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The effect of cognitive behavioral group therapy program on cognitive flexibility and separation anxiety in adolescents in foster care centers

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Abstract

Introduction: Adolescent living in care centers encounter various psychological and social difficulties that can increase their risk of developing issues like anxiety and behavioral disorders. This study aims to explore how a Cognitive Behavioral Group Therapy (CBGT) program influences cognitive flexibility and separation anxiety in adolescents residing in care centers.

Materials and Methods: The study examined adolescents, both boys and girls, from welfare daycare centers in Tehran during the summer and fall of 2023. A total of 30 participants were selected using the convenient sampling method. Cognitive behavioral group therapy interventions were conducted over six sessions lasting 40 minutes each, once a week, separately for boys and girls in one of the centers offices for the experimental group. We used the Cognitive Flexibility Inventory (CFI) and Screen for Child Anxiety-Related Disorders (SCARED) to collection data. Data analysis was performed using SPSS version 27, covariance analysis with repeated measures and the Kruskal-Wallis H test.

Results: There was a significant difference between the experimental group and the control group after intervention in cognitive flexibility ($P< 0.01$). The separation anxiety in the experimental was significantly decreased compared to the control group in the post-test and follow-up stages ($P< 0.01$).

Conclusion: Based on the results, cognitive behavioral group therapy had a positive effect on improving cognitive flexibility and reducing separation anxiety in adolescents living in care centers.

Keywords: Adolescents, Cognitive behavioral therapy, Cognitive flexibility, Separation anxiety

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Introduction

The main goal of Child Protective Services (CPS) is to ensure the safety, both physical and psychological, of adolescents who have experienced abuse or are at risk of neglect. Suppose the family environment poses a threat to the well-being of the teenager. In that case, they may be placed in a foster home or residential care center if their family is unable to provide for them despite CPS intervention (1). Adolescents in care centers often face various challenges in terms of psychological and social issues.

They are usually moved to these centers due to family issues, abuse, or abandonment, which can increase their susceptibility to mental health problems like depression, anxiety, and behavioral disorders (2). Studies on youth in foster care consistently show poor outcomes in terms of education, employment, early parenthood, homelessness, criminal involvement, and substance abuse (3).

Research also indicates a high prevalence of mental health disorders such as conduct disorder, depression, anxiety, and behavioral issues among children and adolescents in care centers (4). Adolescents residing in such environments encounter more difficulties, such as a decline in cognitive flexibility skills, which impacts their ability to adjust to new situations and effectively cope with daily stress (5). Psychological flexibility involves six key interactive processes: acceptance, cognitive defusion, present-focused awareness, self-as-context, committed action, and values-based action (6).

Research findings indicate a significant variance in psychological flexibility, self-esteem, psychological adjustment, emotion regulation, and well-being between adolescents residing in orphanages and those living with their biological parents (5). A study carried out on a group of children residing in care centers also demonstrated that children with limited cognitive flexibility, regardless of a history of abuse, exhibit lower levels of emotion regulation (7).

Separation anxiety, a common psychological issue in children and adolescents, is often seen in environments like care centers. It is closely connected to fear of separation and strong emotional attachment to specific individuals or places, leading to potential emotional and social difficulties (8). The primary characteristic of this disorder is excessive fear or anxiety upon parting from home or loved ones, surpassing what is typical for the individual's developmental stage.

In addition to fear, negative consequences of separation anxiety may include aggression, loss of self-control, guilt, loneliness, and challenges in mental health and social functioning (9). Research indicates a high prevalence of anxiety and depression among young people in care centers (10). Additionally, studies have shown that mental disorders such as post-traumatic stress disorder, major depression, and separation anxiety disorder are commonly found in care center residents, with a notably higher occurrence among men (11). There are several treatment options available for anxiety, including medication, therapy, and physical therapy, but Cognitive Behavioral Therapy (CBT) is recommended as the first choice for children and adolescents with anxiety disorders by international guidelines, the Academy of Child Psychiatry and the American Academy of Pediatrics suggest offering CBT to young patients with social anxiety, generalized anxiety, separation anxiety, specific phobia, or panic disorder (12).

