Revista de Psicopatología y Psicología Clínica, 21, **147-175, 2016**
doi: 10.5944/rppc.vol.21.num.3.2016.17811
www.aepcp.net
http://revistas.uned.es/index.php/rppc
ISSN 1136-5420

Efficacy of transdiagnostic cognitive-behavioral therapy for anxiety and depression in adults, children and adolescents: A meta-analysis

Julia García-Escalera, Paloma Chorot, Rosa M. Valiente, José M. Reales, & Bonifacio Sandín

Universidad Nacional de Educación a Distancia (UNED), Madrid, Spain

Abstract: This meta-analysis examined the effect of transdiagnostic cognitive-behavioral therapy (T-CBT) in adults, children, and adolescents with emotional disorders, exploring the effects of possible moderator variables on efficacy. In contrast with previous reviews, only studies employing transdiagnostic theory-based protocols were included. A total of 48 studies reporting on 6291 participants were identified. Treatment efficacy was examined using a random effects model and taking into account pre- and post-treatment data. Results within the adult population showed large overall effect sizes on anxiety (randomized controlled trials [RCTs]: $g = 0.80$; Uncontrolled studies: $g = 1.02$) and depression (RCTs: $g = 0.72$; Uncontrolled studies: $g = 1.08$) that were stable at follow up. Preliminary analysis with children and adolescents showed medium effect sizes on anxiety ($g = 0.45$) and depression ($g = 0.50$). No significant differences between T-CBT and disorder-specific CBT were found. Overall, results support the efficacy of T-CBT for emotional disorders.

Keywords: Transdiagnostic; cognitive-behavioral therapy; anxiety; depression; internalizing disorders; meta-analysis.

Eficacia de la terapia cognitivo conductual transdiagnóstica en el tratamiento de la ansiedad y la depresión en adultos, niños y adolescentes: Un meta-análisis

Resumen: El presente meta-análisis examina el efecto de la terapia cognitivo conductual transdiagnóstica (TCC-T) en adultos, niños y adolescentes con trastornos emocionales, explorando los efectos de posibles variables moderadoras en su eficacia. A diferencia de los meta-análisis previos, sólo se incluyeron los estudios que emplearon protocolos basados explícitamente en el enfoque transdiagnóstico. Se identificaron 48 estudios que informaron sobre 6291 participantes. La eficacia del tratamiento se examinó utilizando un modelo de efectos aleatorios y teniendo en cuenta los datos pre y post-tratamiento. Los resultados sobre población adulta muestran tamaños del efecto elevados para la ansiedad (ensayos controlados aleatorizados [ECAs]: $g = 0.80$; Estudios no controlados: $g = 1.02$) y la depresión (ECAs: $g = 0.72$; Estudios no controlados: $g = 1.08$), que permanecieron estables durante el seguimiento. El análisis preliminar con población de niños y adolescentes mostró tamaños del efecto medios en ansiedad ($g = 0.45$) y depresión ($g = 0.50$). No encontramos diferencias significativas entre la TCC-T y la TCC para trastornos específicos. En general, los resultados apoyan la eficacia de la TCC-T para los trastornos emocionales.

Palabras clave: Transdiagnóstico; terapia cognitivo conductual; ansiedad; depresión; trastornos internalizados; meta-análisis.

Introduction

The development of disorder-specific cognitive-behavioral therapies (CBT) for anxiety and depressive disorders is a landmark for the progress of clinical psychology. This approach is based on specified cognitive-behavioral models which explain the processes that hypothetically maintain each specific anxiety or depressive disorder, including principles such as habituation, cognitive avoidance, extinction, cognitive schemas, self-efficacy, emotional processing, and inhibitory learning. This theory-driven approach has led to the creation of manualized diagnosis-specific treatments which apply several evidence-based treatment components targeted to specific disorders, including psychoeducation, cognitive restructuring, coping skills, and situational and interoceptive exposure.

Recibido: 17 septiembre 2016; aceptado: 30 septiembre 2016
Corresponding author: Paloma Chorot, Universidad Nacional de Educación a Distancia (UNED), Facultad de Psicología, Juan del Rosal 10, 28040, Madrid, Spain. E-mail: pchorot@psi.uned.es
Acknowledgement: Financial support was provided by a FPU Grant awarded to the first author by the Ministerio de Educación (Spain) and by Grant PSI2013-44480-P to the remaining authors by the Ministerio de Economía y Competitividad (Spain).

For anxiety disorders, and to a lesser degree for unipolar depression, one result of this orientation has been the proliferation of treatment manuals for different anxiety disorders, especially for panic disorder, social phobia, generalized anxiety disorder, and posttraumatic stress disorder (Craske, 2012; McManus, Shafran, & Cooper, 2010; Sandín, Chorot, & Valiente, 2016). A number of these treatments have been rigorously evaluated in randomized controlled trials and designated as empirically validated protocols (i.e., evidence-based CBT) or well-established treatments and have been included in current recommended guidelines (McManus et al., 2010; Nathan & Gorman, 2015). Given the high prevalence and impact of anxiety and depressive disorders, disorder-specific treatments have brought with them enormous progress and benefits. However, this approach is not without significant problems.

A main difficulty related to this diagnosis-specific perspective is that people often meet criteria for more than one disorder. In fact, for anxiety and depressive disorders, comorbidity is more the norm than the exception. For example, Brown and Barlow (2002) reported that 55% of patients with a principal emotional disorder (anxiety or depressive disorder) had at least one additional current emotional disorder, and the rate increased to 76% when lifetime diagnoses were considered. According to these authors, the highest comorbidity rates were associated with a principal diagnosis of posttraumatic stress disorder (PTSD), major depressive disorder (MDD), dysthymia (DYS) and generalized anxiety disorder (GAD). Likewise, it has been estimated that about 40-80% of patients with an anxiety disorder meet diagnostic criteria for at least one other anxiety disorder at the same time (McManus et al., 2010; Mineka, Watson, & Clark, 1998).

Existing literature indicates similar results for children and adolescents, estimating the rate of comorbidity with anxiety disorders from 30% to 75% (Mineka et al., 1998). In treatment-seeking samples of children/adolescents, the rates of comorbidity for anxiety and depression can be as high as 70% (Birmaher et al., 1996). In addition to these high rates of Axis I comorbidity between anxiety and depression, anxiety and depressive disorders "not otherwise specified" (NOS) also co-occur at rates ranging from 8% to two-thirds according to epidemiological studies. It is important to note that emotional disorders share common symptoms (e.g., panic attacks, embarrassment, persistent thoughts, emotional avoidance, repeated checking), creating challenges in differentiating one disorder from another (McManus et al., 2010; Mineka et al., 1998).

Comorbidity has been suggested as a clear threat to the efficacy and effectiveness of diagnosis-specific CBT. The high comorbidity in emotional disorders is a problem for clinicians because most patients present with more than one disorder, and the evidence-based CBT protocols are specific manuals designed for specific disorders. Evidence-based interventions for anxiety and depression have traditionally been disorder-specific, often excluding individuals experiencing this common comorbidity (Ehrenreich-May, Bilek, Queen, & Hernandez Rodriguez, 2012). Though diagnosis-specific treatments for a given anxiety disorder may produce post-treatment reductions in additional comorbid anxiety or depressive disorders that were not specifically addressed, these outcomes are not durable and consistent (Brown, Antony, & Barlow, 1995; Norton & Philipp, 2008). Similarly, the efficacy of CBT protocols for specific anxiety or depression in children/adolescents is weaker when comorbid depression or anxiety, respectively, is present (Ehrenreich-May et al., 2012).

Several other limitations of disorder-specific treatments include (1) the proliferation of manualized treatments for different disorders (sometimes with multiple versions for the same disorder and with only trivial changes), (2) the fact that a considerable number of patients do not respond well to this form of treatment, and (3) the dissemination of a larger number of different protocols to providers, which is a major barrier to delivery of evidence-based practice in service settings (Craske, 2012).

The conceptual overlap among anxiety disorders, the common clinical features across anxiety and depressive disorders (overestimation of threat, shared symptoms, etc.), the communalities in cognitive, behavioral and emotional areas of dysregulation (emotional reasoning, selective attention to threat, interpretive and expectancy biases, physiological anticipation of threat, avoidance of threat, etc.), and the shared general biological vulnerability factor (negative affect or neuroticism), suggest that a "transdiagnostic" approach could be more appropriate than a disorder-specific perspective (Belloch, 2012; Craske, 2012; Harvey, 2004; McManus et al., 2010; Sandín, Chorot, & Valiente, 2012). A transdiagnostic process has been defined as "a major factor that can explain the maintenance of numerous disorders that an individual may experience" (Egan, Wade, & Shafran, 2012). In a similar vein, transdiagnostic treatments are "those that apply the same underlying treatment principles across mental disorders without tailoring the protocol to specific diagnoses" (McEvoy, Nathan, & Norton, 2009). Thus, in contrast with disorder-specific CBT, transdiagnostic cognitive-behavioral therapy (T-CBT)

could be defined as a CBT therapy that is applied to a number of different specific disorders that share commonalities in cognitive, behavioral, and/or emotional areas of dysregulation (Sandín et al., 2012). Several cognitive and behavioral variables have been proposed as possible transdiagnostic concepts and processes (Belloch, 2012; Harvey, 2004; Sandín et al., 2012). For example, Harvey (Harvey, 2004) categorized 14 transdiagnostic processes within the broad domains of attention (e.g., selective attention), memory (e.g., recurrent memories), reasoning (e.g., expectancy bias), thought (e.g., thought suppression), and behavior (e.g., avoidance). Other proposed transdiagnostic constructs include negative affectivity/neuroticism, emotion regulation strategies, distress tolerance, perfectionism, anxiety sensitivity, disgust sensitivity, thought-action fusion, intolerance of uncertainty, self-esteem, alexithymia, and anhedonia (Aldao, 2012; Egan et al., 2012; Belloch, 2012; Sandín et al., 2012).

A conceptual and CBT transdiagnostic approach was first developed by Fairburn, Cooper, and Shafran (2003). These authors described a transdiagnostic model focused on eating disorders and suggested that common mechanisms (e.g., over-evaluation of eating, perfectionism, mood intolerance, low self-esteem) are involved in the maintenance of eating disorders (bulimia nervosa, anorexia nervosa, and atypical eating disorders). On the basis of this transdiagnostic model, they developed a transdiagnostic CBT for eating disorders. The primary characteristics of this new CBT approach are that the treatment was designed to be suitable for all forms of eating disorders and patients' specific eating disorder is not of relevance to the treatment. This line of research was advanced by Barlow, Allen and Choate (2004) for emotional disorders, providing a transdiagnostic theoretical model and a unified (transdiagnostic) treatment for these disorders. These authors proposed the rationale for a "unified treatment" of emotional disorders based on the following three fundamental therapeutic components: (a) altering antecedent cognitive reappraisals (of both internal and external threat and danger), (b) preventing emotional avoidance (cognitive and behavioral avoidance strategies, such as emotion suppression, worry, distraction, interoceptive and exteroceptive avoidance), and (c) modifying action tendencies (emotion-inducing exposure-based procedures).

Based on this theoretical shift toward a transdiagnostic conceptualization of emotional disorders, several transdiagnostic CBT protocols have been created for anxiety and depressive disorders by independent research groups (for a review, see Norton & Paulus, 2015). The *Unified Protocol for Transdiagnostic Treatment of Emotional Disorders* (UP), developed by Barlow's group (Barlow et al., 2011; Farchione et al., 2012), is a transdiagnostic emotion-focused CBT which, while it underscores the fundamental principles of traditional CBT, emphasizes the ways individuals with anxiety or depressive disorders experience and respond to their emotions (emotion regulation). The eight modules of the protocol are typically delivered in no more than eighteen 60-minute individual treatment sessions. It includes five core modules designed to target key aspects of emotional processing and regulation of emotional experiences: (a) increasing present-focused emotional awareness, (b) increasing cognitive flexibility, (c) identifying and preventing patterns of emotion avoidance and maladaptive emotion-driven behaviors, (d) increasing awareness and tolerance of emotion-related physical sensations, and (e) interoceptive and situation-based emotion-focused exposure. Though the UP was designed to be delivered as an individual treatment, recently it has also been adapted to a group format (Bullis et al., 2015; De Ornelas Maia, Braga, Nunes, Nardi, & Silva, 2013).

Another established transdiagnostic CBT program for emotional disorders, developed by Norton (2012a), is the *Transdiagnostic Group Cognitive-Behavioral Therapy for Anxiety* (T-GCBT). It consists of twelve 2-hour weekly sessions in groups of six to eight individuals with any anxiety disorder diagnosis. Treatment emphasizes the excessive or irrational fear of a particular thing (negative evaluation, somatic symptoms, etc.) as opposed to having a particular diagnosis (e.g., panic disorder), so that patients are seen as sharing the same basic pathology, even though the specific stimuli that trigger the fear/anxiety and the associated behavioral responses may differ. The T-GCBT includes psychoeducation, cognitive restructuring, graduated in-session exposure and response prevention, cognitive restructuring of core beliefs, and relapse prevention.

These two transdiagnostic CBT treatments of emotional disorders have shown initial efficacy in treating anxiety and depressive disorders (Norton, 2012b; Norton & Paulus, 2015; Reinholt & Krogh, 2014). In contrast with disorder-specific CBT, they target common psychopathological processes and use generic CBT components to change them. Although internet-delivered treatment for emotional disorders have been suggested as a new development in clinical psychology (Andersson, Nordgren, Buhrman, & Carlbring, 2014; Cuijpers & Riper, 2014), both transdiagnostic treatments use a traditional face-to-face format. However, a transdiagnostic internet-based CBT treatment (T-iCBT) was recently developed by Titov's group (Titov, Dear, Johnston, & Terides, 2012). This T-iCBT includes separate programs to treat anxiety (the

Anxiety Program) and anxiety and depression (the *Wellbeing Program*). It consists of eight core online lessons (each requiring no more than 20 minutes of reading), which participants are asked to complete over ten weeks. The *Wellbeing Program* differs from the *Anxiety Program* by including education and guidelines regarding behavioral activation. The T-iCBT targets maladaptive cognitions (thoughts and beliefs) and behaviors (avoidance, safety behaviors, and underactivity) as well as physical symptoms (hyper-arousal or hypo-arousal). It is based on the main components of CBT but also incorporates therapeutic components of interpersonal therapy. The efficacy of the T-iCBT approach to reduce comorbid symptoms of anxiety and depression has been documented through a number of trials (Dear et al., 2011; Johnston, Titov, Andrews, Spence, & Dear, 2011; Titov et al., 2013; Titov, Andrews, Johnston, Robinson, & Spence, 2010; Titov et al., 2011), including several trials in primary care settings (Newby et al., 2013; Newby, Mewton, Williams, & Andrews, 2014). Drawing from Barlow's UP, Botella's group developed a new T-iCBT protocol (i.e., the *EmotionRegulation* program) designed to the treatment of emotional disorders in adults (anxiety disorders, unipolar mood disorders, and obsessive-compulsive disorder) (González-Robles et al., 2015).

A promising line of research concerns the development or adaptation of transdiagnostic programs to be applied to children and adolescents. Although most children/adolescents who are referred for treatment due to emotional problems show high rates of diagnostic comorbidity, evidence-based treatment approaches in this population have typically been disorder-specific. However recently, drawing from research with the UP in adult samples (Barlow et al., 2011; Davis, Barlow, & Smith, 2010; Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010), Ehrenreich-May's team (Ehrenreich-May et al., 2012; Ehrenreich-May & Chu, 2014), developed two transdiagnostic unified protocols for treatment of anxiety and depression in adolescents (the *Unified Protocol for the Treatment of Emotional Disorders in Adolescents*; UP-A) and children (the *Unified Protocol for the Treatment of Emotional Disorders in Chidren;* UP-C) (Ehrenreich-May et al., 2016). The UP-A is a downward extension of the UP for adolescents (ages 12-17) with a principal anxiety or depressive disorder. It consists of eight core treatment modules and was designed to be delivered within 8 to 21 weekly individual sessions. The UP-C is a downward extension of the UP for younger children (ages 7-12) with anxiety disorders and consists of 15 weekly 90-minute group sessions. Preliminary data suggest that both protocols are effective in reduction of principal and overall emotional diagnosis severity (Ehrenreich-May et al., 2012).

Other transdiagnostic CBT protocols for emotional disorders (anxiety and depression) in children or adolescents have been developed recently. However, they are less established than the UP-A and UP-C: ED and/or are more directed towards preventive goals. Weersing and colleagues created the *Integrated Brief Behavioral Therapy for Anxiety and Depression* (Weersing, Gonzalez, Campo, & Lucas, 2008; Weersing, Rozenman, Maher-Bridge, & Campo, 2012), a brief transdiagnostic treatment for anxiety and depression for implementation in the primary care setting. Additionally, Chu and colleagues designed the *Transdiagnostic Group Behavioral Activation Therapy (GBAT*) to treat adolescents diagnosed with depression, anxiety, or both within a school setting (Chu, Colognori, Weissman, & Bannon, 2009). The *Group Behavior Activation Therapy for Bullying (GBAT-B*) is being developed to address anxiety and mood problems secondary to bullying (Chu, Johns, & Hoffman, 2015; Chu, Hoffman, Johns, Reyes-Portillo, & Hansford, 2014). In the prevention area, *EMOTION: "Coping Kids" Managing Anxiety and Depression* is a transdiagnostic intervention aimed to reduce the likelihood of an anxiety and/or depressive disorder (Kendall, Stark, Martinsen, O'Neil, & Arora, 2013). Finally, Essau and colleagues examined the effectiveness of a transdiagnostic anxiety disorder prevention protocol, *Super Skills for Life* (Essau & Ollendick, 2013; Essau, Lewinsohn, Olaya, & Seeley, 2014).

It has been suggested that, compared to disorder-specific CBT, T-CBT protocols have a number of practical advantages, including better access to the health care system (availability, primary care, prevention, etc.) and an improved approach to comorbidity (Clark, 2009). In general, transdiagnostic interventions provide a more efficient and cost-effective model both for practitioners and for patients (Bullis et al., 2015). In the last few years, new research has emerged on the efficacy of T-CBT. Apart from certain systematic reviews (McEvoy et al., 2009; McManus et al., 2010), a few recent meta-analyses have examined the effectiveness of T-CBT for emotional disorders. Three of these examined the efficacy of T-CBT in adult samples focusing on anxiety (Norton & Philipp, 2008; Reinholt & Krogh, 2014) or on anxiety and depression (Newby, McKinnon, Kuyken, Gilbody, & Dalgleish, 2015). Only one meta-analysis on T-CBT for young people has been published (Ewing, Monsen, Thompson, Cartwright-Hatton, & Field, 2015), and it only dealt with anxiety. In general, these meta-analyses provide preliminary information in support of the effectiveness of T-CBT for emotional disorders. However, these studies have some limitations that make it difficult to draw clear conclusions on the efficacy of T-CBT for

the treatment of emotional disorders (anxiety and depressive disorders).

There are several reasons why a new meta-analysis is necessary at this point. The first, and perhaps the most significant, is that a number of relevant studies investigating the efficacy of T-CBT protocols for anxiety and depression disorders have been published in the last two years, yet some of them are not included in these meta-analyses. Second, the most recent meta-analysis (Newby et al., 2015) mixed studies with no CBT-based treatment protocols, such as mindfulness therapy, psychodynamic psychotherapy, and acceptance and commitment therapy. Third, all of these previous reviews incorporated a number of studies that did not used theory-based transdiagnostic CBT protocols (i.e., T-CBT protocols designed to address underlying mechanisms shared by a group of disorders) such as classical CBT applied to several specific anxiety disorders, hybrid protocols (transdiagnostic/disorder-specific protocols), tailored treatments (i.e., treatments adapted to the patients' specific diagnoses), or modular approaches. Fourth, the previous meta-analyses did not take into account the pre- and post-treatment data when calculating the randomized controlled trial (RCT) effect size. Finally, most of the published T-CBT meta-analyses (e.g., Ewing et al., 2015; Reinholt & Krogh, 2014) only focused on anxiety disorders. These problems make it difficult to draw valid conclusions about the efficacy of T-CBT for the treatment of emotional disorders.

