The Effectiveness of Cognitive-Behavioral Therapy on Perceived Stress in Adolescents with Social Anxiety Disorder

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A B S T R A C T

Objective: This study aimed to investigate the effectiveness of cognitive-behavioral therapy (CBT) on perceived stress in adolescents with social anxiety disorder.

Methods and Materials: The research method was quasi-experimental, utilizing a pre-test and post-test design with a control group, along with a one-month follow-up phase. The statistical population included all adolescents diagnosed with social anxiety disorder, attending 8 counseling centers in Babol, during spring 2024. Initially, the Connor Social Anxiety Questionnaire (2000) was distributed among all participants, and 30 individuals scoring between 16 and 25 (the cut-off score of the questionnaire) were selected using convenience sampling. These individuals were randomly assigned to experimental and control groups. Data were collected using the Perceived Stress Scale (Cohen, 1983) and the Connor Social Anxiety Scale (1969). The experimental group received cognitive-behavioral therapy based on Beck's (1998) manual, administered in 12 sessions of 90 minutes each. The intervention was applied exclusively to the experimental group, while no intervention was provided to the control group. Data were analyzed using repeated measures analysis.

Findings: The findings indicated a significant difference in the perceived stress scores between the experimental and control groups in adolescents with social anxiety disorder ($P \leq 0.01$). In general, cognitive-behavioral therapy is effective in reducing perceived stress in adolescents with social anxiety disorder ($P \leq 0.01$).

Conclusion: Given the results of this study, the role of cognitive-behavioral therapy in creating changes in perceived stress holds important therapeutic implications.

Keywords: *Perceived stress, Cognitive-behavioral therapy, Social anxiety disorder, Adolescents*

1. Introduction

Humans are inherently social beings and interact with others in society. Therefore, the presence of social anxiety in social interactions can lead to numerous challenges (Niles et al., 2015). Social anxiety is considered one of the most common types of social phobia (Guidi et al., 2019), which disrupts at least part of a person's daily activities. Social anxiety is a highly debilitating disorder that can interfere with various aspects of an individual's life. From a perceptual perspective, social anxiety is believed to occur when individuals perceive that the demands and expectations placed on them exceed their available resources, capacities, and abilities (Muntendam et al., 2022). Individuals with social anxiety disorder experience higher levels of perceived stress in their lives. Although perceived stress can act as a positive stimulus for growth and development (Karna & Stefaniuk, 2024; Lievore, 2024; Tarakçıoğlu, 2024), excessive and prolonged perceived stress can negatively impact mental health and overall well-being (Dunne et al., 2010).

Adolescence is a critical and prominent stage in an individual's social and psychological development. During this period, emotional and psychological balance, self-awareness, establishing healthy relationships, and acquiring necessary social skills, such as making friends, are among the most important needs of adolescents (Wattanawongwan et al., 2022). Social anxiety is a highly debilitating disorder that can disrupt many aspects of an individual's life. In severe cases, social anxiety can significantly reduce a person's quality of life (APA, 2022). Therefore, treatment for this disorder during adolescence appears to be essential. Many scholars, recognizing the importance and value of adolescence, have examined early diagnosis and intervention for social anxiety disorder, particularly through playful and practice-based methods such as cognitive-behavioral therapy (Chen, 2024; Matsumoto, 2024; Nuraeni, 2024; N. Nuraeni, 2024; Tarakçıoğlu, 2024; van Dis et al., 2020).

Cognitive-behavioral therapy (CBT) is a psychological treatment that helps individuals learn to identify and change harmful or distressing thought patterns that negatively affect their behavior and emotions (Chen & Jiang, 2024; Sadat Ashkoor et al., 2023). The primary aim of this study is to determine the effectiveness of CBT on perceived stress in adolescents with social anxiety disorder.

In general, perceived stress is a significant and influential factor in the lives of adolescents with social anxiety disorder.

Therefore, understanding the factors affecting perceived stress is crucial for those involved in therapeutic interventions, as it may pave the way for improving treatments for these individuals. Previous studies in the country seem to have not precisely examined the simultaneous impact of CBT on perceived stress in adolescents with social anxiety disorder. Hence, to address the gap in existing studies, the central question of this research is whether CBT is effective in reducing perceived stress in adolescents with social anxiety disorder.