CBT is considered a highly effective method to reduce anxiety symptoms and enhance cognitive flexibility in adolescents, typically involving 12 to 18 hour-long sessions focusing on identifying and modifying problematic behaviors and thoughts (13). One study demonstrated that CBT can increase cognitive flexibility (14), while another suggested that health professionals can use CBT to enhance psychological flexibility (15). Recent research by Giani et al. also supported the efficacy of CBT as the preferred treatment for separation anxiety disorder in youth (16). Studies have shown that CBT is effective in alleviating separation anxiety symptoms, particularly in boys (17).

Adolescents residing in care centers are confronted with various psychological and emotional obstacles due to the unique circumstances of their lives. Being separated from their families and familiar surroundings often results in complex emotions that can impact their ability to regulate emotions, form social connections, and diminish their overall quality of life (2).

It is crucial to conduct further research within this demographic to enhance understanding and potentially enhance intervention and treatment strategies such as CBT.

Although previous studies have highlighted the importance of this issue, there is a lack of research examining the impact of CBT on cognitive flexibility and separation anxiety in adolescent residing in care centers. Consequently, there exists a gap in the current research, and this study aims to address whether cognitive behavioral group therapy can positively influence cognitive flexibility and separation anxiety in this population.

Materials and Methods

The statistical population consisted of all adolescent attending welfare daycare centers in Tehran during the summer and fall of 2023. A sample size of 30 adolescents (15 in the experimental group and 15 in the control group) was selected using convenience sampling and random assignment through coin tossing. The adequacy of the sample size was determined using G-Power software (18).

To be eligible for the study, participants had to be at least 12 years old, have the necessary physical and mental health to take part in the research sessions, reside in care centers in Tehran, provide informed consent, and have not participated in similar training programs within the last three months. One of the requirements for leaving the study was having a medical condition that made it difficult to attend consistently, missing over two training sessions, or not responding to at least eight questions. Researchers obtained approval from their university before going to care centers in Tehran to select a facility for boys and another for girls. The researchers then approached adolescents in these centers to participate in the study, ultimately selecting 39 participants. A larger sample was selected to accommodate for possible dropouts among the participants in the study. During the first interview held in person at the centers, the adolescents were briefed on the research objectives and ethical principles, addressing any queries they may have had. The selection process involved screening at this point to eliminate adolescents who did not meet the research criteria, ultimately choosing 30 participants after a few teens decided not to participate. Afterward, a preliminary test was given to the 30 adolescents using research instruments to collect data.

The participants were then randomly assigned into groups, with the experimental group scheduled to undergo a six-week training program based on cognitive behavioral group therapy. This program consisted of 40-minute sessions conducted once a week at the centers, while the control group did not receive any intervention. More information regarding the material and emphasis of these sessions is available in Table 1 (19). After the sessions concluded, a post-test assessment was conducted for both groups, followed by a three-month evaluation of the research variables. The pre-test, post-test, and follow-up results were subsequently analyzed for comparison between the two groups. Three participants from the experimental group and two from the control group discontinued participation during the study. Figure 1 displays the CONSORT flow diagram.