The present meta-analysis aimed to test the hypothesis that T-CBT is an effective treatment for reducing symptoms of anxiety and depression in adults and youths with principal or comorbid anxiety and/or depressive disorders, or subthreshold anxiety or depression. Moreover, we aimed to explore the impact of potential moderators of treatment effect, including participants' primary characteristics, diagnostic measures, and delivery format.

Thus far, this is the first meta-analysis to examine the efficacy of transdiagnostic CBT protocols explicitly based in the transdiagnostic theory-driven approach, to include studies conducted with both adult and children/adolescent samples, and to use a more complete Hedges *g's* formula to calculate the effect size of RCT, taking into account pre- and post-treatment data.

Method

Protocol and registration

This review was developed following the procedures outlined in the Cochrane Handbook for systematic reviews (Higgins & Green, 2011) and it is reported following the PRISMA guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009).

Eligibility criteria

Types of participants. We included patients with a primary diagnosis of an anxiety and/or a depressive disorder, or with subclinical anxiety and/or depression symptoms. In order to encompass studies conducted prior to the development of DSM-5, we decided to include patients with PTSD, acute stress disorder (ASD), and obsessive compulsive disorder (OCD).

Types of interventions. We included studies that applied theory-driven T-CBT protocols (i.e., protocols designed to target common mechanisms or processes that occur across a group of disorders) to treat multiple anxiety and/or depressive disorders, without tailoring the protocol to specific diagnoses (i.e., the same intervention was delivered for all of the subjects). Studies that delivered treatment in an individual, group, or internet/computer-based format were included.

Types of comparisons. RCTs were included in which the effects of transdiagnostic treatment were compared with: (a) a waiting list control (WLC) condition, (b) an attention control condition (e.g., discussion group), and (c) other therapies (e.g., disorder-specific CBT). We did not exclude uncontrolled studies since a high proportion of the published studies on T-CBT are uncontrolled; we conducted separate analyses for the RCTs and the uncontrolled studies.

Types of outcomes: Studies were included if at least one self-reported measure of anxiety or anxiety and depression was administered at both baseline and post-treatment[1]. We were also interested in examining outcomes at follow up.

Types of study design. RCTs or uncontrolled studies were used if they (a) had at least five participants in the T-CBT condition at pretreatment, (b) were written in English or in Spanish, (c) were published in a peer-reviewed journal, and (d) provided the necessary statistical data to calculate the effect size.

Exclusion criteria

Studies were *excluded* if they (a) used alternative therapies to CBT, (b) used any form of protocol tailored to the treatment of any specific disorder, (c) included a psychological treatment that was combined with drug

[1] The studies of Norton (2012) and Norton & Barrera (2012) did not report pre-treatment data, but we contacted the first author and were able to obtain all the data needed.

therapy, (e) included patients with psychotic disorders, personality disorders, or substance use disorders, or (f) included case studies.

Information sources and search

The studies were traced in several ways. First, comprehensive searches were undertaken in the databases Scopus, PsycINFO, Science Direct, PsycArticles, and Google Scholar using the search string "(transdiagnostic AND anxiety OR depression OR emotional disorder OR depressive disorder OR mood disorder OR anxiety disorder OR internalizing OR negative affectivity)" in keywords, titles and abstracts. Second, the references of the systematic reviews and meta-analysis on T-CBT published to date were reviewed. Third, a search of the reference sections of the retrieved papers was conducted to identify additional studies. The main search for studies was completed in July 2015 and was last updated in March 2016.

Study selection

Those abstracts clearly irrelevant for the current study were discarded, while the remaining full texts were reviewed to assess whether they met the inclusion criteria.

Data collection process and data items

A range of *study characteristics* were coded and extracted from each study: study type (RCT/uncontrolled), control condition if existent, sample size, publication date, country, percentage of attrition, risk of bias, diagnostic measure applied, sample recruitment (community/ clinical) and follow-up period. With regard to *intervention characteristics*, application format (group/ individual/ internet), treatment target (anxiety and/ or depression), and total number of sessions were coded and extracted. *Participant characteristics* studied were as follows: age group (adults/children-adolescents), mean age, gender, inclusion or exclusion of subclinical patients, and primary mental disorder.

Risk of bias in individual studies

An assessment of the studies' methodological quality was undertaken as previous studies have shown that a high risk of bias tends to overestimate the treatment effect size (Savović et al., 2012). The Cochrane Collaboration's tool for assessing risk of bias was used (Higgins & Green, 2011), although minor adaptations of the tool were made in order to be able to assess psychotherapy studies. Performance bias was not coded since it is not feasible to blind therapists and clients to a psychotherapeutic intervention. The main domains assessed included selection bias, detection bias, attrition bias, reporting bias and "other biases." In uncontrolled trials, attrition bias, reporting bias, and other biases were the only domains coded. A judgment of low risk, unclear, or high risk of bias was given within each domain (Table 2).

Summary measures

An a priori decision was made to calculate an effect size for anxiety in those studies that included patients with principal or comorbid anxiety disorders and another effect size for depression in those studies that included patients with principal or comorbid depressive disorders. Except for 6 studies that only reported the changes in anxiety (Essau et al., 2014; Norton, 2008; Norton & Barrera, 2012; Norton, 2012b; Titov et al., 2010 [1&2]), effect sizes for both anxiety and depression outcomes were calculated in all studies. The measures chosen to calculate the effect sizes were the ones present to a greater extent in the majority of included studies (Table 1), and most of the times were the ones defined by the studies' authors as principal outcome measures. The formulas for Hedges' g and it's standard deviation, specifically the formulas (1) and (2) (Botella & Sanchez-Meca, 2015), were used. In the case of the RCTs, we chose a complete non-biased estimator of *g* with a mean weighted standard deviation considering control and experimental groups because these groups are matched at pre-test in the majority of original studies. This equation also corrects the effect that other factors could have had on the control group and uses the descriptive statistics usually reported in the assessed literature.

Like Cohen's *d*, Hedges' *g* is based on the standardized mean difference and effect sizes of 0.2, 0.5, and 0.8 are considered small, medium, and large, respectively (Cohen, 1992).

(1)

$$k = \left(1 - \frac{3}{4n-5}\right);\ g = k\left[\frac{(\bar{X}_{Pre} - \bar{X}_{Post})}{SD_{Pre}}\right]$$

$$SD_g = \sqrt{\frac{n-1}{n(n-3)}(1 + n \cdot g^2) - \frac{g^2}{k^2}}$$

(1) Standardized mean change index (Hedges'*g*) used for uncontrolled studies and its standard deviation. k = sample bias correcting factor; n = sample size; g = Hedges'*g;* $\bar{X}$ = mean; *Pre* = pre-treatment; *Post* = post-treatment; *SD* = standard deviation; SD_g = Hedge's *g* standard deviation.

(2)

$$k = \left(1 - \frac{3}{4(n_T + n_C) - 9}\right); g = k\left[\frac{(\bar{X}_{T\_Pre} - \bar{X}_{T\_Post}) - (\bar{X}_{C\_Pre} - \bar{X}_{C\_Post})}{\sqrt{\frac{(n_T - 1)SD^2_{T\_Pre} + (n_C - 1)SD^2_{C\_Pre}}{n_T + n_C - 2}}}\right]$$

$$SD_g = \sqrt{k^2\left(\frac{n_T + n_C}{n_T \cdot n_C}\right)\left(\frac{n_T + n_C - 2}{n_T + n_C - 4}\right)\left(1 + \frac{(n_T \cdot n_C)g^2}{n_T + n_C}\right) - g^2}$$

(2) Standardized mean change index (Hedges'g) used for RCTs and its standard deviation. k = sample bias correcting factor; n = sample size; C = control; T = treatment; g = Hedges'g; $\bar{X}$ = mean; *Pre* = pre-treatment; *Post* = post-treatment; *SD* = standard deviation; SD_g = Hedge's g standard deviation.

Synthesis of results, risk of bias and additional analysis

The software program, Comprehensive Meta-analysis (2.2) was employed to conduct all the statistical analysis. Because of the variations in methods and samples of the studies, a random effects model was used. The analyses were based on intent-to-treat data to the extent possible. For each comparison between a psychotherapy group and a comparison group, the effect size indicating the difference between the two groups at pre- and post-treatment was calculated. When possible, the effect sizes for pre-treatment to follow-up changes were also computed. The degree of heterogeneity was examined using the Cochrane´s Q statistic and the I^2 index (Higgins & Thompson, 2002). Heterogeneity refers to substantial differences in effect sizes between studies that are due to between-trial differences rather than to chance. The I^2 statistic is a quantification of this heterogeneity with 25%, 50% and 75% reflecting respectively low, medium, and high heterogeneity (Higgins, Thompson, Deeks, & Altman, 2003).

Publication bias was tested using Duval and Tweedie's trim-and-fill procedure (Duval & Tweedie, 2000) within the comprehensive meta-analysis. The Tweedie's trim-and-fill test provides an adjusted effect size correcting for publication bias.

Finally, subgroup analyses were conducted in order to assess possible variations in the effect sizes. A random effects model was used to combine studies within each subgroup. A fixed effects model was used to combine subgroups and yield the overall effect. The between-study variance (tau-squared) was assumed to be the same for all subgroups.

Results

Study selection and characteristics

The inclusion of studies process is summarized in Figure 1. The search yielded 1519 hits. A total of 48 studies (included in 41 publications) met our inclusion criteria (21 RCTs, 27 uncontrolled studies; 43 adult samples; 5 child/adolescent samples). The 48 studies in-

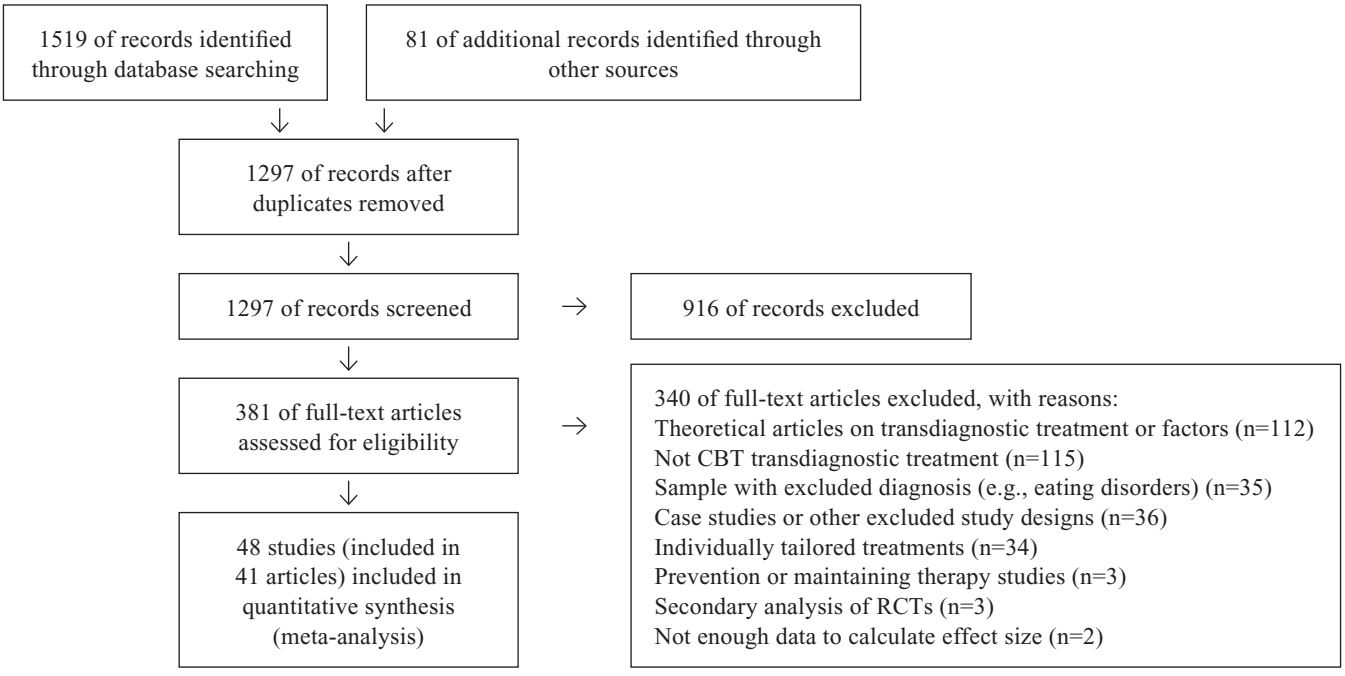


Figure 1. Study flow diagram.

vestigated 22 different transdiagnostic protocols. Concerning the 21 included RCTs, 20 studied adults whereas only 1 (Chu et al., 2016), which used WLC, included participants younger than 18 years of age. Out of the 20 RCTs with adults, 13 studies involved WLC (Bolton et al., 2014; Chu et al., 2016; Farchione et al., 2012; Johnston et al., 2011; Mullin et al., 2015; Newby et al., 2013 (1); Norton, Hayes, & Hope, 2004; Norton & Hope, 2005; Schmidt et al., 2012; Titov et al., 2013; Titov et al., 2010 (1); Titov et al., 2011; Wuthrich & Rapee, 2013), one study used a discussion group for comparison (Wuthrich, Rapee, Kangas, & Perini, 2016), one used TAU for comparison (Ejeby et al., 2014), one used relaxation training (Norton, 2012b), and five studies compared T-CBT with disorder-specific CBT (Dear et al., 2015; Fogliati et al., 2016; Lotfi, Bakhtiyari, Asgharnezhad-Farid, & Amini, 2014; Norton & Barrera, 2012; Titov et al., 2015b). The study characteristics can be found in Table 1.

Participants

The sample for this meta-analysis totaled 6291 participants. There was a greater representation of females than males across studies, with the overall percentage of females being 61.02 (*SD* = 15.55). Participants were on average 41.14 (*SD* = 12.04) years old in the studies including an adult sample and 11.78 (*SD* = 2.60) years in the ones including children and adolescents. In relation to the recruitment method, patients were recruited from clinical samples in seven studies (all of them including adults), while in the rest of the studies patients were recruited, at least partly, through community referrals. A total of 45 studies included data on the percentage of participants who discontinued treatment (attrition). The attrition percentage was on average 23.10 (*SD* = 15.97).

Treatments

Of the 48 included studies, 13 evaluated protocols designed to treat mainly anxiety disorders while 33 were intended to treat both anxiety and depressive disorders (Table 1). However, as stated in the methods section, all studies that included patients with depressive symptoms and reported pre- to posttreatment depression outcomes were included in the depression outcomes' analyses. The duration of the treatment in the included studies ranged from 4 to 18 sessions, with an average of 9.14 sessions (*SD* = 3.99). In 22 studies the treatment was delivered over the Internet; in the remaining 26 it was delivered face to face (in 17 studies in a group format, whereas in 9 in an individual format). The bulk of the studies (23) were conducted in Australia, followed by 18 in the US, 3 in England, 1 in Iran, 1 in Brazil, 1 in Japan, and 1 in Sweden. In relation to the treatment components, all studies included psychoeducation and relapse prevention. Exposure was included in all studies except for the one by Essau and colleagues (Essau et al., 2014); cognitive restructuring was present in all studies except for those by Chu and colleagues (Chu et al., 2009; Chu et al., 2016). Additionally, behavioral activation was included in 33 studies[2], problem solving in 25 studies[3], and relaxation strategies in 29 studies[4]. Response prevention was included in 15 studies[5], and mindfulness was included in 7 studies[6]. The studies tested 22 different transdiagnostic protocols. The most common ones were the Unified Protocol (present in 6 studies), the Wellbeing Course (present in 9 studies), with their different variations, and the Transdiagnostic-Group CBT (present in 5 studies) (see Table 1).

Risk of bias within studies

Table 2 provides an overview of the potential biases of the studies. The RCTs (21 studies) were assessed in 6 categories whereas the uncontrolled studies (27 studies) were only assessed in 3 categories. Taking into account only the RCTs, 11 studies (52.38%) reported low risk of

[2] Behavioral activation not included in: Bullis et al., 2015; De Ornelas Maia et al., 2013; Ellard et al., 2010 (1&2); Espejo et al., 2016; Farchione et al., 2012; Lotfi et al., 2014; Norton et al., 2004; Norton & Hope, 2005; Norton, 2008; Norton & Barrera, 2012; Norton, 2012b; Schmidt et al., 2012; Titov et al., 2010 (1&2).

[3] Problem solving was included in: Bilek & Ehrenreich-May, 2012; Chu et al., 2009; Chu et al., 2016; De Ornelas Maia et al., 2013; Dear et al., 2015; Dear et al., 2011; Essau et al., 2014; Fogliati et al., 2016; Kayrouz et al., 2015; Kayrouz et al., 2016; Kirkpatrick, Manoukian, Dear, Johnston, & Titov, 2013; Mullin et al., 2015; Newby et al., 2013 (1&2); Newby et al., 2014; Queen, Barlow, & Ehrenreich-May, 2014; Titov et al., 2013; Titov et al., 2015a (1&2); Titov et al., 2016 (1, 2, & 3); Titov et al., 2015b; Wuthrich et al., 2016; Wuthrich & Rapee, 2013.

[4] Relaxation not included in: Bilek & Ehrenreich-May, 2012; Bullis et al., 2015; Chu et al., 2009; Chu et al., 2016; Ejeby et al., 2014; Ellard et al., 2010 (1&2); Espejo et al., 2016; Farchione et al., 2012; Gros, 2014 (1); Lotfi et al., 2014; McEvoy & Nathan, 2007; Newby et al., 2014; Norton, 2008; Norton & Barrera, 2012; Norton, 2012b; Schmidt et al., 2012; Wuthrich et al., 2016; Wuthrich & Rapee, 2013.

[5] Response prevention included in: Bilek & Ehrenreich-May, 2012; Bullis et al., 2015; De Ornelas Maia et al., 2013; Ellard et al., 2010 (1&2); Espejo et al., 2016; Farchione et al., 2012; Gros, 2014 (2); Ito et al., 2016; Lotfi et al., 2014; Norton et al., 2004; Norton & Hope, 2005; Norton, 2008; Queen et al., 2014; Schmidt et al., 2012.

[6] Mindfulnes included in: Bullis et al., 2015; De Ornelas Maia et al., 2013; Ellard et al., 2010 (1&2); Farchione et al., 2012; Ito et al., 2016; Queen et al., 2014.

