

Cognitive behavioural therapy for anxiety disorders in children and adolescents (Review)

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ABSTRACT

Background

Childhood and adolescent anxiety disorders are relatively common, occurring in between 5-18% of all children and adolescents. They are associated with significant morbidity and impairment in social and academic functioning, and when persistent, there is a risk of depression, suicide attempts and substance abuse in adulthood. There is accumulating evidence for the efficacy of cognitive behavioural therapy (CBT), with a number of randomised controlled trials (RCTs) suggesting benefit.

Objectives

To determine whether CBT is an effective treatment for childhood and adolescent anxiety disorders in comparison to waiting list or attention controls.

Search strategy

Search of the Cochrane Register of Controlled Trials and the Cochrane Depression, Anxiety and Neurosis Group Register, which includes relevant randomised controlled trials from the bibliographic databases - The Cochrane Library (to January 2004), EMBASE, (1970-2004) MEDLINE (1970-2004) and PsycINFO (1970-2004). We also searched the references of all included studies and relevant textbooks, and contacted authors in order to identify further trials.

Selection criteria

Each identified study was assessed for possible inclusion by two reviewers independently.

Inclusion criteria consisted of randomised controlled trials of CBT versus waiting list/attention controls in children (more than six years of age) and adolescents (under the age of 19 years) with a DSM (Diagnostic Statistical Manual) or ICD (International Classification of Diseases) anxiety diagnosis; and excluding simple phobia, obsessive compulsive disorder and post-traumatic stress disorder. Each study was required to conform to the principles of CBT through use of a protocol and comprising at least eight sessions of CBT.

Data collection and analysis

The methodological quality of included trials was assessed by two reviewers independently. The dichotomous outcome of remission of anxiety diagnosis was pooled using relative risk (RR) with 95% confidence intervals. Means and standard deviations of anxiety symptom continuous scores were pooled using the standardised mean difference (SMD). Heterogeneity was assessed and intention-to-treat (ITT) analyses undertaken. The presence of publication bias was assessed using funnel plots.

Main results

Thirteen studies with 498 subjects and 311 controls met the inclusion criteria and were included in the analyses. The studies involved community or outpatient subjects only, with anxiety of only mild to moderate severity. ITT analyses showed a response rate for remission of any anxiety diagnosis of 56% for CBT versus 28.2% for controls (RR 0.58, 95% CI 0.50 to 0.67), with no evidence of heterogeneity. The number needed to treat (NNT) was 3.0 (95% CI 2.5 to 4.5). For reduction in anxiety symptoms, the SMD was -0.58 (95% CI -0.76 to -0.40) with no significant heterogeneity indicated. Post hoc analyses suggest that individual, group and family/parental formats of CBT produced fairly similar outcomes.

Authors' conclusions

Cognitive behavioural therapy appears an effective treatment for childhood and adolescent anxiety disorders in comparison to waiting list or attention control. There was no evidence for a difference between an individual, group or parental/family format. CBT can be recommended for the treatment of childhood and anxiety disorders, although with only just over half improving, there is a need for further therapeutic developments.

PLAIN LANGUAGE SUMMARY

Cognitive behavioural therapy appears an effective treatment for childhood and adolescent anxiety disorders in comparison to waiting list or an attention control.

Cognitive behavioural therapy has been adapted for the treatment of anxiety disorders in adolescents and children over the age of six years. This psychological treatment can be delivered in various formats: individual, group and family /parent. Cognitive behavioural therapy appears effective in just over 50% of cases. There is no difference between formats.

BACKGROUND

Anxiety disorders are among the most common psychiatric disorders, occurring in 5-18% of all children and adolescents (Costello 1995). Anxiety disorders are often associated with impairment in academic, social and personal functioning (Pine 1997). Significant comorbidity including depression (Kovacs 1989), substance abuse (Kushner 1990) and subsequent adult anxiety, major depression and suicide attempts, highlight the need for effective and readily accessible treatments. However, the evidence base for treatment of anxiety in youths is relatively limited. The initial trials of cognitive-behavioural therapy (CBT) (Kendall 1994; Barrett 1996; Kendall 1997) were positive (Kendall 1997). Since then, there have been further randomised controlled trials of CBT in various formats: individual (Barrett 1996; Flannery-S 2000; Kendall 1994; Kendall 1997; Manassis 2002; Nauta 2003; Silverman 1999b); group (Barrett 1998; Beidel 2000; Cobham 1998; Dadds 1997; Haywood 2000; Manassis 2002; Mendlowitz 1999; Muris 2001; Muris 2002; Silverman 1999; Shortt 2001; Spence 2000) and with parent involvement (Barrett 1998; Cobham 1998; Manassis 2002; Mendlowitz 1999; Nauta 2003; Silverman 1999; Silverman 1999b; Shortt 2001; Spence 2000). A number of these studies have shown a statistically significant benefit for CBT versus controls.

The aim of CBT is to help the child to identify possible cognitive deficits and distortions, to reality-test them, and then to teach new skills or challenge irrational thoughts and beliefs, and replace them with more rational thinking (Kendall 1990). CBT is usually delivered over ten to twenty weekly sessions. More specifically, CBT is a psychological model that involves helping the child to: (a) recognise anxious feelings and bodily or somatic reactions to anxiety, (b) clarify thoughts or cognitions in anxiety-provoking situations (i.e. unrealistic or negative attributions and expectations), (c) develop coping skills (i.e. modifying anxious self-talk into cop-

ing self-talk); and (d) evaluate outcomes. The behavioural training strategies include: modelling, reality exposure (in-vivo exposure), role-playing and relaxation training. The behavioural treatment is based upon the premise that fear or anxiety are learnt responses (classically conditioned) that can be "unlearned". An element of treatment known as systematic desensitisation, involves pairing anxiety stimuli, in vivo or in imagination, in a gradual increasing hierarchy with competing relaxing stimuli such as pleasant images or muscle relaxation. While suitable for older children and adolescents, younger children find it difficult to pair imagined stimuli and use muscle relaxation. A crucial component, and maintaining factor, in anxiety disorders is avoidance (a negative reinforcer). Exposure in vivo or in imagination, usually in a gradual, hierarchical manner, is therefore considered an important element of treatment.

The application of CBT requires a certain level of cognitive development. Kendall (Kendall 1990b) argued that the ability to measure a thought or belief against the notion of a rational standard, and the ability to understand that a thought or belief can cause a person to behave and feel in a certain way, were central to its proper use. The question arises: at what age does a child have the cognitive capacities to undertake these cognitive operations. Clearly, rote learning of rules would not equate to a cognitive therapy (Grave 2004). Unfortunately, few studies of CBT, and none in the field of childhood anxiety disorders, include measures of cognitive change. Young children under the age of 6 years, pre-operational in Piagetian terms, are egocentric and therefore may be able to use de-centring techniques such as narrative or stories. An example has been tried, seemingly successfully, although not subject to component analysis, in the treatment of childhood obsessive-compulsive disorder (March 2001).

A recent systematic review of CBT for the treatment of childhood (>6 years) and adolescent (<19 years) anxiety disorders (Cartwright-H 2004) in comparison to waiting list controls, iden-

tified ten studies (Barrett 1996; Barrett 1998; Dadds 1997; Flannery-S 2000; Haywood 2000; Kendall 1994; Kendall 1997; Shortt 2001; Silverman 1999; Spence 2000). Using conservative criteria in a meta-analysis, the remission rate of diagnosed anxiety disorders was 56.5% in the CBT group compared to 34.8% in the controls, with an odds ratio of 3.3 (95% CI 1.9 to 5.6) suggesting a significant benefit for CBT. The review did not examine continuous measures. The authors noted that the reporting of many aspects of the trials was weak, and many of the studies were efficacy trials, therefore of limited generalisability. A further review of the treatment of childhood and adolescent anxiety disorders using CBT (Compton 2004) identified 21 RCTs with waiting list and/or active treatment controls (Barrett 1996; Barrett 1998; Beidel 2000; Cobham 1998; Cornwall 1996; Flannery-S 2000; Haywood 2000; Kendall 1994; Kendall 1997; King 1998; Last 1998; Menzies 1993; Muris 2001; Muris 2002; Nauta 2003; Shortt 2001; Silverman 1999; Silverman 1999b; Spence 2000). A meta-analysis was not undertaken, however, standardised effect size estimates for a variety of anxiety symptom measures showed a medium to large effect for CBT in reducing symptoms in comparison to waiting list, inactive control and active control conditions. The authors concluded that a substantial evidence base supported the efficacy of problem-specific cognitive behavioural interventions for a variety of childhood anxiety disorders (Compton 2004).

In view of recent safety concerns over the prescribing of selective serotonin re-uptake inhibitors for children and adolescents, psychological treatments are likely to become an increasingly important option in treating children and adolescents with anxiety disorders. A Cochrane review examining the efficacy and safety of pharmacotherapy for anxiety disorders in children and adolescents is currently in progress (Hawkrige 2004). The current review was undertaken to provide comprehensive and up to date evidence on the efficacy of CBT for children and adolescents as an alternative treatment for anxiety disorders, with remission of anxiety disorders and symptom reduction in differing CBT formats considered.

OBJECTIVES

- 1) To carry out a meta-analysis of identified studies to determine whether CBT leads to remission of childhood and adolescent anxiety disorders, and/or a clinically significant reduction in anxiety symptoms in comparison to passive (waiting list) controls and attention controls.
- 2) To carry out a subgroup analysis of different types of CBT according to format (individual, group, parent / family).

CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

Types of studies

Randomised controlled trials (RCTs) of manualised CBT of at least eight sessions were included.

