OPEN ACCESS

ISSN: 2676-7473

RBMS.2024;29(1):e18

ORIGINAL RESEARCH

The effectiveness of rumination-focused cognitive-behavioral therapy on interpretation bias and social isolation in adolescent girls with social anxiety disorder

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Date Received: September, 2024 *Date Accepted: October, 2024* *Online Publication: November 15, 2024*

Abstract

Objective: Social anxiety disorder, one of the most chronic and prevalent anxiety disorders, is often referred to as a "hidden disorder" and can significantly impair both occupational and social functioning. This study aimed to determine the efficacy of rumination-focused cognitive-behavioral therapy (RFCBT) in reducing interpretation bias and social isolation among adolescent girls with social anxiety disorder.

Materials and Methods: This study employed a quasi-experimental pre-test, post-test, and follow-up design. The population of the study consisted of all female high school students diagnosed with social anxiety disorder in Ramashir in 2023. A sample of 25 participants was selected using purposive sampling based on the inclusion criteria. Participants completed the interpretation bias and social isolation questionnaires at pre-test, post-test, and follow-up stages. The experimental group received 10 sessions of 90-minute RFCBT. Data analysis was conducted using repeated measures analysis of variance.

Results: The results indicated that RFCBT led to a significant reduction in interpretation bias and social isolation at post-test ($P<0.001$). This effect was maintained at follow-up, demonstrating the durability of RFCBT.

Conclusion: RFCBT is an effective treatment for social anxiety disorder in adolescent girls. This suggests that RFCBT is a valuable tool for helping individuals with social anxiety disorder overcome cognitive distortions and improve their social functioning. However, more research is needed to determine if these findings apply to different populations and to identify factors that might influence treatment outcomes.

Keywords: Rumination, Cognitive therapy, Interpretation bias, Social isolation, Anxiety

Introduction

Social anxiety disorder is one of the most common anxiety disorders, characterized by a fear of being humiliated or embarrassed in social situations where one is exposed to the scrutiny of others or must perform in front of them (1). Essentially, social anxiety disorder is defined by an intense and irrational fear of being embarrassed in social situations. It is currently the most prevalent anxiety disorder and the third most common mental disorder (2). Individuals with social anxiety disorder typically have poor social relationships and often underperform in academic settings (3). They also have a higher likelihood of comorbid disorders such as depression, agoraphobia, substance abuse, and suicidal ideation and behaviors. The peak onset of social anxiety disorder in adolescents is around 13 years of age (4). In adults, this disorder is more prevalent in women, although adults often report experiencing symptoms from childhood, while the prevalence in children is similar between genders (5, 6).

One of the cognitive functions impaired by social anxiety disorder is interpretation bias. Interpretation bias refers to the tendency to interpret information related to threats in negative ways, encompassing subcomponents such as negative self-evaluation and perceived negative evaluation by others (7). Cognitive models emphasize the assumption that individuals with anxiety disorders perceive social situations as more threatening than others. Therefore, some researchers believe that interpretation bias likely plays a role in the maintenance of social anxiety (8). Interpretation bias is defined as the tendency to interpret ambiguous situations in entirely negative and threatening ways, consisting of two components: negative self-evaluation (self-referential interpretation bias) and perceived negative evaluation by others (other-referential interpretation bias) (9). Studies examining the relationship between interpretation bias and social anxiety disorder suggest that, in addition to attention, judgment, and memory biases, the tendency towards biased interpretation of social events also plays a significant role in the persistence of social anxiety (10). Numerous studies on interpretation bias have shown that when neutral and threatening stimuli are presented together, attention is biased towards the threat in anxious individuals (11, 12).