Table 1. Characteristics of included studies evaluating transdiagnostic cognitive behavior therapy treatments for anxiety and/or depression

Study	Mean age (range) %female	Diagnostic measure (Recruit.[a])	Inclussion	Intervention (Protocol)	Design Target	%Primary diagnosis [patients with comorbid emotional disorders] [b]	N[c] (attrition)	ANX/DEP outcome measure	Count. Follow up[d]
Bilek & Ehrenreich 2012	9.8 (7-12) 45.5% female	ADIS-IV- C/P (Com)	Principal DSM-IV diagnosis of ANX	T-GCBT: 15 x 90min sessions (UP-C)	Uncontrolled ANX	GAD 40.9; SAD 40.9; SP 9.1; SD 9.1 [NR]	T-GCBT 22 (27%)	SCARED/ ---[e]	USA ---
Bolton et al., 2014	35.6 (18-65) 63% female	HTQ/ HSCL-25 (Com)	Report trauma exposure & meet severity criteria for DEP and/or PTSS	T-CBT: 1h weekly sessions (CETA)	RCT ANX+DEP	NR [NR]	T-CBT 182 (18.7%) WLC 165	HSCL-25/ HTQ	USA ---
Bullis et al., 2015	44.6 (20-69) 63.6% female	ADIS-IV-L (Clin)	Principal DSM-IV diagnosis of ANX or DEP	T-GCBT: 12 x 2h sessions (UP)	Uncontrolled ANX+DEP	SAD 36.4; GAD 9.1; DYS 9.1; OCD 9.1; Pan/Ag 9.1; SP 9.1; ADNOS 9.1; Ag 9.1. [72.7%]	T-GCBT 11 (9.1%)	OASIS/ ODSIS	USA ---
Chu et al., 2009	12.8 (12-14) 60% female	ADIS-IV-C (Com)	DSM-IV diagnosis of ANX or DEP	T-GCBT: 13 x 40min sessions (GBAT)	Uncontrolled ANX+DEP	Soc.P 40; MDD 40; GAD 20 [100%]	T-GCBT 5 (20%)	MAS-CP/ CESD-CP	USA ---
Chu et al., 2016	12.1 (12-14) 71.4% female	ADIS-IV-C/P (Com)	Clinical or subclinical principal diagnosis of DSM-IV-TR unipolar DEP or ANX	T-GCBT: 10 x 1h sessions (GBAT)	RCT ANX+DEP	Soc. P 51.4; GAD 17.1; SD 14.3; MDD 11.4; Minor depression 2.9; DYS 2.9 [NR]	T-GCBT 21 (23.8%) WLC 14	SCARED/ CESD-CP	USA ---
Dear et al., 2011	44.4 (NR) 78% female	MINI-t (Com)	DSM-IV diagnosis of ANX or DEP	T-iCBT: 5 sessions/ 8 weeks (Brief version of The Wellbeing Program)	Uncontrolled ANX+DEP	MDD 56.3; GAD 31.3; Pan/Ag 6.3; Soc.P 6.3 [78.1%]	T-iCBT 32 (19%)	GAD-7/ PHQ-9	Australia 3
Dear et al., 2015	43.8 (19-65) 76% female	MINI-t (Com)	Principal complaint of GAD symptoms	T-iCBT: 5 lessons/ 8 weeks (The Wellbeing Course); DS-iCBT: 5 lessons/ 8 weeks (The Worry Course)	RCT GAD	GAD symptoms 100Comorbid disorders: MDD, SAD, Pan/Ag [NR]	T-iCBT 170 (37.1%) DS-iCBT 168 (33.3%)	GAD-7/ PHQ-9	Australia 3, 12 & 24
De Ornelas et al., 2013	35.6 (18-58) 87.5% female	MINI (Com)	Principal DSM-IV diagnosis of DEP and at least one ANX disorder	T-GCBT: 12x 2h sessions (UP)	Uncontrolled ANX+DEP	NR [NR]	T-GCBT 16 (NR)	BAI/BDI	Brasil ---
Ejeby et al., 2014	44.2 (18-65) 78.8% female	ADIS-IV (Clin)	Patients referred to the study by their GPs	T-GCBT: 12x 2h sessions(NR); TAU: medication, referrals to the counsellor	RCT ANX+DEP	Mood disorders 57; Anxiety disorders 37.3 [NR]	T-GCBT 84 (12%) TAU 81 (NR)	CPRS-S-A/ CPRS-S-D	Sweden 12
Ellard et al., 2010 (1)	30 (18-54) 58.8% female	ADIS-IV-L (Com)	Primary DSM-IV diagnosis of ANX	T-CBT: 8-15 x 1h sessions (UP)	Uncontrolled ANX+DEP	Pan/Ag 22.2; SAD 22.2; GAD 16.7; OCD 16.7; MDD 11.1; PTSD 5.5; Hypocondriasis 5.5 [NR%] Average nº diagnoses = 1.9	T-CBT 18 (8.3%)	BAI/ BDI	USA ---
Ellard et al., 2010 (2)	29.7 (18-44) 53.3% female	ADIS-IV-L (Com)	Primary DSM-IV diagnosis of ANX	T-CBT: 12-18 x 1h sessions (UP)	Uncontrolled ANX+DEP	SAD 33.3; GAD 20; OCD 20; Pan/Ag 13.3; GAD+SAD 6.7; GAD+Pan/Ag 6.7. [NR] Average nº diagnosis = 2.2	T-CBT 14 (16.7%)	BAI/ BDI	USA 6
Essau et al., 2014	8.8 (8-10) 29.5% female	SCAS (Com)	Referred by teachers for having significant anxiety problems	T-GCBT: 8 x 45min sessions (Super Skills for Life)	Uncontrolled ANX	NR Anxiety scores were in the clinical range as measured using the SCAS [NR]	T-GCBT 51 (16.4%)	SCAS/ ---	UK 6
Espejo et al., 2016	46.4 (24-70) 24.1% female	MINI (Clin)	DSM-IV diagnosis of ANX	T-GCBT: 12 x 2h sessions (Norton and Hope protocol)	Uncontrolled ANX	Pan/Ag 31; GAD 24.1; SAD 19; PTSD 12.1; SP 5.2: ADNOS 5.2; OCD 3.4 [62.9%]	T-GCBT 51 (25%)	Mini-MASQ/ Mini-MASQ	USA ---

Table 1. Characteristics of included studies evaluating transdiagnostic cognitive behavior therapy treatments for anxiety and/or depression (continuation)

Study	Mean age (range) %female	Diagnostic measure (Recruit.[a])	Inclusion	Intervention (Protocol)	Design Target	%Primary diagnosis [patients with comorbid emotional disorders] [b]	N[c] (attrition)	ANX/DEP outcome measure	Count. Follow up[d]
Farchione et al., 2012	29.8 (19-52) 59.5% female	ADIS-IV-L (Clin)	Principal DSM-IV diagnosis of ANX	T-CBT: 18 x 1h sessions (UP)	RCT ANX	Pan/Ag 21.6; SAD 21.6; OCD 21.6; GAD 18.9; ADNOS 5.4; PTSD 2.7; 2 principal ANX disorders: 8. [NR] Average nº diagnosis = 2.2	T-CBT 26 (15.4%) WLC 11	BAI/ BDI-II	USA 6
Fogliati et al., 2016	41.4 (18-62) 79% female	MINI-t (Com)	Principal symptoms consistent with Pan/Ag	T-iCBT: 5 lessons/ 8 weeks (The Wellbeing Course);DS-iCBT: 5 lessons/ 8 weeks (The Panic Course)	RCT Pan/Ag	Pan/Ag symptoms 100Comorbid disorders: GAD, SAD, Pan/Ag [NR]	T-iCBT 72 (11.1%) DS-iCBT 73 (20.6%)	GAD-7/ PHQ-9	Australia 3, 12 & 24
Gros, 2014 (1)	50.8 (NR) 7.1% female	MINI (Clin)	Principal DSM-IV affective disorder	T-CBT: 12 x 45-60min sessions (NR)	Uncontrolled ANX+DEP	PTSD 46.7; Pan/Ag 26.6; Soc.P 20; MDD 6.7 [100%]	T-CBT 12 (20%)	DASS-ANX/ DASS- DEP	USA ---
Gros, 2014 (2)	49.5 (NR) 24.1% female	MINI (Clin)	Principal DSM-IV affective disorder	T-CBT: 12-16 x 45-60min sessions (TBT)	Uncontrolled ANX+DEP	PTSD 48.2; Pan/Ag 24.1; MDD 24.1; Soc.P 3.4 [100%]	T-CBT 21 (27.6%)	DASS-ANX/ DASS-DEP	USA ---
Ito et al., 2016	35.2 (22-64) 59% female	MINI (Clin)	DSM-IV diagnosis of an ANX or DEP disorder	T-CBT: 18 x 1h sessions (UP)	Uncontrolled ANX+DEP	MDD 53; SAD 24; Pan/ag 12; PTSD 6; ADNOS 6 [82%]	T-CBT 17 (11.8%)	STAI/BDI-II	Japan 3
Johnston et al., 2011	41.6 (19-79) 58.8% female	MINI-t (Com)	Principal DSM-IV diagnosis of GAD, Soc.P or Pan/Ag	T-iCBT: 8 sessions/ 10 weeks (The Anxiety Program)	RCT ANX	GAD 45; Soc.P 34.4; Pan/ Ag 20.6 [70.2%]	T-iCBT 89 (25%) WLC 42	GAD-7/ PHQ-9	Australia 3
Johnston et al., 2014	20.6 (18-24) 78% female	MINI-t (Com)	At least mild symptoms of ANX or DEP	T-iCBT: 4 lessons/ 5 weeks (Mood Mechanic Course)	Uncontrolled ANX+DEP	MDD 28; GAD 28; Soc.P 22; Pan/Ag 5; 17% subclinical patients [92%]	T-iCBT 18 (39%)	GAD-7/ PHQ-9	Australia 3
Kayrouz et al., 2015	33.6 (24-50) 73% female	MINI-t (Com)	Experience at least mild symptoms of ANX or DEP	T-iCBT: 5 lessons/ 8 weeks (Arab Wellbeing Course)	Uncontrolled ANX+DEP	MDD 36; GAD 27; 36.4% subclinical patients [54.6%]	T-iCBT 11 (9%)	GAD-7/ PHQ-9	Australia 3
Kayrouz et al., 2016	36.2 (19-67) 58% female	Self-reported measures (Com)	Experience at least mild symptoms of ANX or DEP	T-iCBT: 5 lessons/ 8 weeks (Arabic Wellbeing Course)	Uncontrolled ANX+DEP	NR [NR]	T-iCBT 36 (64%)	GAD-7/ PHQ-9	Australia 3
Kirpatrick et al., 2013	NR (25-54) 60% female	Self-reported measures (Com)	Self-identified as experiencing at least mild anxiety symptoms	T-iCBT: 5 lessons/ 8 weeks (The Wellbeing Course)	Uncontrolled ANX+DEP	NR [NR]	T-iCBT 10 (0%)	GAD-7/ PHQ-9	Australia 3
Lotfi et al., 2014	34.2 (NR) 53.6% fem.	NR (Clin)	Principal diagnosis of mood or anxiety disorders	T-CBT: 8 x 45min sessions (UP); DS-GCBT: 8 x 45min sessions (DS-CBT manual)	RCT ANX+DEP	GAD 39.1; MDD 21.7; ADNOS 17.4; SAD 17.4; Pan/Ag 4.4 [NR]	T-CBT 12 (14.3%) DS-GCBT 9 (25%)	BAI/ BDI-II(IRQOL)	Iran ---
McEvoy & Nathan, 2007	35.4 (NR) 59.4% female	MINI (NR)	DSM-IV diagnosis of ANX or DEP	T-GCBT: 10 x 2h sessions (Nathan, Rees, & Smith, 2001)	Uncontrolled ANX+DEP	MDD 56.6; Pan/Ag 12.6; Soc.P 10.5; DYS 9.8; GAD 9.8; SP 0.7 [52.4%]	T-GCBT 143 (34.3%)	BAI/BDI	Australia ---
Mullin et al., 2015	27.8 (19-55) 64.3% female	MINI-t (Com)	Self-identified as experiencing symptoms of ANX or DEP	T-iCBT: 3 lessons/ 6 weeks; 6 lessons/ 6 weeks; 5 lessons/ 5 weeks (UniWellbeing Course)	RCT ANX+DEP	Principal diagnosis NR 15.9% subclinical patients [46.9%]	T-iCBT 30 (57%) WLC 23	GAD-7/ PHQ-9	Australia 3
Newby et al., 2013 (1)	44.4 (21-80) 77.8% female	MINI-t (Com)	DSM-IV diagnosis of GAD and/or MDD	T-iCBT: 6 sessions/ 10 weeks (The Worry and Sadness Program)	RCT ANX+DEP	GAD+MDD 47.1; GAD 37.9; MDD 15.0 [NR]	T-iCBT 46 (11%) WLC 53	GAD-7/ PHQ-9	UK 3

Table 1. Characteristics of included studies evaluating transdiagnostic cognitive behavior therapy treatments for anxiety and/or depression (continuation)

Study	Mean age (range) %female	Diagnostic measure (Recruit.[a])	Inclussion	Intervention (Protocol)	Design Target	%Primary diagnosis [patients with comorbid emotional disorders] [b]	N[c] (attrition)	ANX/DEP outcome measure	Count. Follow up[d]
Newby et al., 2013 (2)	39.3 (18-78) 64.7% female	Self-reported measures (Com)	Registered clinicians prescribed the course to their patients	T-iCBT: 6 sessions/ 13 weeks (The Worry and Sadness Program)	Uncontrolled ANX+DEP	NR [NR]	T-iCBT 136 (58.8%)	GAD-7/ PHQ-9	UK ---
Newby et al., 2014	40.2 (18-82) 67.6% female	Self-reported measures (Com)	Registered clinicians prescribed the course to their patients	T-iCBT: 6 lessons/ 12 weeks (The Depression and Anxiety Program)	Uncontrolled ANX+DEP	NR [75%]	T-iCBT 707 (52.7%)	GAD-7/ PHQ-9	Australia ---
Norton et al., 2004	39.6 (NR) 52.6% female	ADIS-IV (Com)	Primary DSM-IV diagnosis of ANX	T-GCBT: 12 x 2.5h sessions (Norton and Hope)	RCT ANX	GAD 36.8; SAD 26.3; OCD 15.8; Pan/Ag 15.8; PTSD 5.3 [79%]	T-GCBT 9 (25%) WLC 10	---/ DASS-DEP	USA ---
Norton & Hope, 2005	39.6 (NR) 52.6% female	ADIS-IV (Com)	Primary DSM-IV diagnosis of ANX	T-GCBT: 12 x 2.5h sessions (Norton and Hope)	RCT ANX	GAD 36.8; SAD 26.3; OCD 15.8; Pan/Ag 15.8; PTSD 5.3 [79%]	T-GCBT 9 (25%) WLC 10	DASS-AN/---	USA ---
Norton, 2008	33.1 (19-71) 56.9% female	ADIS-IV (Com)	Principal DSM-IV diagnosis of ANX	T-GCBT: 12 x 2h sessions (Norton and Hope)	Uncontrolled ANX	SAD 50; Pan/Ag 44; GAD+OCD 4; SP 2. [78%]	T-GCBT 52 (NR)	STAI/---	USA ---
Norton, 2012b	33 (18-62) 62.1% female	ADIS-IV (Com)	Principal DSM-IV diagnosis of ANX	T-GCBT: 12 x 2h sessions (Norton and Hope) RLX: 12 x 2h sessions	RCT ANX	SAD 42.5; Pan/Ag 35.6; GAD 17.2; ADNOS 2.3; SP 1.2; OCD 1.2 [60.7%]	TD- GCBT 65 (29.7%) RLX 22 (57.1%)	BAI/---	USA ---
Norton & Barrera, 2012	31.5 (19-53) 50% female	ADIS-IV (Com)	Principal DSM-IV diagnosis of GAD, SAD or Pan/Ag	T-GCBT: 12 x 2h sessions (Norton and Hope) DS-CBT: 12x 2h sessions	RCT ANX	SAD 54.4; Pan/Ag 23.9; GAD 21.7 [NR]	T-GCBT 23 (21.7%) DS-CBT 23 (39.1%)	STAI/---	USA ---
Queen et al., 2014	15.4 (12-17) 57.6% female	ADIS-IV-C/P (NR)	Principal DSM-IV diagnosis of ANX and/or MDD	T-CBT: 8-21 sessions (UP-A)	Uncontrolled ANX+DEP	GAD 39; Soc.P 32.2; Pan/ Ag 8.5; MDD 18.6; ADNOS 8.5; OCD 6.8; SP 5.1; DYS 3.4. [NR] 38.9% had comorbid DEP	T-CBT 59 (18.4%)	RCADS-ANX/ RCADS-MDD	USA 3&6
Schmidt et al., 2012	36.3 (NR) 72.7% female	SCID-IV (Com)	Principal DSM-IV diagnosis of GAD, Pan/Ag or SAD	T-GCBT: 10 x 120 min sessions (F-SET)	RCT ANX	SAD 36.3; Pan/Ag 36.1; GAD 27.7 [NR]	T-GCBT 57 (7%) WLC 39	ASI/ BDI	USA 6
Titov et al., 2010 (1)	39.5 (18-74) 67.9% female	MINI-t (Com)	DSM-IV diagnosis of GAD, Soc.P or Pan/Ag	T-iCBT: 6 sessions/ 10 weeks (The Anxiety Program)	RCT ANX	GAD 43.6; Soc.P 29.5; Pan/Ag 26.9 [75.6%]	T-iCBT 40 (25%) WLC 38	GAD-7/---	Australia 3
Titov et al., 2010 (2)	40.5 (18-73) 63.2% female	MINI-t (Com)	DSM-IV diagnosis of GAD, Soc.P or Pan/Ag	T-iCBT: 6 sessions/ 10 weeks (The Anxiety Program)	Uncontrolled ANX	GAD 42.1; Pan/Ag 28.9; SP 28.9 [73.7%]	T-iCBT 38 (NR)	GAD-7/---	Australia ---
Titov et al., 2011	43.9 (18-79) 73% female	MINI-t (Com)	Principal DSM-IV diagnosis of GAD, Soc.P, Pan/Ag or MDD	T-iCBT: 8 sessions/ 10 weeks (The Wellbeing Program)	RCT ANX+DEP	MDD 51; GAD 28; Soc.P 11; Pan/Ag 10 [81.0%]	T-iCBT 37 (19%) WLC 37	GAD-7/ PHQ-9	Australia 3
Titov et al., 2013	41.5 (18-59) 72.4% female	Self-reported measures (Com)	Self-identified as having a principal complaint of MDD, GAD, Soc.P or Pan/ Ag	T-iCBT: 5 sessions/ 8 weeks (The Wellbeing Course)	RCT ANX+DEP	GAD 31.1; MDD 35.1; Soc.P 21; Pan/Ag 13 [NR]	T-iCBT 103 (49.8%) WLC 51	GAD-7/ PHQ-9	Australia 3

Table 1. Characteristics of included studies evaluating transdiagnostic cognitive behavior therapy treatments for anxiety and/or depression (continuation)

