A systematic review and economic evaluation of computerised cognitive behaviour therapy for depression and anxiety

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Authors' objectives
To assess the effectiveness of computer-based cognitive behaviour therapy (CCBT) for treating anxiety, depression and phobias, and to compare the cost-effectiveness of CCBT with cognitive behaviour therapy (CBT) by conventional methods and treatment as usual (TAU).

Searching
Seventeen bibliographic databases, including grey literature and current research, were searched from 1966 to September 2001 for English and non-English language studies. The authors reported the individual databases and search terms, and also listed the health services research-related resources searched via the Internet. The Science Citation Index and Social Sciences Citation Index were used for citation searches on key papers and authors. The bibliographies of relevant articles and sponsor submissions were examined.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion. Where RCTs were not available, non-randomised studies were included.

Specific interventions included in the review
Studies of CCBT, delivered alone or as part of a package of care by either a computer interface or over the telephone with a computer-led response (IVR), compared to current standard treatments were included. Current standard treatments were, for example, therapist-led cognitive behaviour therapy (TCBT), non-directive counselling and drug treatment. Sixteen of the included studies involved CBT without any other psychological therapy. Twelve of these studies related to CCBT and five related to self-exposure behaviour therapy. In thirteen of the studies the therapy was administered using desktop computer programmes, one used a palmtop computer, one used an Internet-based programme and one used IVR. Of the studies reporting the number of therapy sessions, the number of sessions of CCBT ranged from 4 to 12. There were three additional studies where CCBT was used as an adjunct to CBT with a therapist. In two of these studies patients used a hand-held computer; in the third study the programme 'Cognitive Therapy: A Multimedia Learning Program' was used.

Participants included in the review
Studies of adults with depression or anxiety (including generalised anxiety, panic disorders, agoraphobia, social phobia and specific phobias) with or without depression, as defined by individual studies, were eligible for inclusion. The following conditions or procedures were excluded: post-traumatic stress disorder, obsessive-compulsive disorder, post-natal depression, bipolar disorder, depression with psychotic symptoms, Tourette's syndrome, schizophrenia, psychosis, serious suicidal thoughts or unstable medical conditions in the previous 6 months, alcohol or substance abuse, psychosurgery or electroconvulsive therapy.

Of the 16 CCBT only studies, four included depressed patients only, four included patients with anxiety or panic disorder only, three included phobic patients only, two included patients with anxiety and/or depression, two included patients with panic disorder and phobia, and one included patients with anxiety, depression or phobias. Two of the studies of CCBT as a treatment adjunct included anxiety or panic disorder patients. The type of participants included in the third study was not reported.

Outcomes assessed in the review
Studies assessing improvement in psychological symptoms, interpersonal and social functioning, quality of life, preference, satisfaction, acceptability of treatment, therapist time and cost were included. All of the included studies reported psychological outcomes. More than one study used the following scales: Beck Depression Inventory, the Beck
Anxiety Inventory, the Hamilton Rating Scale for Depression, Phobic targets, the Hospital Anxiety and Depression Scale, the Attributional Style Questionnaire, the Brief Symptom Inventory, the Work and Social Adjustment Scale, and the Fear Questionnaire. Twelve of the CCBT alone studies reported patient preference, satisfaction, or acceptability outcomes. None reported quality of life outcomes. It is unclear whether any of the studies of CCBT as a treatment adjunct reported these outcomes.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The RCTs were scored for quality according to criteria developed by Jadad et al. (see Other Publications of Related Interest no.1). Non-randomised studies were assessed according to criteria modified from the Users' Guides to Evidence-Based Medicine (see Other Publications of Related Interest no.2). The quality assessment was carried out unblinded to author, institution and journal. The authors do not state how many of the reviewers performed the quality assessment.

Data extraction
The data were extracted by one reviewer using a customised data extraction form, and checked by another. Any disagreements were resolved by discussion. Depending on the data available in the individual studies, the authors extracted the mean (and standard deviation) pre- and post-treatment scores on the outcome measures, between-group difference scores and effect size.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative format and using tabulation.

How were differences between studies investigated?
Studies using CCBT as an adjunct to CBT with a therapist were grouped separately. Between-study differences were evaluated through the text and accompanying tables.

Results of the review
Nineteen studies were included. Sixteen of the included studies (n=953) involved CCBT without any other psychological therapy: 11 RCTs (n=793), 2 cohort studies (n=64), 2 pilot studies (n=53) and one comparative study (n=43). There were 3 studies (n=101) where CCBT was used as an adjunct to CBT with a therapist: one cohort study (n=96) and 2 very small studies (n=1 and n=4).

