack of a control group prevented positive outcomes from being attributed to the intervention itself. For example, while the number of days of cannabis use reduced from baseline to post-intervention by 20%, other factors could have accounted for this. The authors themselves alluded to a concept called 'regression to the mean', describing the tendency for unusually extreme measurements to be followed by measurements closer to the population average.

Also examined was whether participants' stage of change (ie, level of commitment to changing their behaviour) influenced app engagement, perceived usefulness, and cannabis use outcomes, citing research that an individual's stage of change has been shown to influence intervention engagement and drive behavioural changes. Participants fell into either the contemplation or action stages of what is known as the 'five stages of change' (see Effectiveness Bank for more detail):

1. Pre-contemplation: The first stage describes people who are not thinking about changing the behaviour in question and are not sufficiently aware of the health implications of their actions.
2. Contemplation: The second stage is when people start to think seriously about changing their behaviour, but have not yet acted.
3. Preparation: The third stage is characterised by people preparing themselves and their social world for a change in their behaviour.
4. Action: When people successfully and consistently change the behaviour in question, they are regarded as being in the action stage.
5. Maintenance: Progression from the action stage to the maintenance stage occurs when the behaviour has been changed for six months or more.

There were mixed findings about the association between stage of change and intervention engagement and/or behavioural change, which the authors accounted for with research introduced at the end of the paper saying that "while readiness for change should theoretically predict client engagement in a program, many studies have not found this" (1 2). Though stage of change was a considerable focus in the pilot evaluation, there was no indication that that the intervention would be targeted at people in particular stages of change or that the findings would be used as a guide of what to do (or not do) with people depending on their stage of change.

The main appeal of the app was that it would be convenient and relatively easy to access, which could be scrutinised in a number of ways, for example:
• **Participants' satisfaction with the app.** Participants were asked to rate how helpful the app was across different domains: providing feedback; setting a goal; monitoring goal progress; monitoring cannabis use; understanding reasons for use; providing strategies to manage use; and motivating reduced use. Overall satisfaction with the app or by domain was not reported. Instead, the authors reported the degree of satisfaction for each domain for participants in the contemplation versus action stage of change. Based on the results, the authors' conclusion that "stage of change predicted app perceptions" seemed tenuous; analyses revealed that participants in the action stage felt APTT to be more motivating in terms of helping them manage their cannabis use, but found no difference for the remaining six domains.
• **Study retention rate.** Just over two thirds (69%) of participants were retained in the study until the end. A total of 111 were recruited; 93 completed the post-intervention assessment (drop-out rate of 16%), and 75 completed the one-month follow-up assessment (drop-out rate of 32%). Another trial cited in the featured paper tested a face-to-face cognitive-behavioural intervention. In comparison, 74% of participants were followed up a midpoint of 237 days after attending their last treatment session (unfold ☜ supplementary text to read headline findings). While this does not

constitute a like-for-like comparison, and reflects engagement with the studies overall not just the interventions, it does at least suggest that a study testing a digital intervention conferred no advantage over an in-person intervention in terms of being able to maintain engagement – to the contrary, a higher proportion of participants were lost to follow-up, and over a shorter period of time.

• **Exclusion criteria (of the app, not the study).** This iteration of the app was accessible only via an iPhone with internet connectivity. While the market share of the Apple-branded iPhone has dramatically increased from 15% of British households in 2011 to 43% in 2018, its cost compared to others makes it inaccessible to many. However, there was no indication that the app would be permanently exclusive to iPhone users; it might later be developed for phones with other operating systems.

The prospect that digital interventions could make help for problem substance use readily available to more people and for less money – with the promise of greater feasibility as internet access expands and becomes more convenient – has driven studies to test whether such approaches can retain the effectiveness of in-person interventions. If effectiveness is sacrificed, casting the net wider may not be worthwhile. Moreover, the idea that an automated response driven by a computer or smartphone could help people dependent on drugs overcome often desperate situations doesn't quite sit right with everyone. Where is the humanity without the human-to-human contact? And where is the 'therapy' without the familiar cues of patient and practitioner? This reaction is in itself a reason why they might not work, because such therapies would fail to meet a basic criterion for effective psychosocial treatment, that it's about what you do in that culture to get better – that to the patient, it *looks* like 'treatment'. This and more is discussed in an Effectiveness Bank hot topic on digital therapies.

To understand the context for 'treating' problem cannabis use, refer to another hot topic on why "cannabis is worth bothering with".

Thanks for their comments on this entry in draft to research author Dr Lucy Albertella, Research Fellow at the Turner Institute for Brain and Mental Health, Monash University, Melbourne, Australia. Commentators bear no responsibility for the text including the interpretations and any remaining errors.

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