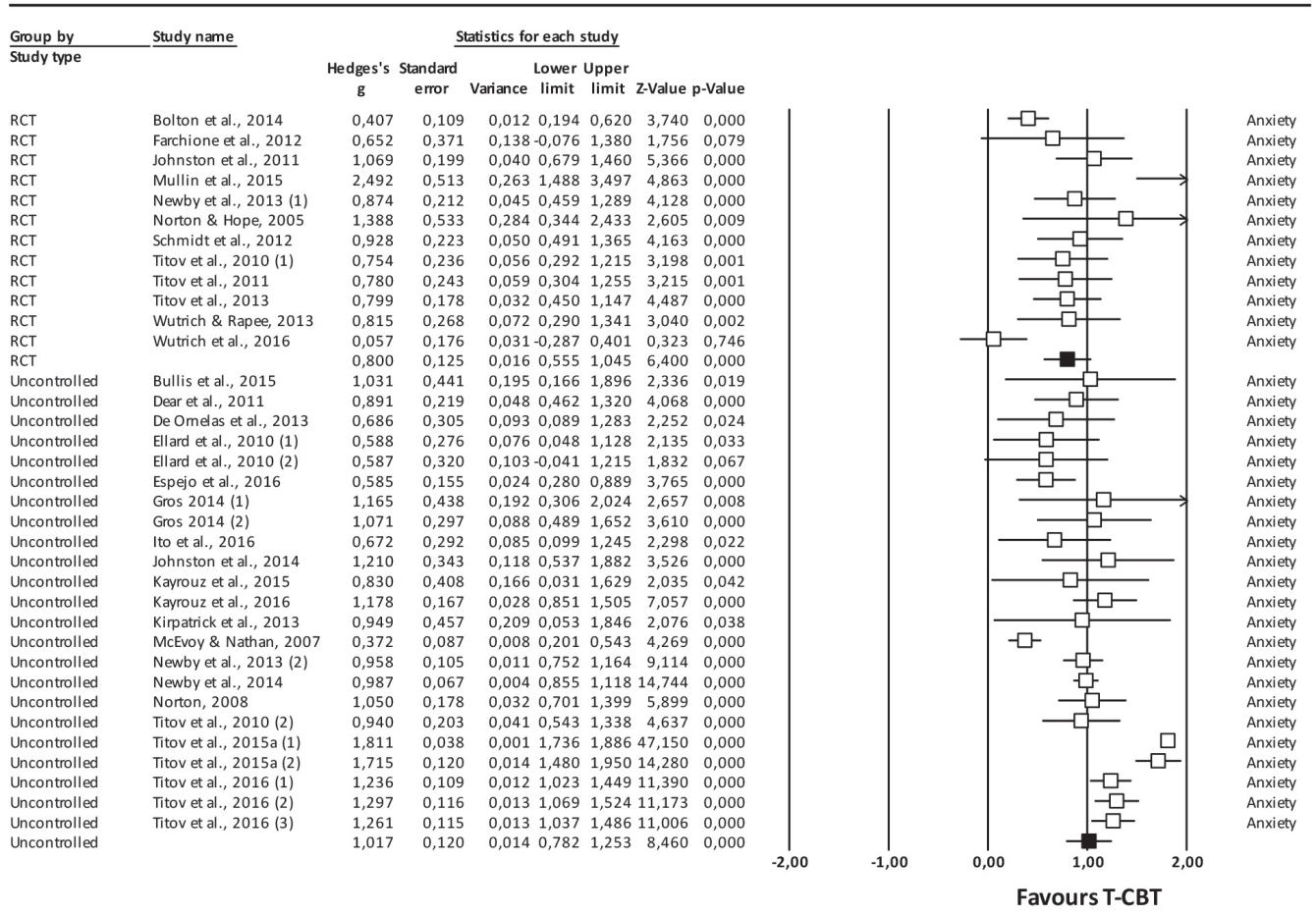
Study	Mean age (range) %female	Diagnostic measure (Recruit.[a])	Inclussion	Intervention (Protocol)	Design Target	%Primary diagnosis [patients with comorbid emotional disorders] [b]	N[c] (attrition)	ANX/DEP outcome measure	Count. Follow up[d]
Titov et al., 2015a (1)	NR (18-60) NR% female	Self-reported measures (Com)	Self-identified as experiencing symptoms of ANX and/or DEP	T-iCBT: 5 lessons/ 8 weeks (The Wellbeing Course)	Uncontrolled ANX+DEP	NR [NR]	T-iCBT 1793 (29.1%)	GAD-7/ PHQ-9	Australia 3
Titov et al., 2015a (2)	NR (>60) NR% female	Self-reported measures (Com)	Self-identified as experiencing symptoms of ANX and/ or DEP	T-iCBT: 5 lessons/ 8 weeks (The Wellbeing Plus)	Uncontrolled ANX+DEP	NR [NR]	T-iCBT175 (19.4%)	GAD-7/ PHQ-9	Australia 3
Titov et al., 2015b	44.2 (18-64) 72% female	MINI-t (Com)	Principal complaint of DEP symptoms	T-iCBT: 5 lessons/ 8 weeks (The Wellbeing Course); DS-iCBT: 5 lessons/ 8 weeks; (The Mood Course)	RCT DEP	MDD symptoms 100 Comorbid disorders: GAD, SAD, Pan/Ag [NR]	T-iCBT 149 (53%) DS-CBT 141 (37.6%)	GAD-7/ PHQ-9/	Australia 3, 12 & 24
Titov et al., 2016 (1)	65 (60-78) 65% female	Self-reported measures (Com)	Principal complaint of symptoms of ANX or DEP	T-iCBT: 5 lessons/ 8 weeks (The Wellbeing Plus)	Uncontrolled ANX+DEP	NR [NR]	T-iCBT 153 (2%)	GAD-7/ PHQ-9	Australia 3
Titov et al., 2016 (2)	66 (60-80) 64% female	Self-reported measures (Com)	Principal complaint of symptoms of ANX or DEP	T-iCBT: 5 lessons/ 8 weeks (The Wellbeing Plus)	Uncontrolled ANX+DEP	NR [NR]	T-iCBT 140 (3%)	GAD-7/ PHQ-9	Australia 3
Titov et al., 2016 (3)	67 (60-93) 63% female	Self-reported measures (Com)	Principal complaint of symptoms of ANX or DEP	T-iCBT: 5 lessons/ 8 weeks (The Wellbeing Plus)	Uncontrolled ANX+DEP	NR [NR]	T-iCBT 140 (5%)	GAD-7/ PHQ-9	Australia 3
Wutrich & Rapee, 2013	67.4 (60-84) 64.7% female	ADIS-IV (Com)	DSM-IV clinical or subclinical criteria for an anxiety and mood disorder	T-GCBT: 12 x 2h sessions (The Ageing Wisely)	RCT ANX+DEP	GAD 34.6; MDD 20.6; DYS 14.1; MDNOS 10.3; Soc. P 10.3; PTSD 4.4; SP 3.5; ADNOS 3.3;11.3% subclinical patients [NR]	T-GCBT 27 (12%) WLC 35	GAI/GDS	Australia 3
Wutrich et al., 2016	67.4 (60-88) 55.6% female	ADIS-IV (Com)	DSM-IV diagnosis of ANX and a unipolar mood disorder	T-GCBT: 11 x 2h sessions; (Ageing Wisely) DG: 11 x 2h sessions	RCT ANX+DEP	GAD 33.1; MDD 27.8 [NR] Average nº diagnosis = 2.92	T-GCBT 76 (13.2%) DG 57 (21.1%)	GAI/GDS	Australia 6

Note. ADIS-IV = Anxiety Disorders Interview Schedule for DSM-IV; ADIS-IV-C = Anxiety Disorders Interview Schedule for DSM-IV-Child Interview; ADIS-IV-C/P = Anxiety Disorders Interview Schedule for DSM-IV-Child and Parent Reports; ADIS-IV-L= Anxiety Disorders Interview Schedule for DSM-IV-Lifetime Version; ADNOS = Anxiety disorder not otherwise specified; ANX = anxiety; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; BDI-II = Beck Depression Inventory, second edition; CBT = cognitive behavior therapy; CESD-CP = Center for Epidemiologic Studies Depression Scale for Children-Child and Parent reports; CETA = Common Elements Treatment Approach; Clin = clinical recruitment; Com = at least in part recruitment through the community; CPRS-S-A = Self-Rating Scale for Affective Syndroms (Anxiety); CPRS-S-D = Self-Rating Scale for Affective Syndroms (Depression); DASS = Depression Anxiety Stress Scales 21-Item Version; DEP = depression; DG = discussion group; DS-GCBT = group-delivered disorder specific cognitive behavior therapy; DS-iCBT = internet-delivered disorder specific cognitive behavior therapy; DYS = dystimia; F-SET = False Safety Behavior Elimination Therapy; GAD = generalized anxiety disorder; GAD-7 = Generalized Anxiety Disorder-7 item Scale; GAI = Geriatric Anxiety Inventory; GBAT = Group Behavioral Activation Therapy; GDS = Geriatric Depression Scale; GPs = general practitioners; HSCL-25 = Hopkins Symptom Checklist 25; HTQ = Harvard Trauma Questionnaire; iCBT = internet-delivered cognitive behavioral therapy; MASC-CP = Multidimensional Anxiety Scale for Children-Child and Parent reports; MDD = major depressive disorder; MDNOS = Mood Disorder Not Otherwise Specified; MINI = Mini International Neuropsychiatric Interview version 5.0.0; Mini-MASQ = The Mini Mood and Anxiety Symptom Questionnaire; MINI-SPIN = MINI Social Phobia Inventory; MINI-t = Mini International Neuropsychiatric Interview version 5.0.0 conducted through telephone; NR = not reported; PTSS = post-traumatic stress symptoms; OASIS = Overall Anxiety Severity and Impairment Scale; OCD = obsessive compulsive disorder; ODSIS = Overall Depression Severity and Impairment Scale; Pan/Ag = panic disorder with or without agoraphobia; PDSS = Panic Disorder Severity Scale; PHQ-9 = Patient Health Questionnaire- 9 item; PTSD = posttraumatic stress disorder; RCADS = Revised Children's Anxiety and Depression Scale; RCT = randomized controlled trial; RLX = relaxation training program; SAD = social anxiety disorder; SCARED = Screen for Child anxiety Related Emotional Disorders–Child and Parent Reports; SCAS = Spence Children's anxiety Scale; SCID-IV = Structured Clinical Interview for Axis I DSM-IV Disorders; SD = Separation Disorder; Soc.P = social phobia; SP = specific phobia; STAI = State-Trait Anxiety Inventory; TAU = Treatment As Usual; T-CBT = Transdiagnostic Behavior Therapy; T-GCBT = group- delivered transdiagnostic cognitive behavior therapy; T-iCBT = internet-delivered transdiagnostic cognitive behavior therapy; UK = United Kingdom; UP = Unified Protocol; UP-A = Unified Protocol for the Treatment of Emotional Disorders in Adolescence; UP-C = Unified Protocol for the Treatment of Emotional Disorders in Children; USA = United States of America; WLC = waiting list control.

[a] Recruitment method; [b] Taking into account the overall sample; [c] Number of participants included in the final analysis of the study and used in our meta-analysis; [d] Follow up is in months; [e] Not included in the study (---)

Table 2. Risk of bias in the included studies

	Selection bias		Detection bias	Attrition bias	Reporting bias	Other bias
Study	Random sequence generation	Allocation concealment	Blinded of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias
T-CBT vs. Controls						
Bolton et al., 2014	Low	Low	High	Low	Unclear	Low
Farchione et al., 2012	High	High	High	Low	Unclear	Low
Johnston et al., 2011	Low	Unclear	High	High	Unclear	Low
Mullin et al., 2015	Unclear	Unclear	High	Low	Unclear	Low
Newby et al., 2013 (1)	Low	Low	High	Low	Unclear	Low
Norton et al., 2004	Unclear	Unclear	High	High	Unclear	Low
Norton & Hope, 2005	Unclear	Unclear	High	High	Unclear	Low
Schmidt et al., 2012	Low	Low	High	Low	Unclear	Low
Titov et al., 2010 (1)	Low	Unclear	High	High	Unclear	Low
Titov et al., 2011	Low	Unclear	High	High	Unclear	Low
Titov et al., 2013	Low	Unclear	High	Low	Unclear	Low
Wutrich & Rapee, 2013	Low	Low	High	Low	Unclear	Low
Wutrich et al., 2016	Low	Unclear	High	Low	Unclear	Low
Uncontrolled T-CBT						
Bullis et al., 2015	---	---	---	Unclear	Unclear	Low
Dear et al., 2011	---	---	---	Low	Unclear	Low
De Ornelas et al., 2013	---	---	---	Unclear	Unclear	Low
Ellard et al., 2010 (1)	---	---	---	Unclear	Unclear	Low
Ellard et al., 2010 (2)	---	---	---	High	Unclear	Low
Espejo et al., 2016	---	---	---	High	Unclear	Low
Gros, 2014 (1)	---	---	---	High	Unclear	Low
Gros, 2014 (2)	---	---	---	High	Unclear	Low
Ito et al., 2016	---	---	---	Low	Unclear	Low
Johnston et al., 2014	---	---	---	Low	Unclear	Low
Kayrouz et al., 2015	---	---	---	Low	Unclear	Low
Kayrouz et al., 2016	---	---	---	Low	Unclear	Low
Kirpatrick et al., 2013	---	---	---	Low	Unclear	Low
McEvoy & Nathan, 2007	---	---	---	High	Unclear	Low
Newby et al., 2013 (2)	---	---	---	Low	Unclear	Low
Newby et al., 2014	---	---	---	Low	Unclear	Low
Norton, 2008	---	---	---	Low	Unclear	Low
Titov et al., 2010 (2)	---	---	---	High	Unclear	Low
Titov et al., 2015a (1)	---	---	---	Unclear	Unclear	Low
Titov et al., 2015a (2)	---	---	---	Unclear	Unclear	Low
Titov et al., 2016 (1)	---	---	---	Low	Unclear	Low
Titov et al., 2016 (2)	---	---	---	Low	Unclear	Low
Titov et al., 2016 (3)	---	---	---	Low	Unclear	Low
T-CBT vs other therapies						
Dear et al., 2015	Low	Low	High	Low	Unclear	Low
Ejeby et al., 2014	Unclear	Low	High	Low	Unclear	Low
Fogliati et al., 2016	Unclear	Unclear	High	Low	Unclear	Low
Lotfi et al., 2014	Unclear	Unclear	High	High	Unclear	Low
Norton, 2012b	Unclear	Unclear	High	High	Unclear	Low
Norton & Barrera, 2012	Unclear	Unclear	High	Low	Unclear	Low
Titov et al., 2015b	Unclear	Unclear	High	Low	Unclear	Low
Children and adolescents						
Bilek & Ehrenreich, 2012	---	---	---	High	Unclear	Low
Chu et al., 2009	---	---	---	Low	Unclear	Low
Chu et al., 2016	Low	Unclear	High	Low	Unclear	Low
Essau et al., 2014	---	---	---	High	Unclear	Low
Queen et al., 2014	---	---	---	Unclear	Unclear	Low



Group by Study type	Study name	Hedges's g	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	
RCT	Bolton et al., 2014	0,407	0,109	0,012	0,194	0,620	3,740	0,000	Anxiety
RCT	Farchione et al., 2012	0,652	0,371	0,138	-0,076	1,380	1,756	0,079	Anxiety
RCT	Johnston et al., 2011	1,069	0,199	0,040	0,679	1,460	5,366	0,000	Anxiety
RCT	Mullin et al., 2015	2,492	0,513	0,263	1,488	3,497	4,863	0,000	Anxiety
RCT	Newby et al., 2013 (1)	0,874	0,212	0,045	0,459	1,289	4,128	0,000	Anxiety
RCT	Norton & Hope, 2005	1,388	0,533	0,284	0,344	2,433	2,605	0,009	Anxiety
RCT	Schmidt et al., 2012	0,928	0,223	0,050	0,491	1,365	4,163	0,000	Anxiety
RCT	Titov et al., 2010 (1)	0,754	0,236	0,056	0,292	1,215	3,198	0,001	Anxiety
RCT	Titov et al., 2011	0,780	0,243	0,059	0,304	1,255	3,215	0,001	Anxiety
RCT	Titov et al., 2013	0,799	0,178	0,032	0,450	1,147	4,487	0,000	Anxiety
RCT	Wutrich & Rapee, 2013	0,815	0,268	0,072	0,290	1,341	3,040	0,002	Anxiety
RCT	Wutrich et al., 2016	0,057	0,176	0,031	-0,287	0,401	0,323	0,746	Anxiety
RCT		0,800	0,125	0,016	0,555	1,045	6,400	0,000	
Uncontrolled	Bullis et al., 2015	1,031	0,441	0,195	0,166	1,896	2,336	0,019	Anxiety
Uncontrolled	Dear et al., 2011	0,891	0,219	0,048	0,462	1,320	4,068	0,000	Anxiety
Uncontrolled	De Ornelas et al., 2013	0,686	0,305	0,093	0,089	1,283	2,252	0,024	Anxiety
Uncontrolled	Ellard et al., 2010 (1)	0,588	0,276	0,076	0,048	1,128	2,135	0,033	Anxiety
Uncontrolled	Ellard et al., 2010 (2)	0,587	0,320	0,103	-0,041	1,215	1,832	0,067	Anxiety
Uncontrolled	Espejo et al., 2016	0,585	0,155	0,024	0,280	0,889	3,765	0,000	Anxiety
Uncontrolled	Gros 2014 (1)	1,165	0,438	0,192	0,306	2,024	2,657	0,008	Anxiety
Uncontrolled	Gros 2014 (2)	1,071	0,297	0,088	0,489	1,652	3,610	0,000	Anxiety
Uncontrolled	Ito et al., 2016	0,672	0,292	0,085	0,099	1,245	2,298	0,022	Anxiety
Uncontrolled	Johnston et al., 2014	1,210	0,343	0,118	0,537	1,882	3,526	0,000	Anxiety
Uncontrolled	Kayrouz et al., 2015	0,830	0,408	0,166	0,031	1,629	2,035	0,042	Anxiety
Uncontrolled	Kayrouz et al., 2016	1,178	0,167	0,028	0,851	1,505	7,057	0,000	Anxiety
Uncontrolled	Kirpatrick et al., 2013	0,949	0,457	0,209	0,053	1,846	2,076	0,038	Anxiety
Uncontrolled	McEvoy & Nathan, 2007	0,372	0,087	0,008	0,201	0,543	4,269	0,000	Anxiety
Uncontrolled	Newby et al., 2013 (2)	0,958	0,105	0,011	0,752	1,164	9,114	0,000	Anxiety
Uncontrolled	Newby et al., 2014	0,987	0,067	0,004	0,855	1,118	14,744	0,000	Anxiety
Uncontrolled	Norton, 2008	1,050	0,178	0,032	0,701	1,399	5,899	0,000	Anxiety
Uncontrolled	Titov et al., 2010 (2)	0,940	0,203	0,041	0,543	1,338	4,637	0,000	Anxiety
Uncontrolled	Titov et al., 2015a (1)	1,811	0,038	0,001	1,736	1,886	47,150	0,000	Anxiety
Uncontrolled	Titov et al., 2015a (2)	1,715	0,120	0,014	1,480	1,950	14,280	0,000	Anxiety
Uncontrolled	Titov et al., 2016 (1)	1,236	0,109	0,012	1,023	1,449	11,390	0,000	Anxiety
Uncontrolled	Titov et al., 2016 (2)	1,297	0,116	0,013	1,069	1,524	11,173	0,000	Anxiety
Uncontrolled	Titov et al., 2016 (3)	1,261	0,115	0,013	1,037	1,486	11,006	0,000	Anxiety
Uncontrolled		1,017	0,120	0,014	0,782	1,253	8,460	0,000	

Figure 2. Forest plot of the efficacy of T-CBT on self-reported anxiety (pre-post effect sizes in adults). The filled squares represent the overall effect sizes. All RCTs used waiting list control except for Wutrich et al., (2016) that used a discussion group. The decimals are separated with a coma.

bias on random sequence generation, 6 studies (28.57%) were assessed with low risk of bias on allocation concealment, and all RCTs reported high risk of bias on blinding of outcome assessment, since in all cases self-report outcome measures were used for the analyses. Taking into account all 48 studies, both RCTs and uncontrolled studies, 27 (56.25%) reported low risk of bias on handling incomplete outcome data, whereas all studies were assessed as having unclear bias on selective reporting. Finally, all studies reported low risk of bias in the other sources of bias categories.

Results of individual studies

Figures 2 to 9 show the effect size (Hedge's *g*), with its standard error, variance, confidence interval, *z*-value and *p*-value for each study on the considered outcomes (anxiety and depression).

