



Computerised therapies for anxiety and depression in children and young people: A systematic review and meta-analysis



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ABSTRACT

One quarter of children and young people (CYP) experience anxiety and/or depression before adulthood, but treatment is sometimes unavailable or inadequate. Self-help interventions may have a role in augmenting treatment and this work aimed to systematically review the evidence for computerised anxiety and depression interventions in CYP aged 5–25 years old. Databases were searched for randomised controlled trials and 27 studies were identified. For young people (12–25 years) with risk of diagnosed anxiety disorders or depression, computerised CBT (cCBT) had positive effects for symptoms of anxiety (SMD -0.77 , 95% CI -1.45 to -0.09 , $k = 6$, $N = 220$) and depression (SMD -0.62 , 95% CI -1.13 to -0.11 , $k = 7$, $N = 279$). In a general population study of young people, there were small positive effects for anxiety (SMD -0.15 , 95% CI -0.26 to -0.03 ; $N = 1273$) and depression (SMD -0.15 , 95% CI -0.26 to -0.03 ; $N = 1280$). There was uncertainty around the effectiveness of cCBT in children (5–11 years). Evidence for other computerised interventions was sparse and inconclusive. Computerised CBT has potential for treating and preventing anxiety and depression in clinical and general populations of young people. Further program development and research is required to extend its use and establish its benefit in children.

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Introduction

One quarter of children and young people suffer anxiety disorders or depression by adulthood (Copeland, Shanahan, Costello, & Angold, 2011; Kessler, Avenevoli, & Ries Merikangas, 2001;

Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). Around 3% of children have an anxiety disorder at any one time, but rates of depression are relatively low (<1%) (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Ford, Goodman, & Meltzer, 2003). In adolescence, rates of anxiety disorders remain similar and rates of depression rise to 3% (Costello et al., 2003; Ford et al., 2003; Lewinsohn et al., 1993), with cumulative prevalence of anxiety disorders and depression of around 10% and 25% respectively by 18 years (Lewinsohn et al., 1993; Merikangas, He, Burstein, et al., 2010). Both anxiety disorders and depression in children and young people are associated with significant adverse mental health and life course outcomes, with the onset of the majority of adult anxiety disorders and depression occurring in childhood or adolescence (Kim-Cohen et al., 2003; Pine, Cohen, Gurley, Brook, & Ma, 1998; Woodward & Fergusson, 2001).

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Collectively, these considerations highlight the significant public health burden of anxiety disorders and depression in children and young people, and the importance of access to effective treatment.

Guidelines that include children and young people recommend psychological interventions as a first line approach for anxiety disorders and depression (Connolly & Bernstein, 2007; NICE, 2005a, 2005b, 2005c). However, there is evidence that many children and young people with anxiety disorders and depression do not receive evidence-based treatment (Kataoka, Zhang, & Wells, 2002; Merikangas, He, Brody, et al., 2010; Stallard, Udwin, Goddard, & Hibbert, 2007; Wang et al., 2007). This may be due to a lack of symptom awareness, poor access to services or, where services are not provided, the cost of intervention. Where mental health services are delivered, these are commonly inadequate (Wang et al., 2007). In the case of Cognitive Behavioural Therapy (CBT), which is recommended for the treatment of both anxiety disorders and depression in children and young people (Connolly & Bernstein, 2007; NICE, 2005a, 2005b, 2005c), barriers to treatment include a lack of training, infrastructure and funding (Gunter & Whittal, 2010; Stallard et al., 2007).

It has been proposed that self-help strategies may relieve some of the burden on health care services (Jorm & Griffiths, 2006) and, with the increasing use of internet and computer technologies, the computerisation of psychological interventions appears a logical step to achieve the provision of cost-effective help to all. There is a relatively large amount of research showing the effectiveness of computerised therapy for anxiety and depression in adults (Andersson & Cuijpers, 2009; Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Reger & Gahm, 2009). Children and young people have shown favourable attitudes towards these types of intervention (Stallard, Velleman, & Richardson, 2010), but systematic reviews of internet-based therapies in children and young people do not include recent research and cover a limited range of computerised therapies (Calear & Christensen, 2010; Richardson, Stallard, & Velleman, 2010). The current review aims to comprehensively review the evidence for all types of computerised therapy for anxiety and depression in children and young people.