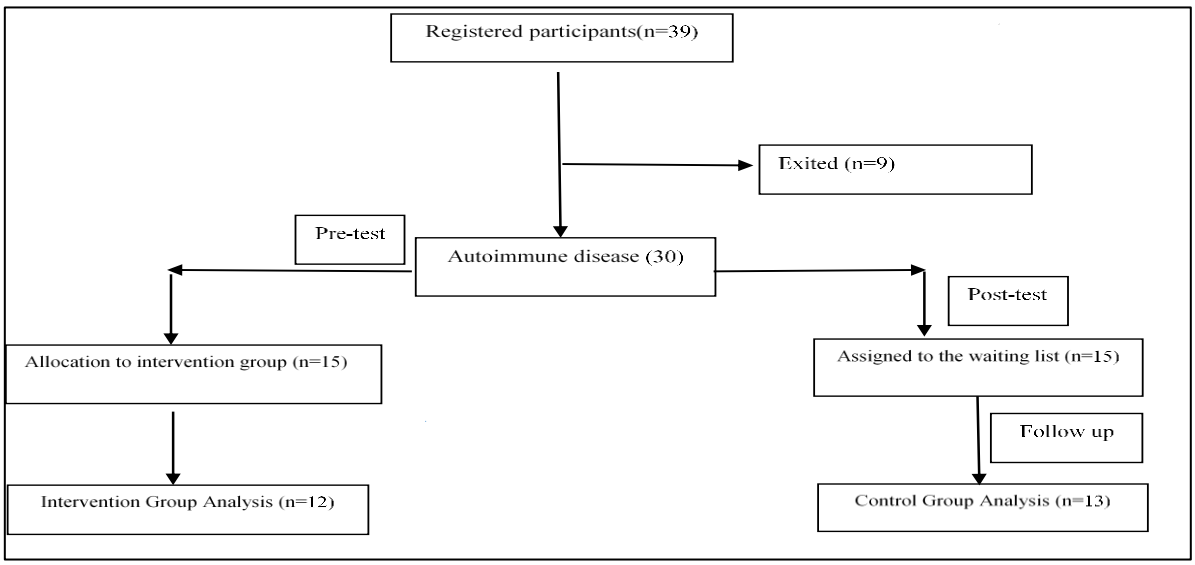

Figure 1. The flow diagram of the study

Research instruments

A) Cognitive Flexibility Inventory (CFI): In 2010, Dennis and Vander Wal created a questionnaire to assess cognitive flexibility and the development of flexible thinking in individuals. The questionnaire consists of 20 questions, each rated on a scale from 1 to 7. These questions are divided into three subscales – alternatives, control, and behavioral alternatives. The total score ranges from 20 to 140. In a study by Dennis and Vander Wal, the questionnaire showed moderate concurrent validity with the Beck Depression Inventory (BDI-II) and strong convergent validity with the Martin and Robin Cognitive Flexibility Scale (20). In an Iranian study, the Cronbach's alpha coefficient for this questionnaire was reported as 0.93, 0.74, and 0.64 (21).

B) Screen for Child Anxiety-Related Emotional Disorders (SCARED): Birmaher et al. developed a questionnaire in 1999 to assess separation anxiety and anxiety symptoms in children and adolescents aged 8 to 18 years old according to the criteria outlined in the DSM-IV. The questionnaire consists of 41 items, each rated on a scale of 1 to 5 (from disagree to agree). It yields a total score, as well as scores on five subscales: generalized anxiety, separation anxiety, school avoidance, panic disorder, and social phobia. Eight of the questions focus on separation anxiety, which was the focus of the current study. To examine the reliability of the questionnaire, Birmaher et al., using the test-retest method, reported the reliability of the questionnaire to be 0.70 to 0.90 and the internal consistency of the questionnaire to be 0.74 to 0.93 (22). A study conducted in Iran found a reliability coefficient of 0.93 for this scale using the test-retest reliability method (23). The researcher calculated the Cronbach's alpha coefficient for this scale to be 0.71.

Table 1. Cognitive-behavioral therapy protocol

Session	Content
First	- A summary of group CBT training - Teaching the fundamental principles of CBT - Explaining key CBT concepts like spontaneous thoughts and cognitive distortions - Planning meeting dates - Going over meeting guidelines - Interacting with the therapist
Second	-Planning the meeting agenda -Assessing, formulating, and providing a conceptual framework for cognitive flexibility and separation anxiety -Conceptualizing adolescent issues
Third	-Introducing the connection between thoughts, feelings, and behaviors -Planning the meeting agenda -Goal setting -Focusing on relaxation techniques
Fourth	- Reviewing coping skills group -Planning the meeting agenda - Recognizing a stressful situation - Practice and master your inner monologue
Fifth	-Planning the meeting agenda -Correcting anxious thoughts -Training the cognitive restructuring techniques for reframing thoughts
Sixth	- Planning the meeting agenda - Identifying cognitive distortions - Reviewing evidence and making confrontation cards - Teaching exercises for cognitive flexibility - Concluding with a summary and post-test

We utilized descriptive statistics, such as mean and standard deviation, Kruskal-Wallis H and covariance analysis with SPSS version 27. The normal distribution was assessed using the Kolmogorov-Smirnov test, while the homogeneity of variances was evaluated using Levene's test. Additionally, Bonferroni's post-hoc test was conducted to compare the means.