2. Methods and Materials

2.1. Study Design and Participants

The research method was a quasi-experimental design with pre-test and post-test, including an experimental group and a control group, followed by a two-month follow-up phase. The statistical population of this study consisted of all adolescents diagnosed with social anxiety disorder who attended eight counseling centers in Babol during spring 2024. Given that the minimum sample size for interventional studies is 15 participants (Delavar, 2020), the Connor Social Anxiety Questionnaire (2000) was initially distributed among all participants. A total of 30 individuals, scoring between 16 and 25 (the cut-off score of the questionnaire), were selected using convenience sampling and were randomly assigned to either the experimental or control group.

2.2. Measures

2.2.1. Social Anxiety

The Connor Social Anxiety Questionnaire, also known as the Social Phobia Inventory (SPIN), is one of the most reliable tools for measuring social anxiety. This questionnaire consists of 17 items that assess the three main dimensions of social anxiety: fear (6 items), avoidance (7 items), and physiological discomfort (4 items). Each item is scored on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). The total score ranges from 0 to 68. Scores between 0 and 19 indicate mild social anxiety, scores from 20 to 40 indicate moderate social anxiety, and scores above 41 suggest severe social anxiety. The validity of this questionnaire has been confirmed in various studies. A recent study by Nagy et al. (2023) showed that the Connor Questionnaire has high content and construct validity, particularly for measuring social anxiety in adolescents and young adults. Confirmatory factor analysis also validated its

three-factor structure. Internal reliability, as measured by Cronbach's alpha, has been reported. In the original version, Cronbach's alpha for the overall scale was 0.94, and for the subscales, it ranged from 0.78 to 0.90. In a more recent study by Freitag et al. (2022), Cronbach's alpha for the overall scale was reported as 0.92 (Mikaeili et al., 2024).

2.2.2. Perceived Stress

The Perceived Stress Scale (PSS) is one of the most well-known tools for assessing the level of perceived stress in individuals. It has three versions: 4-item, 10-item, and 14-item. The 10-item version (PSS-10) is the most commonly used due to its brevity, high reliability, and validity. Respondents rate each item on a 5-point Likert scale (ranging from 0 = "never" to 4 = "very often"). The total score for the 10-item version ranges from 0 to 40, with higher scores indicating higher levels of perceived stress. The construct and content validity of this scale were confirmed by Cohen et al. (1983). Recent studies have also examined its validity. A study by Taylor et al. (2021) demonstrated that the scale has good validity for measuring stress in both adolescents and adults, with confirmatory factor analysis supporting its unidimensional structure. The reliability of this scale has been confirmed in various studies using Cronbach's alpha. In the original study by Cohen et al. (1983), Cronbach's alpha for the 10-item version was reported as 0.84. In a more recent study by Lee et al. (2022), Cronbach's alpha for the 10-item version was 0.87, indicating strong internal reliability (Omidi et al., 2024).

2.3. Intervention

2.3.1. Cognitive Behavioral Therapy (CBT)

This cognitive-behavioral therapy (CBT) intervention is based on Beck's (1998) model, specifically designed to address social anxiety and perceived stress in adolescents. The program consists of 12 structured sessions, each lasting 90 minutes. The intervention focuses on guiding participants to identify and challenge negative automatic thoughts and maladaptive beliefs, using relaxation techniques, cognitive restructuring, and behavioral experiments. The participants are introduced to the therapeutic goals and framework from the onset, with continuous reinforcement and skill-building throughout the sessions. The sessions also integrate relaxation practices, such as guided imagery and progressive muscle relaxation, to reduce physiological symptoms of anxiety. Participants are assigned homework to apply the

learned techniques in real-life scenarios, fostering active involvement and progress tracking.

