Are mobile phones and handheld computers being used to enhance delivery of psychiatric treatment? A systematic review
Ehrenreich B, Righter B, Rocke DA, Dixon L, Hinellhoch S

CRD summary
This review found that use of mobile phones may be effective in augmenting interventions for smoking cessation but there was little evidence of effectiveness for patients with anxiety disorders. The limited search, potential for language and publication biases and the lack of information provided in the results mean that the reliability of the authors' conclusions are unclear.

Authors' objectives
To examine the extent to which mobile phones and handheld computers were useful in providing novel interventions for mental health-related problems

Searching
PubMed and PsycINFO were searched to June 2010 for relevant studies in English; search terms were reported. Bibliographies of retrieved articles were searched for additional studies.

Study selection
Randomised controlled trials (RCT) that used handheld computers or cellular phones to enhance the treatment of patients with psychiatric disorders were eligible for inclusion. Studies of laptops and tablet devices were excluded as were studies that focused on dementia, delirium, other cognitive disorders and disorders other than adult psychiatric disorders.

The interventions included use of mobile phones and handheld computers to augment interventions that targeted smoking abstinence (mobile phones) and the reduction of anxiety symptoms (handheld computers). Telephone counselling and text (SMS) messaging or personalised text messaging, interactive voice responses and internet and email reminders were used to deliver interventions by mobile phone. Handheld computers for patients with anxiety symptoms were used for self-monitoring of symptoms and additional treatment modules and facilitation of homework exercises. Interventions ranged in length from 12 weeks to 12 months.

Two reviewers independently performed the study selection; any discrepancies between the reviewers were resolved by consensus.

Assessment of study quality
Methodological quality was assessed using the Cochrane Risk of Bias Tool for sequence generation, allocation concealment, blinding of outcome assessors, reporting of loss to follow-up, selective outcome reporting and other biases.

The authors did not state how many reviewers assessed methodological quality.

Data extraction
Data were extracted by two independent reviewers as reported in the studies. Any differences between the reviewers were resolved by consensus.

Methods of synthesis
The results of the review were summarised using a narrative synthesis because of differences in diagnosis, interventions and outcomes.

Results of the review
Eight RCTs (2,923 participants) were included in the review. Five trials used devices for smoking cessation interventions. Three trials were interventions targeting anxiety symptoms. Retention rates varied from 57.1% to 92%.
(over 80% in all except two trials). Sequence generation was reported adequately in five RCTs. Allocation concealment was described in only two trials. Outcome assessors were blinded in five trials. All trials reported losses to follow-up. One study was judged to be at unclear risk of selective outcome reporting. There was a lack of clarity on other sources of bias in five RCTs.

**Smoking cessation:** In one study participants who received a cognitive-behavioral therapy (CBT) intervention with telephone counselling for three months were more than five times more likely to achieve abstinence from smoking.

The other studies used mobile phone interventions with text messaging or personalised text messaging, interactive voice responses, internet and email reminders. Study duration ranged from four to 12 months. Retention rates ranged from 74.2% to 92%. Compared with control groups of usual care, self-help booklets and wait-list control, the intervention groups had a greater likelihood of achieving abstinence during the study time period.

**Anxiety disorders:** Two studies examined augmentation of CBT with a handheld computer compared to standard CBT of six weeks and 12 weeks. Treatment with CBT augmented by handheld computers led to significant reductions in panic symptoms compared to the wait-list control group but standard 12-week CBT interventions had the largest and most lasting treatment effects.

In another study a handheld computer to facilitate homework assignments in patients with social phobia was compared to a 12-session CBT programme and wait-list controls. There were no differences in the self-report measures of social phobia between the wait-list controls and the handheld computer intervention group.

**Authors' conclusions**
Cellular telephones can be successfully used to augment interventions that target abstinence from smoking, but there was little evidence to support use of handheld computers for treatment of anxiety disorders.

**CRD commentary**
The review addressed a broad question. Criteria for inclusion of studies in the review were defined and reproducible. Only two appropriate databases were searched for relevant studies, so it was possible that other studies were missed. The review appeared to be restricted to studies in English which meant there was potential for language biases. No attempts were made to identify unpublished literature so there was a risk of publication bias. Steps were taken by the reviewers to minimise errors and bias for study selection and data extraction but no such steps were reported for assessment of methodological quality.

The authors' decision not to combine the results in a meta-analysis appeared justified on the basis of differences in patients, interventions and outcomes. Relatively little information was provided in the review about the size of the effects observed in the results of the included studies. Smoking abstinence data was self-reported with no biochemical measurements, so these results were vulnerable to social acceptability biases and may have been overestimated. Review limitations of potential for language and publication biases, emergence of newer technologies not included in the review and the inability to perform a meta-analysis were acknowledged correctly by the authors.

The limited search, potential for language and publication biases and the lack of information provided in the results mean that the reliability of the authors' conclusions are unclear.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that the small number of rigorous interventions of emerging technologies for mental health problems meant that there were research opportunities to enhance interventions using available tools of contemporary technology.

**Funding**
None.

**Bibliographic details**
Ehrenreich B, Righter B, Rocke DA, Dixon L, Himelhoch S. Are mobile phones and handheld computers being used to...

DOI
10.1097/NMD.0b013e3182349e90

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Anxiety Disorders /therapy; Cell Phones; Computers, Handheld; Humans; Psychotherapy /methods; Smoking Cessation /methods; Treatment Outcome

AccessionNumber
12011007158

Date bibliographic record published
09/03/2012

Date abstract record published
05/10/2012

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.