Narrative Review Article

Evaluating The Effectiveness of Exposure Therapy vs. Cognitive Restructuring Therapy in Treating Anxiety in Children and Adolescents

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ABSTRACT

Anxiety disorders are highly prevalent among children and adolescents. Currently, there are multiple treatments that are effective at reducing symptoms. Two of these treatments include cognitive restructuring and exposure therapy. Cognitive restructuring is more often utilized, focusing on changing the underlying thought processes behind anxiety, while exposure therapy aims to change how individuals respond to anxiety-provoking stimuli. Unfortunately, few studies have directly compared these approaches, limiting evidence on their relative effectiveness. The purpose of this review was to examine the available evidence on cognitive restructuring and exposure therapy and evaluate whether current literature supports separate or integrated use. Across the included studies, exposure-based interventions generally produced more consistent findings than stand-alone cognitive restructuring, although direct comparisons between the two approaches were limited. Significant overlap was found in how they aimed to treat negative thought processing by creating coping strategies. The available evidence suggests that integrating cognitive restructuring with exposure-based strategies may be beneficial; however, comparative studies are needed before firm conclusions can be drawn.

Keywords: Anxiety; Cognitive Restructuring; Exposure Therapy; CBT; Children and Adolescents

INTRODUCTION

Anxiety disorders are among the most common mental health conditions worldwide. In the United States alone, the National Comorbidity Survey Replication-Adolescent Supplement estimated a lifetime prevalence of roughly 32% among youth (1). Anxiety disorders are defined as mental health conditions characterized by excessive and persistent fear or worry; heightened responses to threatening stimuli; biases to threat-relevant stimuli, and threat-based evaluations of ambiguous stimuli; and amygdala responses to threat-relevant stimuli (2). In extreme cases, anxiety disorders can often become debilitating, since these irrational fears can interfere with even the simplest of tasks in everyday life (3). In youth, anxiety disorders are known to be especially impairing (1). If left untreated, they can persist into adulthood and have been shown to be associated with more negative outcomes for adults, such as depression as their condition gets worse (4).

Broadly, Cognitive Behavioral Therapy (CBT) is one category of treatments that have been shown to be effective at reducing symptoms of anxiety (5). CBT encompasses numerous interventions centered on both thought-based and behavior-based approaches practitioners use in the treatment. While CBT offers

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many manualized and non-manualized treatments, the most often chosen treatment options for anxiety are cognitive restructuring and exposure therapy (6). Cognitive restructuring is a technique used to identify, challenge, and replace irrational thoughts. This technique involves working to change thinking patterns so that individuals can reduce the frequency of negative thinking and then modify or reduce maladaptive thought patterns (7). Previous research has extensively described the implementation of cognitive restructuring and how it differs from behavior therapy – which typically involves learning how to cope with negative thoughts through action-oriented strategies. Cognitive restructuring, in contrast to more behavioral techniques, involves identifying cognitive distortions (i.e., irrational, biased or exaggerated thought patterns) and challenging these thought patterns using specific techniques (i.e., thought stopping, positive affirmations, Socratic questioning). Since the 1960s, when it was first implemented, cognitive restructuring has become one of the most widely used treatments for anxiety disorders (5).

Exposure therapy is a behavior-focused intervention that emphasizes gradual confrontation with feared situations (3, 9). It involves guiding patients through gradual, structured contact with feared situations, either simulated or real (9). It is grounded in extinction learning rather than in vivo fear conditioning: whereas fear conditioning describes how a fear is initially acquired, exposure leverages extinction to reduce the conditioned fear response over repeated, non-reinforced encounters (10). Exposure therapy therefore targets how patients respond to feared situations rather than how they think about them (4). Behavioral exposure is derived from principles of associative learning, including fear conditioning and extinction (3, 10). These learning mechanisms make exposure a critical component of effective treatment (3). Specifically, exposure therapy is a highly effective, evidence-based treatment technique for children and adolescents with anxiety disorders (9). Despite this, it remains underutilized in community practice amid strong evidence supporting its efficacy. The main concerns over this behavioral exposure include the way patients usually practice avoidance when it comes to stressful stimuli (8).

