Unguided and Guided Self-Help Interventions for Common Mental Health Disorders in Children and Adolescents: A systematic review and meta-analysis

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Abstract

Mental health problems are common in children and adolescents, yet evidence-based treatments are hard to access. Self-help interventions can increase such access. The aim of this paper is to conduct a systematic review and meta-analysis of the use of guided and unguided self-help for children and young people with common impairing psychiatric symptoms. In contrast to previous reviews of self-help in children, all types of self-help and multiple mental health disorders were investigated in order to increase power to investigate potential moderators of efficacy. Importantly, studies with control arms as well as those comparing against traditional face-to-face treatments were included. 50 studies (n = 3396 participants in self-help/guided self-help conditions) met inclusion criteria. Results demonstrated a moderate positive effect size for guided and unguided self-help interventions when compared against a control group (n = 45; g = -0.48; 95% CI: 0.37 – 0.60, p<.01) and a small, but significant negative effect size when compared to other therapies (n=15; g = -0.19; 95% CI: -0.29 – -0.09, p<.01). Few potential moderators had a significant effect on outcome. Most comparisons resulted in significant heterogeneity and therefore results are interpreted with caution.

Keywords: self-help, anxiety, depression, disruptive behaviour, children, adolescents

Highlights

- Self-help can increase access to therapy to meet a growing unmet need.
- Self-help is efficacious in treating common childhood mental health disorders.
- Guided self-help may be more efficacious than self-help, but this needs further research.
- Self-help interventions for this population may be slightly less effective than face-to-face treatments.

Introduction

A recent UK report found that up to 75% of referrals to local Child and Adolescent Mental Health Services were declined by the service and for those accepted, there was an average waiting time for treatment of up to 200 days (Children's Commissioner, 2016). One way of meeting a large need for psychological therapy is through the use of unguided or guided self-help interventions; the latter involving varying degrees of input from a therapist (Bekker, Griffiths & Barrett, 2016). Self-help reduces both the impact of stigma (as it is possible to access it without others knowing) and the time burden associated with visiting a clinic. In addition, as it requires less therapeutic time and expertise, it is likely to be cost-effective, although this has not yet been established (Lewis, Pearce & Bisson 2012).

The evidence-base for self-help in children and adolescents is growing, partly as a response to the increasing demand for psychological interventions (Bekker et al., 2016) and the UK Children and Young People's Improving Access to Psychological Therapies (CYP-IAPT) Programme is training therapists to deliver guided self-help interventions within a stepped-care model. At the same time, there has been a proliferation of self-help interventions (primarily of technology based interventions in recent years) and of associated reviews and meta-analyses. The reviews to date have made an important contribution to the literature but are limited in that they have been highly specific, focusing on only one disorder (e.g. anxiety), type of self-help (e.g. internet, computerised) or age group. For example, a meta-analysis of fourteen studies investigating self-help for the treatment of emotional problems in adolescents and young adults (12-25 years old) found only a small, non-significant effect size for emotional symptoms, although study quality was poor (Ahmead & Bower, 2008). This analysis did not include younger children and included only those interventions with no or minimal individual contact with a health professional or researcher and therefore some self-help interventions may have been excluded, minimising the ability to investigate the extent to which guidance could be considered as a moderator.

More recent reviews of computerised interventions (of which the majority were self-help or guided self-help) for anxiety and/or depression in youth demonstrated medium to large effect sizes (Ebert et al., 2015; Pennant et al., 2015; Rooksby, Elouafkaoui, Humphris, Clarkson & Freeman, 2015; Stasiak et al., 2016) although findings were inconclusive for younger children (Pennant et al., 2015) and non-computerised interventions, such as bibliotherapy, were not included and therefore the

type of self-help could not be investigated. Rickwood and Bradford (2012) conducted a review of self-help only of mild anxiety disorders, the review was not limited to Randomised Controlled Trials (RCTs) and only contained 6 studies. Self-help programmes may also be effective in the treatment of childhood behaviour disorders (Baumel & Faber, in press; Montgomery, Bjornstad & Dennis, 2006; O'Brien & Daley, 2011). Again, these reviews have been specific and/or not restricted to self-help and guided self-help, for example Baumel and Faber (in press) reviewed the impact of *technology-assisted* parenting programmes for young people with disruptive behaviours.

The specificity of these previous reviews therefore reduces power to investigate potential moderating variables such as the type of self-help (paper versus online) or impact of guidance. Considering the type of self-help (such as computerised or bibliotherapy), has important implications for service development and delivery (e.g. computerised interventions may require provision of computers for those who do not have access at home and may be more expensive to produce in the short term), yet reviews to date have not investigated this as a moderating variable. Furthermore, while it has been assumed that young people prefer modern technology (e.g. Baumel & Faber, in press), it is not yet established whether this is in fact the case.

The specificity of previous reviews additionally reduces the ability to meta-analyse studies comparing self-help against standard face-to-face treatments as very few such studies exist for each mental health disorder in children. Such analysis is important given that the CYP-IAPT model is based on a stepped-care approach and that UK National Institute for Health and Care Excellence (NICE) guidance recommends guided self-help as a first step for intervention in some child mental health disorders (NICE, 2005). Face-to-face treatments differ in their efficacy, for example interventions for anxiety have demonstrated greater effect sizes than interventions for depression (e.g. Spek et al., 2007). Therefore, it may be that self-help is similar in efficacy to some face-to-face interventions but has small effect sizes when compared to no treatment (and therefore may not be a preferred option for commissioners) and conversely, there may be self-help treatments that do not compare favourably to face-to-face treatments but nevertheless are efficacious in comparison to no treatment and therefore suitable to be used in a stepped-care approach. Knowledge of patient characteristics that affect efficacy, including whether they meet diagnostic criteria, would then support decisions regarding which patients are entered into which 'step' in such a care pathway.

Adult reviews have increased power through combining studies of interventions for anxiety and depression (e.g. Cuijpers, Donker, Van Straten, Li & Andersson, 2010) due to high rates of comorbidity between the conditions (Andrews, Slade & Issakidis, 2002) as well as the presence of transdiagnostic interventions designed to treat both anxiety and depression (e.g. Andrews, Cuijpers, Craske, McEvoy & Titov, 2010). Similarly, children and young people tend to have multiple comorbidities, with 40% having more than one diagnosis (Merikangas et al., 2010) and high rates of comorbidity amongst the most common childhood mental health disorders (anxiety, depression and disruptive behaviour disorders). There are child interventions designed to treat comorbid mood and conduct problems (e.g. the Modular Approach to Therapy for Children with Anxiety, Depression, Trauma, or Conduct Problems - MATCH-ADTC; Chorpita & Weisz, 2009) and some child studies have investigated the impact on behaviour interventions on mood and vice versa (e.g. Baker, Sanders, Turner & Morawska, 2017). However, no child reviews to date have combined interventions for anxiety, depression and disruptive behaviour disorders.

This review therefore combines interventions for anxiety, depression and disruptive behaviour in order to investigate possible moderating variables. An understanding of important moderating variables and user satisfaction of interventions may support the development of guidance regarding self-help programmes for children and young people. In particular, it could support services to decide which of the very many self-help interventions to recommend as they roll out self-help as part of stepped-care.

Objectives

The main aim of this review is to systematically assess the evidence-base for the use of unguided self-help and guided self-help for children and young people with symptoms of common mental health disorders (symptoms of anxiety, depression and/or disruptive behaviour). Within this, the objectives are to:

1) Evaluate the efficacy of unguided self-help and guided self-help interventions for symptoms of common mental health disorders in children and adolescents.
2) Compare the effectiveness of unguided self-help and guided self-help interventions to standard face-to face interventions for common mental health disorders in children.
3) Evaluate whether the presence and/or type of guidance given is associated with outcome.

4) Determine whether type and severity of mental health disorder is associated with outcome.
5) Assess treatment acceptability of unguided and guided self-help for children and young people.

Methods

Identification and selection of studies

Search methods

Two reviewers independently conducted searches and assessed them for inclusion. Disagreements were resolved through discussion with a third reviewer.

Databases

EMBASE, MEDLINE, PsycINFO, CINAHL and the Cochrane Central Register of Controlled Trials databases were searched from inception to 11th February 2018. In addition, grey literature searches were conducted through searching the PsycExtra and WorldCat Theses and Dissertations databases. We also searched for trial registrations through clinicaltrials.gov and WHO International Clinical Trials Registry Platform. Citation searches and searches of reference lists of identified papers were also completed. Reference lists of previous reviews were also examined. Additional literature was sought through personal contact with researchers in the area. No restrictions were placed on publication date or language.

Inclusion Criteria

Study type

To minimise bias, only RCTs were included in the search.

Participants

Children up to the age of 18 years, with no lower age limit. Studies with mixed samples including young adults to 25 years old were included, provided the mean age of the sample was under 18 years old. It was acceptable for the intervention to be undertaken primarily with parents, provided that child outcomes were reported. Children must have had impairing psychiatric symptoms, of depression, anxiety and/or disruptive behaviour, assessed through a measure of symptoms such

as the Strengths and Difficulties Questionnaire (Goodman, 1997), a diagnostic instrument, such as the Anxiety Disorders Interview Schedule – Child/Parent (Silverman & Albano, 1996) or self/parent reported difficulties.

Interventions

Self-help interventions, including bibliotherapy and computerised therapy were included. Guided self-help interventions were included in the review, provided that the main aim of the intervention was 'self-help' and that the guidance was restricted to supporting children and/or parents through the programme rather than teaching new materials. Studies that evaluated interventions in which the guided self-help was a part of the intervention (blended treatments with face-to-face psychotherapy and some guided self-help elements) were excluded.

Comparators

Trials with any control group (waiting list, treatment as usual, placebo/attention control or other) were included, as well as with another psychological treatment. Studies which reported insufficient data for the effect size to be calculated were excluded.

Outcome Measures

Outcome measures were any measure related to mental health, such as standardised measures for depression, anxiety, or disruptive behaviour, or diagnostic interviews. The measure had to relate to the mental health of the child and not the parent/carer, although parent-reports of child health/behaviour were acceptable. Qualitative results from measures of treatment acceptability were also extracted where available.

