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The Effect of Cognitive Behavioral Therapy on Anxiety in Adolescents

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ABSTRACT

Background: Anxiety disorders are prevalent among adolescents, significantly impacting their emotional well-being, academic performance, and social interactions. **Objective:** This study aimed to evaluate the effectiveness of Cognitive Behavioral Therapy (CBT) in reducing anxiety symptoms in adolescents. **Methodology:** The study was conducted at Holy Family Hospital, Rawalpindi, from May 1 to October 30, 2024 and included 115 participants. All participants were screened to confirm an anxiety diagnosis and completed baseline assessments using standardized tools, including the State-Trait Anxiety Inventory for Children (STAIC) and the Beck Anxiety Inventory (BAI). **Results:** Participants were divided into experimental and control groups with similar demographic characteristics, including mean ages of 15.4 ± 1.2 and 15.3 ± 1.1 years, respectively, and a male majority in both groups. Most participants were diagnosed with generalized anxiety disorder (GAD) (66.7% in the experimental group, 68% in the control group), while the remainder had social anxiety disorder (SAD). Baseline anxiety scores were comparable between groups, with mean BAI scores of 24.5 ± 5.2 and 23.8 ± 4.8, and STAIC scores of 38.7 ± 6.3 and 37.4 ± 5.9, respectively. **Conclusion:** CBT led to significant improvements in anxiety scores in the experimental group, with benefits sustained at 3- and 6-month follow-ups. These findings confirm the efficacy of CBT as a treatment for reducing anxiety symptoms in adolescents, offering a structured and evidence-based approach to managing this prevalent mental health challenge.

INTRODUCTION

Anxiety disorders are among the most prevalent mental health challenges faced by adolescents, significantly affecting their emotional well-being, academic performance, and social interactions. Adolescents, a group undergoing rapid cognitive, emotional, and social changes, are particularly vulnerable to the onset of anxiety disorders. If left untreated, these disorders can lead to long-term psychological consequences, including depression, substance abuse, and impaired functioning in adulthood [1]. This process has in turn helped demonstrate that anxiety disorders are on the rise, especially among adolescents and thus there is a need for more intensified therapeutic therapies to cover this disturbing trend. There is strong empirical evidence suggesting that among the different therapeutic approaches, Cognitive Behavioral Therapy (CBT) is most helpful in the treatment of anxiety. Based on the assumptions that thoughts, feelings, and behaviors are associated, CBT seeks to alter irrational thinking processes and/or negative behaviors collectively known as diathesis that contribute to anxiety. CBT is framed, goal-directed, and skill-based, which makes it different from other therapeutic techniques that seek to address the problem of anxiety [2]. CBT has been credited for its effectiveness due to it enabling adolescents to develop coping mechanisms and solve problems with a view of eradicating symptoms. This is a very important age due to a lot of neurological and psychological changes hence the need to address any psychological issues. Anxiety at this stage hampers the typical developmental stage that is expected to produce good grades, harmonious interpersonal relations, and high self-esteem. Conventional approaches to treating anxiety include medications and these may cause some form of side effects besides being ineffective for adolescents [3]. CBT, however, is more natural and preventative than

pharmacological interventions since it directs the client to focus on the causes of anxiety and takes a proactive approach to treating anxiety and helping adolescents work through thoughts that may hinder their control. Previous studies have shown that CBT can cause beneficial changes in anxiety symptoms among adolescents. Research evidence points to the fact that CBT not only reduces the intensity of anxiety but also empowers a young person with ways of avoiding further attacks [4]. Cognitive behavior therapy consists of such methods as cognitive restructuring, exposure, and relaxation training, which makes the teenager face feelings of fear, fight with distorted thoughts, and master more constructive strategies. In addition, it has been found that CBT is flexible and can be modified to suit the individual competency of adolescents, and therefore is well suited to populations. It is also evident from the studies that CBT has versatility in the working environment such as in Schools, Clinics, or the Internet [5]. The use of CBT with adolescents in schools has been effective in reaching out to many more cases than normal clinics to most of the adolescents who could not ask for help. Online CBT programs have further extended treatment accessibility for people in the following situations: Areas with little or no access to therapy services [6]. These advancements show that CBT is a flexible model of treatment that can fill the gaps in the provision of psychiatric services. Population surveys indicate that anxiety disorders are the most common category of disorders in childhood/adolescent respondent samples and that the risk of having an anxiety disorder is generally assumed by late adolescence/early adulthood [7]. In principle, fears and anxiety can be useful and developmentally appropriate, however, clinical levels of fear and anxiety, might cause distress in children and families, and impair academic and social performance. Further, the high identified point prevalence combined with the observed impact on functioning contributes to a high economic cost for society to bear [8]. Among children and adolescents, these include separation anxiety disorder, panic disorder with or without agoraphobia, agoraphobia without a history of panic disorder, specific phobia, social phobia, obsessive-compulsive disorder post-traumatic stress disorder, acute stress disorder, generalized anxiety disorder, anxiety disorder due to medical condition, substance-induced anxiety disorder and an anxiety disorder of unspecified type [9]. Hence, the basic aim of the study is to find the effect of cognitive behavioral therapy on anxiety in adolescents.

