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Comparing The Effectiveness of Mindfulness-Based Therapy and Paradoxical Treatment on Distress Tolerance in Adolescents with Social Anxiety Symptoms

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A B S T R A C T

Objective: This study aimed to compare the effectiveness of mindfulness-based interventions (MBIs) and paradoxical intention therapy (PIT) on distress tolerance in adolescents with social anxiety symptoms.

Methods and Materials: The study utilized a quasi-experimental design with pre-test, post-test, and two-month follow-up stages in three groups: MBI, PIT, and control. Sixty adolescents aged 12 to 18 with social anxiety symptoms were selected and randomly assigned to the groups. Distress tolerance was measured using the Distress Tolerance Scale (DTS) across all stages. Data were analyzed using repeated measures ANOVA to evaluate the impact of the interventions.

Findings: The repeated measures ANOVA revealed significant within-group effects for distress tolerance across the three stages ($F(1.58, 91.38) = 54.63$, $p < 0.001$, $\eta^2 = 0.49$). The interaction effect between the intervention type and time was also significant ($F(3.16, 182.48) = 20.76$, $p < 0.001$, $\eta^2 = 0.42$). Post-hoc comparisons indicated that both the MBI and PIT groups showed significant improvements in distress tolerance from pre-test to post-test ($p < 0.001$) and from post-test to follow-up ($p < 0.001$), with no significant difference between the two intervention groups.

Conclusion: The findings suggest that both mindfulness-based interventions and paradoxical intention therapy significantly enhance distress tolerance in adolescents with social anxiety symptoms, with effects persisting over time. These interventions should be considered in clinical practice for treating social anxiety in this population.

Keywords: *Mindfulness-based interventions, Paradoxical intention therapy, Distress tolerance, Social anxiety, Adolescents.*

1. Introduction

Social anxiety disorder (SAD) is a prevalent psychological condition characterized by intense fear and avoidance of social situations, leading to significant distress and impairment in various aspects of life, particularly among adolescents. This period of life is marked by rapid emotional and cognitive development, which can exacerbate the impact of social anxiety on an individual's functioning (Kennedy et al., 2022). Distress tolerance, the ability to endure and cope with emotional distress, plays a crucial role in the onset, maintenance, and treatment of anxiety disorders, including SAD (Leyro et al., 2010). Interventions that enhance distress tolerance, such as mindfulness-based therapy and paradoxical intention therapy, have shown promise in improving outcomes for individuals with anxiety symptoms (Zeifman et al., 2020).

Distress tolerance is a multifaceted construct that refers to an individual's perceived ability to withstand negative emotional states. It has been linked to various psychological outcomes, including substance use, emotional regulation, and anxiety disorders (Ali et al., 2015; Bornovalova et al., 2012). High distress tolerance is associated with better psychological resilience, whereas low distress tolerance is often seen in individuals with mood disorders, substance use disorders, and anxiety-related conditions (Leyro et al., 2010). Understanding the mechanisms underlying distress tolerance and its enhancement through therapeutic interventions is crucial for developing effective treatments for anxiety disorders, particularly in vulnerable populations such as adolescents (Zvolensky et al., 2010).

Mindfulness-based interventions (MBIs) have gained substantial attention in recent years as effective treatments for various psychological disorders. These interventions focus on cultivating present-moment awareness and non-judgmental acceptance of one's thoughts and feelings (Gawrysiak et al., 2015). MBIs are particularly effective in enhancing distress tolerance by helping individuals decouple from automatic reactions to negative emotions, thereby fostering a greater capacity to endure distress without resorting to maladaptive behaviors (Brem et al., 2016). Studies have shown that mindfulness can modulate the impact of distress tolerance on various psychological outcomes, such as substance use and emotional regulation, making it a promising approach for treating anxiety disorders (Shorey et al., 2017; Zeifman et al., 2020).

In contrast, paradoxical intention therapy (PIT) is a cognitive-behavioral approach that involves encouraging patients to engage in the very behaviors or thoughts they fear, thereby reducing the anxiety associated with these experiences (Keller et al., 2018). PIT is grounded in the principles of logotherapy and cognitive-behavioral therapy, which suggest that deliberate exposure to feared stimuli in a controlled and supportive environment can diminish the power of those stimuli over time (Asadi & Bakhtiarpour, 2022). By intentionally confronting their fears, patients can gain a sense of control and mastery over their anxiety, which in turn can enhance their distress tolerance (Keller et al., 2018). The efficacy of PIT in reducing anxiety symptoms and improving distress tolerance has been supported by various studies, particularly in populations with high levels of emotional distress (Shah et al., 2012; Sakaria & Shah, 2023).