Psychological symptoms and interpersonal and social functioning (some studies had more than one comparator, usually TCBT and TAU).

CCBT versus TCBT (7 studies): there was no difference between CCBT and TCBT in six of the studies, with CCBT being as good as TCBT. One study found TCBT to be more effective than CCBT.

CCBT versus TAU (7 studies): CCBT was more effective than TAU in four studies. Three studies found no significant differences between CCBT and TAU, though one of these found a significant improvement in the CCBT group (but not the TAU group) at one month post-treatment; there was no difference at later follow-up.

CCBT versus bibliotherapy (2 studies): one study found no difference between CCBT, TCBT and bibliotherapy, with all three groups showing equal improvement. The second study found bibliotherapy to be more effective on two of the six outcomes.

Patient preference, satisfaction and acceptability (12 studies).
In one study no patients expressed regret at receiving CCBT. One study reported no differences in satisfaction between the CCBT and TCBT groups. Three studies reported drop-out or low participation in patients receiving CCBT, with counselling being more popular in one of the studies. In a further study two patients said the computer made things worse, while in another study the therapist was viewed more positively than CCBT or bibliotherapy. In the remaining five studies the views regarding CCBT were positive.

Therapist time (6 studies).

Of the six studies which reported therapist time in an appropriate format, four reported a marked reduction in therapist time for the CCBT group, one reported more therapist time for the CCBT group than the TCBT group, and one only reported time for the CCBT group (45 minutes) and not the TAU group.

Studies of CCBT as a treatment adjunct.

A significant reduction in the patient's panic and anxiety was reported in the case study. In the second very small study, one patient dropped out and three showed improvement. The final study also showed improvement in patients receiving CCBT in combination with TCBT.

Cost information

The economic modelling was based on the evidence provided in four sponsor submissions in relation to the following programmes: Stresspac, Cope, FearFighter and Beating the Blues. In the first year of implementing Beating the Blues, the costs with an assistant psychologist were £21,691 and with a practice nurse £25,192. Stresspac and FearFighter cost £19,902 and £22,574, respectively. The overall costs for Beating the Blues were estimated to be £275 million in England and 13 million in Wales when employing an assistant psychologist, and £237 million and £11 million, respectively, with a practice nurse. Stresspac was estimated to cost £206 million in England and 10 million in Wales. The authors state that the model estimates should be viewed with caution due to the data deficiencies and the large number of assumptions made.

Authors' conclusions

The authors state that the included studies were heterogeneous in terms of the setting, patient populations, comparators and outcomes measures, and that the evidence for the effectiveness of CCBT is uncertain. They also state that there is limited evidence that CCBT may be effective in the treatment of depression, anxiety and phobias, and this evidence is of poor to moderate quality.

CRD commentary

The review question was well-defined in terms of the intervention, participants, the outcomes of interest and study design. A number of relevant electronic databases were searched and the subject headings used in the search strategy were given. The authors also sought unpublished data and studies were not excluded on the basis of language. There was limited information on the study selection and quality assessment components of the review process. The data extraction was carried out by one reviewer and checked by a second, which helps to reduce errors and any bias. Sufficient information on each of the included studies is provided in both the text and tables, and the findings are discussed in the context of study quality and heterogeneity. The authors' conclusions appear to follow from the evidence presented.

Implications of the review for practice and research

Practice: The authors did not state any implications for practice.

Research: The authors make extensive recommendations regarding future research; further details are provided in the paper. They state that the extent of therapist involvement required to produce optimal outcomes for patients using CCBT needs to be investigated.

There is a need for studies carried out within the general practice setting and, in particular, which include patients with co-morbidities routinely treated within that setting. In addition, patients from a range of socioeconomic and ethnic...
backgrounds, and of different age groups and gender, need to be included. Research should also include patients who cannot access current services because they are housebound.

The role of CCBT within a stepped-care programme needs to be clarified, in addition to how it relates to other methods used to increase access to psychological therapies.

Approaches to treatment aimed at reducing therapist time, such as bibliotherapy and other self-help approaches, should be used as a comparator in studies.

Co-morbidity and medication need to be taken into account when designing studies. Other design issues include research carried out by independent researchers, good-quality RCTs of adequate power, appropriate comparison groups, and well-validated outcome measures.

Further research into the components of CCBT packages, such as the most appropriate length of sessions and software and hardware interface, is also required.

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