Moreover, social anxiety disorder in adolescents is associated with a negative prognosis and various consequences. Studies have shown that social isolation is one of the most evident outcomes (13). Key indicators of social isolation include living alone, having few social relationships, not participating in social or group activities, and ultimately, perceiving feelings of loneliness (14). Research indicates that feelings of isolation and loneliness in adolescents can impact their physical and mental health, as well as their personal and social functioning, in various ways (15). Social withdrawal is a relatively common behavior that can severely distress adolescents and, if left untreated, can lead to other problems such as low self-esteem, depression, anxiety, and irritability. This is particularly true when individuals lack a sense of competence, have low self-esteem, and are unable to express their feelings and opinions, leading to social isolation (16).

In recent decades, cognitive-behavioral therapy (CBT) has emerged as the predominant approach in the treatment of mood and anxiety disorders (17). While the efficacy of CBT for social anxiety disorder has been generally established, many individuals with this disorder do not experience significant benefit from this treatment (18). Regarding the traditional cognitive-behavioral model for social anxiety, Hofmann et al. (19) noted that despite extensive research, treatment strategies based on this model have demonstrated only limited effects. Moreover, research has indicated that to enhance the efficacy of CBT, greater attention should be paid to the interpersonal and emotional components of these individuals (20, 21). In this regard, rumination-focused cognitive-behavioral therapy (RFCBT) is a treatment that specifically targets rumination by modifying the process of thinking (functional analysis and behavioral strategies), rather than focusing on the content of thoughts and challenging them (22). RFCBT guides individuals from a non-constructive thinking style (global, evaluative, and abstract thinking) towards a more constructive thinking style (specific, concrete, descriptive thinking, and attention to all aspects of an event) (23). Rumination, as a transdiagnostic factor and underlying cause of anxiety and depression, is one of the most important etiological and maintaining factors of social anxiety disorder

(24). Research findings indicate the efficacy of RFCBT in improving negative self-evaluation and suicidal ideation in depressed adolescent girls (25); and reducing fear of negative evaluation, interpretation bias, and self-focused attention in women with generalized anxiety disorder (26).

Social anxiety disorder often co-occurs with other psychiatric disorders, with depression and other anxiety disorders showing the strongest comorbidity. Moreover, if left untreated, this disorder can lead to long-term disability, resulting in significant impairments in personal and social functioning. This underscores the importance of developing more effective treatments that address the various aspects of social anxiety. Therefore, given the aforementioned, the present study aimed to investigate the efficacy of RFCBT on interpretation bias and social isolation in adolescent girls with social anxiety disorder.

Materials and Methods

The present study employed a quasi-experimental pre-test-post-test design with follow-up. The population consisted of all female students diagnosed with social anxiety disorder in Ramashir in 2023. Using purposive sampling, three middle schools were selected from the city, and all students completed the social phobia inventory. Participants who scored below the mean on the social anxiety measure and provided informed consent were included in the study. Exclusion criteria included missing more than one therapy session, failing to complete all questionnaires, or withdrawing consent. A total of 25 participants were selected. To ensure ethical considerations, participants were assured of confidentiality and were informed of their right to withdraw from the study at any time. RFCBT was administered in 10, 90-minute sessions over a period of 10 weeks. A summary of the RFCBT sessions is presented in Table 1. A follow-up assessment was conducted 2 months after the intervention.

Table 1. Description of rumination-focused cognitive-behavioral therapy (RFCBT) sessions