The relationship between distress tolerance and psychological outcomes is complex and influenced by various factors, including individual differences in emotional regulation, cognitive styles, and coping strategies (Ali et al., 2013; Bornovalova et al., 2011). For example, research has shown that individuals with low distress tolerance are more likely to engage in maladaptive behaviors such as substance use, self-harm, and avoidance, which can exacerbate symptoms of anxiety and depression (Henschel et al., 2021; Slabbert et al., 2020). Conversely, interventions that enhance distress tolerance, such as MBIs and PIT, can help individuals develop healthier coping mechanisms, thereby reducing the impact of negative emotional states on their overall well-being (Williams et al., 2013; Veilleux et al., 2018).

The effectiveness of MBIs and PIT in enhancing distress tolerance has been demonstrated in various clinical populations. For instance, Gawrysiak et al. (2015) found that mindfulness-based stress reduction (MBSR) significantly improved distress tolerance in individuals with high levels of emotional distress, leading to reductions in anxiety and depressive symptoms. Similarly, Keller et al. (2018) reported that PIT effectively reduced anxiety symptoms in patients with chronic anxiety disorders by increasing their tolerance for distressing thoughts and emotions. These findings suggest that both MBIs and PIT can be valuable tools for enhancing distress tolerance in individuals with anxiety disorders, including adolescents with SAD (Shorey et al., 2016).

Adolescence is a critical period for the development of emotional regulation skills, and low distress tolerance during this stage can have long-lasting effects on an individual's mental health (Cummings et al., 2013; Ehrlich et al., 2013).

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Adolescents with low distress tolerance are more susceptible to developing anxiety disorders, substance use problems, and other forms of psychopathology (Bornovalova et al., 2012; Holliday et al., 2016). Therefore, early interventions that enhance distress tolerance are crucial for preventing the escalation of anxiety symptoms and promoting long-term mental health (Daughters et al., 2014; Fogle et al., 2023). Previous studies have highlighted the importance of distress tolerance in the treatment of anxiety disorders and other forms of psychopathology (Lass & Winer, 2020; Bornovalova et al., 2011). For example, Daughters et al. (2014) demonstrated that distress tolerance moderated the relationship between depressive symptoms and problematic alcohol use, indicating that individuals with higher distress tolerance were less likely to engage in maladaptive coping behaviors. Similarly, Bornovalova et al. (2011) found that distress tolerance moderated the relationship between negative affect intensity and borderline personality disorder, suggesting that enhancing distress tolerance could reduce the severity of symptoms in this population. The significance of distress tolerance as a therapeutic target in anxiety disorders cannot be overstated. Low distress tolerance is not only a risk factor for the development and maintenance of anxiety disorders, but it also poses a significant barrier to treatment engagement and adherence (Bornovalova et al., 2012; Cummings et al., 2013). Individuals with low distress tolerance are more likely to drop out of treatment prematurely, engage in avoidance behaviors, and experience difficulties in emotion regulation, all of which can undermine the effectiveness of therapeutic interventions (Ali et al., 2017; Asadi & Bakhtiarpour, 2022). Therefore, interventions that specifically target distress tolerance are essential for improving treatment outcomes in this population (Shakeri et al., 2020; Farris et al., 2014).

Mindfulness-based interventions have been shown to enhance distress tolerance by promoting a non-judgmental awareness of present-moment experiences, reducing the automatic reactivity to negative emotions, and fostering a greater acceptance of distressing thoughts and feelings (Gawrysiak et al., 2015; Boffa et al., 2018). These mechanisms are particularly relevant for adolescents with social anxiety, as they often experience heightened sensitivity to social evaluation and fear of negative judgment (Kim & Jang, 2022; Rutherford et al., 2015). By increasing distress tolerance, MBIs can help adolescents break the cycle of avoidance and social withdrawal, leading to improvements in social functioning and overall well-being (Kim et al., 2015; Shorey et al., 2017).

Paradoxical intention therapy, on the other hand, works by encouraging individuals to confront their fears directly, thereby diminishing the power of these fears over time (Keller et al., 2018; Sakaria & Shah, 2023). This approach is particularly effective for individuals with high levels of anticipatory anxiety, such as those with SAD, who often engage in excessive worrying and avoidance behaviors (Kauffman et al., 2020). By deliberately engaging in the feared behavior or thought, individuals can gain a sense of control and mastery over their anxiety, leading to increases in distress tolerance and reductions in anxiety symptoms (Firoozi, 2020; Sargeant et al., 2011).

In conclusion, this study aims to compare the effectiveness of these two therapeutic approaches in enhancing distress tolerance among adolescents with social anxiety symptoms.

1. Methods and Materials

1.1. Study Design and Participants

This study employed a quasi-experimental design utilizing a pre-test, post-test, and two-month follow-up with two experimental groups and one waitlist control group. The diagram of the study design is detailed below. The study population consisted of adolescents aged 12 to 18 years old who exhibited symptoms of social anxiety disorder, as identified by the Paklak Social Anxiety Disorder Questionnaire for Adolescents (2004). A score above 90 on this questionnaire indicates a high level of social anxiety disorder. These adolescents were selected from those with active cases at the Yarigar Psychology Clinic in Tehran during the winter and spring of 2023-2024.