METHODOLOGY

This quantitative research study was conducted at Holy Family Hospital, Rawalpindi, from May 1 to October 30, 2024, involving a total of 115 participants. The inclusion criteria for the study encompassed adolescents aged 13 to 18 years with a formal diagnosis of an anxiety disorder, such as generalized anxiety disorder (GAD) or social anxiety disorder, as determined by the diagnostic criteria outlined in the DSM-5. Additionally, participation required parental consent along with assent from the adolescent.

The exclusion criteria were designed to minimize confounding variables. Adolescents presenting with severe mental health disorders, such as schizophrenia or bipolar disorder, were excluded from the study. Furthermore, participants currently engaged in other therapeutic interventions, including pharmacological treatments or alternative therapeutic approaches, which could potentially interfere with the effects of Cognitive Behavioral Therapy (CBT), were also excluded. This stringent selection process ensured a homogenous sample for evaluating the effectiveness of CBT in managing anxiety among adolescents.

Data collection

All participants underwent an initial screening to confirm their diagnosis of anxiety. Following this, they completed baseline assessments using standardized tools such as the *State-Trait Anxiety Inventory for Children (STAIC)*, the *Beck Anxiety Inventory (BAI)*, and a self-reported questionnaire to evaluate the severity of anxiety symptoms. After the pre-treatment assessments, participants were randomly assigned to either the experimental group, which received CBT, or a control group, which received a wait-list or non-active intervention. The CBT intervention was delivered over 8-12 sessions, either individually or in small groups. The therapy focused on identifying and challenging negative thought patterns, teaching relaxation techniques, using exposure-based exercises to gradually confront anxiety-provoking situations, and improving emotional regulation and coping strategies. Once the intervention was completed, participants underwent post-treatment assessments using the same tools used in the pre-treatment phase. Follow-up assessments were also conducted at 3 and 6 months to assess the long-term effects of CBT on anxiety symptoms. The primary outcome measure was the reduction in anxiety symptoms, which was determined by comparing pre- and post-treatment scores.

Data Analysis

Data were analyzed using SPSS v26. Paired sample t-tests used to measure changes within the experimental group, and independent sample t-tests were used for between-group comparisons (CBT vs. control group). Statistical significance was set at $p < 0.05$.

RESULTS

Data were collected from 115 participants. Both groups had a similar mean age, with the experimental group at 15.4 ± 1.2 years and the control group at 15.3 ± 1.1 years. The gender distribution was also similar, with slightly more males in both groups (53.3% in the experimental

group and 52% in the control group). In terms of anxiety disorders, 66.7% of the experimental group and 68% of the control group were diagnosed with generalized anxiety disorder (GAD), while the remainder had social anxiety disorder (SAD). The baseline anxiety scores were similar, with the experimental group having a mean BAI score of 24.5 ± 5.2 and the control group having 23.8 ± 4.8, and STAIC scores of 38.7 ± 6.3 and 37.4 ± 5.9, respectively.