Sessions	Content
1	Introduction, rapport building, pre-test administration, group rules, group therapy goals, and introduction to RFCBT. Homework: Complete an example of a recent rumination episode.
2	Practice and training in identifying rumination, avoidance, and warning signs through homework assignments. Homework: Keep a daily log of rumination with full details; review treatment goals; read the rumination and avoidance identification sheet; record a recent event and write about the associated feelings, thoughts, and behaviors.
3	Conduct a functional analysis to examine the context, background, and function of rumination and avoidance. Homework: Recall a recent example of rumination and another similar situation where rumination did not occur. Compare these two situations and identify why the client functioned well in certain situations to identify strengths and coping mechanisms for rumination.
4	If-then plans: Practice more adaptive responses to warning signs. Homework: Write an example of abstract and concrete thoughts; develop an if-then plan for a problem.
5	Training in shifting from an abstract and ineffective thinking style to a specific, adaptive, and concrete thinking style. Homework: Evaluate potential future events; create an if-then plan to emphasize the alternative behavior that is most contrasting with rumination.
6	Experimenting with the efficacy of rumination and evaluating the effectiveness of alternative strategies such as the "why-how" experiment and comparing it with a concrete thinking style (how did this happen). Homework: Modify environmental factors within the client's control that contribute to rumination, such as listening to sad music, staying home alone, and developing a practical strategy to deal with rumination.
7	Increasing activity and reducing avoidance, including practical plans and exercises for assertiveness and problem-solving. Homework: Practice breathing exercises, mental imagery, and relaxation twice a day and in response to warning signs of rumination.
8	Using behavioral experiments and imagery (including positive memories, absorption, and mindfulness exercises) to test the effectiveness of attention management instead of rumination. Homework: Visualize pleasant scenes and practice mindfulness and absorption when experiencing rumination symptoms.
9	Focusing on the client's values to reduce rumination about worthless areas and encouraging engagement in activities aligned with personal values without getting caught in maladaptive thoughts. Homework: Create a new list of personal values and prioritize them; identify conflicting values in personal life; practice mindfulness and absorption.
10	Relapse prevention to teach relapse prevention, identify relapse signs, and learn how to cope with negative automatic thoughts to overcome rumination and conduct post-test.

Research Instrument

Revised Interpretation Inventory (RII)

The original version of this questionnaire was first used by Butler and Mathews (27) to examine interpretation bias in anxious, depressed, and healthy control individuals. Amin et al. (28) revised the questionnaire in terms of content, format, and number of items to study interpretation bias in individuals with social phobia. The questionnaire has two versions: self-referential (22 items) and other-referential (22 items). Each version includes both ambiguous (15 items) and unambiguous (7 items) scenarios or events. The self-referential and other-referential forms are administered separately with a minimum of 2 hours between them. Each question has three options that participants must rank from 1 to 3. A rank of 1 is assigned to the option that comes to mind first, a rank of 0 is assigned to the option that comes to mind last, and the remaining option is assigned a rank of 2. In scoring, a rank of 1 is given a score of 3, a rank of 2 is given a score of 2, and a rank of 3 is given a score of 1. In the present study, Cronbach's alpha was used to determine the reliability of the self-referential and other-referential versions of the RII, yielding coefficients of 0.81 and 0.83, respectively.

Social Isolation Questionnaire (SIQ)

This questionnaire consists of 19 items. It measures the dimensions of the type of support in social networks (emotional support, instrumental support, informational support, and appraisal support) and the scope of social networks (network size and type of

relationship). The questionnaire uses a 5-point Likert scale (ranging from strongly agree: 5 to strongly disagree: 1). The minimum score is 19 and the maximum score is 95. Higher scores indicate higher levels of social isolation (29). In the present study, Cronbach's alpha was used to determine the reliability of the SIQ, yielding a coefficient of 0.82.

To evaluate the impact of RFCBT on interpretation bias and social isolation in adolescent, repeated-measures analysis of variance (ANOVA) was conducted using SPSS-27 statistical software.

Results

The study sample comprised adolescent girls with social anxiety disorder aged 15 to 18, with approximately 56% falling within the younger age group (15-16) and 44% in the older age group (17-18). Table 2 presents descriptive statistics (means and standard deviations) for self-referential interpretation bias, other-referential interpretation bias, and social isolation across the three measurement points: pre-test, post-test, and follow-up.

Table 2. Means and standard deviations (SD) of self-referential interpretation bias, other-referential interpretation bias, and social isolation.

