

Cognitive behavioral therapy in anxiety disorders: current state of the evidence

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A plethora of studies have examined the efficacy and effectiveness of cognitive-behavioral therapy (CBT) for adult anxiety disorders. In recent years, several meta-analyses have been conducted to quantitatively review the evidence of CBT for anxiety disorders, each using different inclusion criteria for studies, such as use of control conditions or type of study environment. This review aims to summarize and to discuss the current state of the evidence regarding CBT treatment for panic disorder, generalized anxiety disorder, social anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder. Overall, CBT demonstrates both efficacy in randomized controlled trials and effectiveness in naturalistic settings in the treatment of adult anxiety disorders. However, due to methodological issues, the magnitude of effect is currently difficult to estimate. In conclusion, CBT appears to be both efficacious and effective in the treatment of anxiety disorders, but more high-quality studies are needed to better estimate the magnitude of the effect.

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Introduction

Anxiety disorders are characterized by excessive fear and subsequent avoidance, typically in response to a specified object or situation and in the absence of true danger. Anxiety disorders have a high prevalence, with a 12-month rate of about 18% and lifetime rates of about 29%.^{1,2} Cognitive behavioral therapy (CBT) is considered the gold standard in the psychotherapeutic treatment of anxiety disorders and several meta-analyses and reviews of these meta-analytic findings regarding the efficacy and effectiveness of CBT have been published in recent years.³⁻⁹

CBT is defined as:

An amalgam of behavioral and cognitive interventions guided by principles of applied science. The behavioral interventions aim to decrease maladaptive behaviors and increase adaptive ones by modifying their antecedents and consequences and by behavioral practices that result in new learning. The cognitive interventions aim to modify maladaptive cognitions, self-statements or beliefs. The hallmark features of CBT are problem-focused intervention strategies that are derived from learning theory [as well as] cognitive theory principles.^{8,10}

While it is beyond the scope of this article to review specific treatment components of CBT, they generally include various combinations of the following: psychoe-

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education about the nature of fear and anxiety, self-monitoring of symptoms, somatic exercises, cognitive restructuring (eg, logical empiricism and disconfirmation), imaginal and in vivo exposure to feared stimuli while weaning from safety signals, and relapse prevention.⁸ Depending on the specific anxiety disorder, these CBT techniques are weighted differentially during therapy. A plethora of studies have examined the efficacy of CBT for adult anxiety disorders. Furthermore, several meta-analyses have been conducted to quantitatively review the evidence of CBT for anxiety disorders.^{4,6,9,11} In meta-analysis, treatment efficacy is quantified in terms of an effect size. An effect size indicates the magnitude of an observed effect in a standard unit of measurement. However, it is important to realize that different types of effect sizes can be used to appraise the available evidence. For instance, effect sizes are sometimes categorized as “controlled” versus “uncontrolled.”⁴ A controlled effect size expresses the magnitude of a specific treatment effect as compared with alternative treatments or control conditions. Most often, it is calculated by subtracting the post-treatment mean of the control group from the post-treatment mean of the treatment group divided by the pooled standard deviation. This effect size is called Cohen’s *d*.¹² An uncontrolled effect size expresses the magnitude of improvement within a group from pretreatment to post-treatment. It is calculated by subtracting a group’s post-treatment mean from its pretreatment mean divided by the pooled standard deviation. Uncontrolled effect sizes are less preferable than controlled effect sizes, since they are susceptible to threats to internal validity.⁴

Meta-analytic reviews of CBT studies in anxiety disorders have generally found large effect sizes for the majority of treatment studies. Accordingly, recent reviews that summarized the results of these numerous meta-analyses of CBT treatment in anxiety disorders concluded that CBT is highly effective.^{3,4,13}

However, these existing meta-analyses are not without limitations. In particular, most meta-analyses of CBT for anxiety disorders have included studies that vary greatly with respect to control procedures, which range from waitlist, alternative treatments, and placebo interventions that were evaluated with or without randomization while some studies did not include any control groups. However, it is important to determine how including a control condition and their specific nature impacts the efficacy results of CBT in anxiety disorders. Furthermore,

one important question is how results derived from research studies in mostly well-controlled research designs (efficacy) generalize to real-world settings in naturalistic surroundings (effectiveness).

Therefore, this review will particularly focus on two recent meta-analyses by Hofmann⁶ and by Stewart¹¹ regarding CBT treatment for panic disorder, generalized anxiety disorder, social anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder.