Types of participants

Children and adolescents, aged more than six years and under 19 years, meeting diagnostic criteria of the Diagnostic Statistical Manual DSM III, III-R, IV, IV-TR (APA 1980; APA 1987; APA 1994; APA 2000) or International Classification of Diseases ICD9 and ICD10 (WHO 1978, WHO 1992) for anxiety disorder, including one or more disorders of generalised anxiety disorder, over-anxious disorder, separation anxiety disorder, social phobia or panic disorder; but excluding post-traumatic stress disorder, simple phobias, elective mutism and obsessive-compulsive disorder.

Types of intervention

Manualised CBT of at least eight sessions provided by trained therapists under regular supervision. CBT had to be administered according to standard principles: as a psychological model of treatment involving helping the child: (a) recognise anxious feelings and somatic reactions to anxiety, (b) clarify cognitions in anxiety-provoking situations, (c) develop coping skills that involve modification of these anxiety provoking cognitions, (d) behavioural training strategies with exposure in vivo or in imagination, usually in a gradual, hierarchical manner, and relaxation training. No concurrent medications for the treatment of anxiety were to be administered. Controls were subjects placed on the waiting list for at least eight weeks, who received no treatment for anxiety during that period, or active controls who were given attention only (i.e. diary or support, but no elements of CBT).

Types of outcome measures

The primary outcome measure was the presence or absence of an anxiety diagnosis, as evaluated by reliable and valid structured interviews for DSM or ICD child and adolescent anxiety disorders, including the Anxiety Disorder Interview Schedule for Parents Children (ADIS-P), the Anxiety Disorder Interview Schedule for Children (ADIS-C) (Silverman 1987) and the Diagnostic Interview Schedule for Children, Adolescents and Parents (DISCAP) (Holland 1995). The diagnostic interviews were required to be carried out independent of the treatment team.

The secondary outcome was reduction in anxiety symptoms, using psychometrically robust measures of anxiety symptoms (Myers 2002) that yield symptom scores on continuous scales, such as the Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds 1985), the Fear Survey for Children- Revised (FSSC-R) (Ollendick 1998), the Social Phobia and Anxiety Inventory for Children (SPAI-C) (Beidel 1995), the Child Behavior Checklist (CBCL) (Achenach 1991), Social Anxiety Scale for Adolescents (SAS-A) (La

Greca 1998), State-Trait Anxiety Inventory for Children (STAI-C) (Spielberger 1973), Screen for Child Anxiety Related Emotional Disorders (SCARED) (Birmaher 1999) and SCAS (Spence Child Anxiety Scale, Child and Parent Version (Spence 1997). These scales are either (a) self-report, or (b) completed by i) parent or guardian or ii) an independent rater.

Other secondary outcomes included acceptability, as determined by the numbers who are lost to follow-up.

SEARCH METHODS FOR IDENTIFICATION OF STUDIES

See: Cochrane Depression, Anxiety and Neurosis Group methods used in reviews.

Search strategy for identification of studies

See: Cochrane Depression, Anxiety and Neurosis Group search strategy

1. Electronic searches

a) CCDANCTR-Studies were searched using the following search strategy

Diagnosis = Anxiety or Anxious or "Panic Disorder*" or "Social Phobia"

and

Age Group = Children or Adolescent

and

Intervention = Behavior*

b) Electronic searching of databases.

Search of several databases: MEDLINE, EMBASE.

c) Specialised database PSYCINFO was searched

SEARCH TERMS

The electronic search of databases was comprehensive. The breadth of the key word search meant that the review authors identified many studies that were not controlled trials. The key word search was deliberately not restricted to methodological key words, because it was anticipated that some controlled trials would be missed due to poor indexing.

MEDLINE (1966 - 2004) & EMBASE (1988 - 2004)

1 = behavior

2 = behaviour

3 = cognitive-behavior

4 = cognitive-behaviour

5 = anxiety

6 = anxious

7 = panic disorder

8 = social phobia

PSYCINFO (Journal articles 1974 - 2004) (chapters and books 1970-2004)

1 = behavior

2 = behaviour

3 = cognitive-behavior

4 = cognitive-behaviour

5 = anxiety

6 = anxious

7 = panic disorder

8 = social phobia

2. Handsearches

The following journals were hand-searched:

Cognitive Therapy and Research 1977-2004

Journal of Child Psychology and Psychiatry 1970-2004

British Journal of Psychiatry 1970-2004

Behavioural and Cognitive Psychotherapy 1970-2004

British Journal of Clinical Psychology 1970 -2004

Psychological Medicine 1970-2004

Journal of the American Academy of Child and Adolescent Psychiatry 1970-2004

Journal of Consulting and Clinical Psychology 1970-2004

Journal of Clinical Child and Adolescent Psychology 1997-2004

Journal of Abnormal Psychology 1970-2004

Journal of Abnormal Child Psychology 1970-2004

Journal of Behaviour Therapy Experimental Psychiatry 1970-2004

Behaviour Research and Therapy 1970-2004

Behaviour Therapy 1970-2004

3. Reference Lists

The reference lists of all identified studies were inspected for more studies

4. Personal Communication

The lead author on all included studies and other experts in the field were approached to request details of any further published or unpublished studies.

5. Book Chapters

Textbooks on child and adolescent psychiatry and anxiety disorders were searched for additional relevant studies.

METHODS OF THE REVIEW

1. Selection of studies

All citations identified by searching were separately inspected by two reviewers (AS, AJ) to ensure reliability. In cases of doubt or disagreement, the full article was obtained for inspection. Identified articles were obtained and independently assessed as to whether they met review criteria.

2. Quality assessment

It was decided that only high quality studies would be included in the review.

Two sets of criteria were used:

2.1 Concealment criteria from the Cochrane Reviewers' Handbook (Clarke 2002).

- A. Low risk of bias (adequate allocation concealment)
- B. Moderate risk of bias (some doubt about concealment)
- C. High Risk of bias (inadequate concealment).

2.2 Jadad Scale.

- 1. Was the study randomised?
- 2. Was the study double blind?
- 3. Was there a description of withdrawals and dropouts?

Each item scored one point if the answer was positive, and an additional point if there was a description of randomisation/blinding methods. Studies rating B but less than 2 on the Jadad scale were excluded, as well as studies only rating C.

3. Data extraction

References were organised using Reference Manager. Data extraction forms were developed a priori and included information regarding study methods, participant details, treatment details and adherence to treatment protocol and outcome measures. Data was extracted and assessed by AS and AJ independently. Consensus was reached through discussion in case of disagreements between review authors. Any areas of remaining uncertainty were resolved by contacting the author of the study.

4. Data synthesis

4.1 Data types

Post-treatment outcomes were assessed using dichotomous data on remission of anxiety symptoms, and continuous data of anxiety symptoms, using standardised measures.

4.2 Incomplete data

Trials were excluded if endpoint data were available for fewer than 60% of participants. When the attrition rate exceeds 40% the validity of the results is undermined. An intention-to-treat (ITT) analysis and completer analysis were undertaken (see section 4.5.1 for description).

4.3 Dichotomous data

The review used relative risk (RR) and 95% confidence interval (CI) based on the random effects model, with pooling of data via the inverse variance method of weighting. Significance was set at $P < 0.05$. Where possible the number needed to treat (NNT) with 95% confidence intervals was calculated. For each comparison a summary statistic of all those responding to treatment was calculated as a percentage of the total number of participants.

4.4 Continuous data

4.4.1 For those completing trials, analysis of continuous data, based on the random effects model, was conducted. If normally distributed, continuous data, measured in different ways across studies but conceptually the same, were pooled using the standardised weighted mean difference (SMD). Where different studies used the same scale, but a mixture of total and subscale scores were reported (for instance in the case of the RCMAS)

the SMD was calculated. Where both endpoint and change data were available for the same outcome, the endpoint was presented. Significance was set at $P < 0.05$.

4.4.2 Normal distribution: to ensure that the continuous measures data were normally distributed and that parametric tests could be used appropriately, the following standards were applied to all data prior to inclusion (1) standard deviations and means were obtained from the article or by contacting the author(s); (2) where the data were finite measures, for example 0-100, the standard deviation multiplied by two should be less than the mean. If this was not the case, then it would be unlikely that the mean was an appropriate measure of central tendency (Altman 1966). Data that were not normally distributed were presented separately in an 'Other data types' graph.

4.5 Heterogeneity

Trial characteristics were examined to test for heterogeneity that may have influenced the observed treatment effect(s). The I squared and Chi squared tests were used to assess statistical heterogeneity. Significance was set at $P < 0.05$.

4.6 Sub-group analysis

A sub-group analysis was undertaken post-hoc to examine differences between individual, group and family CBT formats.

4.7 Sensitivity analysis

Outcome for intention-to-treat analysis was compared with analysis of those completing studies. For dichotomous data, analysis was undertaken assuming all those not completing the study in the CBT group were treatment failures and all those not completing the study in the control group were treatment successes, thereby allowing analysis of the most conservative treatment outcome. A completer analysis includes only those for whom data are available at the end point of the study. This analysis is, therefore, more open to bias, and requires careful interpretation and understanding of the reasons for subjects not being available at the end of the trial period. For continuous data, analysis of the last observation carried forward (LOCF) was to be undertaken, however, raw data and data on drop outs were not available to allow this analysis to be performed.

4.8 Publication bias

Publication bias was investigated using funnel plots.

4.9 Tables and figures

Data were entered into the Review Manager program, and were presented graphically so that the area to the left of the line of no effect indicated a favourable outcome for CBT. Tables were used to display characteristics of the studies included. Excluded studies were presented in a table with reasons for exclusion.