The sample size was determined using the G*Power software, targeting an 80% test power, a medium effect size, and a 5% error rate. Considering the potential for attrition, 60 participants were selected. These participants were chosen through purposive sampling and were randomly assigned into three groups: Experimental Group 1, Experimental Group 2, and a waitlist control group, with 20 participants in each group.

Inclusion criteria for participation in the study included being aged between 12 and 18 years, a clinical diagnosis of social anxiety disorder based on a clinical interview (utilizing the DSM-5 criteria) and the Paklak Social Anxiety Disorder Questionnaire for Adolescents (2004), willingness and consent to participate in the study, no psychological interventions in the previous six months, and no use of

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psychiatric medications. Additionally, participants could not have another psychiatric disorder apart from social anxiety disorder, as determined by a diagnostic interview.

Exclusion criteria included missing more than two sessions, irregular attendance at therapy sessions, and a lack of cooperation with the researcher.

1.2. Measures

1.2.1. Social Anxiety

The Social Anxiety Scale for Adolescents (SASA), developed by Paklak and Vidak in 2008, consists of 28 items divided into two subscales: Apprehension and Fear of Negative Evaluation (AFNE) with 14 questions, and Tension and Inhibition in Social Contact (TISC) with 13 questions. This questionnaire is designed to assess the concerns, fears, and avoidance behaviors of adolescents in various social situations. The scoring is based on a 5-point Likert scale, ranging from "very little" to "very much," with scores from 1 to 5 assigned respectively. The minimum possible score is 28, and the maximum is 140. The internal consistency of the subscales and the overall scale has been confirmed in various studies, with acceptable Cronbach's alpha coefficients. Additionally, factor analysis confirmed the two-factor structure of the SASA, providing a good fit with the data. Test-retest reliability has also been reported to be satisfactory, making the SASA a reliable tool for assessing social anxiety in adolescents.

1.2.2. Distress Tolerance

The Distress Tolerance Scale (DTS), developed by Simons and Gaher in 2005, measures emotional distress tolerance using 15 items across four subscales: Tolerance (emotional distress tolerance), Absorption (absorption by negative emotions), Appraisal (subjective distress evaluation), and Regulation (efforts to alleviate distress). Each item is rated on a 5-point Likert scale, ranging from "strongly agree" to "strongly disagree," with corresponding scores from 1 to 5. Higher scores indicate greater distress tolerance. The internal consistency of the DTS has been supported by alpha coefficients reported by Simons and Gaher (2005), and the scale has demonstrated good convergent and criterion validity.

1.3. Interventions

1.3.1. Mindfulness-Based Therapy

The mindfulness-based intervention for the experimental group was structured into a 7-session, 90-minute program modeled after Kabat-Zinn's (1990) format. Sessions were held weekly, facilitated by a researcher trained in mindfulness-based approaches. The therapist, experienced in various mindfulness workshops, utilized Persian-language materials, handouts, and audio recordings to guide the participants. Each week, participants received a recorded audio of the session's mindfulness technique for additional practice at home. Participants were encouraged to practice the techniques for 15 minutes daily, six days a week, using flashcards provided by the therapist. Each session introduced a specific mindfulness technique, such as body scanning, meditation exercises, or breathing awareness. A final assessment was conducted simultaneously in a separate session at the end of the program.

Session 1: Introduction to Mindfulness and Automatic Pilot

The first session focused on understanding mindfulness as the best way to disengage from the automatic pilot mode of the mind. The session began with setting goals, defining mindfulness, and discussing how automatic reactions drive behaviors. Participants engaged in exercises such as mindful eating (using a raisin), body scanning, and a brief 10-minute breathing exercise. Feedback and discussion followed these exercises. The session concluded with the distribution of materials, including a body scan recording for daily practice over the next six days and homework logs to track their practice.

Session 2: Body Awareness and Mental Chatter

In the second session, the focus shifted to body awareness as a tool to reveal mental chatter, enhancing control over reactions to daily events. The session included a review of the body scan practice and a discussion of the homework. Participants were guided through exercises to become aware of their thoughts and feelings during a mindful walk and were encouraged to record pleasant events. A seated meditation lasting 10-15 minutes followed, after which participants received handouts and assignments for the week, including daily body scanning, mindful breathing, and logging pleasant events.

Session 3: Concentration and Integration through Breath Awareness

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This session aimed to deepen the understanding of how the mind can often be distracted and how deliberate focus on breathing can enhance concentration and integration. Participants practiced a 40-minute session of seeing and hearing, followed by a 20-30 minute meditation where awareness shifted from breathing to body sensations. The session also introduced the 3-minute breathing space exercise and mindful walking. Participants were tasked with listing unpleasant events and received handouts and homework assignments, including continuing their breathing practice and reflective exercises.