Variables	Pre-test	Post-test	Follow-up
	Mean ± SD	Mean ± SD	Mean ± SD
Self-referential interpretation bias	49.87 ± 2.06	33.73 ± 8.88	33.07 ± 8.18
Other-referential interpretation bias	50.40 ± 2.26	33.73 ± 8.91	33.20 ± 7.80
Social isolation	69.33 ± 2.32	48.80 ± 11.09	48.87 ± 9.48

Prior to conducting the repeated-measures ANOVA, the assumptions were examined. First, the absence of influential outliers in the research variables was ensured based on the skewness and kurtosis tests, thus satisfying the assumption of normality for conducting repeated-measures ANOVA. Additionally, Levene's test was used to assess the homogeneity of variance assumption. The results indicated that the assumption of homogeneity of variance was met for self-referential interpretation bias (F= 1.87, P= 0.166), other-referential interpretation bias (F= 2.89, P= 0.067), and social isolation (F= 2.83, P= 0.071). Furthermore, Box's test (M= 1.14, F= 1.46, P= 0.311) supported this finding. Subsequently, repeated-measures ANOVA was employed to determine the impact of RFCBT on interpretation bias and social isolation in adolescent girls with social anxiety disorder. To identify the specific dependent variables on which the treatment had a significant effect, within-subjects ANOVA was used (Table 3). As shown in Table 3, the effect of RFCBT on self-referential interpretation bias (F= 38.10, P<0.001), other-referential interpretation bias (F= 32.70, P<0.001), and social isolation (F= 33.90, P<0.001) was significant.

Table 3. Results of repeated-measures ANOVA for within-group effects.

Variables	SS	df	MS	F	P	η^2
Self-referential interpretation bias	1755.28	1.29	1355.41	38.10	0.001	0.58
Other-referential interpretation bias	1675.6	1.31	1271.87	32.70	0.001	0.54
Social isolation	2922.15	2	1461.07	33.90	0.001	0.55

Post hoc LSD tests were conducted to compare the pre-test, post-test, and follow-up scores for self-referential interpretation bias, other-referential interpretation bias, and social isolation. As shown in Table 4, RFCBT significantly reduced self-referential interpretation bias from the pre-test to both the post-test and follow-up, indicating a sustained effect (P<0.001). Similarly, RFCBT significantly reduced other-referential interpretation bias and social isolation from the pre-test to both the post-test and follow-up, demonstrating the efficacy and durability of the intervention (P<0.001).

Table 4. Results of LSD post hoc test for within-group effects

Variables	Phase A	Phase B	Mean difference (A-B)	SE	P
Self-referential interpretation bias	Pre-test	Post-test	9.46	1.51	0.001
		Follow-up	9.26	1.37	0.001
	Post-test	Follow-up	-0.20	0.65	0.762
Other-referential interpretation bias	Pre-test	Post-test	9.03	1.59	0.001
		Follow-up	9.26	1.43	0.001
	Post-test	Follow-up	0.23	0.71	0.747
Social isolation	Pre-test	Post-test	11.90	1.72	0.001
		Follow-up	12.26	1.74	0.001
	Post-test	Follow-up	0.37	1.60	0.821

Discussion

This study aimed to investigate the efficacy of RFCBT in reducing interpretation bias and social isolation among adolescent girls with social anxiety disorder. The findings demonstrated that RFCBT was effective in improving both interpretation bias and social isolation, with these effects persisting at follow-up. The first finding indicated that RFCBT was effective in improving interpretation bias at both post-treatment and follow-up stages, aligning with the results of previous studies by Mohebi Arya and Aleyasin (26), and Salek Ebrahimi et al. (30). This finding can be explained by the fact that RFCBT is a highly effective approach for treating social anxiety disorder. Specifically, this therapy focuses on modifying cognitive patterns and interpretation biases, which can lead to a reduction in anxiety symptoms in adolescents. The initial phase of RFCBT involves identifying the cognitive biases of adolescents, such as negative thoughts, overgeneralizations, and unfair self-

and other judgments. By recognizing these biases, adolescents can gain a better understanding of how these thoughts influence their emotions and behaviors (22). Following the identification of biases, the therapist teaches adolescents how to challenge these thoughts. This process involves examining evidence that supports or refutes these thoughts and replacing them with more rational and positive ones. This cognitive restructuring can help reduce interpretation biases and improve adolescents' psychological well-being (31).