Search terms

Search terms including MeSH terms were divided into three main areas: self-help, intervention, and mental health disorder, and the areas combined with the AND operator. See Appendix A for full list of search terms. Searches were developed and conducted in collaboration with a librarian (GM).

Data extraction and management

Data extraction was completed independently by two raters for each paper and disagreements were resolved by discussion with a third reviewer. Data were extracted on a range of

variables: participant characteristics, intervention characteristics and study design characteristics, using a pre-designed data extraction form.

Study design

Data were extracted regarding the comparator (face-to-face, attention, waiting list, treatment as usual, medication) and the target condition (anxiety, depression, disruptive behaviour, or mixed). Length of follow-up (where present) was also determined. We also categorised studies reporting Intention to Treat (ITT) versus those which did not (yes/no).

Participant characteristics

Studies were categorised into child (all participants 13 years old or younger), adolescent (participants all older than 13 years old) or mixed studies. Data on mean age and percentage of males were also extracted, in addition to whether participants met diagnostic criteria for the primary mental health disorder using a validated diagnostic measure (yes/no).

Intervention characteristics

We extracted data regarding: whether the intervention was unguided or guided self-help (guidance yes/no) and how the self-help was delivered (written materials/computer/mixed/other).

Assessment of risk of bias in included studies

Risk of bias was assessed using the Cochrane Risk of Bias Tool (Higgins et al., 2011). 10% of studies were rated by a second independent rater. Disagreements were resolved through discussion with a third independent reviewer. This tool assesses selection bias (including random sequence generation and allocation concealment), blinding of participants and personnel, blinding of outcome assessment (considered at the individual outcome measure level), attrition bias/incomplete outcome data and selective reporting. Regarding blinding of outcome measures, self-report measures were considered at low risk of bias for the purposes of this review. Regarding selective reporting, studies were considered to be at low risk only if there was a study registration or published protocol and the outcomes in the paper matched those pre-specified. We examined the relationship between risk of bias and the effect size by performing meta-regression techniques. In these analyses, the total bias score was entered as the dependent variable. We compared the effect sizes of studies rated as low-risk of bias (all domains evaluated as being at low risk of bias) compared to studies with some risk of bias (one or more domains evaluated as being at unclear or high risk of bias).

Meta-analysis

Measurement of treatment effect

Separate analyses were conducted for studies using control groups and those comparing against face-to-face interventions. Many studies failed to specify a primary outcome measure and therefore multiple measures were used for several studies. This is particularly the case for behaviour interventions. Only measures that directly related to child outcomes were included, however; measures of parenting practices or parenting self-efficacy were not assessed. In cases in which multiple measures were reported, no one measure was prioritised. Instead, we combined the results of all measures.

We calculated Hedges' g for each study outcome, which is the standardised mean difference adjusting for small sample sizes. We used the endpoint score only. Where two or more measures were used per outcome (e.g. depression), the pooled effect sizes were calculated in order to include only one effect size per study in the analysis. Only measures relating to the primary outcome of the disorder were used to generate mean effect sizes (e.g. only measures of depressive symptomatology for a study of a depression intervention). To calculate pooled mean effect sizes, we used Comprehensive Meta-Analysis (CMA) software Version 3 (Biostat, Inc.). A random-effects pooling model was used in all analyses. We transformed standardised mean differences into the Number Needed to Treat (NNT; the number of patients that must be treated to generate one additional positive outcome) using the Kraemer and Kupfer (2006) formula.

We conducted a series of subgroup analyses, according to the mixed effects model. In this model, studies within subgroups are pooled with the random-effects model, whilst tests for significant differences between subgroups are conducted with the fixed-effects model (Borenstein, Hedges, Higgins & Rothstein, 2009). For continuous variables, we used random effects method of moments meta-regression analyses to test whether a significant relationship existed between the continuous variable and the effect size, as indicated by a Z value and associated p-values.

We aimed to analyse the following subgroups:

- Different diagnoses (anxiety, depression and disruptive behaviour).
- Different types of self-help (bibliotherapy versus computerised).
- Different amounts of guidance (i.e. self-help versus guided self-help).

- Different types of guidance (e.g. email, face-to-face, telephone).
- Different severities of mental health disorder (diagnosis confirmed with diagnostic interview versus not meeting diagnostic threshold or diagnosis not confirmed).

In addition, we aimed to conduct meta-regression analyses for age and total risk of bias. Finally, we conducted sensitivity analyses for risk of bias and inclusion of people aged over 18. We repeated the main analyses with only studies rated as at low risk of bias for all items except for participant/personnel blinding (as this is not usually possible within trials of psychological interventions). In addition, as some studies included young people aged 18-25, we conducted analysis of the main intervention effect without these studies included. Finally, we conducted the main analyses using only child-report measures, only parent-report measures and only observer-report measures to determine whether the source of outcome affected the intervention effect.

Treatment acceptability was only analysed qualitatively, as the data were not suitable for meta-analysis.

Assessment of heterogeneity

Statistical heterogeneity was assessed using the I^2 and Cochran's Q statistics (Higgins, Thompson, Deeks & Altman, 2003). Cochran's Q refers to the summed squared deviations of each study's effect size estimate from the overall meta-analytic effect size estimate. This is compared to a X^2 distribution with k-1 degrees of freedom (where k is the number of studies) to derive a p-value. A significant p-value indicates that the effect sizes of different studies may have arisen from different populations. It is commonly used in meta-analysis, however, it has low power for detecting true heterogeneity when there are small numbers of studies. I^2 refers to the percentage of total variation that is due to heterogeneity rather than chance. $I^2 = 100\% \times (Q - df)/Q$, where Q is Cochran's heterogeneity statistic and df is the degrees of freedom. A value of 0% indicates no observed heterogeneity and larger values show increasing heterogeneity.

Assessment of small study effects

A funnel plot was visually inspected to investigate small study effects. We also conducted Egger's test to examine the asymmetry of the funnel plot (Egger, Smith, Schneider & Minder, 1997).

Duval and Tweedie (2000) trim-and-fill analysis was used to obtain an unbiased estimate of the pooled effect size. This is a nonparametric data augmentation technique which is used to estimate the number of studies missing from a meta-analysis due to suppression of the most extreme results of the funnel plot. It then imputes from observed data to increase the symmetry of the plot. This method has been criticised as being at high risk of generating false-positives and therefore the results need to be interpreted with some caution (Sterne & Egger, 2000).

Results

50 studies met inclusion criteria for the meta-analysis of self-help for anxiety, depression and/or disruptive behaviour disorders in children and young people (see Figure 1 for PRISMA flowchart of study selection), with a total of 3396 children in self-help conditions, 1100 in face-to-face therapy groups and 2366 in control groups. 19 studies investigated treatment for disruptive behaviour, 15 investigated treatment for anxiety and 13 investigated treatment for depression. Three investigated treatments for multiple diagnoses (two for depression and anxiety combined, and McGrath and colleagues, 2011, included groups of children with anxiety and disruptive behaviour, which were analysed separately). Six compared against another therapy only, 35 compared against control groups and nine compared against both. Face-to-face therapies typically included evidence based individual Cognitive Behavioural Therapy (CBT) programs for anxiety and depression and individual or group parenting programs for behavioural difficulties. Full study and intervention characteristics are outlined in Table 1.

[FIGURE 1]

Risk of bias

All studied were considered at high risk of bias for blinding of participants and personnel, as all were studies of psychological interventions. Of the remaining five criteria considered in the review, 12 studies had low risk of bias across all five, 10 had low risk for 4, 12 had low risk for three, 10 had low risk for two, 6 had low risk for one and none had risk across all criteria. 34 adequately described random sequence generation, 24 described adequate allocation concealment, 47 described blinding of outcome assessment, 32 had adequate data completion across arms and 24 were registered on a trials database and reported the same outcomes in the final paper. 10% of studies were rated by a

second rater and there was complete agreement for all domains except incomplete outcome data, which was k=0.6. This item is somewhat subjective as there is no clear definition of low attrition. Table 1 provides data on risk of bias for each of the studies.

[TABLE 1]

Treatment Acceptability

Both young people and parents appeared to find self-help and guided self-help interventions acceptable, as indexed by self-reported satisfaction (Appendix B). Some studies demonstrated lower acceptability for self-help arms in comparison to face-to-face treatment. For studies that compared both guided and unguided interventions, many found that the guided treatment was more acceptable to young people and parents. None found a preference for the unguided treatment.

Meta-analysis

Separate analyses are presented for studies comparing against a control group (Table 2) and those comparing against another therapy (Table 3), as well as for anxiety, depression and behaviour interventions within these (Appendix C). A final set of analyses considered only those studies considered to be at low risk of bias (Appendix D).

[TABLE 2, TABLE 3]

Self-help versus control (Table 2)

See Figure 2 for a forest plot of effect sizes for studies with a control condition. The effect of self-help and guided self-help combined on symptoms of common mental health disorders when compared to a control group (including waiting list, attention and non-active treatment as usual) was g = 0.49 (n = 44; 95% CI: 0.37 to 0.61, p<.01), corresponding to the number needed to be treated to achieve one additional positive outcome (NNT) of 3.68, although heterogeneity was very high (I^2 = 70, Q = 144, p<.01). The effect size was smaller but remained significant at short-term (n = 14; g = 0.25, 95% CI: 0.17 to 0.34; I^2 <.01, Q = 9, p = 0.74) and long-term (n = 6; g = 0.23, 95% CI: 0.11 to 0.35; I^2 = 17, Q = 7, p = 0.30). A meta-regression analysis demonstrated no significant effect of total risk of bias on effect size (z = -0.88, p = 0.38).

Additional analyses were undertaken using only the 11 studies with low risk of bias across all domains with the exception of participant/personnel blinding. Considering only those with low risk of bias, the overall effect was reduced but remained significant (g = 0.33; 95% CI: 0.15 to 0.52, p<01), corresponding to an NNT of 5.43. Again, risk of bias for this comparison was high (I^2 = 59, Q = 25, p<.01).

