

Research Paper

Effectiveness of Cognitive Group Therapy on State-trait Anxiety of Anxious Adolescents

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Citation Khayati Ghasemkheyli F, Mirzaian B. Effect of Cognitive Group Therapy on State and Trait Anxiety of Anxious Female Adolescents. *Current Psychosomatic Research*. 2023; 2(1):47-54. <http://dx.doi.org/10.32598/cpr.2.1.154.1>

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ABSTRACT

Background and Objective: Anxiety is considered a significant public health concern, and is one of the main psychological disorders during adolescence. This study aims to evaluate the effectiveness of cognitive group therapy in reducing state and trait anxiety among female adolescents with anxiety.

Materials & Methods: This is an open-label randomized controlled clinical trial with a pre-test/post-test/follow-up design. The study population consists of female students in the seventh, eighth, and ninth grades from a high school in Sari (District one), Iran. Of these, 30 students were selected using a convenience sampling method. The subjects were randomly divided into two groups of 15 people, intervention and control. Cognitive group therapy intervention was conducted for the intervention group for 12 weekly sessions of 90 minutes. There was no intervention for the control group. Participants completed Spielberger's State-Trait Anxiety Inventory (STAI), and data analysis was performed using repeated measures analysis of variance in SPSS software, version 22.

Results: In the pre-test, post-test, and follow-up phases, the mean score of state anxiety, were 46.066 ± 9.277 , 23.533 ± 4.763 , and 33.6 ± 10.479 , respectively. For the trait anxiety, the scores were 51.533 ± 10.246 , 26.133 ± 5.111 , and 31.400 ± 9.014 , respectively. These scores showed a significant decrease in the post-test and follow-up phases compared to the pre-test phase ($P < 0.05$). No significant differences were observed in the control group. Cognitive group therapy significantly reduced both state ($F = 17.407$, $P = 0.001$) and trait anxiety ($F = 17.759$, $P = 0.001$) in anxious adolescents.

Conclusion: The cognitive group therapy is effective in reducing state and trait anxiety of anxious female adolescents. This therapy can be used along with other psychological interventions in educational settings to reduce the psychological problems of anxious adolescents.

Keywords: Group therapy, Cognitive therapy, Anxiety Disorder, Adolescents

Article info:

Received: 11 Nov 2022

Accepted: 11 May 2023

Publish: 01 Aug 2023

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Introduction

Adolescence is a period of personality development and is associated with internal turmoil, spanning between the ages 10-19 [1]. This period includes transformations in the body, mind, visualization, and imagination [2]. Puberty occurs in this period [3]. The physical changes caused by puberty are often considered as a crisis for adolescents, and can lead to the creation and continuation of many problems. Adolescent girls face more health, psychological, and social problems than boys due to physiological differences, social roles, and prevailing social norms [4]. Adolescence is a vulnerable period for mental health, which can lead to many psychological disorders, such as anxiety [5]. Anxiety is a painful feeling determined by the current traumatic situation or the expectation of undefined threats, often accompanied by physical symptoms [6]. Research indicates that anxiety is more prevalent in girls than in boys [7]. A meta-analysis study has estimated a global anxiety prevalence of 13.4% in adolescents [8]. Anxiety is a multifaceted phenomenon and has different aspects, including physical, cognitive, emotional, and interpersonal [9]. Psychologists such as Charles Z. Spielberger and Richard L. Gorsuch categorize anxiety into state and trait types [10]. State anxiety is defined as a temporary emotional state in response to a perceived threat [11], whereas trait anxiety refers to a more general tendency to respond to perceived environmental stressors, which is relatively stable [12].

Given that anxiety is often related to negative thoughts and appraisal of situations, cognitive therapy can be an effective approach to mitigate it, whose clinical efficacy has been shown by various studies [3]. Through cognitive therapy, individuals learn how their thoughts contribute to the onset and persistence of anxiety symptoms and how to mitigate these thought patterns to reduce the occurrence and severity of their reactions. Michael Frey's cognitive therapy approach not only modify a person's rational beliefs but also addresses their emotional beliefs and teach individuals to move from abnormal information processing methods to normal methods. By creating a change and transformation in the individual's cognitive system, it enables their reactions to be changed by cognitive characteristics, allowing the person to correctly understand and interpret the facts [8]. This method is a non-pharmacological treatment. Its advantage compared to other psychotherapy methods is that it directly deals with thoughts and feelings, which are important in all mental disorders. Additionally, its implementation in a group format can increase its effectiveness. Therefore,

since the individual benefits from the support of group members which can expand his/her social skills, and given that the approach is cost- and time-effective, group therapy is more efficient than individual therapy [13].