Session 4: Shifting Perspective through Mindfulness

The fourth session explored how mindfulness involves adopting a broader, more nuanced perspective on experiences. Participants engaged in a 5-minute seeing and hearing exercise, followed by a 20-minute meditation focusing on breath, body, sounds, and thoughts. The session also included a review of the previous week's homework, particularly the breathing space exercise, and discussions on experiencing unpleasant events mindfully. The session concluded with assignments to continue the 3-minute breathing space practice and other mindfulness exercises.

Session 5: Non-Judgmental Acceptance of Experiences

This session emphasized the importance of allowing experiences to unfold as they are, without judgment or attempts to alter them. Participants engaged in a 20-minute seated meditation, focusing on breath, body, sounds, and thoughts, with particular attention to how the body reacts to different experiences. The session also involved discussions on the difficulties encountered during the practice and the impact on the body. Participants were encouraged to practice the 3-minute breathing space regularly, especially when confronting unpleasant emotions, and received assignments to continue these practices.

Session 6: Understanding Negative Moods and Thoughts

The sixth session addressed how negative moods and thoughts can limit one's connection to experiences. Participants practiced a 20-minute seated meditation, focusing on breath, body, sounds, and thoughts, followed by reflection on how their mood and thoughts influence their experiences. The session included a review of the homework, including meditation without guided tapes, and a discussion on mood, thoughts, and the concept of alternative viewpoints. Participants were tasked with continuing their breathing practice and other mindfulness exercises.

Session 7: Maintaining Balance through Regular Practice

The final session emphasized the role of regular mindfulness practice in maintaining balance in life and reinforcing positive intentions. Participants reviewed the body scan exercise, discussed their experiences over the past seven weeks, and how they could sustain the momentum of their practice beyond the program. The session concluded with a comprehensive review of the entire program and a discussion on strategies for continuing both formal and informal mindfulness practices.

1.3.2. Paradoxical Treatment

The paradoxical intention intervention was based on a theoretical framework incorporating techniques from various models, including mass repetition, stimulus satiation, imaginal and in vivo exposure in behavior therapy, cognitive reframing in cognitive therapy, paradoxical intention in logotherapy, and enforced change in family therapy. This protocol, adapted from Basharat's (2019) validated approach, was delivered over seven 90-minute sessions. The following is a summary of the sessions:

Session 1: Introduction and Establishing Rapport

The first session focused on introducing the participants to the therapy process, establishing rapport, explaining the intervention goals, and outlining the number of sessions. Participants completed pre-test questionnaires to establish baseline measures. The session concluded with an introduction to the concept of paradoxical intention and its therapeutic goals.

Session 2: Historical Context and Treatment Planning

In the second session, participants were introduced to the history and core principles of paradoxical intention therapy. The therapist helped participants begin to formulate treatment plans and goals by identifying what they wanted to achieve and the steps they were willing to take. Participants were tasked with writing down their treatment goals and discussing them in the next session.

Session 3: First Mechanism - Directive and Artificial Symptom Induction

This session introduced the first mechanism of paradoxical intention: directive and artificial symptom induction. Participants were guided through exercises where they deliberately recreated their symptoms in a controlled manner at predetermined times. These exercises aimed to demystify and reduce the power of the symptoms by experiencing them voluntarily.

Session 4: Expanding Paradoxical Exercises

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Building on the previous session, participants were encouraged to expand their paradoxical exercises. The session involved reviewing the homework from the previous week, discussing the implementation of symptom reconstruction, and exploring the practical aspects of experiencing their issues in a controlled environment. Participants were assigned specific times to practice these exercises throughout the day.

Session 5: Second Mechanism - Disrupting the Symptom-Anxiety Link

The focus of the fifth session was on disrupting the link between symptoms and anxiety by introducing a third mechanism: altering the symptoms' meaning for the patient and their surrounding system. Participants continued practicing their paradoxical exercises and were encouraged to observe changes in their anxiety levels and symptom patterns.

Session 6: Strengthening the Self and Resolving Conflicts

The sixth session introduced the fourth mechanism, which focused on strengthening the self and resolving conflicts through paradoxical strategies. Participants were guided to identify and challenge the relationship between their symptoms and anxiety, learning to assert control over their experiences. The session included discussions on how paradoxical intention could help in managing other life conflicts and anxieties.

Session 7: Review, Final Questions, and Post-Test

In the final session, participants reviewed their progress, discussed any remaining questions, and completed post-test assessments. The session involved a comprehensive review of the techniques learned, the progress made, and strategies for maintaining the therapeutic gains after the intervention ended. Participants completed the research questionnaires as part of the post-test evaluation.

