A systematic review and meta-analysis of the effectiveness of mobile telephone-delivered contingency management interventions promoting behaviour change in individuals with substance use disorders

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Review question

1. Does telephone delivered contingency management promote treatment adherence in individuals with substance use disorders?
2. Does telephone delivered contingency management promote abstinence in individuals with substance use disorders?

Searches

We will identify published, unpublished, and ongoing studies by searching the following databases from 1995 to present. Electronic Bibliographic Databases: PsycINFO, CINAHL, MEDLINE PubMed, Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, Embase Ovid.

Types of study to be included

Randomised controlled trials (RCTs) that compare telephone delivered Contingency Management interventions with other treatment interventions such as Motivational Enhancement Therapy, Cognitive Behaviour Therapy, or treatment as usual, will be included. Within subject designs comparing no intervention/baseline with an intervention phase will also be included.

Condition or domain being studied

Despite the extensive evidence base for the effectiveness of both psychological and pharmacological interventions in the treatment of substance use disorders, not all who could benefit from these treatments receive them and many treatments do not produce the full patient benefit due to high levels of missed appointments and drop-out (NTA, 2012). Moreover, psychological interventions are infrequently delivered due to large staff caseloads, high rates of clinical staff turnover and limited financial resources (Carroll & Rounsaville, 2007).

Non-adherence among the substance use population include missed outpatient appointments, non-attendance at recovery-based appointments and non-compliance with medication. These issues are not only a wasteful use of limited resources but may in fact have a detrimental impact on the quality of care a patient receives (Department of Health, 2014). As many as 37% of new patient appointments are ‘missed’ due to non-attenders each year in the addiction services across the UK (Mitchell & Selmes, 2007). Individuals who regularly display non-adherence with treatment services are more likely to disengage from treatment entirely (Weisner, Mertens, Tam & Moore, 2001), to experience higher risk of hospitalisations (McCarty et al., 2007), and are less likely to achieve long-term abstinence than those who do engage in their treatment (Sebastian et al., 2012). Improving the effectiveness of treatment adherence interventions could potentially yield a greater impact in the health of the population than any advances in the effectiveness of specific treatments (Haynes et al., 2001).

Behavioural interventions in which rewards and financial incentives are delivered contingent on objective evidence of behaviour change have gained considerable interest due to their success in promoting health-related behaviour change including abstinence from smoking (Ybarra et al. 2013; Ybarra et al. 2012;

Whittaker et al. 2016; Rodgers et al. 2005; Free et al. 2011), alcohol (Gustafson et al. 2014) and substance use (Gonzales et al. 2014). Such behaviour interventions are commonly termed contingency management within the substance use field (Higgins, Silverman & Heil, 2008). One possible way to provide broader, low cost, flexible access to contingency management interventions is to deliver them by telephone. Telephone based systems allow greater accessibility as interventions can be delivered to individuals without the need for them to be present in the clinical service and allow more frequent therapeutic contact without the need to attend frequent appointments (Budman, 2000). They minimise issues of staffing, resources, and access to services. In addition, they allow for individuals who might not regularly access a treatment service to be reached, to monitor or encourage individuals to attend, and allow for services to stay in contact with patients over a longer period of time to support recovery and provide an early warning of relapse. Mobile telephones are increasingly useful in healthcare delivery around the world. The short-messaging-service (SMS) has been used for health service appointment reminders, preventive activities and medication adherence (Free 2013). SMS allows for instant communication between clinicians and patients at any time, place or setting. SMS messages can be tailored to suit individual's needs, making them useful for health behaviour change interventions (Ryan & Lauyer, 2002). In addition, patient engagement between them and the service provider can be quantified and monitored.
There has been a rapid growth in the use of technology and over 90 per cent of the population now have access to mobile phone services, including those with substance misuse problems (Milward et al 2014). Telephones have been used to deliver a variety of health behaviour interventions including continuing care in addiction treatment (for individuals with alcohol, tobacco and drug problems) and studies of their satisfaction and clinical effectiveness at promoting health behaviours such as smoking cessation have shown promise (Rodgers et al, 2005; Free et al, 2011; Abroms et al, 2014; Ybarra et al, 2013; Ybarra et al, 2012; Gustafson et al, 2014; Whittaker et al, 2016; Gonzales et al, 2014).

Participants/population

Individuals,18 years and older, in treatment for substance use disorder (any substance including alcohol, opiates, stimulants, tobacco).

Intervention(s), exposure(s)

We will only include reports that used mobile telephones to (a) accomplish one or both of the main elements of incentives interventions (monitoring behaviour, delivering incentives remotely) and (b) used incentives to encourage treatment adherence and abstinence. Typically, incentive interventions include multicomponent CM (e.g., financial incentives plus praise or feedback about progress) whose independent influence on treatment efficacy is not always assessed. However, we will not require that studies have isolated the effects of incentives apart from those common elements for inclusion.