Synthesis of results

Below, we report the results of the 10 meta-analyses conducted after grouping the studies according to the age sample (adults vs. youth), the existence of a control group (RCTs vs. uncontrolled), the type of control group (WLC or other therapies), and the outcome (anxiety vs. depression).

a) Pre- to post- meta-analytic anxiety outcomes in adult–RCTs (Fig. 2)**.** Of the 12 studies included, 10 reported a significant reduction in self-reported anxiety ($p < .05$), whereas 2 studies did not (Farchione et al., 2012; Wuthrich et al., 2016). Using the random-effects model, the pooled effect size was large and the heterogeneity was significant ($g = 0.80$; Q (11) = 39.91; $I^2 = 72.44$; $p < .001$).

b) Pre- to post- meta-analytic anxiety outcomes in adult–uncontrolled studies (Fig. 2). Of the 23 studies included, 21 reported a significant reduction in self-reported anxiety ($p < .02$), whereas one did not (Ellard et

Group by Study type	Study name	Hedges's g	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	
RCT	Bolton et al., 2014	0,694	0,111	0,012	0,477	0,911	6,266	0,000	Depression
RCT	Farchione et al., 2012	0,882	0,379	0,143	0,140	1,624	2,331	0,020	Depression
RCT	Johnston et al., 2011	0,711	0,193	0,037	0,333	1,089	3,688	0,000	Depression
RCT	Mullin et al., 2015	1,133	0,409	0,168	0,331	1,936	2,768	0,006	Depression
RCT	Newby et al., 2013 (1)	0,770	0,210	0,044	0,359	1,181	3,674	0,000	Depression
RCT	Norton et al., 2004	1,992	0,595	0,354	0,826	3,157	3,349	0,001	Depression
RCT	Schmidt et al., 2012	0,635	0,217	0,047	0,209	1,060	2,925	0,003	Depression
RCT	Titov et al., 2010 (1)	0,538	0,232	0,054	0,084	0,992	2,324	0,020	Depression
RCT	Titov et al., 2011	0,728	0,241	0,058	0,255	1,201	3,015	0,003	Depression
RCT	Titov et al., 2013	0,829	0,178	0,032	0,479	1,178	4,647	0,000	Depression
RCT	Wutrich & Rapee, 2013	1,064	0,276	0,076	0,523	1,604	3,858	0,000	Depression
RCT	Wutrich et al., 2016	0,282	0,176	0,031	-0,063	0,628	1,601	0,109	Depression
RCT		0,716	0,073	0,005	0,572	0,860	9,738	0,000	
Uncontrolled	Bullis et al., 2015	0,586	0,374	0,140	-0,147	1,320	1,568	0,117	Depression
Uncontrolled	Dear et al., 2011	0,987	0,226	0,051	0,543	1,431	4,359	0,000	Depression
Uncontrolled	De Omelas et al., 2013	1,035	0,345	0,119	0,359	1,711	2,999	0,003	Depression
Uncontrolled	Ellard et al., 2010 (1)	0,445	0,265	0,070	-0,075	0,965	1,678	0,093	Depression
Uncontrolled	Ellard et al., 2010 (2)	0,490	0,312	0,097	-0,121	1,101	1,572	0,116	Depression
Uncontrolled	Espejo et al., 2016	0,585	0,155	0,024	0,280	0,889	3,765	0,000	Depression
Uncontrolled	Gros 2014 (1)	1,370	0,476	0,227	0,436	2,303	2,876	0,004	Depression
Uncontrolled	Gros 2014 (2)	1,151	0,306	0,093	0,552	1,751	3,766	0,000	Depression
Uncontrolled	Ito et al., 2016	0,978	0,325	0,106	0,340	1,615	3,006	0,003	Depression
Uncontrolled	Johnston et al., 2014	0,952	0,311	0,097	0,342	1,562	3,059	0,002	Depression
Uncontrolled	Kayrouz et al., 2015	1,225	0,478	0,228	0,288	2,161	2,564	0,010	Depression
Uncontrolled	Kayrouz et al., 2016	1,151	0,165	0,027	0,827	1,475	6,961	0,000	Depression
Uncontrolled	Kirpatrick et al., 2013	1,203	0,508	0,258	0,207	2,199	2,368	0,018	Depression
Uncontrolled	McEvoy & Nathan, 2007	1,012	0,104	0,011	0,808	1,216	9,737	0,000	Depression
Uncontrolled	Newby et al., 2013 (2)	0,878	0,102	0,010	0,677	1,078	8,575	0,000	Depression
Uncontrolled	Newby et al., 2014	1,127	0,070	0,005	0,990	1,265	16,058	0,000	Depression
Uncontrolled	Titov et al., 2010 (2)	0,638	0,184	0,034	0,277	1,000	3,465	0,001	Depression
Uncontrolled	Titov et al., 2015a (1)	1,868	0,039	0,002	1,792	1,945	47,697	0,000	Depression
Uncontrolled	Titov et al., 2015a (2)	1,928	0,129	0,017	1,674	2,181	14,916	0,000	Depression
Uncontrolled	Titov et al., 2016 (1)	1,295	0,111	0,012	1,078	1,512	11,684	0,000	Depression
Uncontrolled	Titov et al., 2016 (2)	1,292	0,116	0,013	1,065	1,519	11,153	0,000	Depression
Uncontrolled	Titov et al., 2016 (3)	1,188	0,112	0,012	0,969	1,407	10,640	0,000	Depression
Uncontrolled		1,077	0,115	0,013	0,852	1,302	9,393	0,000	

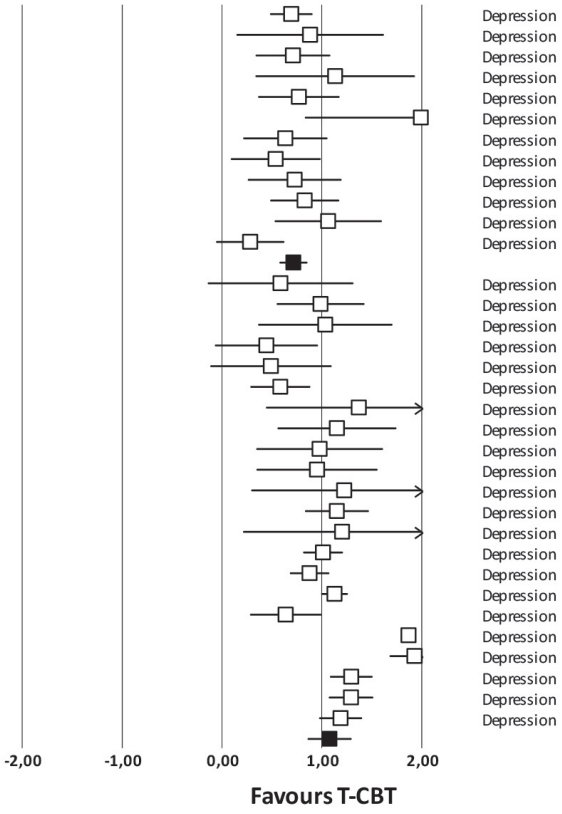


Figure 3. Forest plot of the efficacy of T-CBT on self-reported depression (pre-post effect sizes in adults). The filled squares represent the overall effect sizes. All RCTs used waiting list control except for Wutrich et al., (2016), that used a discussion group. The decimals are separated with a coma.

al., 2010 [2]). Pooling the uncontrolled studies, the pooled effect size and the heterogeneity were large and significant (g = 1.02; Q (22) = 388.01; I^2 = 94.33; p < .001).

Finally, pooling together all the studies, the effect size was large and the heterogeneity was significant (g = 0.91; Q (34) = 535.22; I^2 = 93.65; p < .001). Moreover, the differences between RCTs and uncontrolled studies on pre- and post-anxiety measures were not significant (Q (1) = 1.57; p = .21).

c) Pre- to post- meta-analytic depression outcomes in adults–RCTs (Fig. 3). All of the 12 studies included reported a significant reduction in self-reported depression (p < 0.05). Using the random effects model and combining the RCTs, the pooled effect size was large and the heterogeneity was not significant (g = 0.72; Q (11) = 14.64; I^2 = 24.87; p = .20).

d) Pre- to post- meta-analytic depression outcomes in adults–uncontrolled studies (Fig. 3). Of the 22 studies included, 19 reported a significant reduction in self-reported depression (p < .05), whereas 3 did not (Bullis et al., 2015; Ellard et al., 2010 [1 & 2]). Combing the uncontrolled studies, the effect size was high and the heterogeneity was significant (g = 1.08; Q (21) = 301.15; I^2 = 93.03; p < .001).

Pooling together all the studies, the effect size was large and the heterogeneity was significant (g = 0.82; Q (33) = 441.33; I^2 = 92.52; p < .001). Moreover, the differences between the RCTs and the uncontrolled studies on pre- and post- depression measures were significant (Q (1) = 7.05; p = .01).

e) Uncontrolled pre- to follow-up meta-analytic anxiety outcomes in adults (Fig. 4)**.** A total of 22 studies (taking into account uncontrolled studies and T-CBT vs. Controls studies) included follow up, 21 of which reported a significant reduction in self-reported anxiety (p <.05), whereas 1 study did not (Ellard et al., 2010 [2]). Using the random-effects model, the pooled effect

Study name	Hedges's g	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	
Dear et al., 2011 [3 months]	0,872	0,218	0,047	0,446	1,299	4,008	0,000	Anxiety
Ellard et al., 2010 (2) [6 months]	0,572	0,372	0,139	-0,158	1,302	1,537	0,124	Anxiety
Farchione et al., 2012 [6 months]	0,870	0,207	0,043	0,464	1,276	4,202	0,000	Anxiety
Ito et al., 2016 [3 months]	0,672	0,292	0,085	0,099	1,245	2,298	0,022	Anxiety
Johnston et al., 2011 [3 months]	1,165	0,140	0,020	0,891	1,439	8,330	0,000	Anxiety
Johnston et al., 2014 [3 months]	1,178	0,339	0,115	0,513	1,842	3,475	0,001	Anxiety
Kayrouz et al., 2015 [3 months]	1,098	0,454	0,206	0,209	1,987	2,421	0,015	Anxiety
Kayrouz et al., 2016 [3 months]	1,462	0,185	0,034	1,100	1,825	7,907	0,000	Anxiety
Kirpatrick et al., 2013 [2 months]	1,218	0,511	0,261	0,216	2,219	2,383	0,017	Anxiety
Mullin et al., 2015 [3 months]	2,075	0,473	0,224	1,147	3,002	4,385	0,000	Anxiety
Newby et al., 2013 (1) [3 months]	1,572	0,230	0,053	1,122	2,022	6,846	0,000	Anxiety
Schmidt et al., 2012 [6 months]	2,174	0,252	0,063	1,680	2,667	8,629	0,000	Anxiety
Titov et al., 2010 (1) [3 months]	0,705	0,183	0,033	0,347	1,063	3,857	0,000	Anxiety
Titov et al., 2011 [3 months]	0,946	0,206	0,042	0,542	1,350	4,588	0,000	Anxiety
Titov et al., 2013 [3 months]	1,095	0,127	0,016	0,846	1,344	8,621	0,000	Anxiety
Titov et al., 2015a (1) [3 months]	1,937	0,040	0,002	1,858	2,015	48,308	0,000	Anxiety
Titov et al., 2015a (2) [3 months]	1,839	0,125	0,016	1,593	2,085	14,668	0,000	Anxiety
Titov et al., 2016 (1) [3 months]	1,332	0,112	0,013	1,112	1,552	11,860	0,000	Anxiety
Titov et al., 2016 (2) [3 months]	1,383	0,120	0,014	1,148	1,617	11,555	0,000	Anxiety
Titov et al., 2016 (3) [3 months]	1,427	0,122	0,015	1,189	1,665	11,738	0,000	Anxiety
Wutrich & Rapee, 2013 [3 months]	0,815	0,235	0,055	0,355	1,275	3,474	0,001	Anxiety
Wutrich & Rapee, 2016 [6 months]	0,720	0,131	0,017	0,463	0,977	5,497	0,000	Anxiety
	1,237	0,115	0,013	1,010	1,463	10,712	0,000	

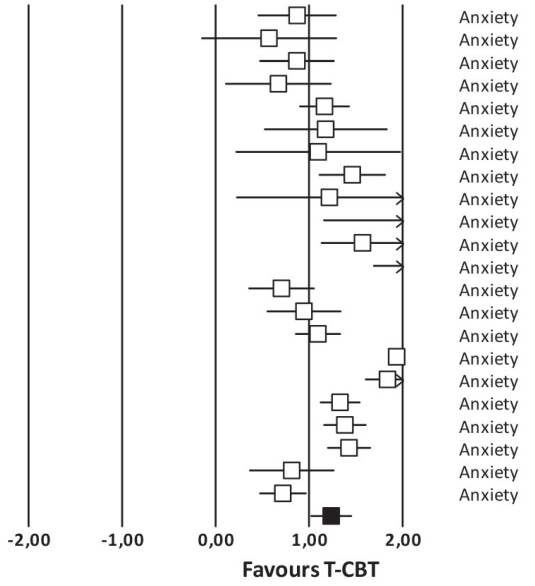


Figure 4. Forest plot of the efficacy of T-CBT on self-reported anxiety (uncontrolled pre-follow up effect sizes in adults). The filled square represents the overall effect size. The decimals are separated with a coma.

Study name	Hedges's g	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	
Dear et al., 2011 [3 months]	0,729	0,208	0,043	0,322	1,136	3,509	0,000	Depression
Ellard et al., 2010 (2) [6 months]	0,684	0,386	0,149	-0,074	1,441	1,769	0,077	Depression
Farchione et al., 2012 [6 months]	0,848	0,206	0,042	0,445	1,250	4,124	0,000	Depression
Ito et al., 2016 [3 months]	0,978	0,325	0,106	0,340	1,615	3,006	0,003	Depression
Johnston et al., 2011 [3 months]	0,837	0,125	0,016	0,591	1,082	6,686	0,000	Depression
Johnston et al., 2014 [3 months]	1,081	0,327	0,107	0,441	1,721	3,310	0,001	Depression
Kayrouz et al., 2015 [3 months]	1,275	0,488	0,238	0,319	2,231	2,614	0,009	Depression
Kayrouz et al., 2016 [3 months]	1,587	0,193	0,037	1,208	1,966	8,205	0,000	Depression
Kirpatrick et al., 2013 [2 months]	1,429	0,558	0,311	0,335	2,522	2,561	0,010	Depression
Mullin et al., 2015 [3 months]	2,289	0,509	0,259	1,292	3,287	4,499	0,000	Depression
Newby et al., 2013 (1) [3 months]	1,598	0,232	0,054	1,144	2,053	6,895	0,000	Depression
Schmidt et al., 2012 [6 months]	1,240	0,181	0,033	0,884	1,595	6,833	0,000	Depression
Titov et al., 2010 (1) [3 months]	0,441	0,171	0,029	0,107	0,776	2,586	0,010	Depression
Titov et al., 2011 [3 months]	0,902	0,203	0,041	0,504	1,300	4,443	0,000	Depression
Titov et al., 2013 [3 months]	0,936	0,120	0,014	0,701	1,172	7,783	0,000	Depression
Titov et al., 2015a (1) [3 months]	1,894	0,040	0,002	1,817	1,972	47,932	0,000	Depression
Titov et al., 2015a (2) [3 months]	1,966	0,131	0,017	1,709	2,222	15,017	0,000	Depression
Titov et al., 2016 (1) [3 months]	1,313	0,112	0,012	1,095	1,532	11,772	0,000	Depression
Titov et al., 2016 (2) [3 months]	1,234	0,113	0,013	1,012	1,457	10,873	0,000	Depression
Titov et al., 2016 (3) [3 monhts]	1,194	0,112	0,013	0,975	1,414	10,672	0,000	Depression
Wutrich & Rapee, 2013 [3 months]	1,129	0,262	0,069	0,615	1,642	4,306	0,000	Depression
Wutrich & Rapee, 2016 [6 monhts]	0,959	0,141	0,020	0,682	1,237	6,787	0,000	Depression
	1,191	0,119	0,014	0,958	1,424	10,026	0,000	

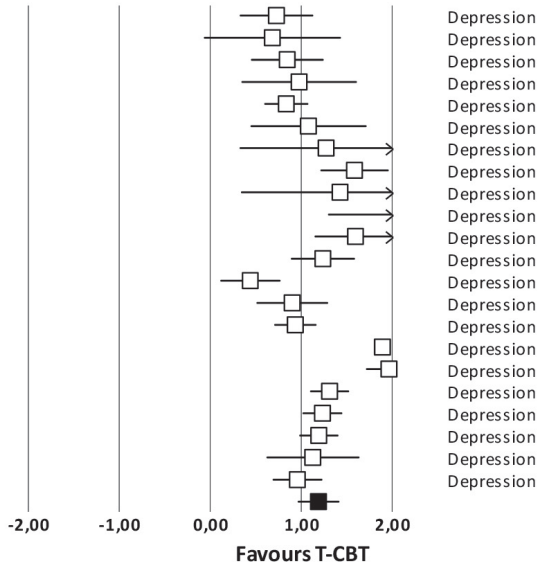


Figure 5. Forest plot of the efficacy of T-CBT on self-reported depression (uncontrolled pre-follow up effect sizes in adults). The filled square represents the overall effect size. The decimals are separated with a coma.

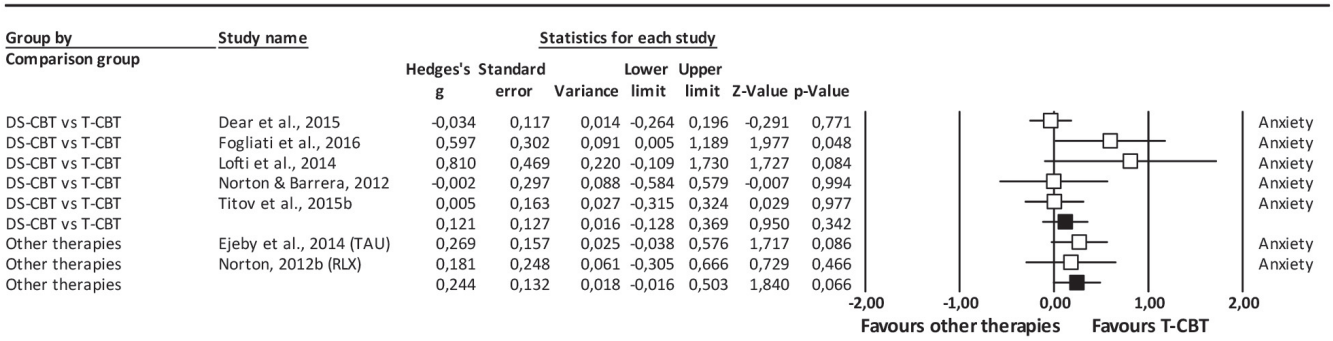


Figure 6. Forest plot of the efficacy of T-CBT vs. DS-CBT/other therapies on self-reported anxiety (pre-post effect sizes in adults). The filled squares represent the overall effect sizes. DS-CBT = disorder specific cognitive-behavioral therapy; RLX = relaxation training; TAU = treatment as usual. The decimals are separated with a coma.

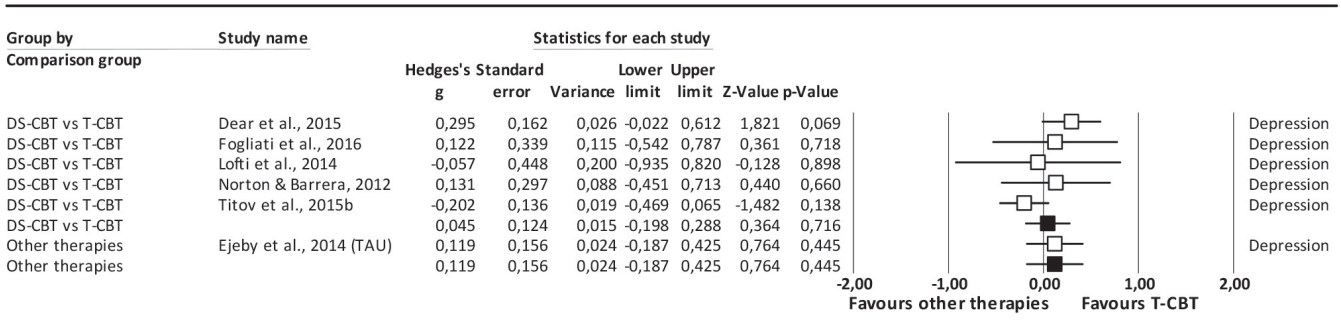


Figure 7. Forest plot of the efficacy of T-CBT vs. DS-CBT/other therapies on self-reported depression (pre-post effect sizes in adults). The filled squares represent the overall effect sizes. DS-CBT = disorder specific cognitive-behavioral therapy; RLX = relaxation training; TAU = treatment as usual. The decimals are separated with a coma.

size was large and the heterogeneity significant (g = 1.24; Q (21) = 251.39; I^2 = 91.65; p < .001).

f) Uncontrolled pre- to follow up meta-analytic depression outcomes in adults (Fig. 5)**.** A total of 22 studies (taking into account uncontrolled studies and T-CBT vs Controls studies) included follow up, 21 of which reported a significant reduction in self-reported depression (p < .05), whereas 1 study did not (Ellard et al., 2010 [2]). Using the random-effects model, the pooled effect size was in the high range and the heterogeneity was significant (g = 1.19; Q (21) = 279.32; I^2 = 92.48; p < .001).

g) Pre- to post- meta-analytic anxiety outcomes of T-CBT vs. other therapies (Fig. 6)**.** Of the 7 studies included, only one (Fogliati et al., 2016) reported a significant reduction of anxiety with T-CBT in comparison with another treatment (in this case, disorder-specific CBT). Using the random-effects model, the pooled effect size of the studies that compared T-CBT and disorder-specific CBT was low and the heterogeneity was not significant (g = 0.12; Q (4) = 6.52; I^2 = 38.68; p = .163). Additionally, considering the two studies that compared T-CBT with TAU and relaxation training (Ejeby et al., 2014; Norton, 2012b), the pooled effect size was low and the heterogeneity was not significant (g = 0.24; Q (1) = .09; I_2 = 0.00; p = .763).