[FIGURE 2]

Small study effects

A funnel plot (Figure 4a) suggested that the effect size for studies with control comparators was influenced by small studies, which was confirmed with Egger's test (t = 4.99; p<.01). Following adjustment for missing studies using the Duval and Tweedie (2000) trim-and-fill procedure (13 imputed studies), Hedges' g for the overall outcome analysis was 0.29 (95% CI: 0.15 to 0.43), corresponding to an NNT of 6.17.

[FIGURE 4a, FIGURE 4b]

Subgroup and moderator analyses

All subgroups showed self-help to be more effective than the control conditions. The only significant subgroup difference was in level of support; there was a statistically significant difference (p<.01) between the effect sizes of guided therapies (n=27; g = 0.65; 95% CI: 0.46 to 0.84; I^2 = 75.64) and those without guidance (n = 14; g = 0.27; 95% CI: 0.14 to 0.40; I^2 = 41.16), although heterogeneity was high in both groups. The difference was smaller and no longer statistically significant when only studies with low risk of bias were considered (supported studies n = 7; g = 0.35; 95% CI: 0.11 to 0.59; I^2 = 56; non-supported studies n = 4; g = 0.31; 95% CI: -0.02 to 0.65; I^2 = 73). There were no other subgroup differences when only studies with low risk of bias were considered (Appendix D). A meta-regression analysis demonstrated no significant effect of age on effect size (z = 0.49, p = 0.62).

Anxiety self-help versus control studies (Appendix C)

There was a medium-large overall effect size for anxiety studies (n = 13; g = 0.64, 95% CI: 0.38 to 0.90), although there was significant heterogeneity (I^2 = 71; Q = 41, p <.01). The only moderator that could be investigated was type of self-help, as all but one study included established

diagnosis and all but one included guidance; this comparison was not statistically significant (p = 0.16).

Disruptive Behaviour self-help versus control studies (Appendix C)

Disruptive behaviour interventions demonstrated an overall medium effect size (n = 17; g = 0.44; 95% CI: 0.28 to 0.60), although heterogeneity was again high (I^2 = 63; Q = 43, p <.01). The effect was not significant when only studies with low risk of bias were considered (n = 3; g = 0.20, 95% CI: -0.10 to 0.51; I^2 = 58; Q = 4.81, p = 0.09). The only significant comparison was between supported interventions (n = 9; g = 0.62, 95% CI: 0.34 to 0.90; I^2 = 69), studies with supported and unsupported arms (n = 3; g = 0.49, 95% CI: 0.27 to 0.70, I^2 <.01) and non-supported studies (n = 5; g = 0.15, 95% CI: 0.01 to 0.29, I^2 <.01), with supported interventions demonstrating larger effect sizes.

Depression self-help versus control studies (Appendix C)

An overall medium effect size was found for depression studies (n = 12; g = 0.47, 95% CI: 0.24 to 0.72, p <.01), although heterogeneity was high (I^2 = 79; Q = 53, p < .01). Studies with guidance (n = 4; g = 0.78, 95% CI: -0.03 to 1.58, I^2 = 92) had a greater effect size than unguided studies (n = 8; g = 0.34, 95% CI: 0.14 to 0.55, I^2 = 54) but there was high heterogeneity and the difference was not statistically significant (p = 0.30).

Self-help versus face-to-face therapy (Table 3)

Overall, the effect of self-help (both guided and unguided) on symptoms of common mental health disorders for the 15 studies that compared it to face-to-face therapy was g = -0.17 (95% CI: -0.27 to -0.07; p <.01) in favour of the face-to-face therapies. This corresponds to an NNT to achieve one additional positive outcome of 10.42. Heterogeneity was low (I^2 = 21; Q = 18, p = 0.22*).* A regression analysis demonstrated a significant effect of total risk of bias on effect size (z = 2.26, p = 0.02), with lower risk associated with a more positive effect size (i.e. closer to the effect of standard face-to-face treatment).

See Figure 3 for a forest plot of effect sizes for studies comparing against an alternative therapy and Table 3 for effect size data. There was not a significant difference in comparison with alternative therapies at either short-term (<12 months) or long-term (≥12 months) follow-up.

[FIGURE 3]

Small study effects

A funnel plot did not demonstrate small study effects in the studies comparing self-help against other therapies (Figure 4b) and Egger's test was not significant (t = 0.85, p = .21). Following adjustment for missing studies using the Duval and Tweedie (2000) trim-and-fill procedure (1 imputed study), Hedges' g for the overall outcome analysis was -0.18 (95% CI: -0.29 to -0.08).

Subgroup and moderator analyses

The effect size for computerised interventions (n = 4; g = 0.08, 95% CI: -0.11 to 0.26; I^2 <.01) was greater than that for bibliotherapy (n = 10; g = -0.25, 95% CI: -0.36 to -0.15; I^2 <.01) and video intervention (n = 1; g = -0.20, 95% CI: -0.69 to -0.20; I^2 <.01) and this difference was statistically significant (p = 0.01). A meta-regression demonstrated a significant effect of total risk of bias on age (z = 2.24, p = 0.03), with older participants demonstrating greater effect sizes than younger participants. However, the effect was no longer significant after primary difficulty was added into the model as a covariate (z = -0.97, p = 0.33).

Discussion

Overall, self-help (both guided and unguided) was associated with significant moderate to large effects on symptoms of anxiety, depression and disruptive behaviour, although there was very high heterogeneity. The overall effect size when compared to face-to-face therapy was negative, suggesting that self-help is better than no intervention but slightly worse than face-to-face treatments. In addition, the overall difference in effect size between guided and unguided self-help interventions together and face-to-face treatments was small and corresponded to an NNT of 10, which may not be of clinical significance. The same pattern of results was seen across studies of interventions for depression, anxiety and disruptive behaviour disorders when considered both together and separately, which is important given the high rates of comorbidity amongst these common mental health disorders in children (Merikangas et al., 2010). These findings, coupled with relatively low costs, ease of accessibility (particularly for communities living at a distance from a clinic) and patient acceptability may suggest that self-help could be a viable option for treatment for common childhood

mental health disorders. However, few studies were considered to be at low risk of bias across all domains considered and there is a great need for well-conducted trials with low risk of bias, particularly comparing against face-to-face treatments. In addition, it is difficult to evaluate the extent to which studies comparing against face-to-face therapies used self-help as a 'control' arm, or rather, were powered as non-inferiority trials to test equivalence to face-to-face treatments. Further fully powered non-inferiority trials would be beneficial. The majority of potential moderators were not found to have an effect. We note that heterogeneity was high for many of the comparisons and therefore results of moderation analyses may not be reliable. Significant small study effects for studies comparing against a control group, as is often found in studies of psychological interventions (Driessen, Hollon, Bockting, Cuijpers & Turner, 2015), may have led to an overestimation of the effect of self-help against control groups.

These potential findings of near-equivalence for self-help compared to face-to-face interventions are in agreement with a number of previous reviews across mental health disorders in adults. Some have found that the interventions have comparable effect sizes (Cuijpers et al., 2010; Perkins, Murphy, Schmidt & Williams, 2006; Priemer & Talbot, 2013). Other reviews have found that although self-help is more effective than no intervention, it is less effective than traditional face-to-face therapy (Hirai & Clum, 2006; Mayo-Wilson & Montgomery, 2013).

Given the efficacy in comparison to no treatment and similar effects to standard face-to-face treatment, self-help may be particularly useful if used in a stepped-care model where those that do not respond are then offered face-to-face treatment. This review did not include any studies of stepped-care in children as there are none that consider self-help alone against stepped-care. In fact, there are very few studies of stepped-care in children. A recent trial comparing stepped-care in child anxiety with standard face-to-face CBT found that the stepped-care approach (Step 1 - guided self-help, Step 2 – standard CBT, Step 3 – individually tailored treatment) produced equivalent effect sizes to standard CBT alone but with significantly less therapist time. Within the stepped-care approach, the strongest treatment gains were seen in Step 1 (self-help; 36 patients remitted from the primary disorder) and Step 2 (a further 36 patients remitted from the primary disorder) rather than Step 3 (a further 13 patients remitted from the primary disorder) (Rapee et al., 2017). There does not appear to be strong evidence to only offer self-help treatments as a first step for less severe cases given there was no difference in efficacy for those meeting diagnostic criteria compared to those that did not.

However, again, this comparison had high levels of heterogeneity and the result requires replication with further studies with low risk of bias. Future studies should investigate the stepped-care model across other common mental health disorders.

Overall, in studies comparing self-help against control groups, the presence of support was associated with better outcome. This finding was significant when disruptive behaviour interventions were considered alone. The same pattern was true in depression studies but the result was not significant. As almost all anxiety studies included guidance, it is not possible to assess whether this is true for anxiety interventions. Importantly, this result was not seen when only the studies with low risk of bias were considered, although heterogeneity was also very high in this comparison and only 4 studies were not supported. The finding of potential superiority of guided intervention compared to unguided intervention is consistent with findings of many reviews of self-help that demonstrate superior effect sizes for greater amounts of therapist contact (e.g. Gellatly et al., 2007 – a review of self-help for depression; Lewis et al., 2012 – a review of self-help for anxiety disorders; O'Brien & Daley, 2011 – self-help for childhood behaviour disorders; Pearcy, Anderson, Egan & Rees, 2016 – a review of self-help for obsessive compulsive disorder; van Boeijen et al., 2005 – self-help for anxiety). Previous research has indicated that increased therapist contact may also be associated with improved acceptability of the intervention (O'Brien & Daley, 2011) and there was some support for this from the present review. The non-significant difference between studies with and without guidance for the treatment of depression may warrant further investigation. Previous reviews have suggested that the level of therapist contact required may vary according to diagnosis (Newman, Erickson, Przeworski & Dzus, 2003).

Other reviews of the type, rather than amount, of therapist contact, suggest that whilst some therapist contact is important, this does not need to be in the form of 'guidance'; 'non-guidance' contact, such as emails to encourage treatment adherence, are also effective (Talbot, 2012). Many studies were not clear with regard to the amount of therapeutic 'guidance' versus non-therapeutic 'encouragement' given and so this was not analysed within our review. However, we did not find any effect of the format of guidance given (i.e. telephone calls, face-to-face, email or mixed). There was some evidence for greater effect sizes in computerised interventions compared to bibliotherapy or other types of self-help.