Comparator(s)/control

For studies that employed a between-subject design, the comparator is the control group who received: no contingency management; treatment as usual; alternative comparable interventions; face to face contingency management. For those studies that employed a within-subjects design, the comparison could be a no intervention baseline phase that preceded and followed the intervention, or a multiple-baseline design wherein the timing of the incentives intervention was staggered in time across different targets or different participants.

Context

Primary outcome(s)

The efficacy of telephone delivered contingency management in encouraging;
1. Abstinence, as measured by: proportion of individuals who are continuously abstinent; length of abstinence period; percentage days abstinent (PDA)
2. Medication Adherence, as measured by: proportion of individuals who are taking their medication as prescribed
3. Treatment Engagement, as measured by; percentage of days in attendance or engagement in therapeutic

activities.

Timing and effect measures

Secondary outcome(s)

None.

Timing and effect measures

Data extraction (selection and coding)

Data Management: Endnote X8 will be used to manage records throughout this review, and Microsoft Excel will be used for data extraction.

Selection Process: Articles will be extracted into Endnote X8 and duplicates removed. Two review authors (CG,AM) will independently scan the title and abstract of every record retrieved to determine which studies should be further evaluated for inclusion. All potentially relevant articles will be investigated as full text. Any discrepancies between the review authors will be resolved through consultation and discussion with a third author. We will contact authors of potential studies for clarification if necessary. Reliability estimates will be calculated using Cohen's KAPPA. This process will be detailed in a PRISMA flow chart.
Data Collection Process: Data will be extracted by one reviewer (CG) with another checking and verifying all entries. Extracted data will be entered into an Excel database developed by CG.
Data Items: Extracted data will include;
1. Study details; Author, year published, title, objective(s), conflicts of interest, funding sources
2. Study design; Study population, sample size, number of conditions, sampling strategy, target behaviour, response and follow-up rates, lengths of follow-up
3. Participant demographics; age, gender, ethnicity, socio-economic status
4. Intervention characteristics; target behaviour, type of reinforcement, reinforcement schedule, duration of treatment, reward delivery, use of telephone (monitor and/or deliver reinforcement)
5. Outcome data/results; main results summary, statistical methods, covariates, primary & secondary outcomes, effect size, power, moderating & mediating factors
6. Sources of bias
Any data pertaining to the intervention and the effects of it on a target behaviour being investigated will also be extracted. Where articles lack these details, study authors will be contacted.
Outcomes sought: Data will be sought for the following outcomes;
1. Abstinence, as measured by: proportion of individuals who are continuously abstinent; length of abstinence period; percentage days abstinent (PDA)
2. Medication Adherence, as measured by: proportion of individuals who are taking their medication as prescribed
3. Treatment Engagement, as measured by; percentage of days in attendance or engagement in therapeutic activities.

Risk of bias (quality) assessment

Risk of bias will be assessed at outcome level for each study using the Cochrane Collaboration risk of bias tool (Higgins & Green, 2011), supplemented by guidance from Systematic Reviews: CRD's guidance for undertaking systematic reviews in health care (University of York, 2009). An overall judgement will then be made of the risk of bias, at outcome level, in each study.

Strategy for data synthesis

Where possible, it is planned that a meta-analysis will be used to compare efficacy of contingency management against control. I^2 would be used to check for heterogeneity and if significant heterogeneity is detected, subgroup sensitivity analyses will be performed to attempt to investigate this. Sensitivity analyses

will also be performed to see if any of the methodical decisions may have influenced the results. If the degree of heterogeneity across studies is such that it precludes us from conducting a meta-analysis, we will describe the findings and effects using the systematic review. Although it may not be possible to combine results into a meta-analysis, displaying the result and confidence interval for each study may help visualise any patterns. This could be done with forest plot or other graphical tools (e.g. L'Abbe plots).
Finally, the report will be set out according to the PRISMA checklist. The report will include the main findings of the review, discussion about the strength of the evidence, generalisability and acceptability, limitations of the review and recommendations for commissioners, policy makers or further research. The review itself will be quality assessed using a tool such as R-AMSTAR. If the tool shows any areas could be improved, these will be altered.

Analysis of subgroups or subsets
Analysis of the effects of contingency management on the use of different drugs.

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Society for the Study of Addiction (SSA).

Conflicts of interest

Language
(there is not an English language summary)

Country
England

Published protocol

Stage of review
Review_Ongoing

Subject index terms status
Subject indexing assigned by CRD

Subject index terms

Behavior Therapy; Cell Phone; Humans; Substance-Related Disorders

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Details of any existing review of the same topic by the same authors

Stage of review at time of this submission

Stage	Started	Completed
Preliminary searches	Yes	No
Piloting of the study selection process	No	No
Formal screening of search results against eligibility criteria	No	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Versions
23 April 2018