Table 1

Demographic and Baseline Characteristics of Participants

Characteristic	Experimental Group (n = 75)	Control Group (n = 75)
Age (Mean, SD)	15.4±1.2	15.3±1.1
Gender		
Male (%)	40 (53.3%)	39 (52%)
Female (%)	35 (46.7%)	36 (48%)
Diagnosed Anxiety Disorder		
Generalized Anxiety Disorder (%)	50 (66.7%)	51 (68%)
Social Anxiety Disorder (%)	25 (33.3%)	24 (32%)
Baseline BAI Score (Mean, SD)	24.5 (5.2)	23.8 (4.8)
Baseline STAIC Score (Mean, SD)	38.7 (6.3)	37.4 (5.9)

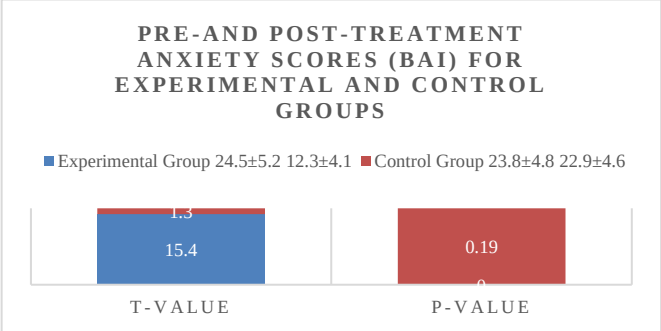
The pre-treatment mean score for the *Beck Anxiety Inventory (BAI)* in the experimental group was 24.5 ± 5.2, which decreased to 12.3 ± 4.1 post-treatment, with a t-value of 15.4 and a p-value of < 0.001, indicating a statistically significant reduction in anxiety. In contrast, the control group showed minimal change, with a pre-treatment mean BAI score of 23.8 ± 4.8, and a post-treatment score of 22.9 ± 4.6, yielding a t-value of 1.3 and a p-value of 0.19, which was not statistically significant.

Table 2

Pre-and Post-Treatment Anxiety Scores (BAI) for Experimental and Control Groups

Group	Pre-Treatment Mean Score (SD)	Post-Treatment Mean Score (SD)	t-Value	p-Value
Experimental Group	24.5±5.2	12.3±4.1	15.4	< 0.001
Control Group	23.8±4.8	22.9±4.6	1.3	0.19

Figure 1



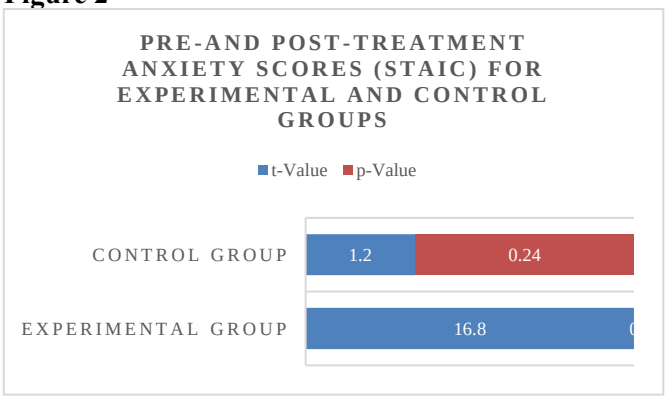
The experimental group showed a significant decrease in anxiety, with pre-treatment scores of 38.7 ± 6.3 and post-treatment scores of 21.4 ± 5.5. This resulted in a t-value of 16.8 and a p-value of < 0.001, indicating a substantial reduction in anxiety symptoms. In contrast, the control group exhibited minimal change in their STAIC scores, with pre-treatment scores of 37.4 ± 5.9 and post-treatment scores of 36.7 ± 5.8, yielding a t-value of 1.2 and a p-value of 0.24, which was not statistically significant.

Table 3

Pre- and Post-Treatment Anxiety Scores (STAIC) for Experimental and Control Groups

Group	Pre-Treatment Mean Score (SD)	Post-Treatment Mean Score (SD)	t-Value	p-Value
Experimental Group	38.7±6.3	21.4±5.5	16.8	< 0.001
Control Group	37.4±5.9	36.7±5.8	1.2	0.24

Figure 2



The *Beck Anxiety Inventory (BAI)* scores for the experimental group showed a significant reduction from pre-treatment (24.5 ± 5.2) to post-treatment (12.3 ± 4.1). At the 3-month follow-up, the mean score remained low at 13.0 ± 4.3, and at the 6-month follow-up, it was 13.5 ± 4.5, indicating that the reduction in anxiety symptoms persisted over the long term.

