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Review

Computer therapy for the anxiety and depression disorders is effective, acceptable and practical health care: An updated meta-analysis

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ABSTRACT

Background: A 2010 meta-analysis of internet-delivered CBT (iCBT) RCTs argued 'computer therapy for the anxiety and depressive disorders was effective, acceptable and practical health care' without data on effectiveness or practicality in routine practice.

Methods: Databases, reviews and meta-analyses were searched for randomised controlled trials of cCBT or iCBT versus a control group (care as usual, waitlist, information control, psychological placebo, pill placebo, etc.) in people who met diagnostic criteria for major depression, panic disorder, social anxiety disorder or generalised anxiety disorder. Number randomised, superiority of treatment versus control (Hedges'g) on primary outcome measure, length of follow-up, follow up outcome, patient adherence and satisfaction/harm were extracted; risk of bias was assessed. A search for studies on effectiveness of iCBT in clinical practice was conducted.

Results: 64 trials were identified. The mean effect size (efficacy) was g = 0.80 (NNT 2.34), and benefit was evident across all four disorders. Improvement was maintained at follow-with good acceptability. Research probity was good, and bias risk low. In addition, nine studies comparing iCBT with traditional face-to-face CBT and three comparing iCBT with bibliotherapy were identified. All three modes of treatment delivery appeared equally beneficial. The results of effectiveness studies were congruent with the results of the efficacy trials.

Limitations: Studies variably measured changes in quality of life and disability, and the lack of comparisons with medications weakens the field.

Conclusions: The conclusions drawn in the original meta-analysis are now supported: iCBT for the anxiety and depressive disorders is effective, acceptable and practical health care.

1. Introduction

Major depression and the anxiety disorders are leading causes of disability worldwide, (Whiteford, Ferrari, Degenhardt, Feigin, & Vos, 2015). Pharmacotherapy and psychotherapy have been the mainstay of treatment for anxiety and depression. CBT is the commonest form of psychotherapy for depression and anxiety and has traditionally been delivered face-to-face. Therapist-delivered CBT is difficult to standardise as factors unique to each therapist-patient interaction can alter how and what treatment is delivered. Central elements of CBT can be omitted and each individual provider can introduce "drift" by administering their own personal version of the intervention (Waller, 2009; Shafran et al., 2009).

Computerised CBT (cCBT) was introduced in 1990, in the form of a CBT manual delivered via CD-ROM (Selmi, 1990). By the end of the decade, it was being delivered over the internet (iCBT). iCBT usually

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takes the form of modules or lessons delivering CBT concepts by desktop, internet or phone app. iCBT has been shown to be equally effective as face-to-face CBT (Andersson, Cuijpers, Carlbring, Riper, & Hedman, 2014), with additional benefits including privacy, convenience and fidelity of treatment. Therapist drift and variability between trial and dissemination in practice is less likely as, once tested and found successful, courses can be distributed exactly as they were designed.

A 2010 meta-analysis, based on 22 randomised controlled trials, argued that computer therapy for the anxiety and depressive disorders was effective, acceptable and practical healthcare (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010). Since that publication, there have been a number of systematic reviews of this area. Hedman et al. (Hedman, Ljotsson, & Lindefors, 2012) identified iCBT for depression, social anxiety disorder and panic disorder as established treatments. Anderssen et al. (Andersson et al., 2014) identified eight direct comparisons of face to face CBT and iCBT in depression, social anxiety disorder and panic disorder, and found them to be equally efficacious. Olthius, Watt, Bailey, Hayden, and Stewart (2015) (Olthius et al., 2015) did a Cochrane Collaboration of face to face CBT, guided and unguided iCBT and found no differences in efficacy. In addition there have been systematic reviews and meta-analyses looking at trans-diagnostic iCBT for these four disorders (Newby, Twomey, Yuan Li, & Andrews, 2016), and for post-traumatic stress disorder (Sijbrandij, Kunovski, & Cuijpers, 2016).

As the field has matured in the intervening years, we have repeated the Andrews et al. meta-analysis (Andrews et al., 2010) using comparable search terms. We identified studies in which iCBT was compared to a control condition in people who met diagnostic criteria on the basis of structured interviews or above threshold scores on standardised questionnaires. This was done for the same four disorders considered in the 2010 meta-analysis − major depressive disorder (MDD), panic disorder (PD), social anxiety disorder (SAD) or generalised anxiety disorder (GAD). A replication and extension of the original meta-analysis to include an examination of the effect of type of control group and risk of bias on outcome, maintenance of improvement over time, as well as time spent by the therapist, will contribute to the discussion as to whether the original claim that 'computerised therapy for the anxiety and depressive disorders is effective, acceptable and practical health care' remains justified.