Lastly, pooling together all the studies that compared T-CBT with other therapies, the effect size in anxiety was low and the heterogeneity was not significant (g = 0.14; Q (6) = 8.01; I^2= 25.07; p = .238).

h) Pre- to post- meta-analytic depression outcomes in T-CBT vs. other therapies (Fig. 7)**.** None of the 6 studies included reported a significant reduction of depression with T-CBT in comparison with another treatments. Using the random-effects model, the pooled effect size of the studies that compared T-CBT and disorder-specific CBT was low and the heterogeneity was not significant (g = 0.05; Q (4) = 5.80; I^2 < 30.97; p = .215). Additionally, only one study compared T-CBT with other treatment that was not disorder-specific CBT, specifically, with TAU (Ejeby et al., 2014): g = 0.12; p = .445.

Lastly, pooling together all the studies that compared T-CBT with other therapies, the effect size in depression

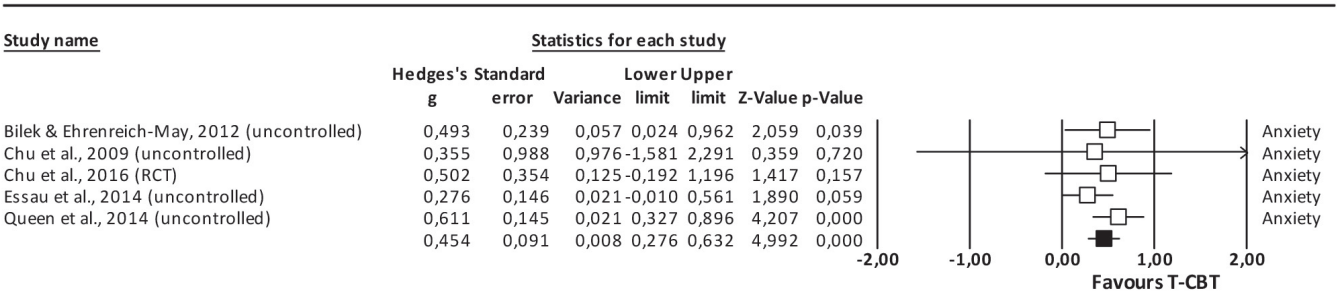


Figure 8. Forest plot of the efficacy of T-CBT on self-reported anxiety (pre-post effect sizes in children and adolescents). The filled square represents the overall effect size. RCT = randomized controlled trial. The decimals are separated with a coma.

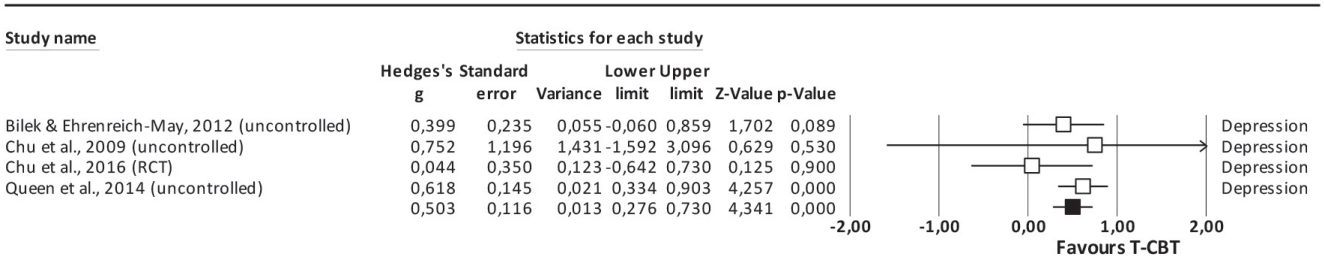


Figure 9. Forest plot of the efficacy of T-CBT on self-reported depression (pre-post effect sizes in children and adolescents). The filled square represents the overall effect size. RCT = randomized controlled trial. The decimals are separated with a coma.

was low and the heterogeneity was not significant (g = 0.06; Q (5) = 6.08; I^2= 17.75; p = .299).

i) Pre- to post- meta-analytic anxiety outcomes in children/adolescents (Fig. 8)**.** Of the 5 studies included, 2 (Bilek & Ehrenreich-May, 2012; Queen et al., 2014) reported a significant reduction in self-reported anxiety (p < .05), while 3 studies did not (Chu et al., 2009; Chu et al., 2016; Essau et al., 2014). Using the random-effects model, the pooled effect size was moderate and the heterogeneity was not significant (g = 0.45; Q (4) = 2.73; I^2 < .001; p = .604].

j) Pre- to post- meta-analytic depression outcomes in children/adolescents (Fig. 9)**.** Of the 4 studies included, 1 (Queen et al., 2014) reported a significant reduction in self-reported depression (p < 0.05), while 3 studies did not (Bilek & Ehrenreich-May, 2012; Chu et al., 2009; Chu et al., 2016). Using the random-effects model, the pooled effect size was moderate and the heterogeneity was not significant (g = 0.50; Q (3) = 2.59; I^2 < .001; p = .460).

Risk of bias across studies

Publication bias was tested using Duval and Tweedie's random effects model trim and fill procedure (Duval & Tweedie, 2000). The results are shown in Table 3. In relation to the effect sizes, the trim-and-fill method suggested that 3 out of 10 of the conducted meta-analyses studies should be trimmed, reducing the effect sizes in the following meta-analysis: pre-post adult anxiety in the RCTs (from g = 0.80 to g = 0.62), pre-post adult depression in the RCTs (from g = 0.72 to g = 0.65), and pre-post adult anxiety in T-CBT vs. disorder-specific CBT (from g = 0.12 to 0.08).

Subgroup analyses

Because we found some heterogeneity among the pre-post anxiety and depression outcomes in the uncontrolled studies and in the RCTs that compared T-CBT with a control group (adult population), we decided to conduct a series of subgroup analyses. For the categorical moderator variable analyses, a random effects ANOVA model was used (see Table 4). We found that using a self-reported diagnostic measure resulted in a higher effect size in comparison to using a face-to-face interview or a telephonic interview for both anxiety symptoms (Q (2) = 10.46; p = .005) and depression symptoms (Q (2) = 8.88; p = .012). In relation to the treatment components, the inclusion of problem solving strategies was associated with a higher effect size for depression (Q (1) = 4.44; p = .035). There were also significant group differences in relation to the participants' diagnosis (Q (2) = 7.13; p = .028) for depression symptoms.

Table 3. Meta- analyses'publication bias data

Meta-analysis		Observed ES	Trim-and-fill ES[a]	Nº of trim-med studies
Pre-post adults AN	RCTs	0.800	0.619	4
	UC	1.017	1.017	0
Pre-post adults DEP	RCTs	0.716	0.650	4
	UC	1.077	1.077	0
Pre-follow up adults	AN	1.237	1.237	0
	DEP	1.191	1.191	0
Pre-post T-CBT vs DS-CBT	AN	0.121	0.079	1
	DEP	0.045	0.045	0
Pre-post children/ adolescents	AN	0.454	0.454	0
	DEP	0.503	0.503	0

Note. AN = anxiety; DEP = depression; DS-CBT = disorder specific cognitive-behavioral therapy; ES = effect sizes; RCTs = randomized controlled trials; T-CBT = transdiagnostic cognitive-behavioral therapy; UC = uncontrolled. [a] Using a random-effects model

Specifically, those studies that did not report the participants' diagnosis resulted in higher effect sizes than those studies that only included participants with a clinical diagnosis and those that also included participants with a subclinical diagnosis. Finally, the variable treatment format (individual, group or internet) influenced outcomes for anxiety (Q (2) = 7.82; p = .020). The studies that applied an internet treatment had higher effect sizes than the group treatments and the individual treatments.

No indication was found that the effect sizes differed according to the country in which the study was conducted (taking into account USA and Australia, since most studies were conducted in those countries), other treatment components apart from problem solving (behavioral activation, mindfulness, relaxation training and response prevention), the applied protocol (considering the most used protocols: Unified Protocol, The Wellbeing Program/Course, the Norton Protocol), the recruitment method (community or clinical), the study design (RCT or uncontrolled) or the treatment target (anxiety or depression).

Meta-regression was used for the quantitative moderator variable analysis (see Table 5), finding that a higher number of treatment sessions was associated with lower effect sizes in anxiety (Z = -2.21; p = .027). No indication was found that the effect sizes differed according to the studies' publication date, the percentage of women in the sample, the percentage of participants with comorbid emotional disorders, the percentage of attrition, or the proportion of categories assessed as having a high or low risk of bias[7].

In relation to the pre-test to follow-up outcomes in adults, no indication was found that the effect sizes differed according to the follow-up period (3 or 6 months) for anxiety (Q (1) = .41; p = .524) or depression (Q (1) = .90; p = .343).

Discussion

Summary of evidence

This study tested the efficacy of transdiagnostic CBT treatments for anxiety and depressive disorders using 48 studies (21 RCTs and 27 uncontrolled studies) with a total of 6291 participants (of which 172 were children or adolescents). We examined the effect of transdiagnostic CBT protocols on outcome measures of anxiety and depression. For the adult sample, the efficacy of the protocols used in RCTs was tested against a control group consisting of a waiting list control (WLC; 12 studies) and a discussion group (1 study). We also studied the effect of transdiagnostic CBT in the uncontrolled studies that reported baseline and post-treatment data (27 studies). Results for both controlled (RCTs) and uncontrolled trials supported the hypothesis that transdiagnostic CBT is an effective treatment for reducing anxiety and depression in adults with principal or comorbid anxiety and/or depressive disorders or with subclinical levels of anxiety and/or depression. We found large overall pre-post effect sizes for anxiety (RCTs: g = 0.80; uncontrolled studies: g = 1.02) and depression (RCTs: g = 0.73; uncontrolled studies: g = 1.08).

These results are generally consistent with the positive findings reported in recent meta-analyses on the effects of transdiagnostic protocols for anxiety and depression (Newby et al., 2015; Norton & Philipp, 2008; Reinholt & Krogh, 2014). As occurred in these previous meta-analyses, the present results support the hypothesis that the uncontrolled trials tend to be associated with larger effect sizes than the RCTs. However, based on categorical moderator variable analyses on pre-post anxiety and depression treatment outcomes, we did not find a significant effect associated with the study design (i.e., RCT vs. uncontrolled trial) for anxiety or depression outcomes (p > .05).

Our findings also demonstrated that the therapeutic gains were maintained, or even increased, at follow-up (3-6 months after treatment), both for anxiety (g = 1.24)

[7] The proportion of categories assessed with a high risk of bias was calculated by dividing the number of categories assessed as having a risk of bias by 3 in the uncontrolled studies and by 6 in the RCTs (see Table 2).

Table 4. Categorical moderator variables analyses on pre and post-anxiety and depression treatment outcomes in adults (uncontrolled studies and RCTs that compared T-CBT with a control group)

Subgroup analysis		Anxiety				Depression			
		N	*g*	95% CI	*p*	*N*	*g*	95% CI	*p*
Country	Australia	20	1.05	.80/1.31	.304	20	1.07	.84/1.29	.207
	USA	11	.82	.46/1.18		10	.80	.45/1.15	
Diagnostic measure	Interview	18	.71	.50/.92		17	.82	.59/1.04	
	T. interview	7	1.05	.71/1.39	.005**	7	.79	.45/1.13	.012*
	Self-reported	10	1.24	1.0/1.49		10	1.29	1.03/1.54	
Inclusion of behavioral activation	Yes	23	1.03	.79/1.27	.290	23	1.08	.87/1.29	.085
	No	12	.80	.46/1.15		11	.73	.40/1.06	
Inclusion of mindfulness	Yes	6	.69	.18/1.20	.265	6	.73	.24/1.21	.272
	No	29	1.01	.79/1.22		28	1.02	.82/1.23	
Inclusion of problem solving	Yes	17	1.10	.86/1.33	.091	17	1.14	.92/1.37	.035*
	No	18	.81	.57/1.05		17	.79	.55/1.03	
Inclusion of relaxation training	Yes	22	1.06	.81/1.30	.187	22	1.06	.83/1.28	.209
	No	13	.78	.45/1.11		12	.81	.48/1.13	
Inclusion of response prevention	Yes	11	.82	.45/1.19	.382	10	.81	.45/1.18	.308
	No	24	1.01	.78/1.25		24	1.03	.82/1.25	
Protocol applied [a]	Unified Protocol	6	.69	.24/1.13	.166	6	.73	.23/1.22	
	Wellbeing P/C.	8	1.18	.79/1.57		8	1.15	.74/1.56	.437
	Norton	5	.76	.31/1.20		3	.98	.28/1.67	
Recruitment	Community	25	1.02	.81/1.24	.428	24	1.00	.78/1.22	.677
	Clinical	9	.84	.45/1.23		9	.90	.50/1.30	
Participants' diagnosis	Not reported	7	1.16	.80/1.52		7	1.27	.94/1.60	
	Clinical	22	.83	.60/1.05	.195	21	.79	.58/1.00	.028*
	Partly subclinical	6	1.14	.73/1.55		6	1.18	.80/1.56	
Study design	Uncontrolled	23	1.02	.79/1.25	.363	22	1.08	.87/1.29	.101
	RCT	12	.84	.51/1.16		12	.78	.49/1.07	
Treatment target	ANX	8	.90	.48/1.32	.762	7	.75	.35/1.16	.231
	ANX+DEP	27	.98	.75/1.20		27	1.03	.83/1.23	
Treatment format	Individual	7	.70	.33/1.07		7	.82	.42/1.22	
	Group	9	.70	.39/1.01	.020*	8	.81	.45/1.18	.318
	Internet	19	1.15	.94/1.35		19	1.09	.86/1.31	

Note. *N* = number of studies included in the analyses; ANX = anxiety; ANX+DEP = anxiety and depression; RCT = randomized controlled trial; T. interview = telephonic interview; T-CBT = transdiagnostic cognitive-behavioral therapy; The Wellbeing P/C. = The Wellbeing Program or The Wellbeing Course. *$p < 0.05$ **$p < 0.01$ [a] For this variable we also included the pre-post treatment data (T-CBT group) of the following studies: Norton and Barrera (2012) and Norton (2012).

Table 5. Quantitative moderator variables' analyses on pre- and post- anxiety and depression treatment outcomes in adults

Subgroup analysis	Anxiety					Depression				
	N	Point estimate	95%CI	*Z*	*p*	*N*	Point estimate	95%CI	*Z*	*p*
Publication date	35	.05	-.02/.11	1.35	.176	34	.04	-.04/.11	1.00	.317
% of women	33	0.00	-.01/.01	.29	.768	32	0.00	-.01/.01	.25	.802
Number of sessions	33	-.04	-.08/-.01	-2.21	.027*	32	-.03	-.07/.01	-1.64	.101
% of attrition	32	.01	-.01/.02	.79	.432	32	0.00	-.01/.01	.30	.761
% of participants with comorbid emotional disorders	17	.01	0.00/.02	1.58	.114	16	0.00	-.01/.01	.46	.643
Proportion of categories with high bias assessment	35	-.97	-2.05/.10	-1.77	.076	34	-1.02	-2.11/.06	-1.85	.065

Note. *N* = number of studies included in the analyses. *$p < 0.05$

and for depression ($g = 1.19$). This suggests that transdiagnostic CBT leads to large reductions of anxiety and depression over time in patients diagnosed with anxiety and/or depressive disorders. Transdiagnostic CBT also appears to be a powerful tool for reducing comorbid anxiety and depression.

An issue reported in recent published meta-analyses on the efficacy of transdiagnostic protocols (Newby et al., 2015; Reinholt & Krogh, 2014) was the presence of high levels of heterogeneity. We also found significant levels of heterogeneity for a number of outcome measures that suggests differences in the treatment effect sizes between the studies; such heterogeneity may contribute to uncertainty regarding the pooled estimates. Based on our categorical moderator variable analyses, we found significant differences for anxiety ($p < .01$) and depression symptoms ($p < .05$) associated with the diagnostic measure applied (clinical interview, telephone interview, and self-reported). Self-reported diagnostic measures were used in 10 studies, all of them conducted through the internet (see Table 1). Specifically, the instruments used were, in most of the studies, the PHQ-9 scale to identify individuals with depressive disorders and the GAD-7 scale to identify individuals with anxiety disorders. Both the PHQ-9 and the GAD-7 have good sensitivity and specificity for detecting depressive disorders and for detecting generalized anxiety, panic, social anxiety and post-traumatic stress disorder, respectively (Kroenke, Spitzer, Williams, & Löwe, 2010). Nonetheless, brief, self-administered scales should not be the sole means to diagnose patients, but rather used as a first step to stratify patients into screen-negative and screen-positive groups, helping clinicians to interview only patients with high scores (Kroenke et al., 2010). Therefore, it is likely that some of the patients diagnosed using self-report measures are actually false positives (clinical analogs). Transdiagnostic CBT protocols are designed for the treatment of emotional disorders, but it appears that they could be particularly effective to treat subclinical conditions of anxiety and depression. Accordingly, studies that did not report the participants' diagnoses and that included subclinical patients were associated with significantly higher effect sizes for depression ($p < 05$).

Transdiagnostic CBT protocols for the treatment of emotional disorders (anxiety and depressive disorders) represent a shift towards a more dimensional approach than disorder-specific CBT and contain similar basic core components, including psychoeducation, exposure-based techniques (situational and/or interoceptive), and cognitive restructuring. However, some CBT transdiagnostic protocols also include certain additional components, such as behavioral activation, problem solving, relaxation training, response prevention, and mindfulness meditation. While it is still unclear which supplementary components lead to superior outcomes, the moderator variables analyses showed that studies using problem solving as an additional component were significantly associated with greater reductions in depression symptoms ($p < .05$). Such an association also appears to be present for anxiety (i.e., there was a trend that studies including problem solving had higher effect sizes on anxiety), although it was not statistically significant ($p = .09$). These results are consistent with the literature (Bell & D'Zurilla, 2009; Hopko, Lejuez, Ruggiero, & Eifert, 2003; Sánchez-Hernández, Méndez, & Garbe, 2014;

Vázquez et al., 2015) and should be taken into account when constructing new transdiagnostic protocols.

We expected that the addition of behavioral activation as a component in transdiagnostic CBT would be associated with larger effect sizes, especially for depression outcomes. However, we only found a statistical trend for depression ($p = .08$), suggesting that behavioral activation tends to favor the decrease of depressive symptoms. Behavioral activation is an important component in some protocols of CBT for depression and seeks to emphasize the impact of behavior on mood symptoms. It has been shown that behavioral activation is equally effective as cognitive therapy or CBT for the treatment of depression, even for as long as 24 months follow-up (Mazzucchelli, Kane, & Rees, 2009). Although it is not yet possible to draw firm conclusions, our results suggest the suitability of including the behavioral activation component in order to maximize the efficacy of the transdiagnostic CBT protocols on depressive symptoms. In addition, the current evidence that behavioral activation could be a viable option as a low-intensity guided self-help treatment for mild to moderate depression (Chartier & Provencher, 2013) warrants the implementation of behavioral activation in internet-delivered transdiagnostic CBT protocols. Interestingly, the behavioral activation component was the most used (23 out of the 35 studies included in the moderator analyses) among all additional therapeutic components.

Relaxation has a long history in clinical psychology as an anxiety-reduction strategy. The extant literature tends to suggest that relaxation has demonstrated its efficacy, albeit without being as efficacious as exposure-based treatments for the anxiety disorders in general and for the generalized anxiety disorder in particular, in terms of diagnostic severity, anxiety, worry, depression and other manifestations of psychopathology (Dugas et al., 2010; Norton & Price, 2007; Norton, 2012b; Öst & Westling, 1995). It has not surprised us that relaxation procedures were one of the most commonly used complementary core components in the transdiagnostic CBT protocols (22 studies). However, our results are in line with the data reviewed by Reinholt and Krogh (2014), which did not reflect a significant association between relaxation and anxiety outcomes. In fact, Reinholt and Krogh (2014) found that the four studies using response prevention as a treatment component had a better outcome compared to the five studies using relaxation training. In this respect, our non-significant data related to the addition of the response prevention component contrasts with Reinholt and Krogh's findings.

It is interesting to note that the inclusion of an additional mindfulness/acceptance module in the transdiagnostic CBT protocols (6 studies) did not provide any additional efficacy (i.e., increase in the effect size) in reducing anxiety or depression outcomes. This result is consistent with the evidence reported by Newby et al. (2015), which indicated that CBT outperformed mindfulness/acceptance-based treatments in reducing anxiety symptoms. Even though mindfulness has acquired a great diffusion and popularity in psychology and other disciplines as a powerful strategy to treat emotional and physical problems, its efficacy has not yet been demonstrated (Goyal et al., 2014; Miró et al., 2011; Öst, 2008).