One key factor that may affect the outcome of self-help interventions is the amount and type of involvement of parents (e.g. Manassis et al., 2014). This may also be associated with patient age - younger children and adolescents may perhaps be more able to make use of a self-help intervention without guidance if there is high parental involvement, for example. Unfortunately, it was not possible to investigate the extent to which this was associated with effect size, as this was in turn associated with the primary difficulty; studies of interventions for behaviour problems and anxiety typically involve parents to some extent and those of depression interventions typically do not. Given the increasing evidence for efficacious interventions delivered entirely to parents (e.g. Thirlwall et al., 2013), future research would benefit from description of the exact amount and type of parental involvement in the intervention across different diagnoses.

Few patient characteristics appeared to make significant differences to the effect size, although there was a significant effect of age on effect size for the studies comparing against face-to-face treatment, with studies of older children and young people demonstrating effect sizes more similar to the face-to-face interventions than studies of younger children. However, this effect was not seen when primary diagnosis was considered in the model. The presence or absence of young people aged over 18 did not make a significant difference to the overall pattern of results.

Limitations

Whilst the broad nature of our inclusion criteria aimed to draw together literature from across child and adolescent studies, this was also a limitation as it created significant heterogeneity. This was heightened by the failure of many studies to specify a primary outcome measure. Several comparisons are under-powered due to the small number of studies with particular characteristics and most studies had risk of bias for at least one of the Cochrane risk of bias domains and therefore results of moderator analyses should be interpreted with caution. Many studies excluded children and young people with intellectual and developmental disabilities and therefore these results may not generalise to these groups of children and young people, although they are known to have particularly high rates of common mental health disorders (Emerson, 2003). Similarly, all studies were conducted in high-income countries.

Directions for Future Research

Overall, additional studies are needed to compare guided self-help treatments against standard face-to-face treatments across anxiety, depression and disruptive behaviour. These results would suggest that guided interventions may be preferable to those without guidance. Direct comparisons of different methods of self-help (e.g. bibliotherapy compared to computerised treatments) would be helpful. Further research investigating the use of self-help and guided self-help interventions in young people who are under-represented by the current research, such as those with intellectual and developmental disabilities and those from low and middle-income countries is warranted.

Role of Funding Sources

This work was supported by the National Institute for Health Research Biomedical Research Centre at Great Ormond Street Hospital for Children NHS Foundation Trust and University College London. The research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Contributors

SB, RS, PC, AC & IH designed the study and wrote the protocol. GM supported development of the search strategy and completion of searches. SB and RS conducted searches and finalised the list of included papers. SB, RS and AC extracted data and conducted risk of bias assessments. MM checked the meta-analytic data extraction. SB conducted the statistical analysis with guidance from DE and PC. SB, RS, DE and PC interpreted the statistical analyses. SB, RS, DE, IH, AC and PC contributed to drafting the first version of the manuscript and all authors contributed to and have approved the final manuscript.

Conflict of Interest

RS receives royalties from Little Brown for ‘Overcoming Perfectionism’, from Constable & Robinson for ‘The Complete CBT Guide for Anxiety’, from Robinson for ‘The CBT Handbook’.

Acknowledgements

The authors are grateful to Hannah Alcott-Watson, Manuela Barona, Emily Booker, Harriet Clarkson, Matthew Constantinou, Eirini Karyotaki, Anup Kharod, Mishka Mahdi, Fiona McFarlane, Jess Simmonds, Shreya Singhal and Fahreen Walji for their contributions.

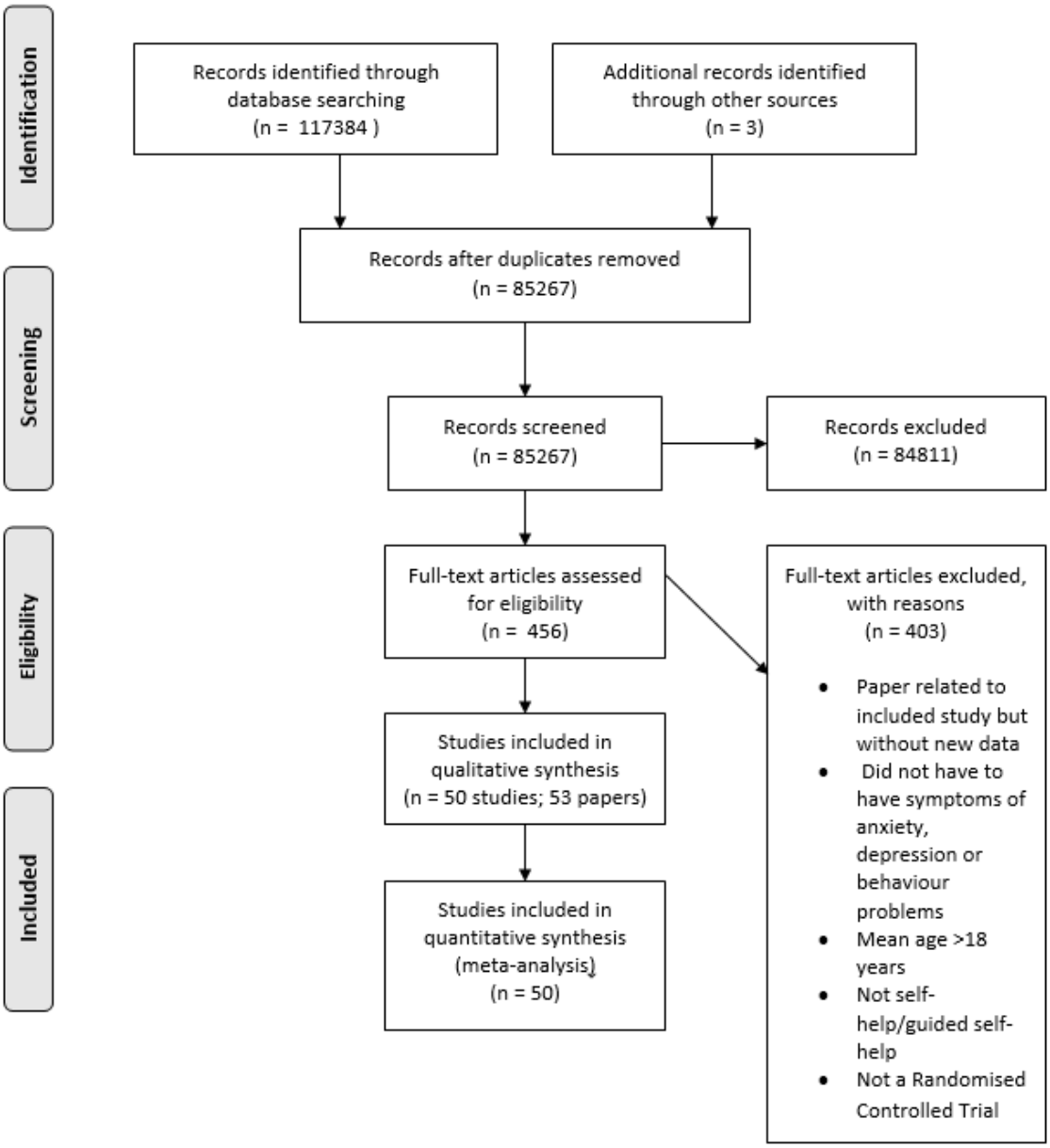

Figure 1. PRISMA flow diagram of study selection

Figure 2. Forest plot of effect sizes for studies comparing self-help with a control therapy.

Primary Symptom	Study Name	Hedges' g	Lower Limit	Upper Limit	p-Value
Anxiety	Cobham, 2012	2.87	1.76	3.99	<.01
	Donovan, 2014	0.32	-0.24	0.88	0.27
	Keller, 2009	0.78	0.07	1.49	0.03
	Lyneham, 2006	0.74	0.41	1.08	<.01
	March, 2009	0.46	-0.05	0.98	0.08
	McGrath, 2011	0.22	-0.20	0.63	0.31
	Rapee, 2006	0.29	-0.05	0.63	0.09
	Spence, 2011	<.01	-0.47	0.47	1.00
	Spence, 2017	0.81	0.06	1.56	0.03
	Thirlwall, 2013	0.30	<.01	0.60	0.05
	Tillfors, 2011	1.24	0.27	2.20	0.01
	Vigerland, 2016	0.86	0.43	1.29	<.01
	Wuthrich, 2012	1.29	0.64	1.94	<.01
	ANXIETY OVERALL	**0.64**	**0.38**	**0.90**	**<.01**
Behaviour	Baker, 2017	0.02	-0.26	0.29	0.89
	Conaughton. 2017	1.10	0.45	1.75	<.01
	Connell, 1997	2.06	1.04	3.07	<.01
	Enebrink, 2012	0.86	0.42	1.30	<.01
	Hinton, 2017	0.07	-0.36	0.49	0.76
	Irvine, 2015	0.10	-0.13	0.32	0.39
	Kierfeld, 2013	0.67	0.09	1.26	0.02
	Kling, 2010	0.59	0.19	1.00	<.01
	McGrath, 2011	0.62	0.15	1.08	0.01
	Morawska, 2006	0.47	0.21	0.73	<.01
	Morawska, 2014	0.27	-0.13	0.66	0.19
	Reid, 2013	0.12	-0.18	0.43	0.43
	Sanders, 2000	0.26	-0.09	0.60	0.14
	Sanders, 2012	0.54	0.17	0.91	<.01
	Stallman, 2007	0.51	-0.02	1.03	0.06
	Webster-Stratton, 1990	0.57	-0.04	1.18	0.07
	Webster-Stratton, 1988	0.58	0.01	1.14	0.04
	BEHAVIOUR OVERALL	**0.44**	**0.28**	**0.60**	**<.01**
Depression	Fleming, 2012	1.57	0.74	2.39	<.01
	Ip, 2016	0.21	-0.03	0.46	0.09
	Lillevoll, 2014	0.02	-0.45	0.50	0.92
	Makarushka, 2011	0.37	0.06	0.68	0.02
	Poppleaars, 2016	-0.01	-0.40	0.37	0.96
	Rickhi, 2015	1.12	0.37	1.87	<.01
	Rohde, 2014	0.12	-0.13	0.36	0.36
	Smith, 2015	0.82	0.43	1.20	<.01
	Stasiak, 2014	0.26	-0.40	0.92	0.44
	Stice, 2008	0.27	-0.04	0.58	0.08
	Wannachaiyakul, 2017	1.57	1.08	2.06	<.01
	Wright, 2017	0.08	-0.44	0.61	0.75
	DEPRESSION OVERALL	0.47	0.21	0.72	<.01
Mixed	Hoek, 2012	-0.04	-0.61	0.53	0.89
	Stallard, 2011	0.71	-0.29	1.72	0.16
	MIXED OVERALL	**0.22**	**-0.48**	**0.92**	**0.54**
VS. CONTROL OVERALL		**0.48**	**0.37**	**0.60**	**<.01**