In the first session, participants are introduced to one another, informed of the therapy goals and rules, and establish a therapeutic relationship. Guided imagery relaxation is practiced. In the second session, cognitive-behavioral therapy is introduced, and participants learn relaxation techniques and how to identify cognitive distortions, followed by homework assignments. The third session focuses on recognizing and addressing negative and dysfunctional thoughts and beliefs. Sessions four and five involve teaching the downward arrow technique to uncover core beliefs and creating a list of those beliefs, followed by practicing cognitive restructuring. Session six involves objectively testing participants' core beliefs through cognitive analysis, while also introducing progressive muscle relaxation. Sessions seven and eight encourage participants to use various cognitive analysis methods, recognize cognitive errors, and engage in systematic desensitization. Session nine emphasizes emotional awareness and problem-solving skills, utilizing the downward arrow technique to uncover dysfunctional schemas. In sessions ten and eleven, participants practice logical analysis of automatic thoughts and cognitive confrontation, reinforcing the use of relaxation techniques. The final session summarizes the entire course, reviews all exercises, and concludes with a post-test and closing of the therapy process (Chen & Jiang, 2024; Chen, 2024; Kamran et al., 2023; Matsumoto, 2024; Mohabb et al., 2021; Sanei, 2023; Shabani, 2023; Tarakçıoğlu, 2024; Turner et al., 2016; van Dis et al., 2020; Van Duine, 2024).

2.4. Data analysis

In this study, descriptive statistics, including mean and standard deviation, were used to analyze the data. To test the research hypotheses, repeated measures analysis was conducted. In the descriptive statistics, central tendency and dispersion indicators were used to examine variables in the experimental and control groups at two time points (pre-test and post-test). In inferential statistics, the normality of the data was examined. Based on the research hypothesis, repeated measures analysis was employed for data analysis. Initially, the assumptions of this method, including homogeneity and the equality of variances between the two groups, were assessed. Multivariate analysis was performed using SPSS version 18.

3. Findings and Results

Table 1 presents the descriptive data for the subscales of perceived stress in both the experimental and control groups.

The mean perceived stress levels in the experimental group decreased from the pre-test to the post-test.

Table 1

Mean (M) and Standard Deviation (SD) of Perceived Stress in the Experimental and Control Groups

Variable	Test	Experimental Group (M ± SD)	Control Group (M ± SD)
Perceived Stress	Pre-test	32.17 ± 4.17	32.43 ± 3.21
	Post-test	21.07 ± 4.38	32.11 ± 4.41
	Follow-up	21.01 ± 4.57	32.04 ± 4.50

The results of the Shapiro-Wilk test for normality showed that the significance level for the research variables was not significant, indicating that the distribution of variables can be assumed to be normal. The results of the M. Box test for the homogeneity of covariance matrices indicated a significance level of 0.261, with a degree of freedom of 6 (F = 1.352), suggesting that the assumption of homogeneity of variances is likely met, meeting the minimum requirements for analysis. Additionally, the results of Levene's test for error variance showed that with a significance level higher than 0.05 (P > 0.05), the F scores from Levene's test confirmed the homogeneity of variances. Mauchly's test for sphericity assumption also showed that the sphericity assumption is valid, and based on the results of the homogeneity of variance test (Mauchly's sphericity test), the significance values were not significant. Thus, the homogeneity of variances across the three-time points is confirmed. A summary of the repeated measures analysis of variance (ANOVA) results for within-group and between-group factors is presented in Table 2.

Table 2

Summary of Repeated Measures ANOVA (Mixed) with Grouping, Educational Phases, and Interaction Effects

Variable	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.	Effect Size	Power
Perceived Stress	Group	1246.820	1	1246.820	41.296	0.01	0.596	1
	Educational Phases	500.356	1	500.356	28.105	0.01	0.501	0.999
	Group × Educational Phases	434.704	1	434.704	24.418	0.01	0.466	0.997

The results in Table 2 indicate that the calculated F value for the effect of the phases (pre-test, post-test, and follow-up) is significant at the 0.01 level. Specifically, a significant difference was found in the interaction between the group and educational phases regarding perceived stress. As a result, there is a significant difference in the mean perceived stress scores across the three phases (pre-test, post-test, and follow-up). The Bonferroni post-hoc test was used to examine the differences between the means in the educational phases. Overall, cognitive-behavioral therapy (CBT) was effective in reducing perceived stress in adolescents with social anxiety disorder.