2. Method

This review was registered (www.ANZCTR.org.au/ACTRN12610000030077.aspx). The protocol for search, extraction and analysis followed the description in the original paper.

2.1. Study selection

Participants must have been aged 18 or over, and met criteria for either major depressive disorder, generalised anxiety disorder, panic disorder with or without agoraphobia or social anxiety disorder as a primary diagnosis. Diagnosis could be determined by a clinician, telephone interview or by meeting a recognised cut-off on a validated self-report questionnaire. Conditions for inclusion were English language randomised controlled trials of iCBT versus either waitlist control (WLC), information control (IC), care as usual (CAU) or placebo. The outcome of interest was change in symptom severity. All papers analysed were either published or in press, and the investigators had copies of all manuscripts. RCTs that compared iCBT vs face-to-face CBT and iCBT vs bibliotherapy were extracted for separate analysis and effect sizes were calculated. Effectiveness studies were identified and reviewed. In addition, a systematic review of the literature was conducted to identify any harms of iCBT.

2.2. Information sources

Papers identified in the search that were published, or available to the authors, before September 2016 were included. Abstracts were identified by combining terms representative of internet-delivered psychological treatment for major depressive disorder, generalised/generalized anxiety disorder, panic disorder (with or without agoraphobia) or social phobia/social anxiety disorder (both MeSH terms and text words). As in the previous study (Andrews et al., 2010), studies of treatments aimed at a range of diagnoses (transdiagnostic studies) were excluded (see Newby (Newby, Twomey et al., 2016) for a recent review), as were studies of depressive or anxiety symptoms in which no data on the probability of satisfying diagnostic criteria were supplied. An example search strategy for Medline is available from the corresponding author, as per PRISMA guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009). The supplementary search consisted of reference lists of reviews and meta-analyses identified as relevant, as well as reference lists of included studies and papers from conferences and other sources.

Data extracted from each study included: number of subjects randomised, details of treatment condition and control group, pre and post means and standard deviations in the principal outcome measure, Hedges'g (Hedges & Vevea, 1996), number needed to treat (NNT) (Kraemer & Kupfer, 2006), adherence and satisfaction/harm. Data was collected for the primary outcome measure(s) named in the study. Adherence was defined as the percentage of participants randomised who finished the course. To analyse risk of bias using the Cochrane Collaboration tool (Higgins et al., 2011), information about sequence generation, allocation concealment, blinding, missing data and selective reporting was also extracted. The extraction of data and the adequacy of bias minimisation was rated independently by two researchers (AB and LE), with differences resolved following discussion with GA.

2.3. Meta-Analysis

We followed both the PRISMA guidelines (Moher et al., 2009) and the recommendations made in Cuijpers (Cuijpers, 2016). Statistical analysis was done using Comprehensive Meta-Analysis version 3 (Comprehensive Meta-Analysis Software (CMA), 2016). The effect size (Hedges'g) was calculated as the post-test difference between the mean of the treatment condition and the mean of the control condition, divided by the pooled post standard deviation and adjusted for sample size. For ease of clinical interpretation, we also calculated the NNT using both the effect sizes and Z scores (Kraemer & Kupfer, 2006). The NNT represents the number of patients one would expect to treat to have one more successful outcome. Where a study had multiple arms, each relevant arm was treated as a separate trial.

Effect sizes from each trial were pooled according to the random effects model, while differences between study subgroups were pooled according to the mixed effects model. As indicators of heterogeneity of pooled effect sizes, we calculated I^2, which indicates the heterogeneity in percentages. We calculated 95% confidence intervals around I^2 (Ionnidis, Patsopoulos, & Evangelou, 2016), using the non-central chi-squared-based approach within the heterogi module for Stata (Orsini, Bottai, Higgins, & Buchan, 2006). Publication bias was tested by inspecting the funnel plot on the primary outcome measures, and by a trim-and-fill procedure, which yields an estimate of the pooled effect size after accounting for bias (Duval & Tweedie, 2009).

3. Results

3.1. Study selection

A total of 4423 abstracts were examined from the following databases: PubMed (N = 1187), Cinahl (N = 139), PsychINFO (N = 538), Medline (N = 468), Social Sciences Citation Index (N = 1193) and Embase (N = 899). See Fig. 1, below.