When choosing a treatment for anxiety disorders, both cognitive restructuring and exposure therapy are effective options. Yet, many practitioners use cognitive restructuring alone (8). Even in cases where they're both implemented, exposure may only be expressed through in-session practice scenarios involving the patient and therapist, making it not as effective as exposure practice outside of sessions (10). Additionally, the number of practitioners who deliver exposure and the number of patients who receive exposure often does not exceed 50% of the treatment population, which suggests that exposure therapy remains underutilized relative to the available evidence (9). Many studies have explored the effectiveness of these treatments alone, and to our knowledge, few studies have directly compared cognitive restructuring and exposure therapy in children and adolescents with anxiety disorders.

This review examines the evidence on cognitive restructuring and exposure therapy for treating anxiety in children and adolescents (7–18 years old). Specifically, it evaluates their therapeutic benefit as stand-alone interventions, identifies shared and distinct treatment effects, and considers the potential benefits of integrating these approaches. Few studies directly compare these interventions, so this review synthesizes evidence across studies that differ in participant age, diagnoses, intervention format, treatment duration, and outcome measures. Because the included studies differed substantially, findings are synthesized qualitatively rather than quantitatively.

EFFECTIVENESS OF COGNITIVE RESTRUCTURING

Cognitive restructuring is a commonly used cognitive-behavioral technique for treating anxiety disorders. These interventions primarily focus on basic functions that underpin cognition, particularly attention, memory, visuospatial perception, and executive functions (11). Although it is commonly paired with exposure sessions, cognitive restructuring has been evaluated by several studies as a stand-alone intervention. For this review, five studies were identified, published between 2011 and 2022 (6, 11–14). Four of them involve patients only (6, 11, 12, 14), and one involving both patients and practitioners (13). Two review papers were also included to broaden the evidence base (5, 7). The efficacy of cognitive restructuring (by itself) will be analyzed and discussed in order to compare it to exposure therapy later on.

All of the studies included children and adolescents 7-18 years of age. Study sample sizes ranged from 10 to 179 subjects. Treatment effectiveness was typically evaluated using self-report questionnaires and clinician-rated measures of anxiety symptoms before and after the intervention. After these sessions, patients were surveyed on how their symptoms affected daily life.

One study conducted in Portugal reported improvements in patients' ability to manage negative thoughts, validate their goals, and improve interpersonal interactions. To evaluate cognitive restructuring's effects on treating social anxiety, they reported that the cognitive restructuring intervention was associated with a significant reduction in symptoms over the study period. Performance-related fears were significantly reduced despite the absence of exposure-based exercises (12).

Similar findings were reported in another study done in the US, which compared the rates of anxiety-motivated coping strategies between adolescents with and without anxiety disorders, and looked at how cognitive restructuring affected these differences. The study found that the rates of coping methods, such as self-blame, in the anxious adolescents decreased to levels comparable with those observed in adolescents without anxiety disorders. Activities ranging from one-on-one sessions with therapists to group counseling reduced social anxiety and academic anxiety. Academic anxiety also decreased significantly despite differences in intervention format (14).

Contrary to these findings, some research has found cognitive restructuring is not more effective than other treatments. For example, in a study conducted in the Netherlands, which measured the treatment's effects on changes in anxiety symptoms, more than 20% of patients dropped out, and roughly half of those who completed treatment showed symptom improvement. The study concluded that cognitive restructuring was less effective than expected at modifying maladaptive thoughts as previously thought (13). While this study found weaker associations, over half of the patients improved, suggesting that cognitive restructuring may benefit some individuals while highlighting considerable variability in treatment response.

When looking at review papers on the topic, the reviewed literature reported associations between therapist use of cognitive restructuring and improved treatment outcomes: therapist use of cognitive restructuring was positively related to therapeutic outcome, lower risk of relapses, lower next-session depressive symptoms, greater cognitive change, and lower attrition (7). Although these findings suggest potential benefits of cognitive restructuring, they should be interpreted in light of several methodological limitations. The available evidence suggests that cognitive restructuring can improve anxiety symptoms in many children and adolescents. However, differences in participant characteristics, anxiety disorders, intervention protocols, and outcome measures make it difficult to directly compare findings across studies.