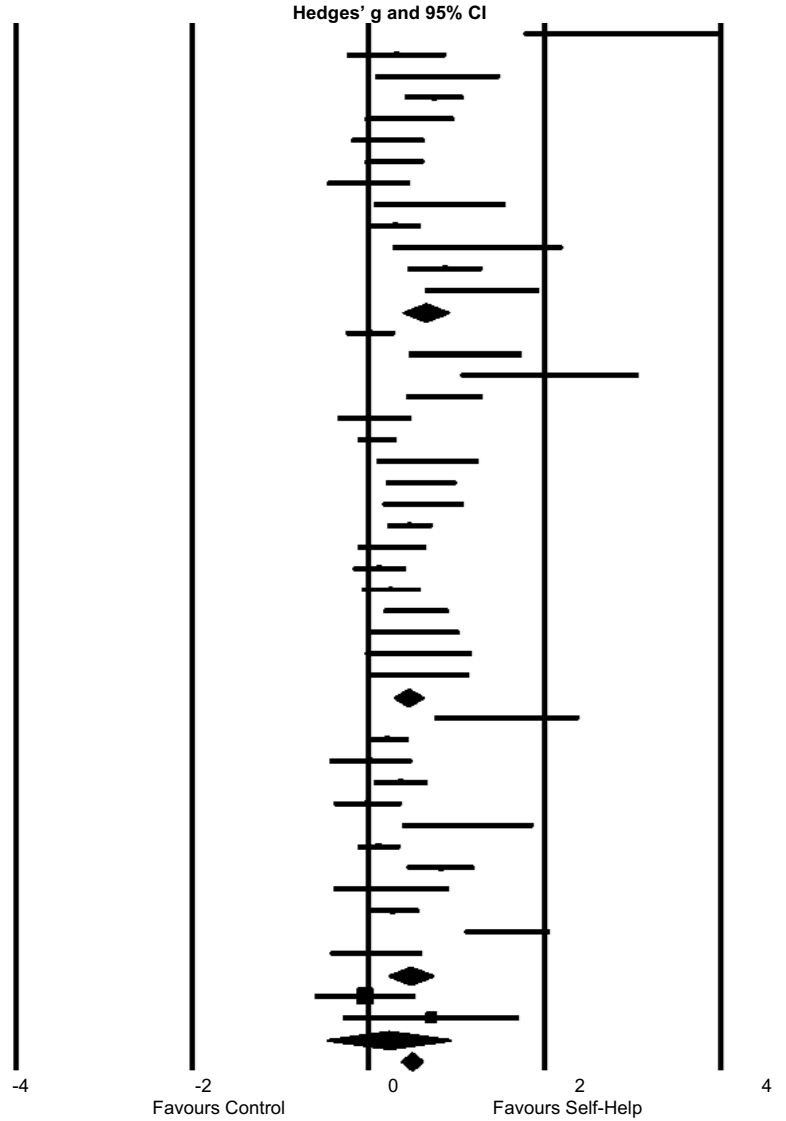

Figure 3. Forest plot of effect sizes for studies comparing self-help with face-to-face therapy.

Primary Symptom	Study Name	Hedges' g	Lower Limit	Upper Limit	p-Value
Anxiety	Chavira, 2014	-0.38	-0.94	0.18	0.18
	Cobham, 2012	0.28	-0.31	0.88	0.36
	Creswell, 2017	-0.15	-0.55	0.25	0.46
	Rapee, 2006	-0.43	-0.78	-0.09	0.01
	Spence, 2011	<.01	-0.41	0.41	1.00
	ANXIETY OVERALL	-0.17	-0.41	0.06	0.15
Behaviour	Berkovits, 2010	-0.22	-1.03	0.59	0.59
	Kling, 2010	-0.27	-0.63	0.09	0.14
	Lavigne, 2008	-0.23	-0.55	0.10	0.17
	Rabbitt, 2016	0.03	-0.47	0.53	0.91
	Sanders, 2000	-0.44	-0.69	-0.19	<.01
	Webster-Stratton, 1988	-0.20	-0.60	0.20	0.32
	BEHAVIOUR OVERALL	-0.28	-0.43	-0.13	<.01
Depression	Merry, 2012	0.11	-0.18	0.39	0.45
	Poppleaars, 2016	0.11	-0.28	0.50	0.57
	Rohde, 2014	-0.27	-0.51	-0.02	0.03
	Stice, 2008	-0.12	-0.34	0.09	0.26
	DEPRESSION OVERALL	-0.07	-0.25	0.10	0.42
FACE TO FACE OVERALL		**-0.19**	**-0.29**	**-0.09**	**<.01**

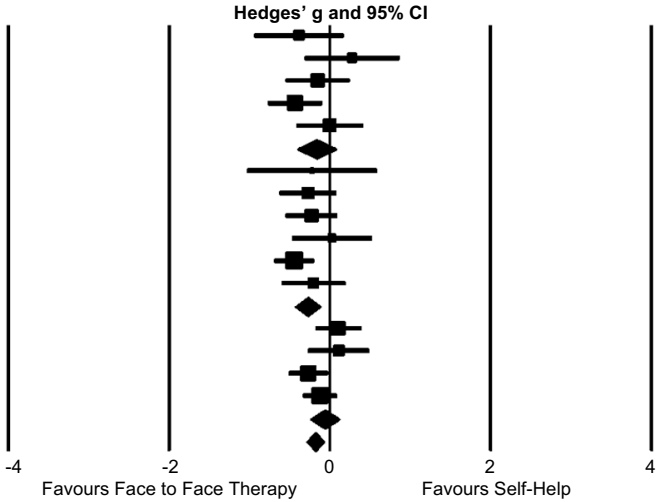

Figure 4a. Funnel plot with imputed studies for studies comparing self-help against a control condition.

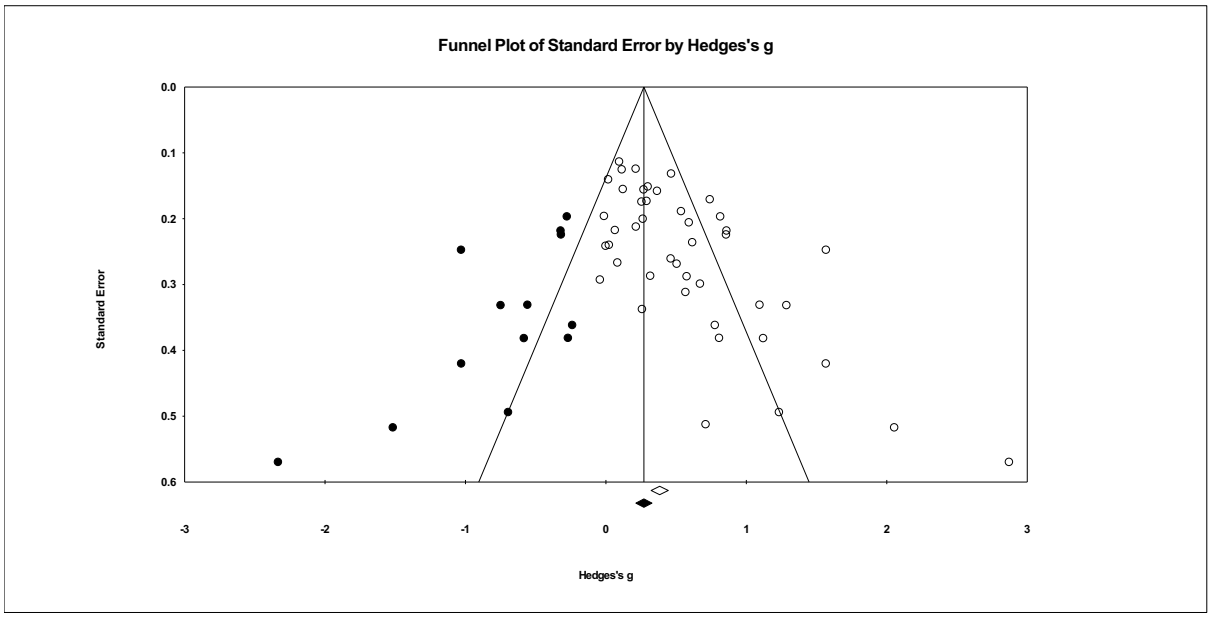

Figure 4b. Funnel plot with imputed studies for studies comparing self-help against a face-to-face condition.