Table 3

Summary of Bonferroni Post-Hoc Test Results to Determine Differences Between Pre-test, Post-test, and Follow-up

Pre-test	Phase 1	Phase 2	Mean Difference	Std. Error	Sig.
Perceived Stress	Pre-test	Post-test	5.711	0.867	0.01
	Pre-test	Follow-up	6.776	0.932	0.01
	Post-test	Follow-up	0.064	0.052	1

The results in Table 3 show that there is a significant difference in the perceived stress scores between the pre-test and post-test, as well as between the pre-test and follow-up phases. However, the difference between the post-test and follow-up is not significant, which indicates stability in the intervention effects. Comparing the means shows that perceived stress significantly decreased in both the post-test and follow-up phases compared to the pre-test phase.

4. Discussion and Conclusion

This study aimed to investigate the effectiveness of cognitive-behavioral therapy (CBT) on perceived stress in adolescents with social anxiety disorder. Based on the results, CBT was effective in reducing perceived stress in adolescents with social anxiety, confirming the research hypothesis. These findings are consistent with prior studies (Chen & Jiang, 2024; Kamran et al., 2023; Sanei, 2023; Shabani, 2023; Van Duine, 2024).

In explaining these results, it can be stated that coping skills training plays a significant role in this type of therapy. Adolescents learn stress and anxiety management skills, which help them handle stressful and anxiety-provoking situations more effectively and develop appropriate problem-solving strategies (Van Duine, 2024). This therapy assists adolescents in identifying and changing their negative and distorted attitudes. Such changes in attitudes can lead to a significant reduction in stress and anxiety. CBT, by employing techniques like positive reinforcement and encouragement, helps adolescents boost their self-confidence and self-assurance (Sanagoo Mohrer et al., 2017). Additionally, CBT improves adolescents' communication skills, enabling them to interact more effectively and healthily in stressful situations. This therapy also enhances self-awareness, allowing adolescents to confront themselves more effectively and feel greater control over their lives. This therapeutic approach focuses on scientifically proven principles and effective methods for reducing anxiety and stress (Chen & Jiang, 2024). These methods include cognitive, behavioral, and protective interventions that help alleviate stress and anxiety. CBT teaches adolescents to recognize and change the negative thought patterns and behaviors that contribute to social anxiety. These positive changes in thoughts and behaviors can significantly reduce perceived stress and anxiety. The therapy provides adolescents with stress and anxiety management skills, including breathing exercises, mental exercises, and relaxation techniques, which help them manage stressful and anxious moments more effectively. Additionally, CBT enhances adolescents' social skills and improves their communication, which can reduce social anxiety and increase self-confidence (Shabani, 2023).

CBT helps adolescents identify and change their dysfunctional and antisocial behaviors (Jacobi et al., 2024). This change in behavior can improve their social relationships, consequently reducing perceived stress. It also boosts adolescents' confidence, allowing them to better handle difficult social situations and reduce stress. Overall, CBT, by combining changes in beliefs, teaching coping skills, modifying behaviors, and increasing self-confidence, can help adolescents with social anxiety disorder reduce their perceived stress and improve their well-being. CBT helps adolescents with social anxiety better cope with stress and anxiety and find effective ways to manage them.

5. Limitations & Suggestions

The limitations of this study include the lack of control over cognitive factors such as intelligence and aptitude. These results may vary based on ethnic and cultural contexts. Generally, CBT programs can be used both as an effective intervention and as a means to enhance positive traits such as social adaptability while reducing negative traits such as perceived stress in individuals facing difficulties. The cognitive-behavioral approach helps individuals share their problems, receive effective coping strategies from group members, challenge negative thoughts and idealistic beliefs, and use techniques such as problem-solving and attention diversion, all of which lead to improved capabilities. Thus, this cost-effective and short-term therapy can be applied to adolescents with social anxiety disorder.

Based on the findings, it can be suggested that direct and indirect use of CBT techniques as a preventive method can help reduce stress and behavioral overload. It is recommended that counselors, considering the effective techniques of CBT, first identify the characteristics of individuals with problems and then employ therapeutic methods to improve their conditions. Future research should explore this topic in different geographic and cultural contexts to better understand various challenges and differences. Further studies could investigate the effects of CBT on social development, considering emotional factors such as emotional interaction. It is also recommended to conduct studies on different age groups and male gender. Future research should employ multiple assessment methods, including observation, interviews, and behavioral history, to overcome the limitations of solely using questionnaires. Random sampling methods are suggested for future research.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed in this article.

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