Several methodological limitations should be considered when interpreting these findings. Limitations include a range of differences between the studies, such as the composition of the participant sample, the durations of these sessions, and uncontrollable outside factors. For example, the study conducted by Felix and colleagues (12) consisted of an all-girl sample, and the treatment time was only 6 weeks, which is among the shortest of the studies. This study cannot be generalized to other genders. The study conducted by Legerstee and colleagues (6) was more balanced, yet it focused on coping strategies by the participants themselves and does not elaborate on treatment methods. Nuraeni and Ratnaya's (14) study focuses on a different type of anxiety (academic anxiety), and only has a sample size of ten participants, which limits the statistical power of the findings. This study also does not look at social anxiety, so these reported effects may not be able to be compared to the other studies. Lastly, Hoogendorn and colleagues (13) failed to include a control group, had a much longer treatment time of 8-12 weeks, and also failed to find the reasons behind the lack of significant differences. Despite these limitations, collectively these studies provide valuable evidence regarding the potential effectiveness of cognitive restructuring for treating anxiety in child and adolescent populations.

EFFECTIVENESS OF EXPOSURE THERAPY

Effectiveness and Delivery of Exposure-Based Interventions

Exposure therapy is a treatment aimed at reducing anxiety through gradual, structured exposure to feared situations in real or simulated environments. During exposure-based treatments, clients are encouraged to refrain from avoidance behaviors and (repeatedly) seek confrontation with fear-provoking stimuli or situations (9). Six studies were identified (4, 8–10, 15, 16) along with a review paper (3) published between 2008 and 2025. These studies primarily focused on the effects of exposure therapy along with the rates of utilization among therapists. Exposure therapy is often delivered as a part of a broader cognitive behavioral therapy program. Only about 25% of therapists use exposure therapy regularly, and that rate has remained low due to clinicians' concerns about implementing exposure therapy, particularly among less experienced therapists (8).

These studies enrolled both children and adolescents 7-18 years old, with sample sizes ranging from 16 to 257. The interventions aimed to reduce fear responses through repeated, structured exposure to feared stimuli while minimizing avoidance behaviors (4). Follow-up assessments commonly evaluated participants' perceived distress during exposure tasks and anxiety symptoms at one or more follow-up visits (16).

Across the included studies, exposure-based interventions produced favorable outcomes despite differences in study design. First, in a study conducted in Norway, therapists used VR simulations to mimic real-life situations. Although the study focused on adolescents with glossophobia (fear of public speaking), these results still demonstrated similar findings to other studies. In the 1-month and 3-month follow-up assessments, participants consistently reported that they felt less anxiety in real-life situations. The intervention reduced participants' anxiety, even though it did not yield any significant differences compared to more traditional methods (16).

In another study conducted in the USA, researchers divided participants into three groups and gave two of them different types of exposure therapies (one with the youth's parents present and one without) and created a control group (without treatment). They hypothesized that therapy without the parents would be most effective. The findings similarly demonstrated that participants receiving exposure-based treatment showed improvements. Specifically, it helped youth change avoidance behavior, verbalize their fears, improve their ability to cope with anxiety-provoking situations, and modify their perception of threat. Researchers hypothesized that challenging cognitive distortions during exposure therapy enhanced participants' ability to cope with anxiety-provoking situations (4).

These findings were consistent across diverse participant characteristics (ethnicity, age, gender, etc.), pretreatment anxiety symptoms, diagnostic status, and treatment duration. One study reported limited between-therapist variation in exposure quality. Some variables that may change outcomes, however, primarily involve external factors such as parent involvement and session size (15).

Mechanisms of Fear Extinction

The mechanism most often invoked to explain the effectiveness of exposure therapy is extinction. Fear conditioning itself refers to the acquisition of fear, when a previously neutral stimulus comes to elicit a fear response after being paired with an aversive one. Extinction is the gradual weakening of that conditioned response when the stimulus is repeatedly encountered without the aversive outcome, and exposure therapy is designed to engage in this process (3). In a study conducted by Lau and colleagues (16) they used experimental fear-conditioning and extinction paradigm to examine extinction learning. Participants who demonstrated stronger extinction learning exhibited substantially reduced fear responses during follow-up. These findings support extinction learning as a key mechanism underlying exposure-based interventions.

Clinical Utilization and Barriers to Implementation

While studies have found that exposure therapy is effective, it continues to be underutilized in clinical practice. In a study conducted in the US to find the barriers to its implementation, they identified several barriers: training history, negative beliefs, and favorability. First, many clinicians reported limited formal training in exposure therapy. Over 70% of clinicians in their study reported that there was a moderate to severe lack of training opportunities. Second, many practitioners believe that exposure therapy may cause excessive distress in clients. Finally, clinicians tended to favor cognitive restructuring, and only a minority of surveyed therapists reported using exposure regularly (8).