Research suggests that anxiety in adolescence can disrupt interpersonal relationships. Since social functioning is crucial during adolescence, anxiety can negatively affect social interactions, for example, by reducing the acceptance of peers and low friendship quality [14]. Anxious adolescents tend to be less engaged in school activities, directly affecting their academic performance and grades [15]. They also experience more psychological issues than their peers, which disrupts their normal life and daily performance [16]. Therefore, early intervention during this critical period is essential to prevent psychological disorders in adulthood [1]. Physically and psychologically healthy children and adolescents are imperative for social development [17]. Investigating solutions to manage the anxiety of adolescents is crucial not only for the individuals and their family but also for the schools and even the government. Therefore, this study aims to examine the effect of cognitive group therapy on state and trait anxiety of female adolescents.

Materials and Methods

This is an open-label randomized controlled clinical trial with a pre-test/post-test/follow-up design. The study population consists of the students from Ayatollah Hashemi Rafsanjani High School for girls in Sari, Iran, in December 2022. Out of 110 students, the parents of 76 students allowed them to participate in the study. After providing explanations about the study objectives, 54 students expressed their willingness to participate in the study. Then, they completed Spielberger's state-trait anxiety inventory (STAI). Those who achieved a minimum score of 30 were included. In this regard, 30 students were purposefully selected and randomly (lottery method) divided into two groups of 15 including intervention and control groups (Figure 1). The sample size of 15 per group was determined using a formula (comparing two means) and based on previous study [18]. Inclusion criteria were age 13-16 years (first-grade high school students), no incurable physical diseases such as cancer or multiple sclerosis, written consent from both parents and students to participate in the study, no major psychiatric disorders such as schizophrenia, no simultaneous attending in other psychological interventions or drug therapies, and a minimum STAI score of 30. The exclusion criterion was the absence from more than two treatment sessions. It should be noted that three students had lower scores in the post-test and follow-up phases

Table 1. The protocol of cognitive group therapy

Session	Content
1	Pre-test assessment, getting to know each other, overview of the ground rules, teaching how to think and feel (the emotional baggage concept in cognitive therapy), homework (writing worries)
2	Reviewing the homework, automatic negative thoughts (ABC sequence), practicing automatic negative thoughts related to group therapy, guided imagery mediation, homework (writing automatic thoughts in the ABC sequence)
3	Reviewing the homework, the behavioral consequences of beliefs, practicing thought induction, the vertical arrow method, practicing the vertical arrow method, homework (thought induction and analyzing the vertical arrow method by the ABC sequence)
4	Reviewing the homework, continuing the vertical arrow technique, classification of beliefs, practicing belief classification, homework (Classifying beliefs and practicing the vertical arrow method)
5	Reviewing the homework, the master list of beliefs and worries, preparing the master list of beliefs and worries, cognitive map, making cognitive map, using the subjective units of distress scale, homework (Classifying beliefs and cognitive mapping)
6	Reviewing the homework, teaching the master list of beliefs and worries, objective assessment, practicing objective assessment, homework (objective assessment of beliefs)
7	Reviewing the homework, standard analysis, practicing standard analysis, efficiency analysis, practicing efficiency analysis, homework (standard and efficiency analysis).
8	Reviewing the homework, logical analysis, practicing logical analysis, continue to perform logical analysis, homework (logical analysis)
9	Reviewing the homework, hierarchy of beliefs, practicing to create a hierarchy of beliefs, countering, practicing countering, homework (countering beliefs)
10	Reviewing the homework, perceptual shift, filling perceptual shift worksheet, homework (perceptual shift)
11-12	Reviewing the homework, self-reward training, sustainable change, use of mental imagery, closing ceremony, appointments for follow-up and evaluation after treatment, post-test assessment

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than in the pre-test phase; however, since their scores was >50, they were selected and referred to the psychiatric center at the discretion of the school counselor and the parents.

The intervention group received cognitive group therapy at 12 weekly sessions of 90 minutes according to Michael Frey's proposed protocol [19] presented in Table 1, which was provided by an expert (MS in clinical psychology), supervised by an expert (PhD in general psychology). The control group did not receive any treatment during the study but was put on a waiting list to receive the cognitive therapy after the end of the study.