Table 4

Follow-Up Anxiety Scores (BAI) for Experimental Group

Follow-Up Time	Mean Score (SD)
Pre-Treatment	24.5±5.2
Post-Treatment	12.3±4.1
3-Month Follow-Up	13.0±4.3
6-Month Follow-Up	13.5±4.5

The pre-treatment mean score was 38.7 ± 6.3, which decreased to 21.4 ± 5.5 post-treatment. At the 3-month follow-up, the mean score was 22.9 ± 5.3, and at the 6-month follow-up, it increased slightly to 23.3 ± 5.6. While the scores showed a small rise, they remained significantly lower than the pre-treatment levels,

indicating that the positive effects of CBT were maintained over time.

Table 5
Follow-Up Anxiety Scores (STAIC) for Experimental Group

Follow-Up Time	Mean Score (SD)
Pre-Treatment	38.7±6.3
Post-Treatment	21.4±5.5
3-Month Follow-Up	22.9±5.3
6-Month Follow-Up	23.3±5.6

DISCUSSION

The results of this study support the hypothesis that Cognitive Behavioral Therapy (CBT) is an effective intervention for reducing anxiety symptoms in adolescents. The group which received CBT, had a decreased mean BAI and STAIC score, meaning that they reduced their level of anxiety. The findings of the present study parallel the results of the prior studies that have shown that CBT can effectively help adolescents with anxiety disorders. The reported changes also correlate to CBT fundamental proposals of restructuring cognitive distortions, teaching clients how to manage their anxiety, and desensitizing them to anxiety-inducing events. The results also suggested the observed improvement in the experimental group was maintained over time [9]. The results of the 3- and 6-month follow-up estimation also revealed that the differences in the anxiety scores were sustained the same level as the final assessment, which means CBT not only offers instantaneous alleviation on anxiety symptoms but also enhances later emotion regulation and coping skills [10]. In fact this finding yields credence to the postulation made by CBT practitioners whereby adolescents learn skills that they can practice in their everyday life even when they are no longer in therapy. In contrast, the control group, which received no CBT showed minimal or no improvement in the degree of anxiety. The present results indicate that CBT was beneficial as an intervention, given that the control group's anxiety levels did not significantly improve over the course of the study [11]. These results support the notion that CBT and other therapeutic modules which are directly aimed at practicing with the teenagers should be initiated to treat anxiety in youth and should not wait for a spontaneous remission [12]. Again, the demographic characteristics of the participants in the experimental and control groups did not differ in terms of age, sex or baseline level of anxiety. There is an implication that these potential confounding factors influenced neither the selection of participants for CBT nor the results as attained in the study in question [13]. Furthermore, the participation of adolescents with both GAD and SAD increases the generalization potential of the study because these conditions are widespread among adolescents [14]. However, there are some drawbacks of the study worth reporting as follows: First, in this study, the data regarding anxiety was gathered by means of self-endorsement, there can be a possibility that participants gave a biased self-score which underestimate or overestimate the extent of the problem [15-16]. Further studies may prove useful by including other independent assessments of anxiety, for example, by assigning and rating clinicians or using physiological measures. Moreover, although the successive evaluations allowed for the evaluation of the delayed impact of CBT, a higher number of patients involved and a longer period of time could improve the conclusions relating to the sustainability of CBT benefits. A further limitation is the relative sample homogenity. This research mainly involved participants from urban setting, and therefore information generated from the study may not be generalised to adolescents from rural or disadvantaged backgrounds. Future research could strive to make clients more heterogeneous so as to establish if CBT beneficial in different socio-economic and cultural environments.

CONCLUSION

It is concluded that Cognitive Behavioral Therapy (CBT) is an effective treatment for reducing anxiety symptoms in adolescents. The study demonstrated significant improvements in anxiety scores, with the benefits sustained at 3- and 6-month follow-ups. These results highlight the long-term efficacy of CBT in helping adolescents manage anxiety and emphasize its importance as a valuable therapeutic intervention.

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