DESCRIPTION OF STUDIES

Using the systematic search methods described above, 31 studies were initially identified as eligible for the review. Five studies were

excluded (Blagg 1984; Blonk 1996; King 1998; Last 1998; Warren 1984) because not all subjects had verifiable anxiety diagnoses. Seven studies had alternative treatment controls rather than waiting list or no treatment conditions (Barrett 2001; Beidel 2000; Bernstein 2000; Cobham 1998; Manassis 2002; Muris 2001; Pina 2003). Three studies involved simple phobias only or a large majority of simple phobias (Cornwall 1996; Menzies 1993; Silverman 1999b). One study was primarily concerned with the issues of comorbidity and presented data previously reported elsewhere (Kendall 2001). One study did not assess the diagnostic status of the no treatment group, and therefore was excluded (Muris 2002). In one foreign language study, cases were allocated on an alternate basis (Joorman 2002).

Thirteen studies met the inclusion criteria for the review (Barrett 1996; Barrett 1998; Dadds 1997; Flannery-S 2000; Ginsburg 2002; Haywood 2000; Kendall 1994; Kendall 1997; Mendlowitz 1999; Nauta 2003; Shortt 2001; Silverman 1999; Spence 2000). The characteristics of the studies are described in the Table of Included Studies. Two studies were pilot studies (Haywood 2000; Ginsburg 2002), one of which was a small pilot school-based study of group CBT (Ginsburg 2002) that included attention controls (attention was described as therapist and peer support i.e. diary keeping without any further elements of CBT). Although not a waiting list control, this attention control did not involve active treatment, and therefore it was included in the analysis. One study (Mendlowitz 1999) did not have data on the primary outcome measure of anxiety diagnostic status, but did have data on child report anxiety symptoms and therefore was retained in the analysis of secondary outcomes.

The thirteen studies involved 519 subjects and 298 controls for inclusion in analyses. All studies involved community or outpatient subjects only. Comorbid conditions were included.

METHODOLOGICAL QUALITY

Valid and reliable assessment is regarded as essential to the successful application of CBT (Thyrer 1991). All the studies used semi-structured instruments to diagnose anxiety disorders: ADIS (The Anxiety Disorder Interview Schedule) (Barrett 1996; Barrett 1998; Dadds 1997; Flannery-S 2000; Haywood 2000; Kendall 1994; Kendall 1997; Nauta 2003; Silverman 1999; Spence 2000) or DISCAP (Diagnostic Interview Schedule for Children, Adolescents and Parents) (Shortt 2001), except Mendlowitz (Mendlowitz 1999). The ADIS is administered separately to the parents and child and then combined to make an overall diagnosis, however, several studies differed from this practice to determine diagnosis (parents only) (Shortt 2001; Spence 2000), and treatment outcome (Spence 2000), parents only (Flannery-S 2000; Kendall 1994; Kendall 1997; Shortt 2001; Spence 2000). Two studies only (Haywood 2000; Silverman 1999) used the clinical severity rating

(CSR) (Albano 1996), a part of the ADIS. This is unfortunate, as the CSR can predict treatment outcome.

Anxiety symptoms were assessed using: The Revised Children's Manifest Anxiety Scale (RCMAS) (Dadds 1997; Flannery-S 2000; Kendall 1994; Kendall 1997; Mendlowitz 1999; Shortt 2001; Silverman 1999; Spence 2000); The Fear Survey for Children Revised (FSSC-R) (Barrett 1996; Barrett 1998; Kendall 1994; Nauta 2003; Silverman 1999); Social Anxiety Scale for Adolescents (SAS-A) (Ginsburg 2002) Social Phobia and Anxiety Inventory for Children (SPAI) (Haywood 2000); STAIC (State-Trait Anxiety Inventory for Children) (Kendall 1997); Spence Child Anxiety Scale, Child and Parent Version (SCAS), (Spence 2000; Nauta 2003); Social Worries Questionnaire-Pupil (SWQ-PU) (Spence 2000); Child Behavior Checklist (CBCL) (Barrett 1996; Barrett 1998; Dadds 1997; Flannery-S 2000; Kendall 1994; Nauta 2003; Shortt 2001; Silverman 1999). All the measures used have been assessed as having reasonably good psychometric properties in terms of reliability, validity and efficacy in measuring internalising symptoms (Myers 2002). In view of the poor agreement between child and parent reporting of anxiety symptoms (Grills 2003), child self-report ratings were preferred when entering data into the meta-analysis. The data on the Child Behavior Checklist (CBCL) were presented in two forms, raw scores and transformed scores, which did not allow direct comparative analysis. A wide range of rating scales was used making comparisons difficult, with certain rating scales used in only one or two studies.

In order to test whether the data was normally distributed, the standard deviation multiplied by two should be less than the mean (Altman 1966). According to this test, RCMAS symptom scores from four studies (Barrett 1996; Dadds 1997; Silverman 1999; Spence 2000) did not appear parametric, and were therefore excluded from the main meta-analysis.

Randomisation

All studies gave poor details on the process of randomisation; all were rated B according to the Cochrane Handbook criteria (some doubts about allocation concealment). In one study (Mendlowitz 1999), a restricted randomisation was used, where subjects were allocated in blocks of four. In the pilot-study by Haywood 2000 subjects were randomised, however, a further 12 controls were recruited and the results reported as one control group.

Treatment protocols

In the majority of the studies a defined, published protocol was used and supervision was included at various stages of the treatment. However, in two studies (Barrett 1998; Kendall 1997) a small number of subjects were treated flexibly, in a non-specified manner. Therapists were mostly post doctorate psychologists. The different formats included individual, group and family formats. Groups were often staged according to age, older and younger children. Family formats differed, and included some sessions with the child or adolescent while others involved sessions with parent(s), or guardian(s) separately. There was considerable variation in the

length of treatments from 7.5 hours (Ginsburg 2002) to 27 hours (Flannery-S 2000). One study (Dadds 1997) was school based, while all the others were clinic-based. Controls were subjects who remained on the waiting list for a maximum of eight weeks without treatment for anxiety before being offered CBT.

Demographics and clinical characteristics

Apart from one pilot study (Haywood 2000), all studies included both sexes and covered a range of socioeconomic classes. Seven studies did not give details on ethnicity (Barrett 1996; Barrett 1998; Haywood 2000; Mendlowitz 1999; Nauta 2003; Spence 2000), and one pilot study was confined to African-Americans (Ginsburg 2002). Although the overall age range was from 6-18 years, four studies had an upper age limit of 13 or 14 years (Dadds 1997; Flannery-S 2000; Kendall 1994; Kendall 1997), which meant that older adolescents were relatively under-represented (it was not possible to calculate the mean age as this was not available from all studies).

The subjects were recruited from the community via newspaper advertisements or outpatient clinics. All met criteria for a psychiatric diagnoses of anxiety disorder, including impairment criteria, the range was from mild to moderate, and did not include severe cases

Outcomes

Remission of any anxiety diagnosis (categorical measure) was made using the ADIS, and DISCAP in eleven studies (Barrett 1996; Barrett 1998; Dadds 1997; Flannery-S 2000; Haywood 2000; Kendall 1994; Kendall 1997; Nauta 2003; Shortt 2001; Silverman 1999; Spence 2000). Some studies reported scores for subscales of the AIDS i.e social phobia (Ginsburg 2002; Haywood 2000; Spence 2000), however, these were too few to be included in an analysis.

Many studies used multiple anxiety rating scales, the main ones being the Revised Children's Manifest Anxiety Scale (RCMAS) and The Fear Survey for Children Revised (FSSC-R); however, for each study in a meta-analysis there should only be one set of values entered. Therefore, two meta-analyses were run with either the Revised Children's Manifest Anxiety Scale (RCMAS) or The Fear Survey for Children Revised (FSSC-R) as the main symptom scale; the results of these analyses were then compared.

All the scores on the anxiety rating scales (ADIS-P -social phobia rating; RCMAS; SCAS; SWQ-PU) in the study by Spence 2000 appeared not to be normally distributed and were not therefore entered into the meta-analysis. In the study by Dadds (Dadds 1997) the scores on the RCMAS also appeared not to be normally distributed and therefore were not included in the meta-analysis. In this study no information was available from the author on the FSSC-R scores

RESULTS

Remission of anxiety disorder

Twelve studies (Barrett 1996; Barrett 1998; Dadds 1997; Flannery-S 2000; Ginsburg 2002; Haywood 2000; Kendall 1994; Kendall 1997; Nauta 2003; Silverman 1999; Shortt 2001; Spence 2000) were included in the final analysis on remission of any anxiety diagnosis. In the intention to treat analysis (ITT) there were 475 treatment subjects and 290 controls, with a response rate for remission of any anxiety diagnosis of 56% for CBT versus 28.2% for controls (RR 0.58, 95% CI 0.50 to 0.67). There was no evidence of heterogeneity, I squared (I^2) = 32.6%; Chi squared (χ^2) = 16.31, df = 11; p = 0.13. The number needed to treat (NNT) was 3.0 (95% CI 2.5 to 4.5).

Using data from the 415 treatment subjects and 252 controls who completed the trials, the response rate for CBT was 64.6% versus 21% for controls (RR 0.43, 95% CI 0.38 to 0.50). There was no evidence of heterogeneity, I^2 = 0%; χ^2 = 9.65, df = 11; p = 0.56. The number needed to treat (NNT) was 2 (95% CI 1.7 to 2.4).

For the differing formats of CBT (individual, group and family), summary statistics based on intention to treat analysis suggested that 54.2% of participants receiving individual CBT had no anxiety diagnosis, in contrast with group CBT at 56.8%, and family CBT at 67% (c^2 = 5.09, df = 2; p = 0.07).