Assessments were carried out in three phases: Pre-test, post-test (March 2023), and follow-up 45 days after the intervention (April 2023), by the first author using the STAI. This tool was developed in 1970 by Charles Z. Spielberger, and has 40 items; items 1-20 measure the state anxiety and items 21-40 assess the trait anxiety. A score of 20-29 shows mild anxiety; score 30-49= mild anxiety, score 50-69= moderate anxiety, and score 70-80= severe anxiety. The Cronbach's α coefficient is 0.92 for the state anxiety subscale and 0.90 for the trait anxiety subscale, with a test-retest coefficient of 0.62 for the state anxiety and 0.68 for the trait anxiety subscale [20].

This questionnaire has been standardized in Iran, which reported reliability scores of 0.92 and 0.91 for state and trait anxiety, respectively. Its validity has been confirmed at a high level [21].

Data were analyzed in SPSS software, version 22, and the significance level was set at 0.05. The repeated measures analysis of variance (ANOVA) with was used to assess the effects of treatment and time.

Results

Table 2 presents the demographic characteristics of the two groups and Table 3 provides the mean scores for the study variables at three phases for each group. Levene's test results confirmed that the assumption of equal variances for the state anxiety ($F=3.132, P=0.088$) and trait anxiety ($F=4.164, P=0.051$). Table 4 presents the results of repeated measures ANOVA, using the Greenhouse-Geisser correction, for the effect of cognitive group therapy on the STAI score in female adolescents. The treatment significantly reduced state anxiety and trait anxiety in the intervention group compared to the control group ($P<0.05$). Moreover, both main effect and interaction effect of time and group were significant on state anxiety and trait anxiety. The Bonferroni post hoc test

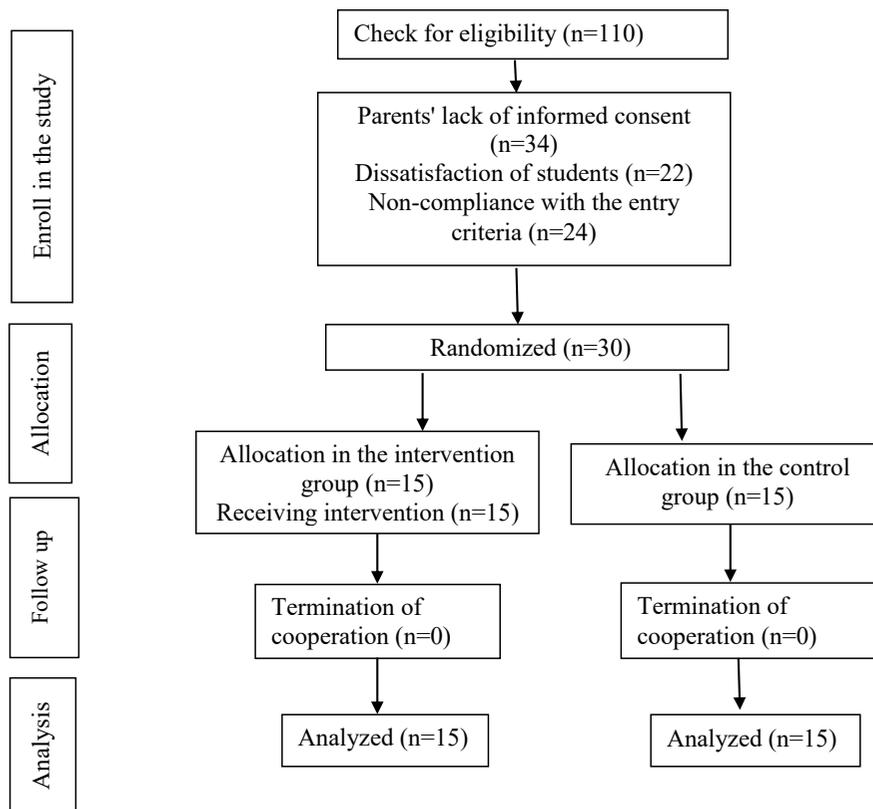


Figure 1. Flowchart of the sampling and allocation processes

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was used for the pairwise comparison in the intervention group. The results are shown in Table 5. As can be seen, the scores of state anxiety and trait anxiety were significantly different between the three assessment phases in the intervention group.