The first meta-analysis⁶ limited the included studies to randomized placebo-controlled trials, the gold standard in clinical outcome research. For example, the Federal Drug Administration (FDA) in the United States and the European Medicines Agency (EMA) require successful randomized placebo-controlled double-blind trials in order to approve a new medication. Pharmacotherapy trials typically administer a sugar pill to individuals in the placebo condition. Instead of including a pill placebo, a number of psychotherapy trials have employed psychological placebo conditions to control for nonspecific factors. To be included in the meta-analysis,⁶ the psychological placebo had to involve interventions to control for nonspecific factors (eg, regular contact with a therapist, reasonable rationale for the intervention, discussions of the psychological problem). Although it is almost impossible to protect the blind in placebo-controlled psychotherapy trials, the randomized placebo-controlled design is still the most rigorous and conservative test of the effects of an active treatment. This approach assesses the overall efficacy of CBT in anxiety disorders under well-controlled research conditions. Overall, 27 studies met inclusion criteria: *n*=7 for social anxiety disorder, *n*=6 for post-traumatic stress disorder, *n*=5 for panic disorder, *n*=4 for acute stress disorder, *n*=3 for obsessive-compulsive disorder, and *n*=2 for generalized anxiety disorder. As a controlled effect size, Hedges’ *g* was calculated, which is a variation of Cohen’s *d* taking into account small sample sizes.

In contrast to well-controlled efficacy studies in research settings, effectiveness studies examine how efficacious interventions are transferred into naturalistic real-world settings. Research treatments might not work equally well in clinical practice settings because of greater disease severity, or more comorbid conditions in patients in general practice compared with patients in research settings. Another variable that might impact the outcome in naturalistic settings is the treatments themselves and the clinicians who provide them. Treatment protocols in

randomized controlled trials are manualized and strictly monitored with an emphasis on treatment integrity. However, therapy manuals are less likely to be used in clinical practice. Furthermore, practitioners typically do not have access to the level of intensive training, monitoring, and supervision available to therapists in research settings. Clinicians in research settings are more likely to be expert in the administration of particular treatments and are motivated through adherence measures to stay consistent with the protocol. In summary, treatments delivered in naturalistic settings may not be as rigorous in terms of content or quality, and this may limit how well results of controlled research trials can generalize to actual clinical practice. Therefore, it is important to empirically examine how well findings from research studies (efficacy) translate into real-world settings (effectiveness). Thus, in the second meta-analysis,¹¹ 56 effectiveness studies were included to assess how CBT treat-

ment works in less well-controlled real-life settings. CBT was defined broadly and included any treatment with cognitive, behavioral (eg, exposure), or a combination of components. In sum, a total of 56 studies were included in these analyses: 17 for panic disorder; 11 each for social anxiety disorder, OCD, and GAD; and 6 for PTSD. No study assessed effectiveness in acute stress disorder.

We will present and contrast the meta-analytically derived controlled and uncontrolled effect sizes reflecting the efficacy and effectiveness results for each anxiety disorder.

Results

Panic disorder

Panic attacks are defined as sudden spells of unidentified feelings consisting of at least four out of 13 symptoms such as palpitations, chest pains, sweating, shortness