CBT also involves the teaching of social skills. By learning how to communicate effectively and navigate social situations, adolescents can gain a greater sense of control over their emotions (30). These skills can help them better cope with anxiety-provoking situations and reduce negative biases. Therapists assist adolescents in gradually confronting social situations that induce anxiety. This exposure is conducted in a controlled manner and with the support of the therapist. Through repeated exposure, adolescents gradually learn that they can be in these situations without experiencing severe anxiety, which helps to reduce interpretation biases. CBT helps adolescents develop greater self-awareness of their thoughts and feelings. This self-awareness can help them more quickly identify and correct their biases and move away from negative thought patterns (19). CBT teaches adolescents how to cultivate positive beliefs about themselves and their abilities. These positive beliefs can help reduce feelings of inadequacy and social anxiety, thereby reducing negative biases.

The current study also revealed that RFCBT was effective in improving social isolation among adolescent girls with social anxiety disorder at both post-treatment and follow-up stages. The researcher was unable to find a study directly aligned with this finding. This finding can be explained by the fact that RFCBT, as an effective treatment for social anxiety disorder, can help reduce social isolation in adolescents. Adolescents learn to identify their negative thought patterns and cognitive biases, such as concerns about being judged, self-criticism, and distorted thinking (23). By challenging these thoughts and replacing them with more positive ones, adolescents can change their emotions and behaviors, thereby reducing social isolation. Therapists teach adolescents essential social skills, including effective communication, active listening, and conflict resolution. Strengthening these skills helps adolescents become more successful in social interactions and prevents social isolation. In therapy, adolescents are gradually exposed to social situations that induce anxiety (22). These controlled exposures help them gradually feel more comfortable in social interactions and reduce their anxiety. CBT increases self-awareness in adolescents. This self-awareness helps them better understand their emotions and behaviors, allowing them to respond to social situations in a more appropriate manner.

Changing negative beliefs and fostering self-belief in adolescents is another goal of RFCBT (23). Increased self-belief helps adolescents to become less fearful of social judgment and gradually become more involved in social interactions. Adolescents in RFCBT learn anxiety management techniques such as deep breathing and relaxation. These techniques help them control their anxiety in social situations and feel more comfortable. Additionally, they establish supportive relationships with family and friends. These relationships can help reduce feelings of loneliness and social isolation. One of the primary causes of social isolation is self-criticism. RFCBT helps adolescents reduce this behavior and, instead, view themselves with kindness and understanding. This shift can lead to increased social connections (23). Developing problem-solving skills helps adolescents better cope with social challenges. These skills enable them to effectively confront social situations rather than avoiding them. Ultimately, RFCBT, through the identification and modification of thought patterns, the teaching of social skills, exposure to social situations, increased self-awareness, and the reinforcement of positive beliefs, helps to reduce social isolation in adolescents with social anxiety disorder. These processes, working together, enable adolescents to have better social interactions and distance themselves from social isolation.

Given that the research was conducted with adolescent girls with social anxiety disorder in Ramashir, caution should be exercised when generalizing the results to adolescent boys and

girls with social anxiety disorder in other cities and cultures. Uncontrolled variables such as socioeconomic status, living with one or two parents, family size, and parental education level may have influenced the study's findings. It is recommended that future research investigate these variables in other age groups and both genders and compare the results to the present study.

The findings of this study provide strong evidence for the efficacy of RFCBT in addressing interpretation bias and social isolation among adolescent girls with social anxiety disorder. The significant reduction in these symptoms observed at both post-test and follow-up stages highlights the durability and effectiveness of this therapeutic intervention. These results suggest that RFCBT can be a valuable tool in helping individuals with social anxiety disorder to overcome cognitive distortions and improve their social functioning. Further research is needed to explore the generalizability of these findings to different populations and to investigate potential moderators or mediators of treatment outcomes.

Conflict of interest

Author declares no conflict of interest.

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