Results

The adolescents were categorized based on gender into groups of boys and girls. Similarly,

they were separated into three age categories: 12 to 13 years old, 13 to 14 years old, and 14 to 15 years old. The results of the Kruskal-Wallis test indicated no significant difference between the participants in terms of gender (P= 0.851). Thus, the groups were comparable in terms of gender. However, there was a discrepancy in age among the participants (P= 0.036) (Table 2). Table 3 presents the mean and standard deviation of the variables in the research groups.

Table 2. Demographic characteristics in the experimental and control groups

Variable		CBGT		Control		Total		Kruskal-Wallis H	P
		N	%	N	%	N	%		
Age	12-13	3	25.0%	6	46.2%	9	36.0%	0.270	0.036
	13-14	6	50.0%	3	23.1%	9	36.0%		
	14-15	3	25.0%	4	30.8%	7	28.0%		
Gender	Boy	6	50.0%	6	46.2%	12	48.0%	0.603	0.851
	Girl	6	50.0%	7	53.8%	13	52.0%		

Table 3. Description of variables

VARIABLE	STAGE	GROUPS	N	MEAN	STD. DEVIATION
Cognitive Flexibility	Pre-test	CBGT	12	72.167	2.725
		Control	13	72.538	2.933
	Post-test	CBGT	12	76.333	2.498
		Control	13	72.308	2.750
	Follow-up	CBGT	12	79.583	1.443
		Control	13	72.077	2.783
Separation Anxiety	Pre-test	CBGT	12	28.333	1.670
		Control	13	28.846	1.519
	Post-test	CBGT	12	26.333	1.231
		Control	13	28.385	1.609
	Follow-up	CBGT	12	24.000	1.477
		Control	13	28.385	1.261

Table 3 showed no significant variance in the mean score of the cognitive flexibility between the groups in the pre-test stage.

However, there was a variation in the mean between the groups during the post-test and follow-up stages. Overall, the mean scores in the post-test and follow-up stages in the experimental group decreased compared to the control group.

Similarly, the mean of the separation anxiety variable during the pre-test did not differ significantly between the experimental and control groups. Nevertheless, there was a variance in the mean between the control and experimental groups during the post-test and follow-up stages. Table 4 displays the results from the analysis of the covariance test with repeated measurements.

Table 4. Covariance analysis test

Variable		Source	SS	MS	F	P	Eta Squared
Cognitive flexibility	Within subjects effects	Time	1.104	1.104	0.229	0.638	0.011
		Time × Pre-test	0.742	0.742	0.154	0.699	0.008
		Time × Gender	1.944	1.944	0.403	0.533	0.020
		Time × Group	37.249	37.249	7.725	0.012	0.279
		Time × Gender × Group	6.970	6.970	1.445	0.243	0.067
	Between subjects effects	Pre-test	0.862	0.862	0.233	0.635	0.012
		Gender	90.185	90.185	24.348	< 0.001	0.549
		Group	426.332	426.332	115.103	< 0.001	0.852
		Gender × Group	3.398	3.398	0.917	0.350	0.044
Separation anxiety	Within subjects effects	Time	2.490	2.490	2.196	0.154	0.099
		Time × Pre-test	1.913	1.913	1.687	0.209	0.078
		Time × Gender	0.001	0.001	0.001	0.971	6.608×10^{-5}
		Time × Group	15.595	15.595	13.758	0.001	0.408
		Time × Gender × Group	13.212	13.212	11.656	0.003	0.368
	Between subjects effects	Pre-test	1.333	1.333	0.861	0.365	0.041
		Gender	13.933	13.933	8.999	0.007	0.310
		Group	127.728	127.728	82.499	< 0.001	0.805
		Gender × Group	3.325	3.325	2.147	0.158	0.097

Based on the covariance analysis, the *P* value for the between-subjects effects was significant for the groups and adolescent boys and girls in cognitive flexibility (*P*< 0.001). This indicated a significant difference in the groups while controlling for the effects of the pre-test stage. Additionally, the significance in the within subjects effects for the cognitive flexibility showed interactive effects between time and group (*P*= 0.012). Furthermore, the *P* value in the between-subjects effects was significant for the separation anxiety between the groups, as well as between adolescents (*P*< 0.01). The within subjects effects for the separation anxiety showed significant interaction effects between time, group, and gender (*P*= 0.003). We also analyzed the pairwise interaction effects between stages and groups for the cognitive flexibility in Table 5. Figure 2 displays pairwise analysis of the interaction effects between time and groups for the cognitive flexibility.