Reduction in anxiety symptoms

The findings for the reduction in anxiety symptom scores were in the moderate range (Cohen 1988). Based on RCMAS scores, the SMD was -0.58 (95% CI -0.76 to -0.40), with no significant heterogeneity (I^2 = 0%, χ^2 = 8.01, df = 9, p = 0.53). Based on FSSC-R scores, the SMD was -0.55 (95% CI -0.74 to -0.36), with no significant heterogeneity (I^2 = 6.4%; Chi squared = 9.61, df = 9, p = 0.38).

There was no evidence of publication bias based upon asymmetry in the funnel plots for RCMAS or FSSC-R symptoms scores, although relatively small numbers limit the conclusions one can draw.

Acceptability

There was no difference in the rate of those lost to follow-up between groups, indicating a similar degree of acceptability. In the CBT group, the rate of loss to follow-up was 12% (60/498) versus 9.8% (29/302) in the control group (RR 1.02, 95% CI 0.54 to 1.94). There was no evidence of heterogeneity, I squared (I^2) = 35.7%; Chi squared (χ^2) = 17.11, df = 11; p = 0.1

DISCUSSION

The present systematic review indicates that cognitive behavioural therapy is a potentially useful treatment for anxiety disorders in children and adolescents. Using conservative intention-to-treat (ITT) criteria, the remission rate for anxiety disorders, 56% for CBT and 28.2% for controls, is very similar to the findings of the meta-analysis reported by Cartwright-Hatton (Cartwright-H

2004) at 56.5% for CBT and 34.8% for controls. This adds weight to the finding reported in this review, and suggests that one can expect just over half of subjects to respond to CBT, compared to a natural response rate of about a third. The numbers needed to treat (NNT) using conservative ITT data is 3.0 (95%CI 2.5 to 4.5), which means that in order for one additional subject to obtain remission from anxiety disorder using CBT, one needs to treat three subjects. In terms of medical and, indeed, psychological treatments, this is an acceptable finding, allowing one to recommend CBT in clinical practice. Indeed, despite being a relatively common psychiatric problem, the treatment of childhood and adolescent anxiety disorders remains a very under-researched area, and CBT stands out as psychological paradigm which has been subjected to evaluation.

In considering these findings, there are methodological issues which need to be addressed. Although the review identified a relatively small number of studies, all studies were in the direction of showing benefit for cognitive behavioural therapy. There were methodological shortfalls in all the studies, most notably inadequate details on the process of randomisation and allocation. There was inadequate reporting of those lost to therapy, according to the revised CONSORT criteria for randomised controlled trials (Consolidated Standards of Reporting Trials <http://www.consort-statement.org>) (Moher 2001). It is not possible in this type of research to blind the subjects - an obvious potential for bias - however, the evaluations were carried out blind, although details of this processing were in most cases not made clear.

In considering generalisability of the findings, it is of note that only community or outpatient subjects were included in the studies, so it is not possible to extrapolate the results to the most severe cases of anxiety disorder, who might have received daypatient or inpatient treatment. Comorbid disorders were included, however, allowing some generalised conclusions to be drawn.

CBT appears to be an acceptable form of therapy, when comparing the rates of those lost to follow-up between the CBT and the controls groups as a proxy measure. There is some difficulty, however, in employing waiting list controls, as control subjects receiving no treatment may become dissatisfied and leave to seek treatment elsewhere. Nevertheless, in the CBT group the rate of loss to follow-up was 12% (60/498) versus 9.8% (29/302) in the control group, a very similar and acceptably low rate.

While cognitive behavioural therapy appears to be effective in comparison to waiting list and attention controls, two trials of cognitive behavioural therapy versus education support (Last 1998; Silverman 1999b) found no greater benefit for cognitive behavioural therapy. In an attempt to disentangle the effectiveness or otherwise of the cognitive components of cognitive behavioural therapy, Muris (Muris 2002b) looked at cognitive coping versus emotional disclosure (ED), and found a non-significant superiority for cognitive coping. A report of an RCT by the same group (Muris 2002) comparing CBT to emotional disclosure (ED) and

no treatment controls, found CBT to be superior to emotional disclosure ED, which itself was no more effective than no treatment. Clearly, further evaluation of CBT in comparison to active treatments needs to be undertaken. Also, apart from social anxiety disorder (SOP), where there have been specific trials (Haywood 2000; Spence 2000), the trials in childhood and adolescence have considered anxiety disorders (OAD, SAD, GAD, SOP) as a group together. This differs from the situation in the adult literature, where trials of specific disorders (panic disorder, social phobia) have been reported. In order to produce more specific or targeted treatments, it is essential to examine the cognitive mechanisms underlying these anxiety disorders. A necessary step is to study specific types of anxiety disorders. For example, in adults with panic disorder, it has been possible to examine the hypothesis that a mediator in the treatment response of CBT is a 'fear of fear' (Smits 2004). Indeed, the question whether cognitive elements of CBT are a necessary part of a psychological treatment package, rather than a purely behavioural treatment, does need examination. For example, a school-based study showed behavioural therapy to be an effective treatment for social phobia (Masia 2001).

An important question is the durability of any treatment effects for CBT. Ten studies (Barrett 1996; Barrett 1998 [numbers at follow-up not given]; Flannery-S 2000; Haywood 2000; Kendall 1994; Kendall 1997; Nauta 2003; Shortt 2001; Silverman 1999; Spence 2000) reported follow-up data, varying from 3 months to 72 months (average 13 months), for an estimated 82% (449/604) of initial patient completers. The proportion in remission of any anxiety diagnosis at follow up was 69% (396/568) (data not provided by Kendall 1994; Kendall 1997). Bearing in mind the loss to follow-up of trial participants, which was not large, the effects of cognitive behavioural therapy appear durable.

AUTHORS' CONCLUSIONS

Implications for practice

Cognitive behavioural therapy (CBT) appears a promising therapy for the treatment of anxiety disorders in youths. The number of studies is relatively small, and confined to community or outpatient samples with mild to moderate cases only. Nonetheless, CBT is, by far and away, the most researched psychological treatment modality in children and adolescents. The evidence from this review indicates that CBT is effective in 56% of cases compared to a natural remission rate of 28.2% in waiting list controls. Clearly, there is room for development of further therapeutic treatments. There is a lack of evidence for a difference between the formats of individual, group or parent/family CBT. It is likely that there is going to be an even greater emphasis upon psychological treatments for childhood anxiety disorders, particularly in view of the recent safety concerns over the use of selective serotonin re-uptake inhibitors (SSRIs) in children and adolescents.

Implications for research

Based on the findings obtained in this review, it is clear that further methodologically rigorous studies of CBT are required. Future studies should include more severe cases, older adolescents and those with learning disabilities i.e. more diverse populations to allow greater generalisation. Studies should be stratified by age, to allow adequate investigation of the age/developmental appropriateness of the CBT model used. In particular, studies need to employ measures of cognitive, rather than simple symptom change, which are sensitive to developmental and age changes, especially in pre-operational children and older adolescents (Grave 2004). As for adult studies, there is a need to focus on more specific anxiety disorders, rather than grouping together disorders such as over-anxious disorder (OAD), social anxiety disorder (SOP) and generalised anxiety disorder (GAD). In order to examine the durability of CBT changes and whether, as in the case of depression, booster CBT sessions are necessary, long-term follow-up studies with adequate controls are required. The evidence of the efficacy of the differing formats or methods of delivery of CBT individual, group, parental / family, needs further study. Comparison studies with other forms of treatment such as pharmacotherapy, including combined treatments, are warranted.

NOTES

Please note that a few minor changes have been made to this review.

POTENTIAL CONFLICT OF INTEREST

There were no potential conflicts of interest for any of the reviewers

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- * Indicates the major publication for the study

TABLES

Characteristics of included studies

Study	Barrett 1996
Methods	RCT, WL control; blind assessment. completer analysis;

Characteristics of included studies (Continued)

	Sample size (initial/completed) Individual CBT 28/28, individual +family 25/25, W/L controls 26/23
Participants	N= 79; age range 7-14 years; mean age= 9.3 years; 57% male; Ethnicity not specified; community sample OAD (n=30), SAD (n=30),SOP (n=19); Exclusion criteria: 'principal diagnosis of simple phobia or other (non-anxiety) diagnoses'; intellectual or physical disabilities; 'antianxiety or depression medication; parents 'involved in acute marital breakdown'
Interventions	Clinic based individual CBT 12 * 60 -80 minutes; Clinic based CBT+ family intervention 12 * 60-80 minutes : Waiting list controls (12 weeks then offered treatment)
Outcomes	ADIS-C ADIS-P RCMAS FSSC-R CBCL
Notes	Follow up 12 months, then then 72 months (Barrett 2001)
Allocation concealment	B – Unclear

Study **Barrett 1998**

Methods	RCT, WL control and alternative treatment; blind assessment. completer analysis; Sample size (initial/completed) Group CBT 23/19; Group + family CBT 17/15; W/L controls 20/16.
Participants	N= 60; age range 7-14 years; 53% male; Ethnicity not specified; community sample OAD (n=30), SAD (n=26),SOP (n=4); Exclusion criteria: 'Intellectual or physical disabilities; current 'antianxiety or depression medication; parents 'involved in acute marital breakdown'
Interventions	Clinic based group CBT 12 * 2 hours; Clinic based group CBT+ family intervention 12 * 2 hours : Waiting list controls (12 weeks then offered treatment)
Outcomes	ADIS FSSC-R CBCL
Notes	Follow up 12 months
Allocation concealment	B – Unclear