Our findings also point out potential sources of heterogeneity related to the delivery format of the treatment. Curiously, in most of the transdiagnostic CBT studies in adults the treatment was delivered via internet. Internet-delivered treatments had larger effect sizes compared to face-to face (individual or group treatments) for anxiety. These results support the preliminary findings reported by Newby et al. (2015) which concluded that computer/internet interventions outperformed face-to-face transdiagnostic treatments. Newby et al. (2015) included in their meta-analysis some internet transdiagnostic treatments that were not transdiagnostic CBT protocols (a lot of them where tailored to patients' specific diagnoses); thus, it appears that the superior efficacy of internet-delivered formats is independent of the type of treatment. The authors suggested that the possible added benefit of the internet-delivered and computerized treatments could be due to its highly standardized nature, which could enhance fidelity. In the present meta-analysis, a number of the internet-delivered studies were done with subclinical samples, so it is possible that the superiority of this treatment format could be associated with the sample diagnosis (i.e., clinical vs. subclinical). Considering that most of the internet-based studies have been conducted by Titov`s group, we expect that other transdiagnostic internet-based protocols should corroborate these promising findings in the future (González-Robles et al., 2015).

A feature of transdiagnostic treatment is to address comorbidity of anxiety and depressive disorders. The transdiagnostic CBT protocols reviewed in the present meta-analysis have usually targeted either anxiety disorders or both anxiety and depressive disorders. We did not find outcome differences associated with these two types of treatment targets. In addition, even though there was some variability between studies in the percentage of comorbidity of emotional disorders (ranging from 52.40% to 100%), our quantitative moderator variable analysis showed no significant effects due to percentage of subjects with comorbid emotional disorders (anxiety disorders and/or depressive disorders). This result does not support preliminary findings reported in the Reinholt

and Krogh meta-analysis (2014) on the negative association of comorbid depression with a less positive outcome. According to the present meta-analysis, it appears that the degree of comorbidity does not interfere with the treatment outcome of transdiagnostic CBT protocols. A possible explanation of this discrepancy with the Reinholt and Krogh results is that they included in their meta-analysis some studies based on not strictly transdiagnostic CBT protocols (only 7 out of 11 studies examined in this author's meta-analysis were included in our meta-analysis). Thus, in contrast with Reinholt and Krogh, our findings are consistent with the extent literature which suggests that transdiagnostic CBT can tolerate high levels of comorbidity (anxiety and/or depression) without losing efficacy in the treatment of emotional disorders (Norton et al., 2013; Paulus, Talkovsky, Heggeness, & Norton, 2015). In line with the suggestions of Norton and Paulus (2015), we may conclude that the presence of a depressive disorder and/or an anxiety disorder has no adverse impact on treatment outcome, supporting the hypothesis that patients with only an anxiety disorder do not differ in response to treatment from patients with anxiety and comorbid depression.

Some authors have raised the issue that CBT for comorbid disorders is less effective on comorbidity outcomes than CBT for specific disorders (Craske et al., 2007). However, more recent studies have stated that transdiagnostic CBT appears to be superior to disorder-specific CBT in reducing comorbid anxiety symptoms (Norton et al., 2013). In the present meta-analysis we were able to examine the effect sizes of 5 studies that compared transdiagnostic CBT with disorder-specific CBT for comorbid anxiety and depression. Although the pooled effect size was not significant, some studies suggested that transdiagnostic outperformed disorder-specific CBT for anxiety (two studies) and depression (one study) at post-treatment. Three of the 5 studies (Dear et al., 2015; Fogliati et al., 2016; Titov et al., 2015b) reported outcome measures of anxiety and depression at long-term follow-up (i.e., 24 months post-treatment), showing a significant enduring enhancement of the therapeutic effects in alleviating anxiety and depression in the transdiagnostic CBT group in two of the studies (Dear et al., 2015; Fogliati et al., 2016). Overall, these results tend to indicate that transdiagnostic CBT treatments somehow outperformed disorder-specific CBT on both outcome measures and also confirm preliminary suggestions in the literature that transdiagnostic treatments may be fairly superior in reducing comorbid symptoms of anxiety and depression in comparison to disorder-specific CBT (Newby et al., 2015; Norton & Paulus, 2015; Norton et al., 2013). Although one may conclude that a transdiagnostic CBT approach is more effective than a disorder-specific CBT approach for anxiety and depressive disorders when there are comorbid diagnoses and symptoms, it is necessary to conduct new analyses based on a larger number of studies in order to draw more definitive conclusions.

While there is relatively high evidence demonstrating that transdiagnostic CBT is an effective treatment in addressing emotional disorders in adults, we found only one RCT concerning children and adolescents, four open trials, and a number of case studies, reflecting just an initial development in this important area. We did not find studies that directly compared transdiagnostic versus disorder-specific CBT with children and/or adolescents. The pooled effect size (g = 0.45) of the 5 studies was statistically significant ($p < .001$) and suggests a medium-sized efficacy of transdiagnostic CBT for anxiety disorders. In comparison to the effect size found applying other therapies for reduction of anxiety symptoms in children and adolescents (Reynolds, Wilson, Austin, & Hooper, 2012), transdiagnostic CBT is superior to non-CBT therapies (g = 0.25), similar to generic CBT (g = 0.53), and lower than disorder-specific CBT (g = 0.77). However, considering the preliminary nature of these results and the small number of studies, we cannot draw firm conclusions about their relative impact. Similar results were found concerning depression outcomes (overall g = 0.50, $p < .001$). This effect is similar to pooled effect sizes found in recent meta-analyses of disorder-specific CBT for depression in children (Forti-Buratti, Saikia, Wilkinson, & Ramchandani, 2016), although the small number of studies included in the meta-analysis makes this result difficult to interpret meaningfully. Although the evidence is still inconclusive, it appears that the efficacy of transdiagnostic CBT protocols applied to children and/or adolescents is somewhat lower than the efficacy of the protocols applied to adults.

In general, the included studies showed an unclear or high risk of bias in most of the assessed categories with none of the studies having all categories rated as possessing a low risk of bias (see Table 2). Therefore, a considerable proportion of studies were at high risk of a biased estimate of effect, which is consistent with previous meta-analysis on T-CBT (Newby et al., 2015; Reinholt & Krogh, 2014). In relation to the publication bias, there were only three meta-analyses in which studies were trimmed: pre- to post-anxiety outcomes on RCTs in an adult population, in which the treatment effect was reduced from a high effect size (g = 0.80) to a medium effect size (g = 0.62), pre- to post-depression outcomes on RCTs in an adult population, in which the treatment effect was reduced from a high effect size (g = 0.72) to a medium to high effect size (g = 0.65), and pre- to post-anxiety

outcomes on RCTs that compared T-CBT and disorder-specific CBT from a low effect size (g = 0.12) to a slightly lower effect size (g = 0.08). Therefore, most of the meta-analyses conducted were not at risk of having publication bias, and the three meta-analyses that were at risk did not have a high reduction in the effect size.

Limitations

While these results are encouraging, some limitations of this review should be taken into account. First, we chose to analyze anxiety and depression as generic outcome measures, but choosing other measures such as diagnosis-specific symptoms, transdiagnostic variables (e.g., negative affect), level of functioning, or client satisfaction with the treatment would provide a more complete understanding of the effectiveness of transdiagnostic CBT. Second, both outcomes (anxiety and depression) were based on self-report measures and none of the studies were double-blinded, allowing the possibility of some contamination with self-report bias; thus, it is possible that a different impact of the treatment could be found by using clinician-rated scores of anxiety and depression (Pennant et al., 2015). Third, a possible shortcoming of the present review is that we included studies with subclinical samples. Nevertheless, the utilization of psychometrically defined subclinical, or "analogue," samples has contributed substantially to our understanding of psychopathology and psychological treatment. It is also common in psychopathology to identify and clarify the role of clinically relevant phenomena in analogue samples before validating their importance in clinical samples (Tull, Stipelman, Salters-Pedneault, & Gratz, 2009). Therefore, transdiagnostic CBT being a relatively new kind of treatment, it is understandable that some studies decide to be more flexible with the diagnosis inclusion criteria and not exclude subclinical participants. Fourth, due to the small number of studies examined, only preliminary conclusions can be drawn for the efficacy of transdiagnostic protocols applied to children and adolescents and in comparison to the efficacy of disorder-specific CBT. Lastly, the lack of consensus within the research community regarding the appropriate instruments to measure the effectiveness of transdiagnostic CBT for anxiety and depressive disorders should be noted, as well as the way to define the patients' comorbid disorders (some studies reported the average number of diagnosis per patient, others the percentage of additional anxiety and/or depressive disorders, etc.). Future research on transdiagnostic CBT should address other important issues, including the differential efficacy of established protocols (both for adults and for children and adolescents) and their delivery format, the therapeutic enhancement of additional core treatment components (e.g., problem solving, behavioral activation, etc.) and new developments (Barajas, 2015; Sánchez-Arribas, Chorot, Valiente, & Sandín, 2015; Sandín et al., 2016; Sandín, Sánchez-Arribas, Chorot, & Valiente, 2015; Torrents-Rodas et al., 2015), the inclusion of other transdiagnostic outcomes (e.g., neuroticism, positive affect, disorder-specific symptoms), and the examination of variables clinically relevant to the transdiagnostic CBT protocols, such as fidelity, feasibility, and acceptability.

Conclusions

The present meta-analysis provides evidence for the efficacy of transdiagnostic CBT in reducing anxiety and depression in individuals with comorbid diagnoses of anxiety and depression. This quantitative review updates and extends reported evidence in recent meta-analyses of the efficacy of transdiagnostic treatments for anxiety and depressive disorders. Overall, the RCTs showed that transdiagnostic CBT for anxiety and depressive disorders in adults is superior to control conditions (large effect sizes), and that transdiagnostic CBT is similar (in the pre-post condition) or fairly superior (at follow-up) to disorder-specific CBT. Likewise, uncontrolled studies indicate that transdiagnostic CBT was associated with significant reductions of anxiety and depressive symptoms in adults (large effect sizes) and in children/adolescents (moderate effect sizes).

As far as we know, this meta-analysis is the first to quantitatively review the efficacy of transdiagnostic CBT protocols focusing explicitly on the new transdiagnostic approach, excluding studies based on classical CBT applied to groups of several specific anxiety disorders, hybrid protocols, tailored protocols, and non-CBT transdiagnostic therapies. In this respect, we only included 7 out of 11 studies reviewed by Reinholt and Krogh (2014) and 15 out of 47 studies reviewed by Newby et al. (2015). Based on 48 selected studies (RCTs and uncontrolled trials), we reviewed the efficacy of transdiagnostic CBT across (a) additional treatment core components (behavioral activation, problem solving, relaxation training, response prevention, and mindfulness), (b) diagnostic procedures and sample diagnosis (clinical, subclinical), (c) treatment delivery format (internet, face-to-face, individual/group), (d) treatment target (anxiety disorders vs. anxiety and depressive disorders), and (e) consolidated transdiagnostic CBT protocols (UP, Well-being P/C, T-GCBT). Overall, our findings based on the effects of moderators suggest that the transdiagnostic CBT treatment efficacy could be maximized by using an

internet-delivery format applied to subclinical individuals and by adding a complementary problem-solving module to the basic transdiagnostic protocol. Finally, our meta-analysis is the first to quantitatively review the efficacy of transdiagnostic CBT protocols in reducing anxiety and depression in children and adolescents.

The current study has several strengths, one of which is reviewing new recent transdiagnostic CBT studies not previously examined. Results reported in the present meta-analysis are based on 48 transdiagnostic CBT studies (6291 participants), of which 43 (21 RCTs and 22 uncontrolled studies) were conducted with adults and 5 (1 RCT, 4 uncontrolled) with children/adolescents. The most recent published transdiagnostic meta-analyses only included 7 transdiagnostic CBT studies conducted with samples of adults (3 RCTs, 4 uncontrolled; Reinholt & Krog, 2014) and 15 (9 RCTs, 6 uncontrolled; Newby et al., 2015). This study also used a more rigorous criteria, both for the selection of the studies and for the calculation of Hedges' *g* (to calculate the effect size of RCTs). Another strength is the comprehensive analysis of potential moderator variables. This meta-analysis also stands out in its inclusion of studies based on child and adolescent samples and offers a preliminary analysis comparing the efficacy of three main emerging transdiagnostic CBT protocols (UP, Wellbeing Program/Course, and T-GCBT). Finally, it sets forth a preliminary examination, based on recent RCTs, of the efficacy of transdiagnostic compared with disorder-specific CBT.

In spite of its possible limitations, this meta-analysis provides positive evidence for the efficacy of transdiagnostic CBT for anxiety and depressive disorders. However, the present meta-analysis also highlights the need for future RCTs to compare the efficacy of transdiagnostic CBT to disorder-specific CBT for anxiety and depressive disorders. Finally, future research is particularly needed to determine the extent to which the efficacy of transdiagnostic CBT with adults is also applicable to children and adolescents. In this sense, large-scale RCTs with good methodological quality and diagnostically heterogeneous samples are required to establish more reliable evidence on the efficacy of transdiagnostic CBT in this population.

References

Aldao, A. (2012). Emotion regulation strategies as transdiagnostic processes: A closer look at the invariance of their form and function. *Revista de Psicopatología y Psicología Clínica, 17*(3), 261-277.

Andersson, G., Nordgren, L. B., Buhrman, M., & Carlbring, P. (2014). Psychological treatments for depression delivered via the internet and supported by a clinician: An update. *Revista de Psicopatología y Psicología Clínica, 19*(3), 217-225.

Barajas, S. (2015). Evitación y psicopatología: Un estudio a través de una tarea experimental y su relación con medidas de autoinforme. *Revista de Psicopatología y Psicología Clínica, 20*(1), 63-73.

Barlow, D. H., Allen, L. B., & Choate, M. L. (2004). Toward a unified treatment for emotional disorders. *Behavior Therapy, 35*(2), 205-230.

Barlow, D. H., Farchione, T. J., Fairholme, C. P., Ellard, K. K., Boisseau, C. L., Allen, L. B., ... Ehrenreich-May, J. (2011). *Unified protocol for transdiagnostic treatment of emotional disorders: Therapist guide*. New York, NY, US: Oxford University Press.

Bell, A. C., & D'Zurilla, T. J. (2009). Problem-solving therapy for depression: A meta-analysis. *Clinical Psychology Review, 29*(4), 348-353.

Belloch, A. (2012). Propuestas para un enfoque transdiagnóstico de los trastornos mentales y del comportamiento: Evidencia, utilidad y limitaciones. *Revista de Psicopatología y Psicología Clínica, 17*(3), 295-311.

[8]*Bilek, E. L., & Ehrenreich-May, J. (2012). An open trial investigation of a transdiagnostic group treatment for children with anxiety and depressive symptoms. *Behavior Therapy, 43*(4), 887-897.

Birmaher, B., Ryan, N. D., Williamson, D. E., Brent, D. A., Kaufman, J., Dahl, R. E., ...Nelson, B. (1996). Childhood and adolescent depression: A review of the past 10 years. Part I. *Journal of the American Academy of Child & Adolescent Psychiatry, 35*(11), 1427-1439.

*Bolton, P., Lee, C., Haroz, E. E., Murray, L., Dorsey, S., Robinson, C., ... Bass, J. (2014). A transdiagnostic community-based mental health treatment for comorbid disorders: Development and outcomes of a randomized controlled trial among burmese refugees in thailand. *PLoS Med, 11*(11), e1001757.

Botella, J., & Sánchez-Meca, J. (2015). Meta-análisis en ciencias sociales y de la salud [Meta-analysis in social and health sciences]. *Madrid, Spain: Sintesis*.

Brown, T., Antony, M., & Barlow, D. (1995). Diagnostic comorbidity in panic disorder: Effect on treatment outcome and course of comorbid diagnoses following treatment. *Journal of Consulting and Clinical Psychology, 63*(3), 408.

Brown, T., & Barlow, D. (2002). Classification of anxiety and mood disorders. *Anxiety and its Disorders: The Nature and Treatment of Anxiety and Panic, 2*, 292-327.

*Bullis, J. R., Sauer-Zavala, S., Bentley, K. H., Thompson-Hollands, J., Carl, J. R., & Barlow, D. H. (2015). The unified protocol for transdiagnostic treatment of emotional disorders: Preliminary exploration of effectiveness for group delivery. *Behavior Modification, 39*(2), 295-321.

Chartier, I. S., & Provencher, M. D. (2013). Behavioural activation for depression: Efficacy, effectiveness and dissemination. *Journal of Affective Disorders, 145*(3), 292-299.

*Chu, B. C., Colognori, D., Weissman, A. S., & Bannon, K. (2009). An initial description and pilot of group behavioral

[8] References marked with an asterisk indicate studies included in the meta-analysis.

activation therapy for anxious and depressed youth. *Cognitive and Behavioral Practice, 16*(4), 408-419.

*Chu, B. C., Crocco, S. T., Esseling, P., Areizaga, M. J., Lindner, A. M., & Skriner, L. C. (2016). Transdiagnostic group behavioral activation and exposure therapy for youth anxiety and depression: Initial randomized controlled trial. *Behaviour Research and Therapy, 76*, 65-75.

Chu, B. C., Johns, A., & Hoffman, L. (2015). Transdiagnostic behavioral therapy for anxiety and depression in schools. In *Cognitive and behavioral interventions in the schools* (pp. 101-118). New York: Springer.

Chu, B. C., Hoffman, L., Johns, A., Reyes-Portillo, J., & Hansford, A. (2014). Transdiagnostic behavior therapy for bullying-related anxiety and depression: Initial development and pilot study. *Cognitive and Behavioral Practice, 22*(4), 415-429.

Clark, D. A. (2009). Cognitive behavioral therapy for anxiety and depression: possibilities and limitations of a transdiagnostic perspective. *Cognitive Behaviour Therapy, 38*(S1), 29-34.

Cohen, J. (1992). Statistical power analysis. *Current directions in psychological science, 1*(3), 98-101.

Craske, M. G. (2012). Transdiagnostic treatment for anxiety and depression. *Depression and Anxiety, 29*(9), 749-753.

Craske, M. G., Farchione, T. J., Allen, L. B., Barrios, V., Stoyanova, M., & Rose, R. (2007). Cognitive behavioral therapy for panic disorder and comorbidity: More of the same or less of more? *Behaviour Research and Therapy, 45*(6), 1095-1109.

Cuijpers, P., & Riper, H. (2014). Internet interventions for depressive disorders: An overview. *Revista de Psicopatología y Psicología Clínica, 19*(3), 209-216.

Davis, L., Barlow, D. H., & Smith, L. (2010). Comorbidity and the treatment of principal anxiety disorders in a naturalistic sample. *Behavior Therapy, 41*(3), 296-305.

*De Ornelas Maia, A., Braga, A., Nunes, C., Nardi, A., & Silva, A. (2013). Transdiagnostic treatment using a unified protocol: Application for patients with a range of comorbid mood and anxiety disorders. *Trends in Psychiatry and Psychotherapy, 35*(2), 134-140.

*Dear, B. F., Staples, L. G., Terides, M. D., Karin, E., Zou, J., Johnston, L., ... & Titov, N. (2015). Transdiagnostic versus disorder-specific and clinician-guided versus self-guided internet-delivered treatment for generalized anxiety disorder and comorbid disorders: A randomized controlled trial. *Journal of anxiety disorders, 36,* 63-77.

*Dear, B. F., Titov, N., Schwencke, G., Andrews, G., Johnston, L., Craske, M. G., & McEvoy, P. (2011). An open trial of a brief transdiagnostic internet treatment for anxiety and depression. *Behaviour Research and Therapy, 49*(12), 830-837.

Dugas, M. J., Brillon, P., Savard, P., Turcotte, J., Gaudet, A., Ladouceur, R., ... Gervais, N. J. (2010). A randomized clinical trial of cognitive-behavioral therapy and applied relaxation for adults with generalized anxiety disorder. *Behavior Therapy, 41*(1), 46-58.

Duval, S., & Tweedie, R. (2000). Trim and fill: A simple funnel-plot–based method of testing and adjusting for publication bias in meta-analysis. *Biometrics, 56*(2), 455-463.