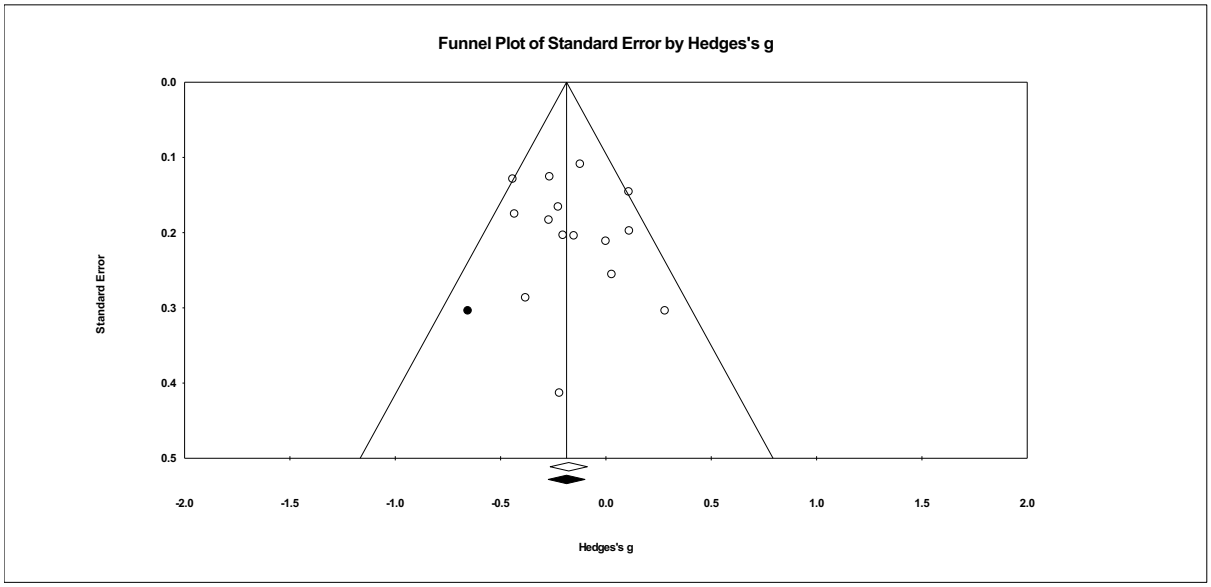

Table 2. Meta-analysis results for studies comparing self-help against a control condition.

		Ncomp	g	95%CI	Z	I^2	p	NNT	Q(p)
Overall effect (post)		44	0.49	0.37 – 0.61	8.08	70.30	<.01***	3.68	144.77(<.01)
Effect without studies inc. >18y		38	0.50	0.37 – 0.62	7.96	66.18	<.01***	3.62	109.41(<.01)
Only studies with low risk of bias		11	0.33	0.15 – 0.52	3.50	59.78	<.01***	5.43	24.87(.01)
Child report only		18	0.45	0.22 – 0.68	3.83	77.60	<.01***	4.00	77.60(<.01)
Observer report only		23	0.58	0.37 – 0.79	5.44	78.77	<.01***	3.14	103.61(<.01)
Parent report only		21	0.48	0.33 – 0.63	6.47	60.17	<.01***	3.76	50.21(<.01)
Effect at <12 months follow-up		14	0.25	0.17 – 0.34	5.66	<.001	<.01***	7.14	9.38(0.74)
Effect at ≥12 months follow-up		7	0.23	0.11 – 0.35	3.74	17.34	0.01***	7.69	7.26(0.30)
Study characteristics									
Target condition	Anxiety	13	0.64	0.38 – 0.90	4.88	70.52	0.53	2.86	40.70(<.01)
	Behaviour	17	0.44	0.28 – 0.60	5.39	62.67		4.10	42.86(<.01)
	Depression	12	0.47	0.21 – 0.72	3.60	79.43		3.85	53.48(<.01)
	Mixed	2	0.22	-0.48 – 0.92	0.61	38.39		8.06	1.62(0.20)
Meet diagnostic criteria	No	28	0.43	0.29 – 0.57	6.13	70.57	0.14	4.20	91.73(<.01)
	Yes	16	0.50	0.40 – 0.88	5.26	69.31		3.62	48.88(<.01)
Type of self help	Bibliotherapy	12	0.51	0.28 – 0.74	4.35	75.51	0.74	3.55	44.91(<.01)
	Computer	26	0.52	0.34 – 0.70	5.69	74.11		3.50	96.56(<.01)
	Other	6	0.43	0.27 – 0.59	5.16	<.001		4.20	2.86(0.72)
Supported?	Both	3	0.49	0.27 – 0.70	4.39	<.001	0.01***	3.68	0.10 (0.95)
	No	14	0.27	0.14 – 0.40	4.20	41.16		6.58	22.09 (0.05)
	Yes	27	0.65	0.46 – 0.84	6.66	75.64		2.82	106.74 (<.01)
Type of support	Lyneham[+]	1	0.74	0.41 – 1.08	4.34	<.001	0.96	2.50	<.001(>.99)
	Email	5	0.71	0.06 – 1.36	2.14	85.84		2.60	28.25(<.01)
	Face-to-face	2	0.61	0.23 – 0.98	3.19	<.001		2.99	0.05(0.83)
	Mixed	11	0.68	0.34 – 1.02	3.95	75.49		2.70	40.79(<.01)
	Telephone	11	0.59	0.34 – 0.85	4.56	69.29		3.09	32.57(<.01)

*p <. 1; ** p <. 05; *** p <. 01

Ncomp = Number of comparisons; NNT = Number Needed to Treat; [+] = More than one condition – telephone, email and mixed

Table 3. Meta-analysis results for all studies comparing self-help against face-to-face therapy.

		Ncomp	g	95%CI	Z	I^2	p	NNT	Q (p)
Overall effect (post)		15	-0.17	-0.27 – -0.07	-3.27	20.64	0.01***	10.42	17.64 (0.22)
Effect without studies inc. >18y		12	-0.21	-0.33 – -0.08	-3.31	12.13	0.01***	8.47	12.52(0.33)
Only studies with low risk of bias		2	0.07	-0.16 – 0.31	0.62	<.001	0.54	25.00	0.18(0.67)
Child report only		4	0.03	-0.26 – 0.31	0.18	61.45	0.86	62.50	7.78(0.05)
Observer report only		11	-0.20	-0.40 – <.001	-1.98	72.24	0.05**	8.93	36.03(<.001)
Parent report only		8	-0.24	-0.37 – -0.10	-3.48	<.001	<.01***	7.46	6.82(0.45)
Effect at <12 months follow-up		11	-0.09	-0.21 – 0.04	-1.39	21.17	0.16	20.00	12.69(0.24)
Effect at ≥12 months follow-up		6	-0.02	-0.16 – 0.11	-0.32	18.45	0.75	83.33	6.13(0.29)
Study characteristics									
Target condition	Anxiety	5	-0.17	-0.41 – 0.06	-1.45	28.82	0.20	10.42	5.62(0.23)
	Behaviour	6	-0.28	-0.43 – -0.13	-3.72	<.001		6.41	3.31(0.65)
	Depression	4	-0.07	-0.25 – 0.10	-0.80	39.60		25.00	4.97(0.17)
Meet diagnostic criteria	No	10	-0.16	-0.28 – -0.04	-2.61	24.33	0.79	11.11	11.89(0.22)
	Yes	5	-0.19	-0.42 – 0.03	-1.71	28.42		9.43	5.59(0.23)
Type of self help	Bibliotherapy	10	-0.25	-0.36 – -0.15	-4.78	<.001	0.01**	7.14	8.25(0.51)
	Computer	4	0.08	-0.11 – 0.26	0.80	<.001		21.74	0.25(0.97)
	Other	1	-0.20	-0.60 – 0.20	-1.00	<.001		8.93	<.001(>.999)
Supported?	No	7	-0.18	-0.35 – -0.01	-2.08	52.82	0.94	9.80	12.72(0.05)
	Yes	8	-0.17	-0.31 – -0.02	-2.29	<.001		10.42	4.91(0.67)
Type of support	Face-to-face	1	-0.27	-0.63 – 0.09	-1.48	<.001	0.19	6.58	<.001(>.99)
	Mixed	4	<-0.01	-0.23 – 0.23	-0.02	<.001		>166.67	1.42(0.70)
	Telephone	3	-0.28	-0.50 – -0.06	-2.53	<.001		6.41	0.16(0.92)

*p <. 1; ** p <. 05; *** p <. 01

Ncomp = Number of comparisons; NNT = Number Needed to Treat

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Appendix A: search terms

Self-help: audio*, book*, distance*, homework, information, instruct*, “instant messaging”, iCBT, Internet*, Web*, Phone, Mobile, e-mail*, email*, leaflet*, material*, multi-media, multimedia, online*, on-line, pamphlet, pamphlets, program, programme, remote, tele*, tape, taped, workbook*, “self help”, “self-help”, “self change”, “Self-change”, “self care”, “self-care”, “self-directed”, “self directed”, “minimal guidance”, “minimal contact”, Bibiotherap*, Manual*, Computer*, Internet, www, cd-rom, cd, cdrom, online, DVD, floppy, audio*, video*, Virtual*,

Intervention:

1. Therap*
2. interven*
3. treat*
4. instruct*
5. psychol*

Mental Health Disorder:

Anxiety:

6. exp Anxiety Disorders/
7. anxi*
8. panic
9. phobi*

Depression:

1. Depression (Emotion)”/ or Major Depression/ or Affective Disorder/ or Dysthymic Disorder/
2. (depressi* adj3 disorder*)
3. (depressi* adj3 symptom*)
4. (depressi* adj3 episode*)
5. subclinical depress*
6. Depress*

7. Dysthymi*
8. “low mood”
9. Low-mood

Behaviour:

1. behavior disorder/ or behaviour disorder/ or attention deficit disorder/ or disruptive behavior / or impulse control disorder/ or oppositional defiant disorder/
2. (conduct adj5 (disorder* or disturb*))
3. oppositional*
4. antisocial behavior/
5. ((antisocial$ or anti-social$) adj5 (behavior or behaviour or conduct))

General:

1. Mental adj1 health
2. Mental adj1 illness
3. Psychol* adj1 illness
4. Psychol* adj1 disorder*
5. Psychiat* adj1 illness
6. Psychiat* adj1 disorder

Appendix B. Satisfaction measures.

