Cognitive behavior therapy via the Internet: a systematic review of applications, clinical efficacy and cost-effectiveness
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CRD summary
The review concluded that, although internet-delivered cognitive behavioural therapy was a promising treatment option for several disorders it can be regarded as a well-established treatment only for depression, panic disorder and social phobia. The authors' conclusions reflect the evidence presented but the lack of quality assessment and within-group analysis means the reliability of the conclusions is uncertain.

Authors' objectives
To determine the applications, clinical effectiveness and cost-effectiveness of internet-based cognitive behavioural therapy (ICBT).

Searching
PubMed was searched to June 2012 for studies published in English. Search terms were reported. Reference lists of included studies were examined. Review authors contacted their research network.

Study selection
Eligible clinical effectiveness studies were randomised controlled trials (RCTs) of ICBT for adult patients. Studies had to report diagnosis and presenting problem for participants and report outcomes in terms of assessment of symptoms of the target problem. Eligible cost-effectiveness studies had to compare ICBT to an alternative measure of costs and outcomes.

Most RCTs were aimed at depression, anxiety disorders and chronic pain. Studies were published between 2000 and 2012. Most studies were conducted in Australia, Germany, Sweden, UK, Netherlands, USA and Switzerland. Most ICBT interventions included text-based treatments with minimal therapist support using email-like messaging.

The authors did not state how many reviewers selected studies for inclusion.

Assessment of study quality
The authors did not state that they assessed study quality.

Data extraction
Data on clinical effectiveness were extracted for main outcomes and converted into the standardised mean difference effect size measure using Cohen’s d based on within-group changes (pre and post treatment) in the ICBT treatment arms of each study. Corresponding 95% confidence intervals were calculated. Data for non-ICBT treatment arms were only extracted for the comparison with conventional cognitive behavioural therapy (CBT).

The authors did not state how many reviewers extracted data.

Methods of synthesis
Studies were grouped by disorder and mean effect differences and 95% confidence intervals were calculated. The evidence status for each clinical application was determined using American Psychologist Association criteria for empirically supported treatments (details reported).

Results of the review
One hundred and three RCTs were included in the clinical effectiveness analysis. More than 12,374 participants were included in the treatment arms of the RCTs. Samples sizes of participants ranged from 11 to 2,794.

ICBT for depression, social phobia and panic disorder were classified as well-established, meeting the highest level of criteria for evidence.
Depression and anxiety disorders: Large treatment effects were reported for ICBT for depression or depressive symptoms (SMD 0.94, 95% CI 0.77 to 1.11; 20 RCTs), panic disorder (SMD 1.42, 95% CI 0.86 to 1.99; nine RCTs), social phobia (SMD 1.13, 95% CI 0.99 to 1.28; 16 RCTs), post-traumatic stress disorder (SMD 1.23, 95% CI 0.83 to 1.63; six RCTs), generalised anxiety disorder (SMD 1.12, 95% CI 0.61 to 1.62; two RCTs) and transdiagnostic treatments for anxiety disorders (SMD 1.07, 95% CI 0.75 to 1.39; seven RCTs). Individual studies on obsessive-compulsive disorder, severe health anxiety and spider phobia also reported large treatment effects.

Functional disorders: Large treatment effects for ICBT were reported for irritable bowel syndrome (SMD 1.20, 95% CI 0.57 to 1.84; four RCTs). Small to moderate treatment effects were reported for chronic pain (SMD 0.60, 95% CI 0.31 to 0.88; 10 RCTs), tinnitus (SMD 0.51, 95% CI -0.15 to 1.18; three RCTs), sexual dysfunction (SMD 0.67, 95% CI -0.25 to 1.59; five RCTs) and fatigue (SMD 0.21; one RCT).

Eating disorders: Large treatment effects were reported for ICBT for eating disorders (SMD 0.97, 95% CI 0.63 to 1.31; five RCTs).

Other disorders and clinical problems: Small-to moderate treatment effects were reported for ICBT for stress (SMD 0.49, 95% CI -0.52 to 1.5; three RCTs). Moderate treatment effects were reported for ICBT for body dissatisfaction (SMD 0.72, 95% CI -0.24 to 1.69; three RCTs). Other results were reported in single studies.

Comparing ICBT to conventional CBT: Treatment effects were equivalent for ICBT (SMD 1.04, 95% CI 0.73 to 1.35) and conventional CBT (SMD 1.14, 95% CI 0.72 to 1.56) in 12 RCTs.

Cost information
Eight studies reported data on cost-effectiveness. Studies comparing ICBT to waiting list controls, indicated that ICBT is a cost-effective intervention compared to no treatment with the average probability of 57% (95% CI 18.2 to 94.9) at a willingness to pay of zero. ICBT has a 79.5% probability of being more clinically efficacious than conventional CBT at a lower societal cost, and was cost-effective (1 RCT).

Authors’ conclusions
Although ICBT is a promising treatment option for several disorders, it can be regarded as a well-established treatment only for depression, panic disorder and social phobia. It seems that ICBT is as effective as conventional CBT for respective clinical disorders, that is, if CBT works then ICBT works. The large effects and the limited therapist time required suggest that the treatment is highly cost effective for well-established indications.

CRD commentary
The review question and inclusion criteria were broadly defined. Only one database was searched and inclusion was restricted to studies published in English so some studies may have been missed. The authors did not report whether methods to reduce reviewer error and bias were used throughout the review process. Study quality of individual trials was not assessed and this made it difficult to determine the reliability of the evidence presented (particularly for the comparative analysis of ICBT with conventional CBT).

The synthesis appeared appropriate given the between-study variation in disorders and outcomes. Only a small subset of studies (12 out of 105) were included in a comparative analysis (ICBT compared to conventional CBT). Effect sizes based on pre and post treatment effects rather than compared to an active comparator may overestimate the treatment effect.

The authors’ conclusions reflect the evidence presented but the lack of quality assessment and within-group analysis means the reliability of the conclusions is uncertain.

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

Research: The authors stated that further research using well-powered trials comparing ICBT with active treatments such as conventional CBT were needed to evaluate effectiveness. Further research regarding cost-effectiveness of ICBT was needed.
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