In another study determining which types of anxiety are often treated using exposure therapy, Social Anxiety Disorder and PTSD were not as commonly treated with it in comparison to Generalized Anxiety Disorder and non-trauma focused therapies. Even when it is used, therapists prefer to use it in milder cases since many negative attitudes exist over its ability in treating trauma-related situations (9). The poor dissemination and implementation of these practices likely contribute to these misconceptions. Reid and colleagues (8) determined that the best method in improving its implementation is to create more programs and pathways to receive training. According to them, around 92% of practitioners surveyed are already in favor of this, so this move may improve dissemination and implementation of exposure therapy.

The included studies had adequate sample sizes and broad inclusion criteria encompassing multiple anxiety disorders. Despite this, generalizability remains limited for most studies. Additionally, some studies also lacked long-term follow-up sessions and replication, which is necessary to obtain the clearest picture of the treatment's effects (3). The studies which analyzed the rates of utilization, however, were more susceptible to bias. In

the study conducted by Scheveneels and colleagues (9), the practitioners' surveys may have been prone to self-selection bias, making the results appear much more optimistic since it was up to the practitioners to inspect their own training, past patients, and beliefs. In the study by Reid and colleagues (8), only private practice therapists in the US were surveyed, leaving out any potential differences in public or foreign settings, and their documented histories only included the last 12 months, which was done in order to remove recall bias. The available evidence supports the effectiveness of exposure-based interventions. However, differences in study populations, intervention formats, and methodologies warrant cautious interpretation of these findings.

COMPARISON

This review aimed to compare the effectiveness of cognitive restructuring and exposure therapy in treating anxiety disorders in minors. The included studies examined children and adolescents with anxiety disorders, although the age ranges differed across studies, with outcomes measured through self-reports, clinician ratings, and behavioral changes following treatment.

When comparing findings across studies, differences emerge in both the consistency and type of outcomes. Cognitive restructuring demonstrates effectiveness in reducing anxiety symptoms, particularly in altering thought patterns such as negative automatic thoughts, self-blame, and cognitive distortions (17). Several studies noted improvements in coping strategies and emotional regulation, suggesting that cognitive restructuring is specifically useful for handling the internal cognitive processes underlying anxiety (7, 12–14). However, the results were inconsistent, with variability in treatment outcomes, dropout rates, and symptom reduction across studies.

In contrast, across the reviewed exposure studies, findings were generally more consistent. However, differences in study populations and methodologies prevent direct comparison with the cognitive restructuring literature. Exposure-based treatments led to reduced avoidance behaviors and improved individuals' ability to respond to stimuli (3, 4). These findings suggest that exposure therapy was consistently associated with reduced avoidance behaviors and improved behavioral responses to feared stimuli. Additionally, outcomes were relatively consistent across implementation methods, including in vivo and virtual reality exposure, suggesting similar findings across the included studies (4, 15, 16).

The two interventions share several therapeutic goals, particularly involving their therapeutic targets. While cognitive restructuring primarily targets thought patterns and exposure therapy focuses on behavior, both treatments appear to influence cognitive and emotional processing (3). For example, exposure therapy is shown to alter threat perception while cognitive restructuring improves coping strategies (7, 10). These findings suggest that the interventions may influence overlapping cognitive and behavioral processes.

Despite these similarities, some important differences exist regarding their effectiveness and utilization. Exposure therapy appeared to produce more consistent outcomes across the reviewed studies, although these observations are based on indirect comparisons between heterogeneous studies (3, 4, 15, 16). Cognitive restructuring studies demonstrated greater variability in reported outcomes when taken alone. It is evident when it comes to behavioral changes months after the sessions, especially if not consistently treated (13). Cognitive restructuring may be used more frequently in clinical practice, partly because clinicians report greater familiarity with it and perceive it as lower risk (8). These findings suggest that the two approaches may complement one another by targeting different aspects of anxiety. Exposure therapy primarily addresses avoidance behaviors, whereas cognitive restructuring focuses on modifying maladaptive thought patterns.

Overall, the reviewed studies indicate that exposure-based interventions generally produced more consistent findings than stand-alone cognitive restructuring. The characteristics of the included studies are summarized in Table 1. However, because relatively few studies directly compared the two interventions, these observations should be interpreted cautiously.