Study **Dadds 1997**

Methods	RCT, control school blind assessment. completer analysis; Sample size (initial/completed) CBT 42/41; controls 61/60.
Participants	N= 100; age range 7-14 years; mean age= 9.5 (sd 1.6) years; 26.4% male; Ethnicity not specified; Schools any DSM IV anxiety diagnosis (sub clinical sample reported but not included in this analysis Exclusion criteria: 'disruptive behaviour problems', developmental problems or disabilities', 'English not spoken at home', clinical anxiety higher than 5 on an 8 point rating scale'
Interventions	School based group CBT 10 * 1-2 hours parent sessions*3
Outcomes	ADIS-P RCMAS FSSC-R CBCL
Notes	
Allocation concealment	B – Unclear

Characteristics of included studies (Continued)

Study	Flannery-S 2000
Methods	RCT, WL control and alternative treatment; blind assessment, ITT completer analysis; Sample size (initial/completed) Individual CBT 18/13; Group CBT 13/12; W/L controls 14/12.
Participants	N= 45; age range 8-14 years; 403% male; Ethnicity 89% white; community sample GAD (n=21), SAD (n=11),SOP (n=5); Exclusion criteria: 'Disabling physical condition'; 'psychotic symptoms'; 'current use of antianxiety or antidepressant medication';
Interventions	Clinic based group CBT 18 * 90 minutes, some parental advice given; Clinic based individual CBT intervention 18 * 50 - 60 minutes, some parental advice given;; Waiting list controls (9 weeks then offered treatment)
Outcomes	ADIS- IV-C AIDS-IV-P RCMAS CBCL
Notes	Follow up 12 months
Allocation concealment	B – Unclear

Study	Ginsburg 2002
Methods	RCT, alternative control- therapist and group peer support, blind assessment, completer analysis. initial/completed) Group CBT 6/4; active controls 6/5.
Participants	N =12; age range 14-17 mean 14.6 years;Ethnicity African Americans. Inclusion criteria: DSM IV anxiety diagnosis;Score >24 on ADIS-C and > 4 on ADIS-CIR. Exclusion obsessive-compulsive disorder and posttraumatic stress disorder;receiving other psychiatric treatment; suicidal intent or needing immediate/ alternative treatment
Interventions	School based group CBT 10* sessions 45 minutes
Outcomes	ADIS- IV-C ADIS-CIR SCARED SAS-A
Notes	No follow-up
Allocation concealment	B – Unclear

Study	Haywood 2000
Methods	RCT, No treatment control (W/L); blind assessment, completer analysis; Sample size (initial/completed) Group CBT 12/11; controls 23/22.
Participants	N= 35; mean age 15.8 years; 100% female; Ethnicity unspecified; Community sample SOP (n=35); Exclusion criteria: "current 'major depression', 'current or previous panic, agoraphobia, substance abues, psychotic disorder';'using psychotropic medication'
Interventions	Clinic based group CBT 16 * 1.5 hours,: No treatment control
Outcomes	ADIS CSR SPAI-C
Notes	Follow up 12 months
Allocation concealment	B – Unclear

Characteristics of included studies (Continued)

Study	Kendall 1994
Methods	RCT, W/L control ; blind assessment not clear, completer analysis; Sample size (initial/completed) Individual CBT 30/27; W/L controls 30/20.
Participants	N= 47; age range 9-13 years; 60% male; Ethnicity 76% white; Community sample OAD (n=30), SAD (n=8), AVD (n=9); Exclusion criteria: IQ below 80; "disabling physical condition", 'psychotic symptoms', "current use of anti-anxiety or antidepressant medication"
Interventions	Clinic based group individual CBT 17 * 50 minutes,: W/L control (8 weeks then offered treatment)
Outcomes	ADIS-P RCMAS FSSC-R CBCL-I
Notes	Follow up 3? months, then 2-5 years (Kendall 1996)
Allocation concealment	C – Inadequate

Study	Kendall 1997
Methods	RCT,W/L control ; blind assessment not clear, completer analysis; Sample size (initial/completed) Individual CBT 75/60; W/L controls 43/34.
Participants	N= 94; age range 9-13 years; 62% male; Ethnicity 85% white; Community sample OAD (n=55), SAD (n=22), AVD (n=17); Exclusion criteria: 'psychotic symptoms', ' anti-anxiety medication'
Interventions	Clinic based group individual CBT mean 18 * 60 minutes,: W/L control (8 weeks then offered treatment)
Outcomes	ADIS-P RCMAS STAIC
Notes	Follow up 12 months
Allocation concealment	A – Adequate

Study	Mendlowitz 1999
Methods	RCT,W/L control ; blind assessment not clear, completer analysis; Sample size (initial/completed) group child CBT 23/23; group child +parent 21/21 W/L controls 18/18.
Participants	N= 68; age range 9-13 years; mean age 9.3 years; 43% male; Ethnicity unspecified; Community sample :children with anxiety disorders using DICA-R-P Exclusion criteria: ???
Interventions	Clinic based group group child CBT 12 * 90 minutes,:group parents CBT 12 * unspecified no of minutes; group child +parent CBT 12 *unspecified no of minutes W/L control (2 to 6 months then offered treatment)
Outcomes	RCMAS CCSC GIS
Notes	Follow up 12 months
Allocation concealment	B – Unclear

Characteristics of included studies (Continued)

Study	Nauta 2003
Methods	RCT, WL control; blind assessment. ITT analysis; Sample size (initial/completed) Individual CBT 29/26, individual + 7 sessions parental CBT 30/30, W/L controls 20/20
Participants	N= 79; age range ??? years; mean age= 11.0 years; 49% male; Ethnicity not specified; community sample GAD (n=15), SAD (n=26),SOP (n=31); PAD (n=7) Exclusion criteria: 'principal diagnosis of simple phobia or other (non-anxiety) diagnoses'; intellectual or physical disabilities; 'antianxiety or depression medication; parents 'involved in acute marital breakdown'
Interventions	Clinic based individual CBT 12 sessions; Clinic based 12 individual CBT+ 7 sessions parental CBT family intervention 12 * unspecified no of minutes + 7 * unspecified no of minutes : Waiting list controls (duration not specified then offered treatment)
Outcomes	ADIS-C ADIS-P FSSC-R CBCL SCAS-c/p
Notes	Follow up 3 months
Allocation concealment	B – Unclear
Study	Shortt 2001
Methods	RCT, WL control; blind assessment. completer analysis; Sample size (initial/completed) group CBT 54/48, W/L controls 17/16
Participants	N= 71; age range 7-14 years; mean age= 7.85 years; 41% male; Ethnicity 92% Australian; community sample GAD (n=42) , SAD (n=19),SOP (n=10); Exclusion criteria: 'intellectual or severe physical impairment'; 'currently receiving other treatment'.
Interventions	Clinic based group CBT- children 10 (plus 2 boster sessions) *50-60 minutes; parents 6 hours : Waiting list controls (10 weeks then offered treatment)
Outcomes	DISCAP RCMAS CBCL
Notes	Follow up 12 months
Allocation concealment	B – Unclear
Study	Silverman 1999
Methods	RCT, WL control; blind assessment. completer analysis; Sample size (initial/completed) group + parent CBT 37/25, W/L controls 19/16
Participants	N= 56; age range 6-16 years; mean age= 9.66 years; 61% male; Ethnicity 45% white; community sample OAD (n=29), GAD (n=12),SOP (n=15); Exclusion criteria: 'pervasive developmental disorders', 'psychotic symptoms', 'current treatment'.
Interventions	Clinic based group CBT with parent component -15 minutes conjoint meeting - child 12 * 55 minutes; parent 12 * 55 minutes Waiting list controls (8-10 weeks then offered treatment)
Outcomes	ADIS-C ADIS-P

	RCMAS FSSC-R CBCL-I PGRSI
Notes	Follow up 12 months
Allocation concealment	B – Unclear

Study	Spence 2000
Methods	RCT, WL control; blind assessment. completer analysis; Sample size (initial/completed) group child and parent CBT 17/16, group child CBT 19/15, W/L controls 14/9
Participants	Clinic based. CBT N= 50; age range 7-14 years; mean age= 10.7 years; 62% male; Ethnicity not specified; community sample SOP (n=50); Exclusion criteria: 'principal diagnosis of simple phobia or other (non-anxiety) diagnoses'; intellectual or physical disabilities; 'antianxiety or depression medication; parents 'involved in acute marital breakdown'
Interventions	Clinic based group CBT 14 * 90 minutes; Clinic based group CBT+ family intervention child 14 * 90 minutes : parent 14* 90 minutes, Waiting list controls - no treatment
Outcomes	ADIS-P CSR RCMAS
Notes	Follow up 12 months
Allocation concealment	B – Unclear

ADIS-P= Anxiety Disorder Interview Schedule for Parents , ADIS-C = Anxiety Disorder Interview Schedule for Children; CBCL =Child Behavior Checklist ; FSSC-R= The Fear Survey for Children Revised ; CCSC = Children's Coping Strategies Scale; CIS= Clinical Improvement Scale; CSR = Clinical Severity Scale; DISCAP =Diagnostic Interview Schedule for Children, Adolescents and Parents; RCMAS = The Revised Children's Manifest Anxiety Scale; SAS = Social Anxiety Scale for Adolescents; SCARED = Screen for Child Anxiety Related Emotional Disorders; SCAS =Spence Child Anxiety Scale, Child and Parent Version ;SPAI =Social Phobia and Anxiety Inventory for Children ; STAIC = State-Trait Anxiety Inventory for Children ; SWQ-PU =Social Worries Questionnaire-Pupil ;

Characteristics of excluded studies

Study	Reason for exclusion
Barrett 2001	Alternative treatment group- individual CBT versus group CBT
Beidel 2000	Participants received 'testbusters' - an active but non specified treatment
Bernstein 2000	Alternative treatment controls- CBT versus CBT plus imipramine
Blagg 1984	Primarily a paper on behavioural rather than cognitive-behavioural therapy. Primary outcome school refusal rather than anxiety diagnosis.
Blonk 1996	Primary outcome measure did not include an anxiety diagnosis
Cobham 1998	Alternative treatment control-Individual CBT versus CBT plus family intervention.
Cornwall 1996	Simple phobia: Data on those responding not available
Joorman 2002	Allocation of cases on an alternate basis, not randomised..
Kendall 2001	Primarily a paper on comorbidity; data presented previously in other papers.
King 1998	Target was school refusal rather than primary anxiety diagnosis. Primary outcome measure was school attendance (% days present), rather than an anxiety diagnosis.