Discussion

The findings of this research demonstrate that cognitive group therapy had a significant effect on state and trait anxiety of anxious adolescent girls. We found no similar study to compare the results. A study in Kish Island, Iran, revealed that cognitive-behavioral group therapy reduced state-trait anxiety in girls aged 15-17 and enhanced their mental health [22]. This is consistent with our results, although we used cognitive therapy alone, without behavioral

treatment. A study explored the effectiveness of cognitive group therapy based on Michael Frey’s method on reducing rumination and depression of female high school students, where the findings confirmed the effectiveness of cognitive group therapy [8]. A study on the effect of metacognitive group therapy for adolescents with anxiety disorders and depression also indicated its promising results [23]. In another study, the effects of cognitive-behavioral group therapy on rumination and anxiety among patients with multiple sclerosis were examined. The findings indicated that cognitive-behavioral group therapy led to significant improvements because in this type of thinking and feeling treatment, patients to organized their absolute beliefs about themselves and others, and the therapy effectively reduced negative imagery and dysfunctional attitudes related to irrational thoughts [24]. Additionally, a related study demon-

Table 2. Age and educational level of the participants in two groups

Group	Age (%)			Educational level (%)		
	14 Years	15 Years	16 Years	7 th Grade	8 th Grade	9 th Grade
Intervention	60	40	0	20	53.3	26.7
Control	60	3.33	6.7	13.3	46.7	40

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Table 3. Mean scores of state and trait anxiety in two study groups

Variables	Stage	Mean±SD	
		Intervention	Control
State anxiety	Pre-test	46.066±9.277	44.333 ±9.484
	Post-test	23.533±4.763	44.2±9.674
	Follow-up	33.6±10.749	43.466±7.717
Trait anxiety	Pre-test	51.533±10.246	46.333±8.989
	Post-test	26.133±5.111	40.333±9.036
	Follow-up	31.400±9.014	47.266±6.363

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Table 4. Results of repeated measures ANOVA for within-group and between-group comparisons of state anxiety and trait anxiety

Variables	Mean Square	F	P	Effect Size	
State anxiety	Time	666.667	16.912	0.001	0.377
	Time×group	504.600	12.801	0.001	0.314
	Group	2037.600	17.407	0.001	0.383
Trait anxiety	Time	1382.400	21.217	0.001	0.431
	Time×group	1664.267	25.543	0.001	0.477
	Group	1545.878	17.759	0.001	0.388

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strated the efficacy of cognitive-behavioral therapy in alleviating anxiety during the pandemic, which caused a state anxiety created by an unstable condition [25]. According to studies, to manage psychosocial factors, it is necessary to use psychological methods (such as cognitive group therapy) for the anxious adolescents [26].

In explaining the effectiveness of cognitive group therapy on the state and trait anxiety, it can be said that this intervention which is based on cognitive processes and emotional reactions, affect the persistence of psy-

chological problems in the individuals since people’s feelings and behaviors are influenced by their perception of events. What is important in explaining psychological problems is the way people interpret and perceive a distressing event and the cognitive content of their reactions to achieve the flow of thoughts and schemas that affects a person’s perceptual structure and behavior control assessment. This therapy is a direct and structured approach to help individuals identify and eliminate distorted and ineffective thinking patterns through regular and organized homework. In addition, since it was per-

Table 5. Results of Bonferroni post hoc test for pairwise comparison in the intervention group

Variables	Pre-test - Follow-up			Post-test - Pre-test			Post-test - Follow-up		
	Mean Difference	SD	P	Mean Difference	SD	P	Mean Difference	SD	P
State anxiety	6.667	1.621	0.001	-11.333	2.331	0.001	-4.667	1.764	0.040
Trait anxiety	9.600	2.048	0.001	-15.700	2.086	0.001	-6.100	1.853	0.007

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formed in a group format and the group members benefit from each other's skills, it had a great impact. By challenging negative thoughts, it improve the planning to achieve goals and reduces anxiety [5, 10, 11].

Conclusion

One of the disadvantages of this clinical trial was the use of only one experimental group. In addition, the results cannot be generalized to all anxious people, since the intervention was conducted only on female samples. For future research, it is recommended to include both male and female adolescents and to use a longer study duration to observe long-term effects. The providers of educational, therapeutic, and support services to adolescents in Iran are recommended to use cognitive group therapy, along with other methods for the psychological treatment of anxious adolescents.

Ethical Considerations

Compliance with ethical guidelines

This study has ethical approval from the ethics committee of [Islamic Azad University, Sari branch](#) (Code: IR.IAU.SARI.REC.1401.232).

Funding

The article was extracted from the master's thesis of [Fatemehzahra Khayati Ghasemkheyli](#), approved by Department of Psychology, Faculty of Medicine, [Sari Branch, Islamic Azad University](#).

Authors' contributions

The authors contributed equally to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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