A meta-analysis of the effects of Internet- and computer-based cognitive-behavioral treatments for anxiety

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CRD summary
The authors concluded that internet- or computer-based cognitive-behavioural therapy was superior to waiting list and placebo and equal to therapist-delivered treatment of anxiety. The strength of the findings was limited by the methodological weaknesses of included studies. The authors’ conclusions follow from the results and their caution regarding the strength of the evidence underlying the conclusions is appropriate.

Authors’ objectives
To evaluate the effectiveness of internet- or computer-based cognitive-behavioural therapy (ICT) in adults with anxiety disorders.

Searching
PubMed, PsycINFO and Cochrane Central Register of Controlled Trials were searched for articles up to 2007. Search terms were reported. The reference lists of relevant articles were checked. Authors of relevant articles were contacted to obtain further manuscripts or data.

Study selection
Randomised controlled trials (RCT) that measured anxiety, depression, general distress, dysfunctional thinking or functioning/quality of life of ICT delivered to adults with anxiety were eligible for inclusion, provided enough information was present to enable calculation of an effect size. Studies of ICT delivered using equipment other than a standard personal computer with or without Internet connection were excluded.

Selected studies evaluated a range of different ICTs. Most consisted of psychoeducation, cognitive (restructuring and challenging) and behavioural (breathing, relaxation, exposure and goal setting) components. Some ICTs consisted solely of vicarious exposure or modelling. Where stated, the mean number of sessions completed ranged from 4.2 to 7.8. Control conditions were waiting list, treatment as usual (therapist-delivered cognitive behavioural therapy) or attentional or active placebo. Participants experienced a range of anxiety conditions of subclinical or clinical levels: generalised anxiety; post-traumatic stress disorder (PTSD); panic disorder; specific phobias; social phobia; and stress. The mean age of participants ranged from 19.9 years to 40.8 years. Where stated, a significant proportion of participants had a post-secondary level of education. A wide range of standardised measures were used to assess the outcomes of interest.

The authors stated neither how the studies were selected for the review nor how many reviewers performed the study selection.

Assessment of study quality
The validity of the included studies was assessed using a rating scheme developed by West et al (2002) based on the four broad categories: study population, interventions, measurement of effect and data presentation. The maximum possible score was 78. The authors did not state how the validity assessment was performed.

Data extraction
The mean and standard deviation of the outcome measures were extracted for the intervention and control groups in each study and used to calculate Cohen's d. Where more than one measure was used in a domain, the mean effect size was calculated. The authors stated neither how the data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
The results were combined in a fixed-effects meta-analysis that calculated the pooled effect in each of the outcome
domains and the effect for all domains combined. The weight of each effect size was inversely proportional to the conditional variance in the study. Statistical heterogeneity was assessed using the Q statistic. Where significant heterogeneity was found (p<0.05), a random-effects model was used. Subgroup analyses were performed according to control conditions, specific anxiety disorders, clinical versus non-clinical populations and studies with and without face-to-face clinician contact. Publication bias was assessed using a funnel plot.

Results of the review
Nineteen RCTs were included for review (n=1,170). The overall quality of the included studies was low. Only eight studies scored more than 40 on the quality assessment. No publication bias was detected.

ICT was associated with significantly fewer symptoms in all domains combined when compared to waiting list (effect size 0.76, 95% CI 0.60 to 0.92; 10 studies) and placebo (effect size 0.86, 95% CI: 0.61 to 1.11; seven studies). When the domains were analysed separately, moderate to large effects were also observed for anxiety, depression, general distress, dysfunctional thinking and functioning/quality of life compared to waiting-list controls and placebo controls. ICT was as effective as treatment as usual in reducing symptoms except on measures of depression, where ICT showed a moderately greater effect in reducing symptoms compared to treatment as usual. All results were significant at p<0.05. There was no evidence of significant statistical heterogeneity except for the outcomes of dysfunctional thinking and anxiety in the waiting list control condition.

In participants with panic disorder, ICT was associated with a large effect compared to waiting-list and placebo and no difference compared to treatment as usual. ICT demonstrated a moderate to large effect in participants with phobias compared to waiting list and placebo controls and a moderate effect in participants with post-traumatic stress disorder. The p-values for these outcomes were not reported. There were no significant differences between participants with a clinical diagnosis and sub-clinical groups and between those participants with clinician contact and those without.

Authors' conclusions
ICT was superior to waiting list and placebo and equal to therapist-delivered treatment of anxiety in adults. The strength of these findings was limited by the methodological weaknesses of included studies and further research was needed.

CRD commentary
The review addressed a clear question with well defined inclusion criteria. Three relevant databases were searched. It is unclear whether appropriate steps were taken to minimise language bias. Publication bias was assessed and none detected. There was insufficient information about the review process to rule out the possibility of reviewer error and bias. The methodological quality of the included studies was assessed using suitable criteria. The quality of included studies was generally low, so the data may not be reliable. The decision to combine the studies in a meta-analysis was appropriate. Subgroup analyses were conducted. However, it should be noted that two studies were excluded because calculation of an effect size was not possible. The authors' conclusions follow from the results of the review and their caution regarding the strength of the evidence underlying the conclusions is appropriate.

Implications of the review for practice and research
Practice: The authors stated that ICT may be useful in stepped-care models of treatment for adults with anxiety.

Research: The authors stated that further large-scale placebo-controlled RCTs are needed using a standardised battery of outcome measures and exploring the relationship between participants' demographic characteristics and outcomes. Research is needed into participants' preferences for therapist-delivered versus computer-delivered therapy. ICT may be a useful tool in investigating the relative importance of specific components of cognitive behavioural therapy through adding, modifying or removing specific components of the intervention.

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