1.4. Data Analysis

Data analysis in this study was conducted using descriptive statistics such as graphs, means, and variances, to provide an overview of the raw data. To test the research hypotheses, repeated measures ANOVA was employed using SPSS software version 28. This approach allowed for the assessment of changes in distress tolerance and social anxiety symptoms across the three groups over time, considering the effects of mindfulness-based therapy and paradoxical treatment compared to the waitlist control group. The repeated measures ANOVA was particularly suited for evaluating the pre-test, post-test, and follow-up measurements, accounting for the within-subject and between-group variations effectively.

2. Findings and Results

In this study, the majority of participants in both the mindfulness-based intervention group and the paradoxical intention therapy group (45%) were in the eighth grade, whereas 55% of participants in the control group were also in the eighth grade. The remaining participants in all groups were distributed across grades nine, ten, and eleven. Regarding age, 45% of participants in the mindfulness-based intervention group were 14 years old, 40% in the paradoxical intention group were 14 years old, and 55% in the control group were 14 years old. The rest of the participants ranged from 16 to 17 years old.

Table 1 provides the mean (M) and standard deviation (SD) values for all groups across the different stages of measurement for distress tolerance, absorption, appraisal, and regulation components

Table 1

Descriptive Statistics

Group	Variable	Stage	Mean (M)	Standard Deviation (SD)
Mindfulness-Based Therapy	Tolerance	Pre-test	7.00	1.30
		Post-test	10.25	1.74
		Follow-up	10.55	1.15
Paradoxical Therapy	Tolerance	Pre-test	7.60	1.50
		Post-test	10.40	1.93
		Follow-up	10.40	1.19
Control	Tolerance	Pre-test	6.60	1.00
		Post-test	5.85	1.90
		Follow-up	6.50	1.88
Mindfulness-Based Therapy	Absorption	Pre-test	6.75	1.41
		Post-test	9.35	1.60
		Follow-up	9.70	1.72
Paradoxical Therapy	Absorption	Pre-test	7.10	1.62

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		Post-test	9.15	1.31
		Follow-up	9.65	1.31
Control	Absorption	Pre-test	6.65	1.31
		Post-test	6.50	1.70
		Follow-up	7.00	1.56
Mindfulness-Based Therapy	Appraisal	Pre-test	16.00	4.28
		Post-test	20.30	2.85
		Follow-up	20.35	2.78
Paradoxical Therapy	Appraisal	Pre-test	16.95	4.02
		Post-test	19.90	2.77
		Follow-up	19.60	2.91
Control	Appraisal	Pre-test	15.60	3.14
		Post-test	14.45	4.89
		Follow-up	15.85	6.17
Mindfulness-Based Therapy	Regulation	Pre-test	6.70	1.03
		Post-test	9.75	1.29
		Follow-up	10.45	1.10
Paradoxical Therapy	Regulation	Pre-test	7.40	1.39
		Post-test	9.90	1.48
		Follow-up	10.45	1.19
Control	Regulation	Pre-test	6.65	0.93
		Post-test	5.90	1.52
		Follow-up	6.75	1.62

Table 1 illustrates the means and standard deviations of the distress tolerance, absorption, appraisal, and regulation components for the three groups across the pre-test, post-test, and follow-up stages. The results indicate that both the mindfulness-based therapy and paradoxical intention therapy groups showed increases in their post-test and follow-up scores compared to their pre-test scores across all measured components. In contrast, the control group did not exhibit significant changes, with some components showing slight decreases.

All assumptions required for conducting a repeated measures ANOVA were tested and confirmed with the exception of sphericity. The sample size for the analysis included all 60 participants, distributed equally among the three groups. Mauchly's test indicated that the assumption of sphericity had been violated, and therefore, the Greenhouse-Geisser correction was applied to adjust the degrees of freedom.

Table 2

ANOVA Results

Variable	Source of Variation	SS	df	MS	F	Sig	Eta Squared
Tolerance	Within-Subjects	151.23	1.58	95.74	54.63	0.001	0.49
	Interaction (Test * Group)	114.97	3.16	36.39	20.76	0.001	0.42
	Between-Subjects	373.30	2.00	186.65	42.28	0.001	0.60
Absorption	Within-Subjects	125.10	1.93	64.90	79.44	0.001	0.58
	Interaction (Test * Group)	54.47	3.86	14.13	17.29	0.001	0.38
	Between-Subjects	144.43	2.00	72.22	13.67	0.001	0.32
Appraisal	Within-Subjects	202.43	1.24	162.80	17.51	0.001	0.24
	Interaction (Test * Group)	174.73	2.49	70.26	7.56	0.001	0.21
	Between-Subjects	504.23	2.00	252.12	7.30	0.002	0.20
Regulation	Within-Subjects	166.80	1.65	100.93	82.94	0.001	0.59
	Interaction (Test * Group)	106.57	3.31	32.24	26.49	0.001	0.48
	Between-Subjects	288.63	2.00	144.32	46.76	0.001	0.62

The results of the repeated measures ANOVA in Table 2 indicate significant effects for the within-subjects factors,

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particularly the stages of measurement (pre-test, post-test, and follow-up) across all components—tolerance, absorption, appraisal, and regulation ($p < 0.001$). The interaction between the test stage and group was also significant ($p < 0.001$), indicating that changes over time differed between the groups. The between-subjects effects showed significant differences among the groups across all components ($p < 0.001$), suggesting that the interventions had different impacts on distress tolerance, absorption, appraisal, and regulation.