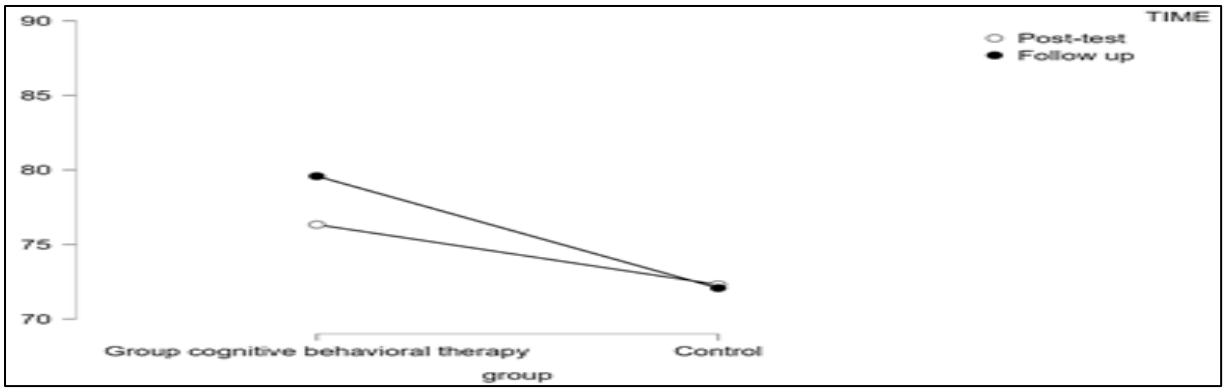

Figure 2. Pairwise analysis of the interaction effects between time and groups for the cognitive flexibility

Table 5. Post-hoc comparisons - group × time

Variable			MD	SE	t	pbonf
Cognitive flexibility	CBGT- Post-test	Control- Post-test	4.137	0.830	4.981	< 0.001
		CBGT- Follow-up	-3.232	0.898	-3.600	0.004
		Control- Follow-up	4.377	0.829	5.280	< 0.001
	Control- Post-test	CBGT- Follow-up	-7.369	0.829	-8.889	< 0.001
		Control- Follow-up	0.240	0.866	0.277	0.785
	CBGT- Follow-up	Control- Follow-up	7.609	0.830	9.162	< 0.001
	Boy	Girl	-2.811	0.570	-4.934	< 0.001

Table 5 and Figure 2 indicated a significant difference in cognitive flexibility in the CBGT group compared to the control group at all stages (*P*< 0.01). The increase in mean scores of this variable in the experimental group confirms the effectiveness of CBGT intervention in enhancing cognitive flexibility. A notable contrast was noticed between the CBGT during the post-test and follow-up stages, showing consistent results (*P*= 0.004). We analyzed the interaction effects between stages, groups, and gender for the separation anxiety (Table 6). Figure 3 displays Pairwise analysis of the interaction effects between gender × group × time for the separation anxiety.

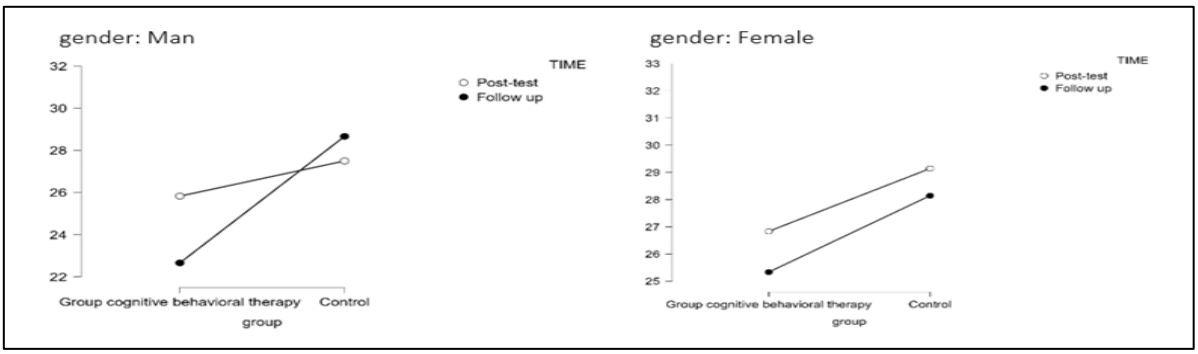

Figure 3. Pairwise analysis of the interaction effects between gender × group × time for the separation anxiety