Characteristics of excluded studies (Continued)

Last 1998	Placebo-control group received 'education support therapy'. Supportive therapy included elements of CBT- keeping diaries of thoughts and feelings, and learning to distinguish fear and anxiety. Primary target was anxiety based school refusal rather than anxiety diagnoses.
Manassis 2002	Alternative treatment control: individual CBT versus group CBT, categorical outcomes not reported; no of completers not reported;
Menzies 1993	Simple phobia; alternative treatment control; categorical outcomes not reported; insufficient data to calculate effect size; too few sessions;
Muris 2001	Alternative treatment control - individual CBT versus group CBT, no of completers not specified.
Muris 2002	Diagnostic status of the no treatment group not assessed
Pina 2003	Data presented elsewhere. No control subjects.
Silverman 1999b	Treatment primarily of simple phobia (84% of cases) using exposure-based contingency management and an exposure-based cognitive self control versus educational support.
Warren 1984	No formal diagnosis of anxiety disorder.

Characteristics of ongoing studies

Study	Kendall 1
Trial name or title	Child focused CBT versus family focused CBT versus attention/ support/ education
Participants	Youths aged 7-13 with separation anxiety disorder, social phobia or generalised anxiety disorder
Interventions	CBT individual CBT family Controls attention , education , support.
Outcomes	Results awaited 1 year follow up being undertaken
Starting date	
Contact information	Professor Kendall Temple University , Philadelphia, US.
Notes	

Study	Kendall 2
Trial name or title	Child focused CBT versus sertraline versus placebo
Participants	Youths aged 7-17 with separation anxiety disorder, social phobia or generalised anxiety disorder
Interventions	CBT individual Sertraline placebo education , support.
Outcomes	Results awaited
Starting date	
Contact information	Professor Kendall Temple University , Philadelphia, US.
Notes	

ANALYSES

Comparison 01. CBT versus control: ITT analysis

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Anxiety diagnosis: CBT (all formats) versus control	12	765	Relative Risk (Random) 95% CI	0.58 [0.50, 0.67]
02 Anxiety diagnosis: Individual CBT versus control	5	290	Relative Risk (Random) 95% CI	0.56 [0.47, 0.66]
03 Anxiety diagnosis: Group CBT versus control	7	314	Relative Risk (Random) 95% CI	0.61 [0.49, 0.75]
04 Anxiety diagnosis: Family CBT versus control	4	187	Relative Risk (Random) 95% CI	0.38 [0.29, 0.51]

Comparison 02. CBT (all formats) vs control: Completer analysis

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Anxiety diagnosis	12	668	Relative Risk (Random) 95% CI	0.43 [0.38, 0.50]
02 Reduction in anxiety symptoms (RCMAS symptom score)	10	579	Standardised Mean Difference (Random) 95% CI	-0.58 [-0.76, -0.40]
03 Reduction in anxiety symptoms (FSSC-R symptom score)	10	579	Standardised Mean Difference (Random) 95% CI	-0.55 [-0.74, -0.36]

Comparison 03. CBT (all formats) vs control: other data types (non-parametric data)

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Reduction in anxiety symptoms: RCMAS symptom scores	4	260	Standardised Mean Difference (Fixed) 95% CI	-0.20 [-0.46, 0.05]

Comparison 04. CBT (all formats) versus control :participants lost to follow-up

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Participants lost to follow-up	13	800	Relative Risk (Random) 95% CI	1.02 [0.54, 1.94]

INDEX TERMS

Medical Subject Headings (MeSH)

Adolescent; Anxiety Disorders [*therapy]; *Cognitive Therapy; Randomized Controlled Trials

MeSH check words

Child; Humans

COVER SHEET

Title Cognitive behavioural therapy for anxiety disorders in children and adolescents

Authors James A, Soler A, Weatherall R

Cognitive behavioural therapy for anxiety disorders in children and adolescents (Review)
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Date new studies found but not yet included/excluded	Information not supplied by author
Date new studies found and included/excluded	Information not supplied by author
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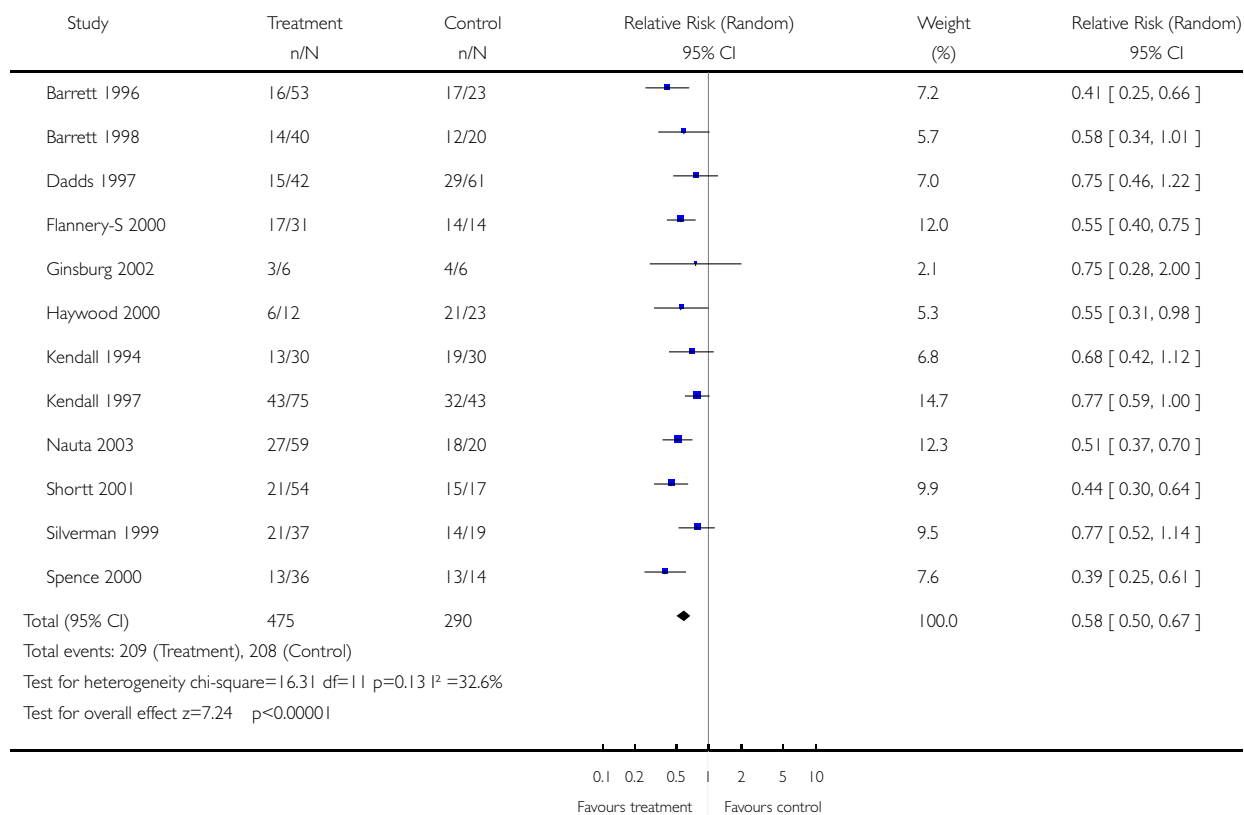
GRAPHS AND OTHER TABLES

Analysis 01.01. Comparison 01 CBT versus control: ITT analysis, Outcome 01 Anxiety diagnosis: CBT (all formats) versus control

Review: Cognitive behavioural therapy for anxiety disorders in children and adolescents

Comparison: 01 CBT versus control: ITT analysis

Outcome: 01 Anxiety diagnosis: CBT (all formats) versus control

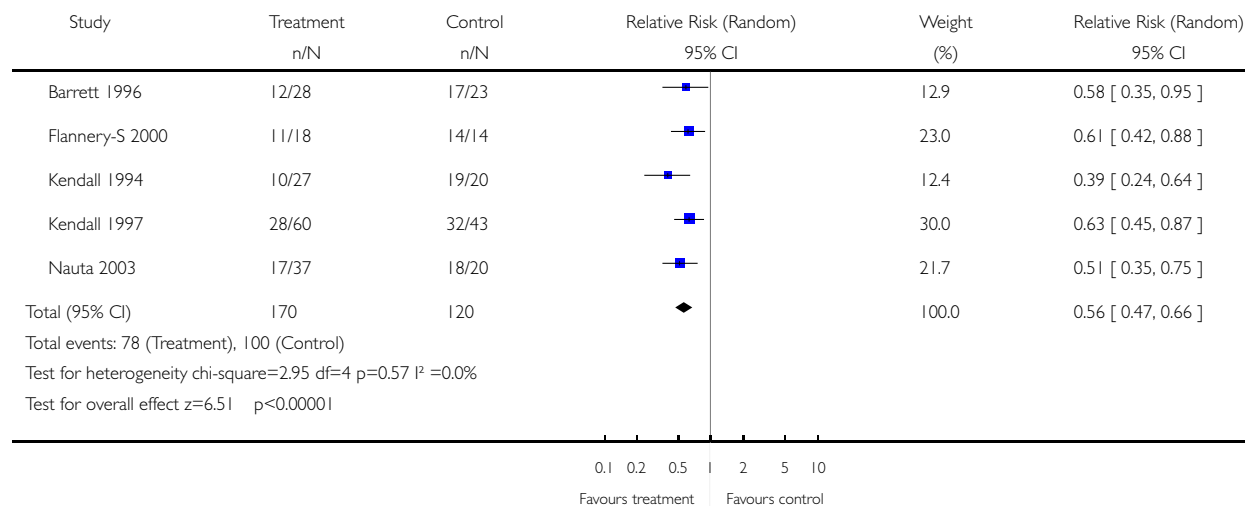


Analysis 01.02. Comparison 01 CBT versus control: ITT analysis, Outcome 02 Anxiety diagnosis: Individual CBT versus control