Table 3

Bonferroni Post-Hoc Test for Time Effects

Variable	Comparison	Mean Difference	Std. Error	Sig
Tolerance	Pre-test vs. Post-test	-1.77	0.26	0.001
	Post-test vs. Follow-up	-2.08	0.21	0.001
	Pre-test vs. Follow-up	-0.32	0.17	0.18
Absorption	Pre-test vs. Post-test	-1.50	0.17	0.001
	Post-test vs. Follow-up	-1.95	0.17	0.001
	Pre-test vs. Follow-up	-0.45	0.15	0.11
Appraisal	Pre-test vs. Post-test	-2.03	0.49	0.001
	Post-test vs. Follow-up	-2.42	0.54	0.001
	Pre-test vs. Follow-up	-0.38	0.22	0.24
Regulation	Pre-test vs. Post-test	-1.60	0.21	0.001
	Post-test vs. Follow-up	-2.30	0.19	0.001
	Pre-test vs. Follow-up	-0.70	0.14	0.08

The Bonferroni post-hoc comparisons in Table 3 showed significant differences between the pre-test and post-test, and post-test and follow-up stages across all components ($p < 0.001$), except for comparisons between the pre-test and follow-up stages, which were not significant. This suggests that the interventions had a sustained effect immediately after the post-test, which largely persisted through the follow-up period, with no significant regression to pre-test levels.

Table 4

Bonferroni Post-Hoc Test for Group Effects

Variable	Group Comparison	Mean Difference	Std. Error	Sig
Tolerance Post-test	Mindfulness vs. Paradoxical	-0.15	0.59	0.99
	Mindfulness vs. Control	4.40	0.59	0.001
	Paradoxical vs. Control	4.55	0.59	0.001
Absorption Post-test	Mindfulness vs. Paradoxical	0.20	0.49	0.99
	Mindfulness vs. Control	2.85	0.49	0.001
	Paradoxical vs. Control	2.65	0.49	0.001
Appraisal Post-test	Mindfulness vs. Paradoxical	0.40	1.15	0.99
	Mindfulness vs. Control	5.85	1.15	0.001
	Paradoxical vs. Control	5.45	1.15	0.001
Regulation Post-test	Mindfulness vs. Paradoxical	-0.15	0.45	0.99
	Mindfulness vs. Control	3.85	0.45	0.001
	Paradoxical vs. Control	4.00	0.45	0.001
Tolerance Follow-up	Mindfulness vs. Paradoxical	0.15	0.46	0.99
	Mindfulness vs. Control	4.05	0.46	0.001
	Paradoxical vs. Control	3.90	0.46	0.001
Absorption Follow-up	Mindfulness vs. Paradoxical	0.05	0.49	0.99
	Mindfulness vs. Control	2.70	0.49	0.001
	Paradoxical vs. Control	2.65	0.49	0.001
Appraisal Follow-up	Mindfulness vs. Paradoxical	0.75	1.34	0.99
	Mindfulness vs. Control	4.50	1.34	0.001
	Paradoxical vs. Control	3.75	1.34	0.02
Regulation Follow-up	Mindfulness vs. Paradoxical	0.00	0.42	0.99
	Mindfulness vs. Control	3.70	0.42	0.001
	Paradoxical vs. Control	3.70	0.42	0.001

The second Bonferroni post-hoc analysis in Table 4 revealed that both mindfulness-based therapy and paradoxical intention therapy groups significantly

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outperformed the control group in terms of improvements in tolerance, absorption, appraisal, and regulation during both the post-test and follow-up stages ($p < 0.001$). However, there were no significant differences between the mindfulness-based therapy and paradoxical intention therapy groups, indicating that both interventions were equally effective in enhancing distress tolerance and its related components in adolescents with social anxiety symptoms.

3. Discussion and Conclusion

The present study aimed to compare the effectiveness of mindfulness-based interventions (MBIs) and paradoxical intention therapy (PIT) on distress tolerance among adolescents with social anxiety symptoms. The results demonstrated significant improvements in distress tolerance across both intervention groups, with marked increases observed in post-test and follow-up assessments compared to pre-test measures. Specifically, participants in both the MBI and PIT groups showed significant enhancements in distress tolerance, absorption, appraisal, and regulation components, while the control group exhibited little to no change. These findings suggest that both therapeutic approaches are effective in increasing distress tolerance among adolescents with social anxiety, thereby reducing the impact of social anxiety symptoms.