Study	Measure	Main Findings
Baker 2017	Client Satisfaction Questionnaire (CSQ; Sanders, Markie-Dadds, & Turner, 2012)	Mean score of 40.34 out of 56 (SD= 8.08). Eighty-eight per cent of participants rated the quality of the service they received as at least 'good' and 77% were at least 'satisfied' with the program.
Berkovits 2010	Therapy Attitude Inventory (TAI; Eyberg, 1993)	Mothers found parent-child interaction therapy acceptable/very acceptable when delivered in a group setting and acceptable when delivered as written materials.
Chavira 2014	Parent Consumer Satisfaction Scale (March, 1999) Barriers to Treatment Participation Scales (Kazdin, Holland, Crowley & Brenton, 1997)	Parents whose children received face-to-face CBT or therapist-supported cognitive behavioural bibliotherapy reported similar levels of high treatment satisfaction. Both groups reported few obstacles to treatment, low treatment demands, high perceptions of relevance and unproblematic relationships with therapists.
Cobham 2012	Custom Client Satisfaction Questionnaire	Parents (mostly mothers) expressed a high level of satisfaction both with family-focused CBT delivered face-to-face or as therapist supported bibliotherapy.
Conaughton 2017	Adapted Treatment Satisfaction Scale (Spence, Holmes, March, & Lipp, 2006)	Children and parents reported moderate levels of satisfaction following treatment (child ratings: M =3.03, SD =1.03; parent ratings: M =3.58, SD =.86 – both on a 5 point scale).
Connell 1997	Adapted the Therapy Attitude Inventory (TAI; Eyberg, 1993)	Mothers reported being fairly satisfied with the self-directed behavioural family intervention.
Creswell 2017	N/A	
Donovan 2014	Custom Treatment Satisfaction Scale.	On average, parents were satisfied quite a bit/a lot with internet-based CBT; they were very much willing to recommend the program to a friend and thought the program was effective in helping their child.
Enebrink 2012	N/A	
Fleming 2012	N/A	
Hinton 2017	Client Satisfaction Questionnaire (CSQ; Sanders, Markie-Dadds, & Turner, 2001)	Ninety-six percent of participants rated the quality of service they received as 'good' with 98% of parents stating that they were at least 'satisfied' with the program. Similarly, 96% of parents also felt that the Triple P Online - Disability program helped them deal more effectively with their child's problem behaviors.

Hoek 2012	Client Satisfaction Questionnaire (CSQ-8) (Larsen, Attkisson, Hargreaves, & Nguyen, 1979) Open-ended feedback	Adolescents were moderately satisfied with a web-based problem-solving intervention for depression and anxiety. Main suggestions for improvement included: - More feedback on assignments and alerts about feedback - More clarity on what to do and why - A clearer website - More elaborative exercises with more time to work on them
Ip 2016	None	
Irvine 2015	Five items rated on 7 point Likert scale	Out of 7, users rated the following: Overall satisfaction (x=6.1, SD1.0) Useful (x=6.1, SD1.1). Ease of use (x=6.3, SD1.3) Enjoyable (x=5.6, SD1.2) Likelihood that participants would recommend the program to a friend (x=6.6, SD0.14) Time of use was not correlated with any satisfaction scores.
Keller 2009	6-item questionnaire created by Kenardy et al. (2003) for an online anxiety prevention project.	Out of 7, users rated the following: Usefulness of the programme (M = 4.85, SD = 1.54) Satisfaction with the programme (M = 5.15, SD = 1.46) Acceptability of computer as delivery modality (M = 5.95, SD = 0.83) Likelihood of recommending the programme (M = 6.05, SD = 1.43)
Kierfeld 2013	Custom Consumer Satisfaction Scale	All parents reported being at least 'satisfied' with the contents of a self-help book, 44% of whom reported being 'very satisfied'. Almost half were 'very satisfied' with the telephone consultations (47%), 36.1% were 'satisfied' and 16.7% were 'somewhat satisfied'.
Kling 2010	Credibility/Expectancy Questionnaire (Devilly & Borkovec, 2000)	Parents who underwent group or self-administered parent management training rated each treatment as highly credible.
Lavigne 2008	Questions about reasons for non-use in a custom post-intervention questionnaire	A large proportion of adolescents somewhat or fully agreed that they 'forgot about it [internet-based CBT] or could not spare the time' (57.7%). Around a third (28.9%) somewhat or fully agreed that they 'felt the need to talk to someone' rather than do the program, or doubted that such a program could help them (30.5%). Forty-two percent felt ambivalent of their need or interest in the program.
Lillevoll 2014	N/A, although investigated reasons for non-use	Top reason for non-use (endorsed by 58%) was 'I forgot about it or could not spare the time'.

Lyneham 2006	N/A	
Makarushka 2011	Custom Satisfaction and Program Usability Scale	Adolescents were generally satisfied with computerised CBT for depression. They found the intervention quite usable and the material mostly informative.
March 2009	Custom Satisfaction Scale; 8 items	Children and parents reported moderate levels of satisfaction with internet-based CBT for anxiety disorders.
McGrath 2011	Custom Satisfaction Questionnaire (telephone-administered)	Parents were generally very satisfied with a telephone-based family intervention. They were most satisfied with the utility and punctuality of communication and least satisfied with a relaxation CD.
Merry 2012	Custom Satisfaction Questionnaire	Both computerised CBT and face-to-face counselling were positively received by adolescents but significantly more would recommend the counselling treatment to a friend than computerised CBT (95.8% vs. 80.5%, respectively). Of those who received computerised CBT, 52.3% were happy with the length of sessions (20-40 minutes) whilst 44.3% wanted longer sessions.
Morawska 2006	Client Satisfaction Questionnaire (CSQ; Sanders, Markie-Dadds, & Turner, 2001)	Mothers reported being mostly/very satisfied with a telephone-assisted behavioural family intervention, significantly more so than mothers receiving a self-directed behavioural family intervention who were somewhat/mostly satisfied.
Morawska 2014	Client Satisfaction Questionnaire (CSQ; Sanders et al., 2001) – completed at 6 month follow-up	On average, parents were moderately satisfied with a parenting program delivered via podcasts. The majority of parents listened to all seven podcasts at least once (76.5%) and rated their quality as 'good' or better.
Poppleaars 2016	Three statements rated on 5 point scale	Participants rated their liking of the two conditions similarly. OVK (F2F) was rated as a more attractive option for adolescents and was perceived as more useful in daily life than SPARX (the GSH program).
Rabbitt, 2016	Parent Evaluation Inventory (PEI; Kazdin et al., 1992) Acceptability of Treatment Modality (ATM)	Parents in the Full Contact Parent Management Training (PMT) rated treatment to be more acceptable than parents in the Reduced Contact PMT group [PEI: t(58) = 2.06, p = .04, d = 0.53]. At both time points, parents rated the treatments as highly acceptable.
Rapee 2006	N/A	
Reid 2013	Scale based on other measures (Forehand & McMahon, 1981; Pelham et al., 2000).	Satisfaction with programme overall mean(SD) = 5.5(0.6) out of 7 Satisfaction with telephone coach mean(SD) = 5.9(0.1) out of 7
Rickhi 2015	N/A	

Rohde 2014	5 point satisfaction questionnaire	Not reported separately (only as a potential moderator of treatment efficacy)
Sanders, 2000	Client Satisfaction Questionnaire (CSQ; Sanders et al., 2001)	Parents were very satisfied with an enhanced or standard face-to-face behavioural family intervention. Those who self-administered the family intervention were moderately satisfied – significantly less so than the other groups.
Sanders 2012	Client Satisfaction Questionnaire (CSQ; Sanders et al., 2012)	Parents reported high levels of satisfaction with an online parenting intervention: 99% rated the quality of service as at least 'good' and 88% were at least 'satisfied' with the program.
Smith 2015	N/A	
Sourander 2016	Bespoke measure for study	Parent satisfaction (defined as agree and strongly agree) ranged from 98% (the program met the needs of participants) to 84% (program reduced stress of the participant).
Spence 2011	Adapted Treatment Satisfaction Scale (Spence, Holmes, March, & Lipp, 2006)	Adolescents reported moderate satisfaction with both online and face-to-face CBT for anxiety. Parents reported significantly higher but still moderate satisfaction with online and face-to-face CBT.
Spence 2017	Treatment Satisfaction Questionnaire with 6-items for children and 8-items for parents adapted from March et al. (2009)	There were no significant differences between CBT-SAD and CBT-GEN in terms of treatment satisfaction ratings at 12-weeks, for either parents or youth. The ratings are indicative of moderate satisfaction with the programs.
Stallard 2011	Custom Satisfaction Questionnaire	On the whole, adolescents expressed moderate/high satisfaction with computerised CBT for depression and anxiety – they felt that it helped them understand their problems and find new ways to cope with them. They were in very high agreement that 'it was helpful having someone with them' whilst using the program and felt that the difficulty was 'just right'. Most would recommend the program to a friend experiencing similar problems.
Stallman 2007	Client Satisfaction Questionnaire (CSQ: Sanders et al., 2000)	Parents were neither satisfied nor dissatisfied with a self-directed parenting intervention; parents who also received therapist telephone consultations were quite satisfied. The significant difference between these groups disappeared when controlling for program participation, suggesting that greater involvement enhanced satisfaction.
Stasiak 2014	Custom Acceptability Scale	More than half of adolescents found computerised CBT for depression good/excellent (56.6%), easy to use (66.7%) and useful (55.5%). Sixty-seven percent would recommend the intervention 'as is' to other adolescents, but 44% suggested that the intervention could be improved. Criticisms included: - Too much reading - Age inappropriate content (e.g., suited younger adolescents more) - Technical faults Adolescents generally praised the intervention for: - Being computer-based

		- Providing new information and being about mental health - Being for adolescents Accessible at school
Stice 2008	Custom satisfaction scale	Seventy-six percent of adolescents felt pleased or extremely pleased with face-to-face group CBT, compared to 71% of those receiving face-to-face supportive-expressive group therapy and 29% given a cognitive-behavioural self-help book–only 28% reported that they read half of the book.
Thirlwall 2013	Satisfaction scale previously described by Spence and colleagues (Spence, Holmes, March, & Lipp, 2006), who adapted the questionnaire from an 11-point scale originally developed by Cobham et al. (1998).	Consisted of eight items measured on a 5-point scale. Adolescents and parents reported moderate to high satisfaction with the treatment received, although parents in the face to face condition reported statistically higher programme satisfaction compare to the self-help condition.
Tillfors 2011	Single post-test satisfaction question	Most adolescents (66.7%) were 'mostly satisfied' with internet-based CBT for social anxiety, 20% were 'very satisfied'.
Vigerland 2016	Client Satisfaction Scale (CSS; Ollendick, 2010)	Children and their parents were moderately satisfied with internet-based CBT for anxiety disorders. Eighty-six percent of parents were in general or strong agreement that they would recommend internet-based CBT to a friend; 82% of children agreed or very much agreed that the treatment was effective.
Wannachaiyakul 2017	N/A	
Webster-Stratton 1990	Consumer satisfaction scale (specific scale not reported)	No descriptive data reported, but parents undergoing a self-administered parenting intervention (video-tape modelling) either with or without additional therapist consultation reported 'high satisfaction scores' for treatment usability, difficulty, and child improvements.
Webster-Stratton 1988	Consumer Satisfaction Questionnaire (CSQ; adapted from Forehand & McMahon, 1981)	No descriptive data reported, but parents reported that a face-to-face group-based parenting intervention (video-tape modelling) was significantly easier to implement than parents who self-delivered the intervention. Mothers also reported seeing greater improvements in their children's problematic behaviour following the group-based vs. self-administered intervention.
Wright 2017	N/A	
Wuthrich 2012	Preferences and Attitudes Questionnaire (Cunninghman & Wuthrich, 2008)	Adolescents rated the therapist- plus parent-assisted computerised CBT modules for anxiety as 'quite useful' – no modules were rated as 'not useful'. Interactive forms were the most preferred information format.