Review: Cognitive behavioural therapy for anxiety disorders in children and adolescents

Comparison: 01 CBT versus control: ITT analysis

Outcome: 02 Anxiety diagnosis: Individual CBT versus control

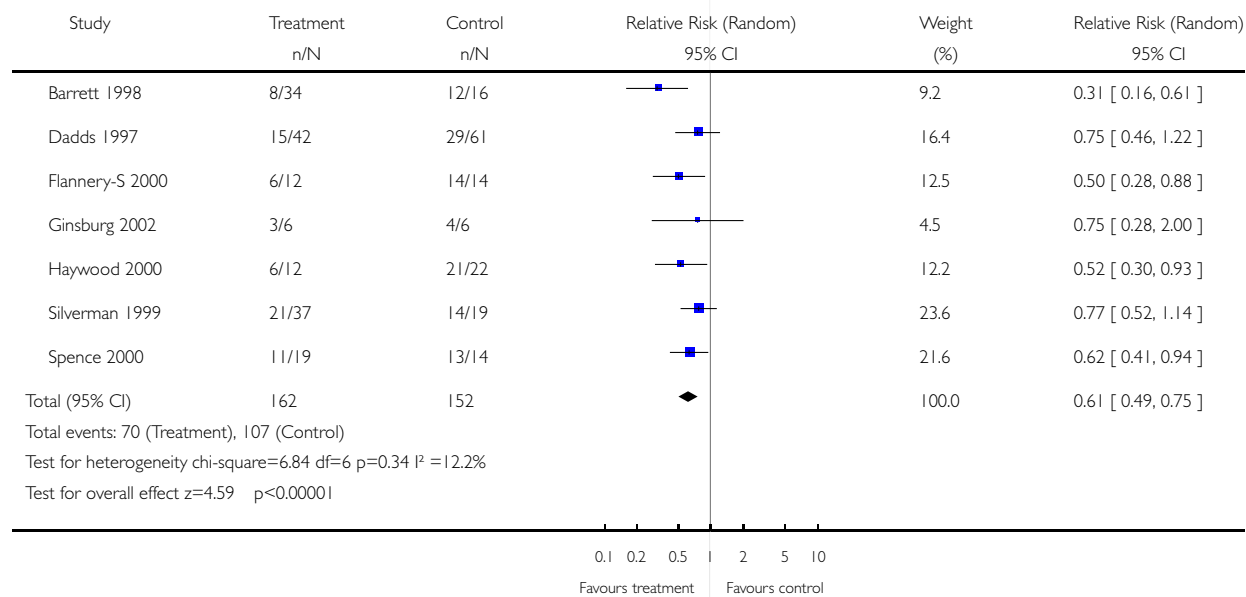


Analysis 01.03. Comparison 01 CBT versus control: ITT analysis, Outcome 03 Anxiety diagnosis: Group CBT versus control

Review: Cognitive behavioural therapy for anxiety disorders in children and adolescents

Comparison: 01 CBT versus control: ITT analysis

Outcome: 03 Anxiety diagnosis: Group CBT versus control

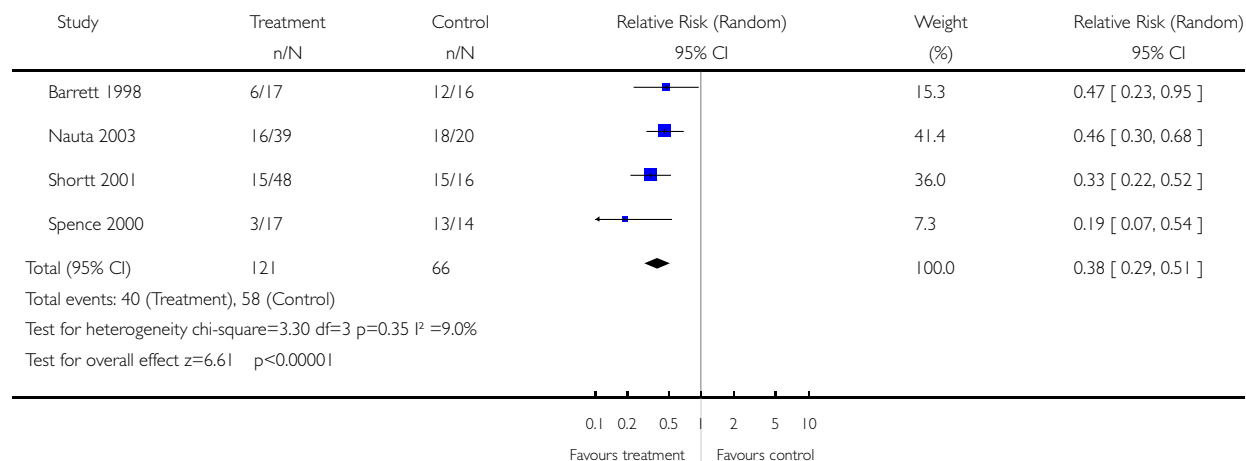


Analysis 01.04. Comparison 01 CBT versus control: ITT analysis, Outcome 04 Anxiety diagnosis: Family CBT versus control

Review: Cognitive behavioural therapy for anxiety disorders in children and adolescents

Comparison: 01 CBT versus control: ITT analysis

Outcome: 04 Anxiety diagnosis: Family CBT versus control

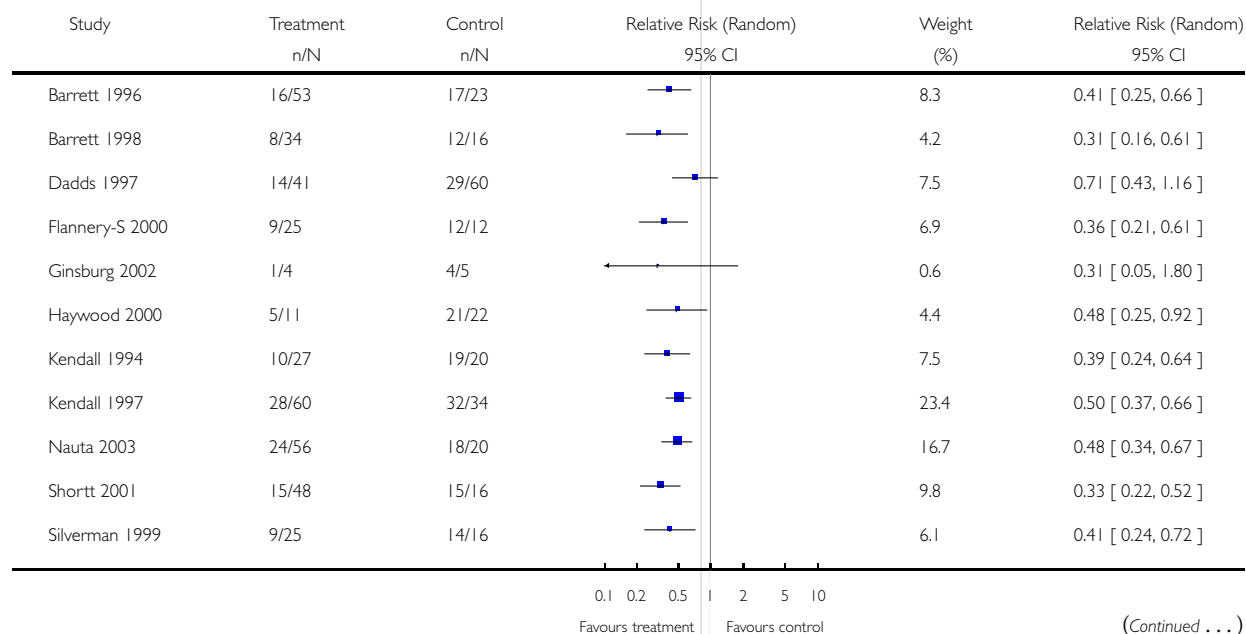


Analysis 02.01. Comparison 02 CBT (all formats) vs control: Completer analysis, Outcome 01 Anxiety diagnosis

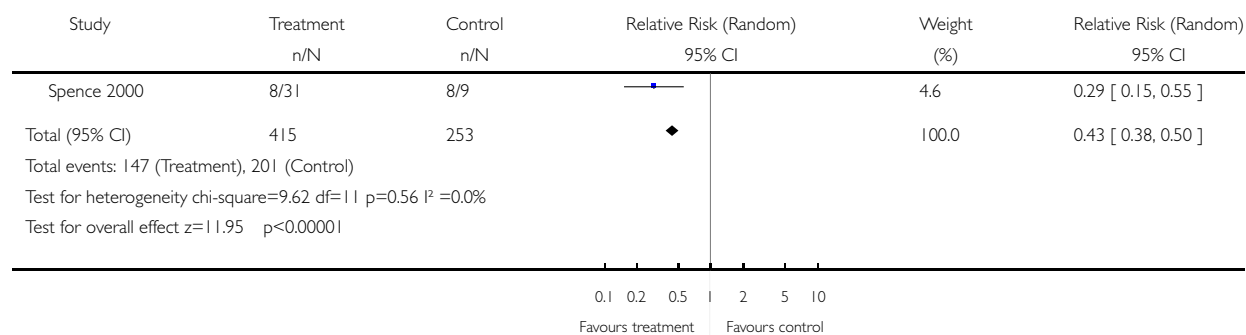
Review: Cognitive behavioural therapy for anxiety disorders in children and adolescents