This review has several limitations regarding this topic. First, few studies directly compared cognitive restructuring and exposure therapy in child and adolescent populations, making many conclusions dependent on indirect comparisons across separate studies. In addition, the included studies varied in sample size, participant characteristics, anxiety disorders examined, treatment duration, and outcome measures, which limit the ability to make direct comparisons. Finally, because this review relied solely on published literature, publication bias may overrepresent studies with positive findings. These limitations highlight the need for more trials directly comparing cognitive restructuring and exposure therapy in children and adolescents.

Table 1. Summary of studies included in this narrative review. *The table summarizes participant populations, intervention characteristics, sample sizes, outcome measures, principal findings, and major limitations for each included study.*

Study (Reference)	Population	Intervention Type	Sample size	Outcome Measures	Key Findings	Limitations
Tiwari *et al*. (4)	Youth (7-13) with anxiety disorders	Exposure Therapy	61 participants	Avoidance behavior, coping ability	Exposure reduced avoidance behaviors, improved coping and threat perception	Limited generalizability
Legerstee *et al*. (6)	Adolescents (12-16)	Cognitive restructuring and coping	159 cases 370 control	Coping strategies, self-blame, anxiety symptoms	Reduced maladaptive coping and anxiety symptoms	Focused on coping rather than treatment methods
Reid *et al*. (8)	US private-practice therapists	Survey on exposure therapy utilization	257 therapists	Utilization rates, training, therapist attitudes	Exposure therapy is effective but underutilized due to limited training/beliefs	Only U.S. private practitioners; previous 12 months only to avoid recall bias
Scheveneels *et al*. (9)	Therapists specialized in anxiety disorders	Survey of exposure therapy use	190 respondents	Exposure use across anxiety disorders	Exposure less commonly used for Social Anxiety Disorder and PTSD	Practitioner self-report; possible self-selection bias
Lau *et al*. (10)	Children and adolescents with anxiety disorders	Experimental fear-conditioning and extinction paradigm	16 anxiety patients 30 healthy control	Fear extinction, follow-up anxiety	Stronger extinction learning was associated with reduced responses	Limited follow-up across studies and replication
Karch *et al*. (11)	Youth with anxiety aged 7-17	Cognitive training interventions	Not specified in review	Cognitive functioning	Supports cognitive trainings as part of anxiety treatment	Not exclusively focused on anxiety disorders
Félix *et al*. (12)	Adolescent girls with social anxiety	Stand-alone cognitive restructuring	23 participants	Social anxiety symptoms, negative thoughts	Significant reduction in social anxiety symptoms without exposure	All-female sample; 6-week treatment duration
Hogendoorn *et al*. (13)	Dutch adolescents with anxiety	Cognitive restructuring/ CBT	Not specified in review	Anxiety symptoms, cognition, coping	Mixed results; only about half improved	No control group; variable treatment duration and mixed treatment response
Nuraeni and Ratnaya (14)	High school students with academic anxiety	Cognitive restructuring	10 participants	Academic anxiety	Reduced academic anxiety symptoms	Very small sample; focused only on academic anxiety
Fjermestad *et al*. (15)	Youth (8–17 years) with anxiety disorders	Exposure therapy	68 participants	Exposure quality and treatment outcomes	Exposure quality showed limited between-therapist variation	Included children; not adolescent-specific
Kahlon *et al*. (16)	Adolescents with fear of public speaking	Virtual reality exposure therapy	27 participants	Anxiety immediately after treatment and follow-up	Anxiety decreased and improvements maintained at 1 and 3-month follow-up	Focused only on glossophobia; non-randomized feasibility study

CONCLUSION

In conclusion, the reviewed literature suggests that both cognitive restructuring and exposure therapy reduce anxiety symptoms in children and adolescents through different therapeutic mechanisms. Across the included studies, exposure-based interventions generally demonstrated more consistent findings, although substantial differences in study design and participant characteristics limit direct comparisons. Current evidence suggests that integrating cognitive restructuring with exposure-based strategies may provide complementary benefits, but future randomized controlled trials that directly compare stand-alone cognitive restructuring, stand-alone exposure therapy, and integrated interventions are needed to determine the optimal treatment approach for pediatric anxiety disorders.

CONFLICT OF INTEREST

The author declares that there are no conflicts of interest related to this work.

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