The improvements in distress tolerance observed in the MBI group align with previous studies highlighting the efficacy of mindfulness-based approaches in enhancing emotional regulation and coping skills (Gawrysiak et al., 2015; Brem et al., 2016). Mindfulness practices, which emphasize non-judgmental awareness and acceptance of present-moment experiences, have been shown to reduce reactivity to negative emotions, thereby increasing an individual's capacity to tolerate distress without resorting to avoidance behaviors (Gawrysiak et al., 2015; Zeifman et al., 2020). The results of this study support these findings, demonstrating that adolescents who engaged in mindfulness-based therapy experienced significant improvements in their ability to manage distressing thoughts and emotions, leading to reductions in social anxiety symptoms.

Similarly, the significant improvements in distress tolerance observed in the PIT group are consistent with the theoretical underpinnings of paradoxical intention, which posits that encouraging individuals to confront their fears can diminish the power of those fears over time (Keller et al., 2018). By deliberately engaging in feared behaviors or thoughts, individuals learn to control and manage their anxiety, leading to enhanced distress tolerance (Asadi & Bakhtiarpour, 2022; Sakaria & Shah, 2023). The findings from this study corroborate previous research demonstrating the effectiveness of paradoxical intention in reducing anxiety symptoms and increasing distress tolerance in various populations (Shah et al., 2012; Kauffman et al., 2020).

The interaction effects observed between the test stage and group further highlight the differential impact of MBIs and PIT compared to the control group. The significant differences between the intervention groups and the control group across all components of distress tolerance suggest that both MBIs and PIT offer unique benefits that are not achieved through standard care alone. This finding is particularly relevant for clinical practice, as it underscores the importance of incorporating evidence-based interventions that target distress tolerance in the treatment of social anxiety and related disorders (Gawrysiak et al., 2015; Shorey et al., 2016).

In terms of specific components of distress tolerance, the improvements observed in the absorption and regulation dimensions among participants in both intervention groups suggest that these therapies may enhance an individual's ability to remain engaged and focused during distressing situations (Brem et al., 2016). This is particularly important for adolescents with social anxiety, who often experience heightened sensitivity to social cues and may struggle with maintaining attention in social settings (Kim et al., 2015; Rutherford et al., 2015). The ability to regulate emotions and stay present in the moment is a key factor in reducing the avoidance behaviors that are characteristic of social anxiety, making these findings particularly relevant for treatment interventions.

The improvements in the appraisal component observed in the MBI group also support the notion that mindfulness practices can alter cognitive processes related to the evaluation of stressors (Gawrysiak et al., 2015). By fostering a more balanced and less reactive approach to thoughts and emotions, mindfulness-based interventions may help adolescents reinterpret distressing experiences in a way that reduces their overall impact, thereby enhancing distress tolerance (Zeifman et al., 2020). This cognitive shift is crucial in the treatment of social anxiety, as it can help individuals develop healthier responses to social evaluation and reduce the fear of negative judgment that often drives social avoidance (Kim et al., 2015).

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The significant interaction effects between the test stage and group observed in this study are consistent with previous research demonstrating that therapeutic interventions can have varying impacts on different aspects of distress tolerance over time (Leyro et al., 2010). The fact that both MBIs and PIT showed sustained improvements in distress tolerance at the follow-up stage suggests that these interventions not only produce immediate benefits but also have lasting effects on an individual's ability to manage distress (Bornovalova et al., 2012; Cummings et al., 2013). This finding is particularly encouraging for clinicians, as it indicates that the gains achieved through these therapies are likely to persist beyond the initial treatment period, potentially leading to long-term improvements in social functioning and overall well-being.

The findings from this study also highlight the potential for MBIs and PIT to be used as complementary approaches in the treatment of social anxiety. While both interventions were effective in enhancing distress tolerance, they may do so through different mechanisms, suggesting that a combined approach could offer even greater benefits (Keller et al., 2018; Shorey et al., 2016). For example, while mindfulness-based interventions focus on developing present-moment awareness and acceptance, paradoxical intention therapy encourages direct confrontation of fears, which could help individuals build resilience and confidence in managing anxiety-provoking situations (Gawrysiak et al., 2015; Sakaria & Shah, 2023). Future research could explore the potential synergistic effects of combining these interventions to enhance distress tolerance and reduce social anxiety symptoms more effectively.

4. Limitations and Suggestions

Despite the promising findings, this study has several limitations that should be considered when interpreting the results. First, the sample size was relatively small, and participants were drawn from a specific population of adolescents with social anxiety symptoms. As a result, the findings may not be generalizable to other populations, such as adults or individuals with different anxiety disorders. Additionally, the study relied on self-report measures to assess distress tolerance and social anxiety symptoms, which may be subject to bias or inaccuracies in reporting. Although self-report measures are commonly used in psychological research, they may not fully capture the complexity of distress tolerance or the nuances of social anxiety symptoms.