	Adapted Barriers to Treatment Participation Scale (Kazdin, Holland, Crowley, & Breton, 1997)	The most frequent user barrier was 'finding time', despite 25% reporting that this happened often or very often (68% reported that this happened sometimes or occasionally). Most barriers "fell between never and sometimes a problem." Common likes included: - Anxiety education - Easy to use - Listening to the characters' stories and calming music Common dislikes included: - Hard to find time to use the program and do the homework tasks

APPENDIX C: Meta-analysis comparison results separated by primary diagnosis for studies with a control comparator

Anxiety against control studies

		Ncomp	g	95%CI	Z	I^2	p	NNT	Q(p)
Overall effect (post)		13	0.64	0.38 – 0.90	4.88	70.52	<.01***	2.86	40.70(<.01)
Effect without studies inc. >18y		12	0.61	0.35 – 0.87	4.59	71.48	<.01***	2.99	38.57(<.01)
Effect at <12 months follow-up		1	0.48	0.05 – 0.90	2.20	<.01	<.03**	3.76	<.01(>.99)
Effect at ≥12 months follow-up		1	0.43	0.00 – 0.85	1.97	<.01	.05**	4.20	<.01(>.99)
Only studies with low risk of bias		5	0.37	0.04 – 0.70	2.18	61.94	0.03**	4.85	10.51(0.03)
Child report only		6	0.74	0.16 – 1.33	2.49	86.28	0.01**	2.50	36.45(<.01)
Observer report only		11	0.72	0.36 – 1.08	3.94	81.94	<.01***	2.56	55.37(<.01)
Parent report only		5	0.64	0.43 – 0.85	6.04	5.85	<.01***	2.86	4.25(0.37)
Study characteristics									
Type of self help	Bibliotherapy	4	0.78	0.23 – 1.34	2.76	88.66	0.16	2.39	22.49(<.01)
	Computer	8	0.66	0.35 – 0.97	4.14	54.20		2.78	15.28(0.03)
	Other	1	0.22	-0.20 – 0.63	1.02	<.001		8.06	<.01(>.99)

Ncomp = Number of comparisons

NNT = Number Needed to Treat

Nb. It was not possible to run subgroup analyses on the following due to too few studies in one or more subgroups:

- Established diagnoses – all but one study included established diagnosis
- Support – all but one study included guidance
- Type of support – all but one study included guidance

Behaviour against control studies

		Ncomp	g	95%CI	Z	I^2	p	NNT	Q(p)
Overall effect (post)		17	0.44	0.28 – 0.60	5.39	62.67	<.01***	4.10	42.86(<.01)
Effect without studies inc. >18y		17	0.44	0.28 – 0.60	5.39	62.67	<.01***	4.10	42.86(<.01)
Effect at <12 Months follow-up		5	0.26	0.14 – 0.38	4.15	<.01	<.01***	6.85	3.27(0.51)
Effect at ≥12 months follow-up		2	0.26	0.10 – 0.43	3.07	<.01	<.01***	6.85	0.15(0.70)
Only studies with low risk of bias		3	0.20	-0.10 – 0.51	1.32	58.39	0.19	8.93	4.81(0.09)
Child report only		1	0.38	-0.22 – 0.98	1.24	<.01	0.22	4.72	<.01(>.99)
Observer report only		7	0.42	0.07 – 0.76	2.36	76.33	0.02**	4.27	25.34(<.01)
Parent report only		16	0.43	0.27 – 0.59	5.12	61.45	<.01***	4.20	38.91(<.01)
Study characteristics									
Confirmation of diagnosis	Not confirmed with diagnostic interview	14	0.42	0.25 – 0.59	4.87	62.55	0.66	4.27	34.71(<0.01)
	Confirmed	3	0.55	-0.01 – 1.11	1.94	72.97		3.31	7.40(0.02)
Type of self help	Bibliotherapy	6	0.53	0.20 – 0.87	3.10	68.61	0.81	3.68	15.93(0.01)
	Computer	6	0.38	0.08 – 0.69	2.47	76.62		4.72	21.38(<.01)
	Other	5	0.47	0.29 – 0.64	5.17	<.01		3.85	1.67(0.80)
Supported?	More than one condition (mixed)	3	0.49	0.27 – 0.70	4.39	<.01	<.01***	3.76	0.10(0.95)
	No	5	0.15	0.01 – 0.29	2.16	<.01		11.90	3.98(0.41)
	Yes	9	0.62	0.34 – 0.90	4.36	68.58		2.96	25.47(68.58)
Type of support	Email	1	0.86	0.42 – 1.30	3.82	<.001	0.79	2.19	<.01(>.99)
	Face-to-face	1	0.59	0.19 – 1.00	2.88	<.001		3.09	<.01(>.99)
	Mixed	3	0.53	-0.15 – 1.21	1.54	70.78		3.42	6.84(0.03)
	Telephone	7	0.64	0.33 – 0.96	4.02	64.54		2.86	16.92(0.01)

Depression against control studies

		Ncomp	g	95%CI	Z	I^2	p	NNT	Q(p)
Overall effect (post)		12	0.47	0.24 – 0.72	3.60	79.43	<.01***	3.85	53.48(<.01)
Effect without studies inc. >18y		8	0.46	0.17 – 0.75	3.14	70.43	<.01***	3.91	23.67(<.01)
Effect at <12 months follow-up		6	0.23	0.10 – 0.37	3.36	<.01	<.01***	7.69	4.66(0.59)
Effect at ≥12 months follow-up		2	0.18	-0.02 – 0.38	1.81	46.20	0.07*	9.80	5.58(0.13)
Only studies with low RoB		3	0.44	0.01 – 0.86	2.00	70.50	0.05**	4.10	6.78(0.03)
Child report only		9	0.37	0.09 – 0.65	2.57	79.28	0.01**	4.85	38.61(<.01)
Observer report only		5	0.59	0.16 – 1.01	2.72	75.42	0.01**	3.09	16.28(<.01)
Study characteristics									
Supported?	No	8	0.34	0.14 – 0.55	3.24	54.21	0.30	5.26	15.29(0.03)
	Yes	4	0.78	-0.03 – 1.58	1.89	92.01		2.39	37.55(92.01)
Type of self help	Bibliotherapy	2	0.18	-0.02 – 0.37	1.80	<.01	0.05**	9.80	0.60(0.44)
	Computer	10	0.55	0.23 – 0.88	3.32	81.46		3.31	48.54(<.01)

Ncomp = Number of comparisons

NNT = Number Needed to Treat

Nb. It was not possible to run subgroup analyses on the following due to too few studies in one or more subgroups:

- Established diagnosis – only one study included established diagnoses
- Type of self-help – two studies included email support, one included mixed support and one included telephone support

Appendix D: Low Risk of Bias studies comparing against control conditions

		Ncomp	g	95%CI	Z	I^2	p	NNT	Q(p)
Only studies with low RoB		11	0.33	0.15 – 0.52	3.50	59.78	<.01***	5.43	24.87(0.01)
Effect without studies inc. >18y		11	0.33	0.15 – 0.52	3.50	59.78	<.01***	5.43	24.87(0.01)
Effect at <12 months follow-up		6	0.24	0.12 – 0.37	3.90	<.01	<.01***	7.46	3.82(0.58)
Effect at ≥12 months follow-up		4	0.31	0.18 – 0.44	4.57	<.01	<.01***	5.75	0.88(0.83)
Child report only		3	0.37	-0.09 – 0.83	1.60	74.57	0.11	4.85	7.87(0.02)
Observer report only		8	0.35	0.11 – 0.59	2.82	58.21	<.01***	5.10	16.75(0.02)
Parent report only		2	0.07	-0.14 – 0.27	0.63	<.01	0.53	25.00	0.24(0.62)
Study characteristics									
Target condition	Anxiety	4	0.37	0.04 – 0.70	2.18	61.94	0.63	4.85	10.51(0.03)
	Behaviour	3	0.20	-0.10 – 0.51	1.32	58.39		8.93	4.81(0.09)
	Depression	3	0.44	0.01 – 0.86	2.00	70.50		4.10	6.78(0.03)
Confirmation of diagnosis	Not confirmed with diagnostic interview	5	0.27	0.01 – 0.52	2.02	65.49	0.47	6.58	11.59(0.02)
	Confirmed	6	0.41	0.12 – 0.70	2.02	57.79		4.39	11.85(0.04)
Type of self help	Bibliotherapy	2	0.21	0.00 – 0.43	1.97	<.01	0.57	8,47	0.67(0.41)
	Computer	7	0.38	0.08 – 0.67	2.47	72.34		4.72	21.70(<.01)
	Other	2	0.40	0.01– 0.08	2.02	47.22		4.50	1.59(0.21)
Supported?	No	4	0.31	-0.02 – 0.65	1.82	72.80	0.86	5.75	11.03(0.01)
	Yes	7	0.35	0.11 – 0.59	2.82	56.05		5.10	13.65(0.03)
Type of support	Mixed	3	0.23	0.00 – 0.46	1.99	<.01	0.29	7.69	1.22(0.54)
	Telephone	4	0.50	0.06 – 0.93	2.24	74.52		3.62	11.78(0.01)

Ncomp = Number of comparisons

NNT = Number Needed to Treat