Table 6. Post-hoc comparisons - gender × group × time

		MD	SE	t	p_{bonf}	p_{holm}
Boy, CBGT, Post-test	Girl, CBGT, Post-test	-0.577	0.722	-0.799	1.000	1.000
	Boy, Control, Post-test	-1.582	0.671	-2.359	0.656	0.258
	Girl, Control, Post-test	-3.231	0.646	-5.000	< 0.001	< 0.001
	Boy, CBGT, Follow-up	3.323	0.626	5.305	< 0.001	< 0.001
	Girl, CBGT, Follow-up	0.619	0.702	0.881	1.000	1.000
	Boy, Control, Follow-up	-2.684	0.675	-3.975	0.008	0.005
	Girl, Control, Follow-up	-2.160	0.651	-3.316	0.055	0.030
Girl, CBGT, Post-test	Boy, Control, Post-test	-1.005	0.703	-1.429	1.000	0.966
	Girl, Control, Post-test	-2.654	0.681	-3.894	0.010	0.006
	Boy, CBGT, Follow-up	3.901	0.702	5.554	< 0.001	< 0.001
	Girl, CBGT, Follow-up	1.196	0.658	1.818	1.000	0.681
	Boy, Control, Follow-up	-2.107	0.695	-3.032	0.121	0.056
	Girl, Control, Follow-up	-1.583	0.672	-2.355	0.663	0.258
Boy, Control, Post-test	Girl, Control, Post-test	-1.649	0.644	-2.559	0.405	0.174
	Boy, CBGT, Follow-up	4.905	0.675	7.265	< 0.001	< 0.001
	Girl, CBGT, Follow-up	2.201	0.695	3.167	0.084	0.042
	Boy, Control, Follow up	-1.102	0.617	-1.787	1.000	0.681
	Girl, Control, Follow-up	-0.578	0.646	-0.894	1.000	1.000
Girl, Control, Post-test	Boy, CBGT, Follow-up	6.554	0.651	10.063	< 0.001	< 0.001
	Girl, CBGT, Follow-up	3.850	0.672	5.729	< 0.001	< 0.001
	Boy, Control, Follow-up	0.547	0.646	0.846	1.000	1.000
	Girl, Control, Follow-up	1.071	0.572	1.873	1.000	0.681
Boy, CBGT, Follow-up	Girl, CBGT, Follow-up	-2.705	0.722	-3.746	0.016	0.009
	Boy, Control, Follow-up	-6.008	0.671	-8.956	< 0.001	< 0.001
	Girl, Control, Follow-up	-5.483	0.646	-8.485	< 0.001	< 0.001
Girl, CBGT, Follow-up	Boy, Control, Follow-up	-3.303	0.703	-4.696	< 0.001	< 0.001
	Girl, Control, Follow-up	-2.779	0.681	-4.077	0.006	0.004
Boy, Control, Follow-up	Girl, Control, Follow-up	0.524	0.644	0.814	1.000	1.000

Based on Table 6 and Figure 3, the separation anxiety in the CBGT group during the follow-up stage differed significantly from the control group in both boys and girls ($P< 0.01$). The decrease in mean scores of this variable in the experimental group indicated the effectiveness of CBGT in reducing separation anxiety. Additionally, a notable contrast was identified between the CBGT among girls at the post-test stage and the experimental boys at the post-test stage, as well as the control girls. The positive mean difference between boys and girls suggests a greater reduction in separation anxiety among boys in the experimental group during both the post-test and follow-up stages. Furthermore, a significant distinction was seen solely in the boys at the post-test and follow-up stages ($P< 0.001$), illustrating the consistent positive effects experienced by the boys.