Methods

Study selection

A systematic search for English language studies was conducted in the following databases from database inception to June 2013: Australian Education Index (AEI), Applied Social Sciences Index and Abstracts (ASSIA), British Education Index (BREI), British Humanities Index (BHI), Education Resources in Curriculum (ERIC), Cochrane Central Database of Controlled Trials (CENTRAL) [Cochrane Library], Cumulative Index to Nursing and Allied Health Literature (CINAHL), Education Resources Information Center (ERIC), Embase, International Bibliography of Social Science (IBSS), Medline, PAIS International, PreMedline, PsycINFO, Social Services Abstracts (SSA) and Sociological Abstracts. Studies were identified using search terms for disorders of “anxiety or depression” appended to “computerised therapy” (see Appendix 1 for details of the full list of search terms used). Reference lists of included studies and previous reviews were also searched for additional evidence. Citations were screened and hard copies of potentially relevant studies obtained.

Inclusion criteria

Randomised controlled trials of any computerised psychological therapies (for example, CBT, problem solving therapy and interpersonal psychotherapy) in children (5–11 years old) and young

people (12–25 years old) (CYP) were included in the review. Computerised therapies could be delivered via the Internet, downloadable software, CD-ROMs or smartphone applications. Studies only including adults > 25 years of age, or mixed populations where the mean age was >18 years, were excluded. Studies in CYP with diagnosed depression or an anxiety disorder, studies in at risk populations (with elevated depression or anxiety symptom scores) and studies of preventative interventions in general, non-clinical, populations were included. Studies of any computerised therapy were included, provided that the majority of the intervention (>50%) was undertaken without the input of a therapist. Studies where a larger proportion of the intervention was delivered directly by a therapist (and not via a computer) were excluded from the review. Studies comparing an intervention with a non-therapeutic control (e.g. wait-list or no treatment) and studies comparing an intervention with another active intervention (e.g. face-to-face therapy), were included in the review. For the purposes of this review, we focused on outcomes that were a direct assessment of mental health and studies reporting only outcomes related to potential mechanisms of change (e.g. improvements in psychometric training tests) were not included.

Data extraction

Data extraction was conducted by one reviewer and checked by a second and any disagreements were resolved by consensus. Information on participant and study characteristics and mental health outcomes were extracted into an excel spreadsheet, previously piloted on typical studies. Study characteristics included the country, setting, inclusion and exclusion criteria, duration and components of the intervention and control conditions, numbers of participants randomised, rates of attrition and sources of funding. Participant characteristics included age, gender, primary disorder and co-morbidities and baseline severity score. Data for self- (primary outcome) and clinician- (secondary outcome) rated outcomes were extracted. Where studies were relevant but data could not be obtained from the publication, authors were contacted to obtain the data. For interventions aimed at treating anxiety, the critical outcome was symptoms of anxiety and, for interventions aimed at treating depression, the critical outcome was symptoms of depression. For interventions aimed at treating both anxiety and depression, symptoms of anxiety and depression were included.

Quality assessment

Risk of bias for each study was assessed with the Cochrane tool (Higgins & Green, 2011) by one reviewer and checked by a second and any disagreements were resolved by consensus. This tool assesses risk of bias in randomised controlled trials in domains relating to the allocation of participants to groups (selection bias), exposure to care or other factors in addition to the intervention of interest (performance bias), independence of outcome assessment (detection bias) and the presence of loss to follow-up (attrition bias) and selective outcome reporting (reporting bias). The overall risk of bias was judged on the basis of whether any source of bias was likely to have had a significant impact on the findings (not simply on a count of the number of sources of bias). The overall quality of the evidence (certainty in effect estimates) for each outcome was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (Guyatt, Oxman, Schunemann, Tugwell, & Knottnerus, 2011). Evidence was downgraded by one or two levels based on the following factors: a) risk of bias, b) inconsistency of results (heterogeneity between study effect sizes; defined as $I^2 > 50\%$), c) indirectness (poor applicability of the population, intervention, control or

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