Egan, S. J., Wade, T. D., & Shafran, R. (2012). The transdiagnostic process of perfectionism. *Revista de Psicopatología y Psicología Clínica, 17*(3), 279-294.

Ehrenreich-May, J., Bilek, E. L., Buzzella, B., Kennedy, S. M., Mash, J. A., & LBennett, S. (2016). *Unified protocols for the treatment of anxiety disorders in adolescents and children*. New York: Oxford University Press [in press].

Ehrenreich-May, J., Bilek, E. L., Queen, A. H., & Hernandez Rodriguez, J. (2012). A unified protocol for the group treatment of childhood anxiety and depression. *Revista de Psicopatología y Psicología Clínica, 17*(3), 219-236.

Ehrenreich-May, J., & Chu, B. C. (2014). In Ehrenreich-May J., Chu B. C. (Eds.), *Transdiagnostic treatments for children and adolescents: Principles and practice*. New York, NY, US: Guilford Press.

*Ejeby, K., Savitskij, R., Öst, L., Ekbom, A., Brandt, L., Ramnerö, J., ... Backlund, L. G. (2014). Randomized controlled trial of transdiagnostic group treatments for primary care patients with common mental disorders. *Family Practice, 31*(3), 273-280.

*Ellard, K. K., Fairholme, C. P., Boisseau, C. L., Farchione, T. J., & Barlow, D. H. (2010). Unified protocol for the transdiagnostic treatment of emotional disorders: Protocol development and initial outcome data. *Cognitive and Behavioral Practice, 17*(1), 88-101.

*Espejo, E. P., Castriotta, N., Bessonov, D., Kawamura, M., Werdowatz, E. A., & Ayers, C. R. (2016). A pilot study of transdiagnostic group cognitive–behavioral therapy for anxiety in a veteran sample. *Psychological services,13*(2), 162.

Essau, C., Lewinsohn, P., Olaya, B., & Seeley, J. (2014). Anxiety disorders in adolescents and psychosocial outcomes at age 30. *Journal of Affective Disorders, 163*, 125-132.

*Essau, C., Olaya, B., Sasagawa, S., Pithia, J., Bray, D., & Ollendick, T. (2014). Integrating video-feedback and cognitive preparation, social skills training and behavioural activation in a cognitive behavioural therapy in the treatment of childhood anxiety. *Journal of Affective Disorders, 167*, 261-267.

Essau, C., Ollendick, T. (2013). *The super skills for life programme*. London, UK: University of Roehampton.

Ewing, D. L., Monsen, J. J., Thompson, E. J., Cartwright-Hatton, S., & Field, A. (2015). A meta-analysis of transdiagnostic cognitive behavioural therapy in the treatment of child and young person anxiety disorders. *Behavioural and Cognitive Psychotherapy, 43*(5), 562-577.

Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A "transdiagnostic" theory and treatment. *Behaviour Research and Therapy, 41*(5), 509-528.

*Farchione, T. J., Fairholme, C. P., Ellard, K. K., Boisseau, C. L., Thompson-Hollands, J., Carl, J. R., ... Barlow, D. H. (2012). Unified protocol for transdiagnostic treatment of emotional disorders: A randomized controlled trial. *Behavior Therapy, 43*(3), 666-678.

*Fogliati, V., Dear, B., Staples, L., Terides, M., Sheehan, J., Johnston, L., ... Titov, N. (2016). Disorder-specific versus transdiagnostic and clinician-guided versus self-guided internet-delivered treatment for panic disorder and comorbid disorders: A randomized controlled trial. *Journal of Anxiety Disorders, 39*, 88-102.

Forti-Buratti, M. A., Saikia, R., Wilkinson, E. L., & Ramchandani, P. G. (2016). Psychological treatments for depression in pre-adolescent children (12 years and younger): Systematic review and meta-analysis of randomised controlled trials. *European Child & Adolescent Psychiatry,* 1-10.

González-Robles, A., García-Palacios, A., Baños, R., Riera, A., Llorca, G., Traver, F., ... & Botella, C. (2015). Effectiveness of a transdiagnostic internet-based protocol for the treatment of emotional disorders versus treatment as usual in specialized care: study protocol for a randomized controlled trial. *Trials, 16*(1), 488.

Goyal, M., Singh, S., Sibinga, E. M., Gould, N. F., Rowland-Seymour, A., Sharma, R., ... Shihab, H. M. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine, 174*(3), 357-368.

*Gros, D. F. (2014). Development and initial evaluation of transdiagnostic behavior therapy (TBT) for veterans with affective disorders. *Psychiatry Research, 220*(1-2), 275-282.

Harvey, A. G. (2004). *Cognitive behavioural processes across psychological disorders: A transdiagnostic approach to research and treatment.* Oxford University Press, USA.

Hedges, L., & Olkin, I. (1985). Statistical models for meta-analysis. *New York: Academic Press.Hedges, LV, & Pigott, TD (2001). The Power of Statistical Tests in Meta-Analysis.Psychological Methods, 6*, 203-217.

Higgins JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.

Higgins, J. P., & Thompson, S. G. (2002). Quantifying heterogeneity in a meta-analysis. *Statistics in Medicine, 21*(11), 1539-1558.

Higgins, J. P., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ, 327*(7414), 557-560.

Hopko, D. R., Lejuez, C., Ruggiero, K. J., & Eifert, G. H. (2003). Contemporary behavioral activation treatments for depression: Procedures, principles, and progress. *Clinical Psychology Review, 23*(5), 699-717.

*Ito, M., Horikoshi, M., Kato, N., Oe, Y., Fujisato, H., Nakajima, S., ... & Usuki, M. (2016). Transdiagnostic and transcultural: Pilot study of unified protocol for depressive and anxiety disorders in Japan. *Behavior therapy, 47*(3), 416-430.

*Johnston, L., Dear, B. F., Gandy, M., Fogliati, V. J., Kayrouz, R., Sheehan, J., ... Titov, N. (2014). Exploring the efficacy and acceptability of internet-delivered cognitive behavioural therapy for young adults with anxiety and depression: An open trial. *The Australian and New Zealand Journal of Psychiatry, 48*(9), 819-827.

*Johnston, L., Titov, N., Andrews, G., Spence, J., & Dear, B. F. (2011). A RCT of a transdiagnostic internet-delivered treatment for three anxiety disorders: Examination of support roles and disorder-specific outcomes. *PLoS ONE, 6*(11), e28079

*Kayrouz, R., Dear, B. F., Johnston, L., Gandy, M., Fogliati, V. J., Sheehan, J., & Titov, N. (2015). A feasibility open trial of guided internet-delivered cognitive behavioural therapy for anxiety and depression amongst arab australians. *Internet Interventions, 2*(1), 32-38.

*Kayrouz, R., Dear, B. F., Karin, E., Gandy, M., Fogliati, V. J., Terides, M. D., & Titov, N. (2016). A pilot study of self-guided internet-delivered cognitive behavioural therapy for anxiety and depression among arabs. *Internet Interventions, 3*, 18-24.

Kendall, P. C., Stark, K. D., Martinsen, K., O'Neil, K. A., & Arora, P. (2013). *EMOTION: "Coping kids" managing anxiety and depression; group leaders manual*. Ardmore, PA: Workbook Publishing.

*Kirkpatrick, T., Manoukian, L., Dear, B. F., Johnston, L., & Titov, N. (2013). A feasibility open trial of internet-delivered cognitive-behavioural therapy (iCBT) among consumers of a non-governmental mental health organisation with anxiety. *PeerJ, 1*, e210.

Kroenke, K., Spitzer, R. L., Williams, J. B., & Löwe, B. (2010). The patient health questionnaire somatic, anxiety, and depressive symptom scales: A systematic review. *General Hospital Psychiatry, 32*(4), 345-359.

*Lotfi, M., Bakhtiyari, M., Asgharnezhad-Farid, A. A., & Amini, M. (2014). Comparison of the effect of transdiagnostic therapy and cognitive-behavior therapy on patients with emotional disorders: A randomized clinical trial. *Zahedan Journal of Research in Medical Sciences, 16*(10), 15-18.

Mazzucchelli, T., Kane, R., & Rees, C. (2009). Behavioral activation treatments for depression in adults: A meta-analysis and review. *Clinical Psychology: Science and Practice, 16*(4), 383-411.

*McEvoy, P. M., & Nathan, P. (2007). Effectiveness of cognitive behavior therapy for diagnostically heterogeneous groups: A benchmarking study. *Journal of Consulting and Clinical Psychology, 75*(2), 344-350.

McEvoy, P. M., Nathan, P., & Norton, P. J. (2009). Efficacy of transdiagnostic treatments: A review of published outcome studies and future research directions. *Journal of Cognitive Psychotherapy, 23*(1), 20-33.

McManus, F., Shafran, R., & Cooper, Z. (2010). What does a 'transdiagnostic' approach have to offer the treatment of anxiety disorders?. *British Journal of Clinical Psychology, 49*(4), 491-505.

Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual Review of Psychology, 49*(1), 377-412.

Miró, M. T., Perestelo-Pérez, L., Pérez, J., Rivero, A., González, M., Fuente, J. D. L., & Serrano, P. (2011). Eficacia de los tratamientos basados en Mindfulness para los trastornos de ansiedad y depresión: una revisión sistemática. *Revista de Psicopatología y Psicología Clínica, 16*(1), 1-14.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of internal medicine, 151*(4), 264-269.

*Mullin, A., Dear, B. F., Karin, E., Wootton, B. M., Staples, L. G., Johnston, L., ... Titov, N. (2015). The UniWellbeing course: A randomised controlled trial of a transdiagnostic internet-delivered cognitive behavioural therapy (CBT) programme for university students with symptoms of anxiety and depression. *Internet Interventions, 2*(2), 128-136.

Nathan, P. E., & Gorman, J. M. (2015). *A guide to treatments that work.* Oxford University Press.

Newby, J. M., McKinnon, A., Kuyken, W., Gilbody, S., & Dalgleish, T. (2015). Systematic review and meta-analysis of transdiagnostic psychological treatments for anxiety and depressive disorders in adulthood. *Clinical Psychology Review, 40*, 91-110.

*Newby, J. M., Mackenzie, A., Williams, A. D., McIntyre, K., Watts, S., Wong, N., & Andrews, G. (2013). Internet cognitive behavioural therapy for mixed anxiety and depression: A randomized controlled trial and evidence of effectiveness in primary care. *Psychological Medicine, 43*(12), 2635-2648.

*Newby, J. M., Mewton, L., Williams, A. D., & Andrews, G. (2014). Effectiveness of transdiagnostic internet cognitive behavioural treatment for mixed anxiety and depression in primary care. *Journal of Affective Disorders, 165*, 45-52.

*Norton, P. J. (2008). An open trial of a transdiagnostic cognitive-behavioral group therapy for anxiety disorder. *Behavior Therapy, 39*(3), 242-250.

Norton, P. J. (2012a). *Group cognitive-behavioral therapy of anxiety: A transdiagnostic treatment manual*. New York, NY, US: Guilford Press.

*Norton, P. J. (2012b). A randomized clinical trial of transdiagnostic cognitive-behavioral treatments for anxiety disorder by comparison to relaxation training. *Behavior Therapy, 43*(3), 506-517.

*Norton, P. J., & Barrera, T. L. (2012). Transdiagnostic versus diagnosis-specific CBT for anxiety disorders: A preliminary randomized controlled noninferiority trial. *Depression and Anxiety, 29*(10), 874-882.

Norton, P. J., Barrera, T. L., Mathew, A. R., Chamberlain, L. D., Szafranski, D. D., Reddy, R., & Smith, A. H. (2013). Effect of transdiagnostic CBT for anxiety disorders on comorbid diagnoses. *Depression and Anxiety, 30*(2), 168-173.

*Norton, P. J., Hayes, S. A., & Hope, D. A. (2004). Effects of a transdiagnostic group treatment for anxiety on secondary depression. *Depression and Anxiety, 20*(4), 198-202.

*Norton, P. J., & Hope, D. A. (2005). Preliminary evaluation of a broad-spectrum cognitive-behavioral group therapy for anxiety. *Journal of Behavior Therapy and Experimental Psychiatry, 36*(2), 79-97.

Norton, P. J., & Paulus, D. J. (2015). Toward a unified treatment for emotional disorders: Update on the science and practice. *Behavior Therapy, [Article in press]*.

Norton, P. J., & Philipp, L. M. (2008). Transdiagnostic approaches to the treatment of anxiety disorders: A quantitative review. *Psychotherapy: Theory, Research, Practice, Training, 45*(2), 214-226.

Norton, P. J., & Price, E. C. (2007). A meta-analytic review of adult cognitive-behavioral treatment outcome across the anxiety disorders. *The Journal of Nervous and Mental Disease, 195*(6), 521-531.

Öst, L. (2008). Efficacy of the third wave of behavioral therapies: A systematic review and meta-analysis. *Behaviour Research and Therapy, 46*(3), 296-321.

Öst, L., & Westling, B. E. (1995). Applied relaxation vs cognitive behavior therapy in the treatment of panic disorder. *Behaviour Research and Therapy, 33*(2), 145-158.

Paulus, D. J., Talkovsky, A. M., Heggeness, L. F., & Norton, P. J. (2015). Beyond negative affectivity: A hierarchical model of global and transdiagnostic vulnerabilities for emotional disorders. *Cognitive Behaviour Therapy, 44*(5), 389-405.

Pennant, M. E., Loucas, C. E., Whittington, C., Creswell, C., Fonagy, P., Fuggle, P., ... Kendall, T. (2015). Computerised therapies for anxiety and depression in children and young people: A systematic review and meta-analysis. *Behaviour Research and Therapy, 67*, 1-18.

*Queen, A. H., Barlow, D. H., & Ehrenreich-May, J. (2014). The trajectories of adolescent anxiety and depressive symptoms over the course of a transdiagnostic treatment. *Journal of Anxiety Disorders, 28*(6), 511-521.

Reinholt, N., & Krogh, J. (2014). Efficacy of transdiagnostic cognitive behaviour therapy for anxiety disorders: A systematic review and meta-analysis of published outcome studies. *Cognitive Behaviour Therapy, 43*(3), 171-184.

Reynolds, S., Wilson, C., Austin, J., & Hooper, L. (2012). Effects of psychotherapy for anxiety in children and adolescents: A meta-analytic review. *Clinical Psychology Review, 32*(4), 251-262.

Sánchez-Arribas, C., Chorot, P., Valiente, R. M., & Sandín, B. (2015). Evaluación de factores positivos y negativos relacionados con el trastorno de pánico: Validación del CAPT. *Revista de Psicopatología y Psicología Clínica, 20*(2), 85-100.

Sánchez-Hernández, O., Méndez, F. X., & Garbe, J. (2014). Prevención de la depresión en niños y adolescentes: Revisión y reflexión. *Revista de Psicopatología y Psicología Clínica, 19*(1), 63-76.

Sandín, B., Chorot, P., & Valiente, R. M. (2012). Transdiagnóstico: Nueva frontera en psicología clínica. *Revista de Psicopatología y Psicología Clínica, 17*(3), 185-203.

Sandín, B., Chorot, P., & Valiente, R. M. (2016). *TCC de los trastornos de ansiedad: Innovaciones en niños y adolescentes*. Madrid: Klinik.

Sandín, B., Sánchez-Arribas, C., Chorot, P., & Valiente, R. M. (2015). Anxiety sensitivity, catastrophic misinterpretations and panic self-efficacy in the prediction of panic disorder severity: Towards a tripartite cognitive model of panic disorder. *Behaviour Research and Therapy, 67*, 30-40.

Savović, J., Jones, H. E., Altman, D. G., Harris, R. J., Jüni, P., Pildal, J., ... Gluud, L. L. (2012). Influence of reported study design characteristics on intervention effect estimates from randomized, controlled trials. *Annals of Internal Medicine, 157*(6), 429-438.

*Schmidt, N. B., Buckner, J. D., Pusser, A., Woolaway-Bickel, K., Preston, J. L., & Norr, A. (2012). Randomized controlled trial of false safety behavior elimination therapy: A unified cognitive behavioral treatment for anxiety psychopathology. *Behavior Therapy, 43*(3), 518-532.

*Titov, N., Andrews, G., Johnston, L., Robinson, E., & Spence, J. (2010). Transdiagnostic internet treatment for anxiety disorders: A randomized controlled trial. *Behaviour Research and Therapy, 48*(9), 890-899.

*Titov, N., Dear, B. F., Johnston, L., Lorian, C., Zou, J., Wootton, B., ... Rapee, R. M. (2013). Improving adherence and clinical outcomes in self-guided internet treatment for anxiety and depression: Randomised controlled trial. *PLoS One, 8*(7), e62873.

Titov, N., Dear, B. F., Johnston, L., & Terides, M. (2012). Transdiagnostic internet treatment for anxiety and depression. *Revista de Psicopatología y Psicología Clínica, 17*(3), 237-260.

*Titov, N., Dear, B. F., Staples, L. G., Bennett-Levy, J., Klein, B., Rapee, R. M., ... Ritterband, L. (2015a). MindSpot clinic: An accessible, efficient, and effective online treatment service for anxiety and depression. *Psychiatric Services, 66*(10), 1043-1050.

*Titov, N., Dear, B. F., Staples, L. G., Terides, M. D., Karin, E., Sheehan, J., ... McEvoy, P. M. (2015b). Disorder-specific versus transdiagnostic and clinician-guided versus self-guided treatment for major depressive disorder and comorbid anxiety

disorders: A randomized controlled trial. *Journal of Anxiety Disorders, 35*, 88-102.

*Titov, N., Dear, B. F., Schwencke, G., Andrews, G., Johnston, L., Craske, M. G., & McEvoy, P. (2011). Transdiagnostic internet treatment for anxiety and depression: A randomised controlled trial. *Behaviour Research and Therapy, 49*(8), 441-452.

*Titov, N., Fogliati, V. J., Staples, L. G., Gandy, M., Johnston, L., Wootton, B., ... Dear, B. F. (2016). Treating anxiety and depression in older adults: Randomised controlled trial comparing guided v. self-guided internet-delivered cognitive–behavioural therapy. *British Journal of Psychiatry Open, 2*(1), 50-58.

Torrents-Rodas, D., Fullana, M. A., Vervliet, B., Treanor, T., Conway, C., Zbozinek, T., & Craske, M. G. (2015). Maximizar la terapia de exposición: Un enfoque basado en el aprendizaje inhibitorio. *Revista de Psicopatología y Psicología Clínica, 20*(1), 1-24.

Tull, M. T., Stipelman, B. A., Salters-Pedneault, K., & Gratz, K. L. (2009). An examination of recent non-clinical panic attacks, panic disorder, anxiety sensitivity, and emotion regulation difficulties in the prediction of generalized anxiety disorder in an analogue sample. *Journal of Anxiety Disorders, 23*(2), 275-282.

Vázquez, F. L., Blanco, V., Hermida, E., Otero, P., Torres, A., & Díaz-Fernández, O. (2015). Eficacia de las intervenciones psicológicas breves para reducir los síntomas depresivos en cuidadores: Revisión sistemática y meta-análisis. *Revista de Psicopatología y Psicología Clínica, 20* (3), 173-188.

Weersing, V. R., Gonzalez, A., Campo, J. V., & Lucas, A. N. (2008). Brief behavioral therapy for pediatric anxiety and depression: Piloting an integrated treatment approach. *Cognitive and Behavioral Practice, 15*(2), 126-139.

Weersing, V. R., Rozenman, M. S., Maher-Bridge, M., & Campo, J. V. (2012). Anxiety, depression, and somatic distress: Developing a transdiagnostic internalizing toolbox for pediatric practice. *Cognitive and Behavioral Practice, 19*(1), 68-82.

*Wuthrich, V., Rapee, R., Kangas, M., & Perini, S. (2016). Randomized controlled trial of group cognitive behavioral therapy compared to a discussion group for co-morbid anxiety and depression in older adults. *Psychological Medicine, 46*(4), 785-795.

*Wuthrich, V., & Rapee, R. (2013). Randomised controlled trial of group cognitive behavioural therapy for comorbid anxiety and depression in older adults. *Behaviour Research and Therapy, 51*(12), 779-786.