Computerised cognitive behavioural therapy for insomnia: a systematic review and meta-analysis
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CRD summary

This review concluded that computerised cognitive-behavioural therapy was a mildly to moderately effective over the short term for insomnia. The authors' conclusions should be treated with caution given the uncertainties about the research methodologies. The recommendations for further research appear appropriate given the short-term nature of the included trials.

Authors' objectives

To evaluate the effectiveness of computerised cognitive-behavioural therapy for insomnia

Searching

The authors searched several databases (including MEDLINE, PsycINFO, EMBASE, CINAHL and The Cochrane Library) for studies published in English between 1990 and March 2011. Search terms were reported. Relevant journals were searched and experts in the field of computerised cognitive-behavioural therapy and internet interventions were contacted. Reference lists and bibliographies of all potentially relevant papers identified were searched.

Study selection

Eligible studies needed to include adults (aged 18 and older) with a clinical diagnosis of insomnia according to DSM-IV or ICD-10, insomnia associated with anxiety or depression or insomnia without a clinical diagnosis. Studies of shift workers, those with an acute psychotic or manic disorder, participants with a head injury and those unable to read were excluded. Studies had to investigate computerised cognitive-behavioural therapy delivered through a computer and including the specific components sleep hygiene, stimulus control, relaxation training, sleep restriction and cognitive restructuring. Alternative treatments and waiting list controls were eligible comparators. Primary outcome variables included sleep onset latency, wake time after sleep onset, total sleep time, number of awakenings, time in bed, sleep efficiency and sleep quality. The Insomnia Severity Index was also used as an outcome measure.

Patients in five out of six trials had a formal diagnosis of insomnia. Five trials used internet-based computerised cognitive-behavioural therapy compared with waiting list control. One study used handheld computer devices compared with self help therapy as control. Most trials used completely self-help computerised programmes; minimal therapist support via email was also used. Study duration, nature and content of the interventions varied across the trials. The mean age of patients ranged from 39.6 to 56.7 years (where reported). The percentage of male patients ranged from 14% to 65%.

The authors did not state how many people were involved in study selection.

Assessment of study quality

Studies were assessed using the Critical Appraisal Skills Programme (CASP) tool for randomised controlled trials (RCTs). The review included only those with a score of 60% or higher on this assessment tool.

The authors did not state how many people assessed study quality.

Data extraction

Outcome data for post treatment differences for treatment and control groups were extracted.

The authors did not state how many people were involved in data extraction.

Methods of synthesis

Studies were pooled using a fixed-effect model of meta-analysis or a random-effects model where heterogeneity was present. Overall effect sizes and their 95% confidence intervals (CI) were calculated for the various outcomes by

measuring the post-treatment difference between the mean of the treatment condition and the mean of the control condition divided by the pooled standard deviation. Numbers needed to treat (NNT) were calculated. Two trials were excluded from the meta-analysis due to differences in intervention or non-clinical diagnosis of insomnia; these trials were synthesised narratively.

Results of the review

Two trials were rejected due to poor methodology. Six RCTs were deemed to be of good methodological quality and were included in the review (433 participants). The average CASP quality score was 90%. Four trials scored 100% on the CASP tool and the other two RCTs did not report on the procedure for randomisation, power analysis or intention-to-treat analysis.

Computerised cognitive-behavioural therapy was statistically superior to control post-treatment for sleep onset latency (-0.55, 95% CI -0.80 to -0.30; I^2=0%; four trials), number of awakenings (-0.45, 95% CI -0.70 to -0.20; I^2=51%; four trials), sleep efficiency (0.40, 95% CI 0.15 to 0.64; I^2=63%; four trials), sleep quality (0.41, 95% CI 0.16 to 0.65; I^2=45%; four trials) and Insomnia Severity Index (-0.86, 95% CI -1.18 to -0.53; I^2=0%; two trials).

No statistically significant differences were found between groups for wake time after sleep onset (-0.18, 95% CI -0.43 to 0.06; I^2=55%; four trials), total sleep time (0.22, 95% CI -0.03 to 0.46; I^2=0%; four trials) and time in bed (-0.25, 95% CI -0.57 to 0.07; I^2=0%; three trials).

Numbers needed to treat across four trials for the outcome of Insomnia Severity Index ranged from 1.44 to 5.36 (average of 3.59). Treatment adherence was 78% based on those who completed computerised cognitive-behavioural therapy.

Authors' conclusions

Computerised cognitive-behavioural therapy was a mildly to moderately effective self-help therapy over the short term for insomnia.

CRD commentary

This review was based on documented inclusion criteria for participants, intervention, comparator and outcomes. Searching encompassed a range of electronic and other resources. The restriction to studies published in English risked language and publication biases. Studies were quality assessed in order to determine eligibility for the review. It was unclear whether more than one reviewer was involved in study selection, data extraction and quality assessment which opened up the possibility of bias and error in these processes. A meta-analysis appeared to be appropriate.

The authors' conclusions should be treated with caution given the uncertainties about the research methodologies. The recommendations for further research appear appropriate given the short-term nature of the included trials.

Implications of the review for practice and research

Practice: The authors stated that computerised cognitive-behavioural therapy can be considered an acceptable form of low-intensity therapy in the stepped care model for insomnia.

Research: The authors stated that generalisability to patients referred from physicians needed to be addressed as did the effectiveness of computerised cognitive-behavioural therapy for insomnia secondary to a psychiatric disorder. Researchers needed to consider how to make computerised cognitive-behavioural therapy deliverable and acceptable to elderly patients with insomnia. It was unclear whether symptoms of emotional distress could also be helped by use of computerised cognitive-behavioural therapy for insomnia. The long-term benefits of computerised cognitive-behavioural therapy (up to one year) should be assessed.

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