Discussion

This study found that CBGT significantly improved cognitive flexibility and reduced separation anxiety in adolescents, particularly in boys. These findings are consistent with previous research showing the effectiveness of CBT in enhancing cognitive among women with breast cancer in Iran flexibility (14) and improving psychological flexibility (15) among women suffering from marital burnout in Iran (15). Additionally, Giani et al. conducted a systematic review on the efficacy of CBT for separation anxiety disorder in childhood and adolescence, examining studies from various countries (16), while Abbasi et al. reported that Modular CBT (MCBT) was effective in reducing separation anxiety in 6-7-year-old children in Iran (17). Unlike these studies, which examined broader adolescent

populations, our study specifically focused on adolescents in care centers in Iran, highlighting the role of environmental factors in shaping treatment outcomes. This distinction suggests that CBGT may be particularly beneficial for vulnerable populations, where structured group interventions provide additional social support.

One explanation for this result is that cognitive flexibility, a crucial aspect of the brain's executive function, involves people's ability to adapt their thoughts and behaviors when faced with new or challenging situations. This ability is particularly important for mental health in adolescence, a time of significant cognitive and emotional changes (6). Adolescents can enhance their cognitive flexibility through CBGT, which utilizes techniques like cognitive restructuring to help identify and modify negative or irrational thoughts. By recognizing thought patterns that contribute to anxiety and replacing them with positive and realistic thoughts, adolescents can improve their mental well-being. Additionally, group therapy sessions foster a sense of social connection and empathy by allowing adolescents to share experiences and challenges with their peers, thereby increasing flexibility (24). Furthermore, group therapy can be beneficial in reducing separation anxiety, especially in boys. Boys may benefit more from this treatment due to societal expectations that discourage them from expressing vulnerability or seeking emotional support. By participating in group therapy, boys can learn healthier ways to manage their emotions and address anxiety through peer interaction, ultimately decreasing their separation anxiety (25). Cognitive behavioral interventions taught in group therapy, such as positive reinforcement, exposure therapy, communication skills, and problem-solving strategies, aim to challenge and modify dysfunctional beliefs and gradually reduce separation anxiety in adolescents. These techniques encourage individuals to effectively assess and modify their thoughts and knowledge (26). The current study has various limitations when assessing the applicability. Factors such as the quality of nursing in care centers and the extent of social support could influence the outcomes and were not regulated in this study, suggesting that future research should address these variables. Variations in individuals' acceptance and motivation to engage in group sessions could impact treatment outcomes, highlighting the need for future studies to implement strategies to enhance participants' motivation, such as orientation sessions, and elucidating treatment advantages. Techniques involving psychometric assessments to gauge motivation levels could also prove beneficial. The study was carried out specifically in Iranian juvenile detention centers, and it is crucial to acknowledge that cultural and social contexts could yield distinct findings in other regions; therefore, conducting analogous investigations in diverse geographic and cultural settings could bolster the generalizability of the findings. Comparing outcomes across different demographic groups may also be advantageous. One of the limitations is that data relied on adolescents' self-reports, which could introduce biases, indicating that incorporating more objective reports from educators, trainers, or psychologists and employing observational tools could help mitigate this issue. Furthermore, genetic or biological factors potentially influencing anxiety levels or cognitive adaptability were not addressed in this study; hence, future research endeavors should explore the impact of genetic and biological variables on flexibility and anxiety.

Conclusion

Based on the findings, cognitive behavioral group therapy impacts positively on enhancing cognitive flexibility and diminishing separation anxiety in adolescents residing in care centers. This discovery highlights the potential of group interventions in assisting adolescents, particularly boys, in developing their cognitive and emotional abilities and effectively dealing with separation anxiety.

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Conflict of interest

There was no conflict of interest.

Funding

This research received no funding.

Ethical Considerations

Ethical considerations for this research encompassed obtaining informed consent from participants and ensuring confidentiality of information. To adhere to ethical guidelines, adolescents in the control group received additional training sessions after the study ended.

Code of Ethics

IR.IAU.K.REC.1403.221.

Authors' Contributions

First author: data gathering, all authors: statistical analysis, and final edition. The second and third authors: the concept and design. The fourth author: drafting of the manuscript. The fifth author supervises the research process and writes the final version of the manuscript.

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