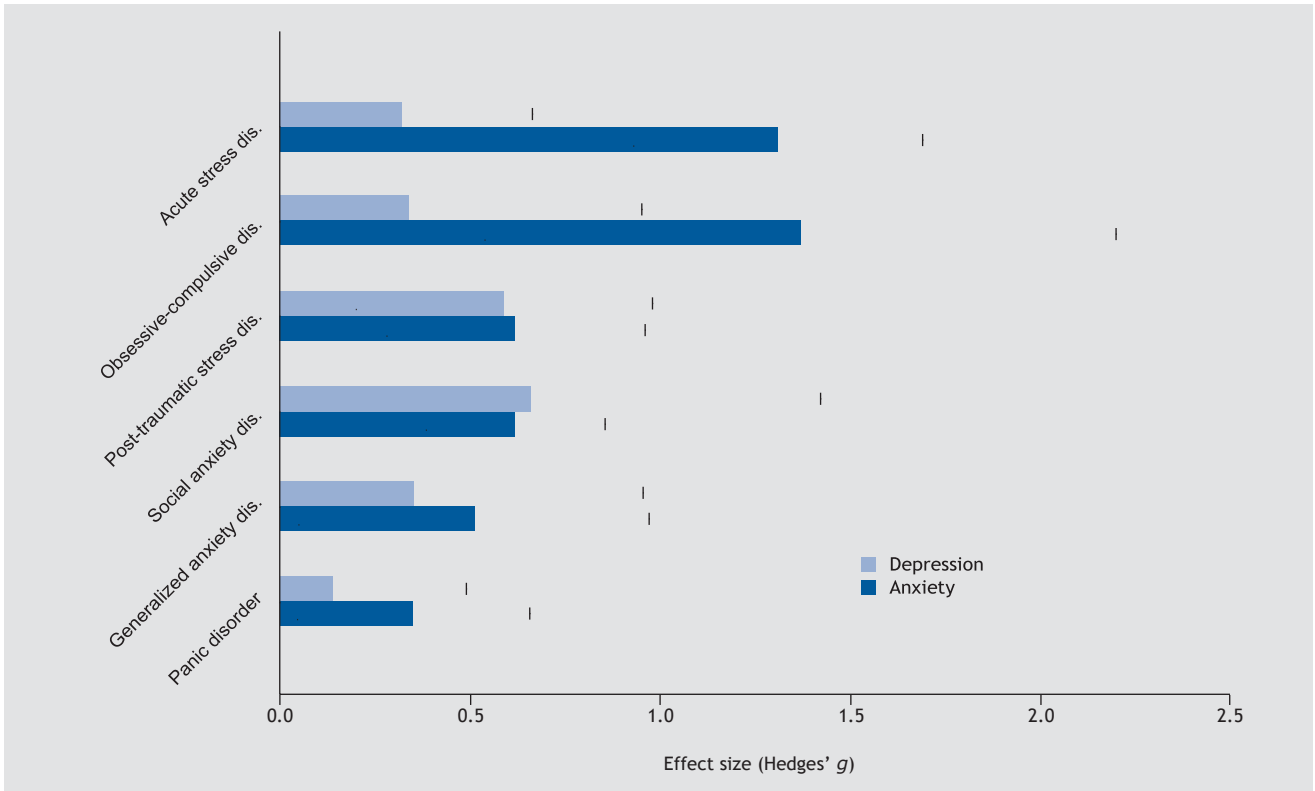


Figure 1. Average effect size estimates and corresponding 95% confidence intervals of the acute treatment efficacy of cognitive-behavioral therapy as compared with placebo on the various anxiety disorders for the primary continuous anxiety measure (dark blue bars) and depression measures (light blue bars)

Adapted from ref6: Hofmann SG, Smits JA. Cognitive-behavioral therapy for adult anxiety disorders: a meta-analysis of randomized placebo-controlled trials. *J Clin Psychiatry.* 2008;69:621-632. Copyright © Physicians' Postgraduate Press, 2008

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of breath, feelings of choking, trembling, nausea, dizziness, paresthesias, chills or hot flushes, depersonalization or derealization, and fear of dying or losing control. In order to make a diagnosis of panic disorder, additional criteria are that these attacks at least once have been unexpected, followed by at least 1 month of fearful expectation or concern about the consequences of an attack. Panic disorder is frequently followed (or accompanied) by agoraphobia, which is defined as follows: (i) fear of being in places or situations from which escape might be difficult or help might not be available; (ii) these situations are avoided or endured with marked distress or the patient needs a companion.

CBT for panic disorder typically involves education about the nature and physiology of the panic response, cognitive therapy techniques designed to modify catastrophic misinterpretations of panic symptoms and their consequences, and graduated exposure to panic-related body sensations (ie, interoceptive exposure) and avoided situations.

Efficacy

Five studies examined the efficacy of CBT in panic disorder in a randomized placebo-controlled design.⁶ The effect size was 0.35 (95% CI 0.04-0.65), indicating a small to medium effect (*Figure 1*). How important it is to take into account the type of effect size when appraising the magnitude of effect can be seen from a different meta-analysis that calculated uncontrolled pre- to post-treatment effect sizes.⁹ That meta-analysis reported an effect size of 1.53 for CBT in panic disorder.

Effectiveness

Several studies examined the effectiveness of CBT in panic disorder.¹¹ The calculated uncontrolled pre- to post-treatment effect size was 1.01 (95% CI 0.77-1.25) for panic attacks and 0.83 (95% CI 0.60-1.06) for avoidance.