Comparison: 02 CBT (all formats) vs control: Completer analysis

Outcome: 01 Anxiety diagnosis



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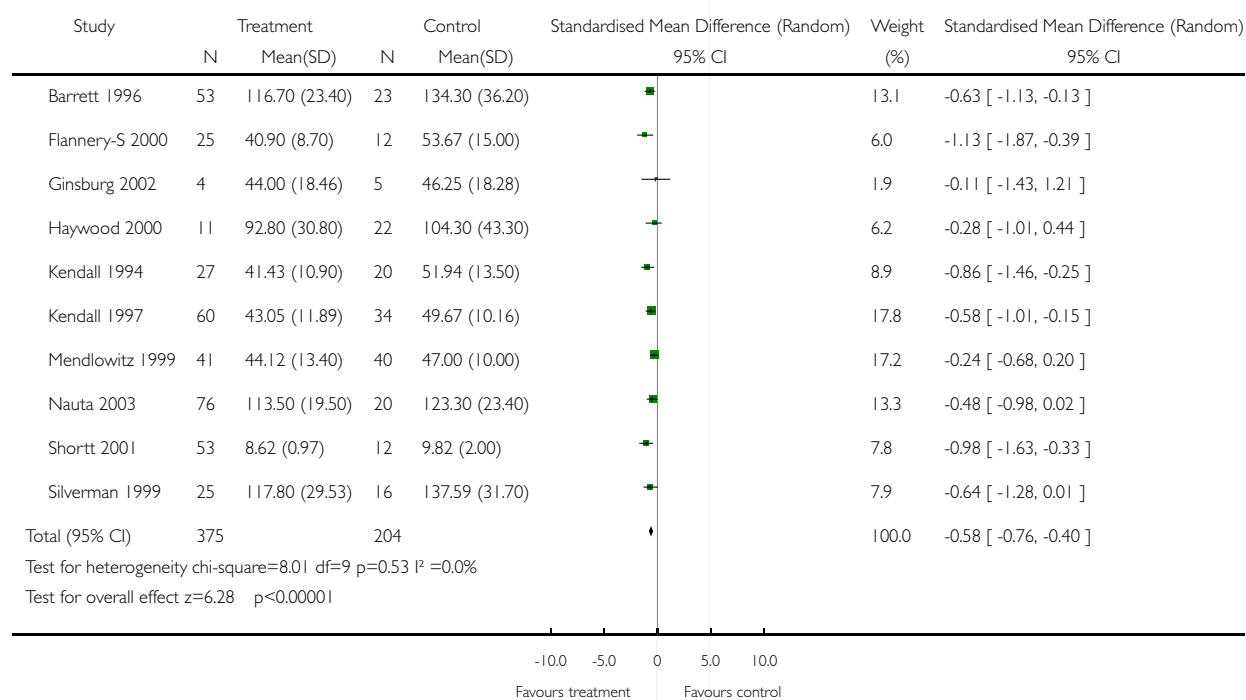


Analysis 02.02. Comparison 02 CBT (all formats) vs control: Completer analysis, Outcome 02 Reduction in anxiety symptoms (RCMAS symptom score)

Review: Cognitive behavioural therapy for anxiety disorders in children and adolescents

Comparison: 02 CBT (all formats) vs control: Completer analysis

Outcome: 02 Reduction in anxiety symptoms (RCMAS symptom score)

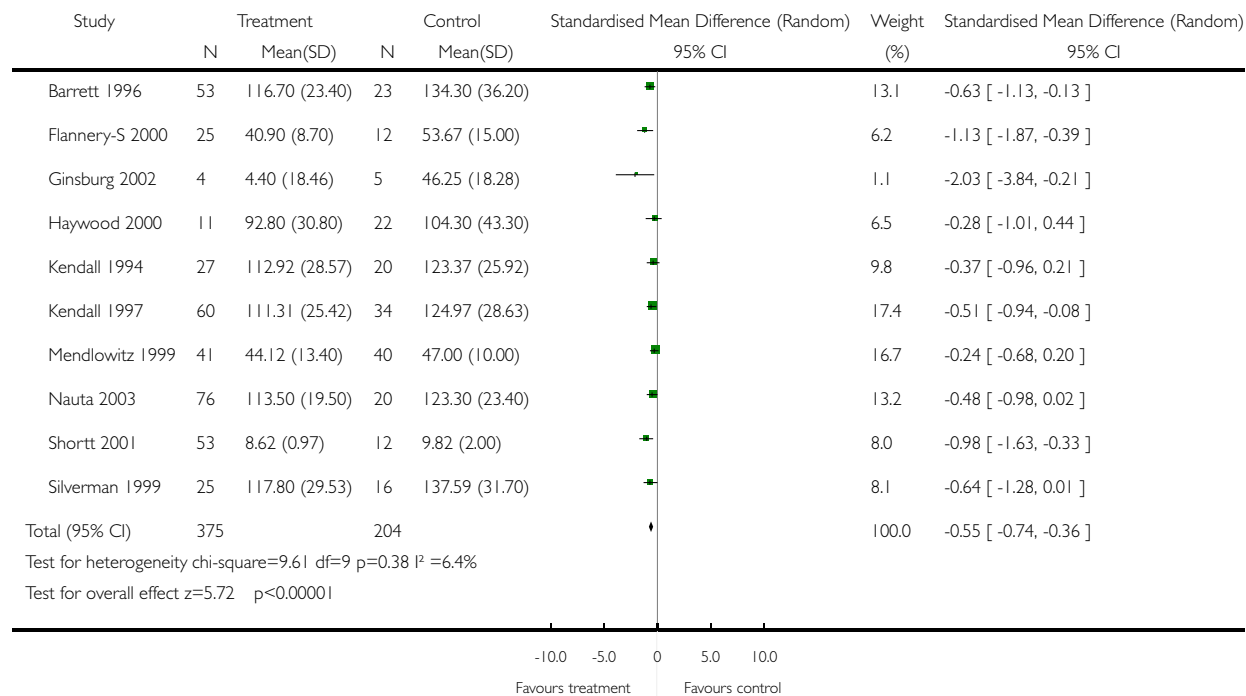


Analysis 02.03. Comparison 02 CBT (all formats) vs control: Completer analysis, Outcome 03 Reduction in anxiety symptoms (FSSC-R symptom score)

Review: Cognitive behavioural therapy for anxiety disorders in children and adolescents

Comparison: 02 CBT (all formats) vs control: Completer analysis

Outcome: 03 Reduction in anxiety symptoms (FSSC-R symptom score)

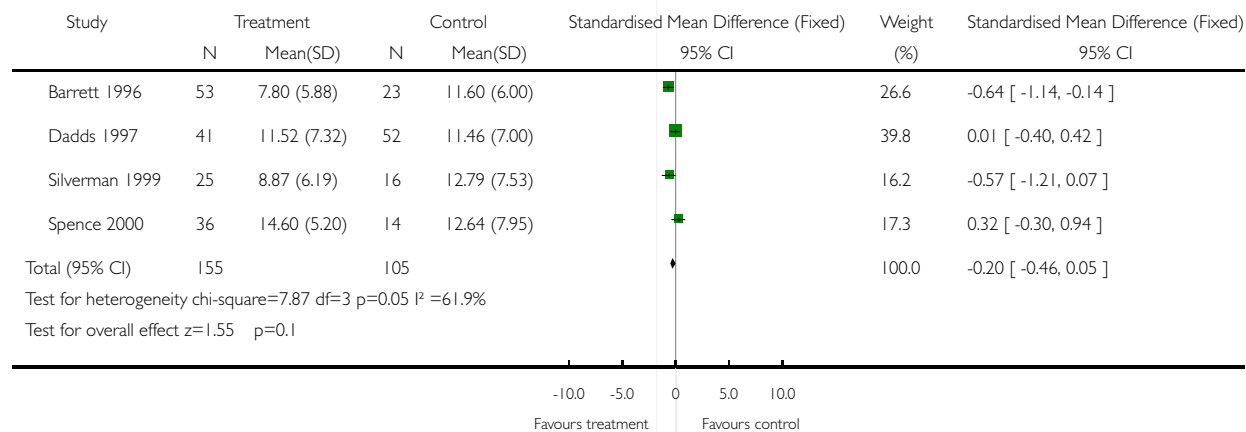


Analysis 03.01. Comparison 03 CBT (all formats) vs control: other data types (non-parametric data), Outcome 01 Reduction in anxiety symptoms: RCMAS symptom scores

Review: Cognitive behavioural therapy for anxiety disorders in children and adolescents

Comparison: 03 CBT (all formats) vs control: other data types (non-parametric data)

Outcome: 01 Reduction in anxiety symptoms: RCMAS symptom scores



**Analysis 04.01. Comparison 04 CBT (all formats) versus control :participants lost to follow-up, Outcome 01
Participants lost to follow-up**

Review: Cognitive behavioural therapy for anxiety disorders in children and adolescents

Comparison: 04 CBT (all formats) versus control :participants lost to follow-up

Outcome: 01 Participants lost to follow-up