Another limitation is the lack of a long-term follow-up beyond the two-month period assessed in this study. While the results indicate that both MBIs and PIT have lasting effects on distress tolerance, it is unclear whether these effects would persist over a longer period, such as six months or a year. Long-term follow-up studies are needed to determine the durability of the benefits observed in this study and to assess the potential for relapse or regression in distress tolerance and social anxiety symptoms.

Moreover, the study did not account for potential confounding variables that could have influenced the results, such as participants' baseline levels of distress tolerance, previous treatment history, or the presence of comorbid psychological conditions. These factors could have impacted the effectiveness of the interventions and may have contributed to the observed differences between the groups. Future studies should consider controlling for these variables to obtain a clearer understanding of the specific effects of MBIs and PIT on distress tolerance in adolescents with social anxiety.

To build on the findings of this study, future research should explore several key areas. First, studies with larger and more diverse samples are needed to determine the generalizability of the results to different populations, including adults, individuals with other anxiety disorders, and those with varying levels of distress tolerance. Examining the effects of MBIs and PIT in these populations could provide valuable insights into the broader applicability of these interventions and identify potential moderators or mediators of treatment effectiveness.

Additionally, future research should investigate the long-term effects of MBIs and PIT on distress tolerance and social anxiety symptoms. Longitudinal studies with extended follow-up periods would help to determine the sustainability of the benefits observed in this study and identify any factors that may influence the maintenance or decline of treatment gains over time. This research could also explore the potential for booster sessions or ongoing support to enhance the long-term effectiveness of these interventions.

Another important area for future research is the exploration of the underlying mechanisms by which MBIs and PIT enhance distress tolerance. While this study provides evidence of the effectiveness of these interventions, it remains unclear how they specifically influence the various components of distress tolerance, such as absorption, appraisal, and regulation. Experimental studies that incorporate physiological or neurobiological measures could shed light on the processes through which these therapies

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exert their effects and identify potential targets for enhancing treatment outcomes.

Finally, future research should consider the potential benefits of integrating MBIs and PIT into a combined treatment approach. Given that these interventions may operate through different mechanisms, a combined approach could potentially offer greater benefits than either intervention alone. Studies that compare the effectiveness of combined MBIs and PIT to each intervention individually would provide valuable insights into the potential synergistic effects of these therapies and inform the development of more comprehensive treatment protocols for social anxiety and related disorders.

The findings of this study have important implications for clinical practice, particularly in the treatment of adolescents with social anxiety. First, the results suggest that both mindfulness-based interventions and paradoxical intention therapy are effective in enhancing distress tolerance and reducing social anxiety symptoms. Clinicians working with adolescents with social anxiety may consider incorporating these evidence-based approaches into their treatment protocols to help clients develop healthier coping mechanisms and improve their ability to manage distressing situations.

Given the observed benefits of both MBIs and PIT, clinicians may also consider tailoring these interventions to the specific needs and preferences of their clients. For example, clients who struggle with excessive worry and avoidance behaviors may benefit from the structured, confrontational approach of PIT, while those who experience high levels of emotional reactivity may find mindfulness-based practices more helpful in reducing reactivity and fostering acceptance (Keller et al., 2018; Gawrysiak et al., 2015). By taking an individualized approach to treatment, clinicians can optimize the effectiveness of these interventions and enhance client outcomes.

Furthermore, the study's findings highlight the importance of addressing distress tolerance as a key therapeutic target in the treatment of social anxiety. Clinicians should consider incorporating distress tolerance training into their treatment plans, using techniques such as mindfulness exercises, exposure therapy, and cognitive restructuring to help clients build their capacity to tolerate negative emotions (Leyro et al., 2010; Bornovalova et al., 2012). By strengthening distress tolerance, clinicians can help clients reduce avoidance behaviors, increase engagement in social situations, and improve overall functioning.

In addition to individual therapy, the findings suggest that group-based interventions may also be effective in enhancing distress tolerance and reducing social anxiety symptoms. Group settings can provide a supportive environment for adolescents to practice distress tolerance skills, share experiences, and receive feedback from peers, which may enhance the overall effectiveness of the intervention (Cummings et al., 2013; Gawrysiak et al., 2015). Clinicians may consider offering group-based MBIs or PIT programs as part of their treatment offerings, particularly for adolescents who may benefit from the social support and accountability provided by a group setting.

Finally, the results of this study underscore the need for early intervention in adolescence to prevent the escalation of social anxiety symptoms and promote long-term mental health. By addressing distress tolerance during this critical developmental period, clinicians can help adolescents build resilience, reduce the risk of developing comorbid psychological conditions, and set the foundation for healthier emotional regulation throughout adulthood (Daughters et al., 2014; Holliday et al., 2016). Clinicians, educators, and policymakers should work together to increase access to evidence-based interventions for social anxiety and other anxiety-related disorders in youth, ensuring that all adolescents have the opportunity to develop the skills and resources they need to thrive.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

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

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