The Effectiveness of Adolescent-centered Mindfulness Therapy on Academic Engagement and Buoyancy in Anxious Middle School Students

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A r t i c l e   I n f o

Article type:
Original Research

How to cite this article:

A B S T R A C T

Objective: The present study aimed to investigate the effectiveness of adolescent-centered mindfulness therapy on academic engagement and buoyancy in anxious middle school students.

Methods and Materials: The research method was quasi-experimental with a pre-test, post-test design, including a control group and a two-month follow-up period. The statistical population of this study consisted of anxious middle school students in Isfahan during the 2023-2024 academic year. A total of 34 anxious students were selected through purposive sampling and randomly assigned to experimental and control groups (18 students in the experimental group and 16 students in the control group). Students in the experimental group received adolescent-centered mindfulness therapy over ten weeks in ten 90-minute sessions. The questionnaires used in this study included the Anxiety Inventory (Beck et al., 1988), the Academic Engagement Questionnaire (Fredericks, Blumenfeld, & Paris, 2004), and the Academic Buoyancy Questionnaire (Martin & Marsh, 2008). The data were analyzed using mixed ANOVA and Bonferroni post hoc test with SPSS23 software.

Findings: The results showed that adolescent-centered mindfulness therapy had a significant impact on academic engagement (P<0.0001; Eta=0.56; F=41.68) and academic buoyancy (P<0.0001; Eta=0.58; F=44.22) in anxious students.

Conclusion: Based on the findings of this study, it can be concluded that adolescent-centered mindfulness therapy, through the application of mindful practices such as mindful eating, purposeful and mindful breathing, and mindful walking, can lead to an increase in the mindful skills of anxious students, thereby enhancing their academic engagement and buoyancy.

Keywords: Adolescent-centered mindfulness therapy, Academic engagement, Academic buoyancy, Anxious students

1. Introduction

In the academic process of students, there are factors that can negatively impact their academic performance. One such factor is anxiety, which leads to significant academic harm in students (Alfonso & Lonigan, 2021; Rodríguez-Arce et al., 2020). Psychologists and education specialists believe that a moderate level of anxiety can act as a motivational factor, enhancing an individual's effort and performance. In contrast, excessive anxiety has different effects, potentially disrupting the psychological processes essential for proper functioning, as various studies have shown that anxiety significantly impacts academic performance (Prinz et al., 2019). Anxiety refers to a state in which an individual is excessively worried, tense, and distressed about a dreadful future event. Anxiety can be considered the result of continuous stress experienced throughout life. Accordingly, anxiety is an emotional and physiological response to an all-encompassing inner sense of danger that can easily be dismissed. Anxiety is accompanied by specific physical symptoms and serves as a warning signal, indicating impending danger and preparing the individual to cope with it (Metzler et al., 2016).

The onset of anxiety can cause psychological and cognitive disturbances in the student population, leading to academic decline and gradually diminishing their academic engagement (Liu et al., 2020). The growth of positive psychology and its focus on resilience and the development of individual abilities have brought academic engagement to the forefront of researchers' interests in positive psychology, as academic engagement can influence the performance of students (Closson & Boutilier, 2017; Schellenberg & Bailis, 2015). Engagement directs students' academic orientation, supports a positive and directed academic process instead of trying to eliminate existing academic problems, and fosters scientific growth and students' mental health (Zhen et al., 2020). Academic engagement refers to the quantity and quality of students' physical and mental energy invested throughout their academic career (Zhang et al., 2018). According to Richardson and Long (2003), this concept refers to the quality of effort students invest in purposeful educational activities to directly achieve desirable outcomes (Farajzadeh et al., 2020; Fredricks et al., 2004). Various definitions and models of academic engagement have been proposed. Reschly and Christenson (2006) believe that academic engagement is a multidimensional construct comprising cognitive, emotional, and behavioral components (Farajzadeh et al., 2020).

Reduced academic engagement can lead to a decrease in students' academic buoyancy. Moreover, anxiety in students also results in decreased buoyancy. Academic buoyancy refers to students' ability to successfully overcome academic obstacles and challenges (Comerford et al., 2015). Another definition of academic buoyancy describes it as a positive, constructive, and adaptive response to the ongoing and continuous challenges and obstacles in the academic field (Putwain et al., 2012). When an individual performs a task spontaneously, they do not feel tired but instead experience increased energy. Additionally, academic buoyancy is a significant indicator influencing students' successful education and learning, where competencies and abilities culminate in scientific progress (Solberg et al., 2012). The antecedents of academic buoyancy include psychological factors, school and participation factors, and family and peer factors. Martin and Marsh (2008) highlighted motivational and psychological factors, such as academic self-regulation and self-efficacy. School-related factors include classroom structure, quality of classroom time, positive attitudes toward the class, and participation in improving the classroom environment. Family and peer factors involve cognitive and emotional support from family and friends and communication patterns with family and peers (Martin & Marsh, 2008).

Various therapeutic and educational methods have been employed for anxious students. One effective therapeutic method for addressing and reducing anxiety in anxious students is adolescent-centered mindfulness therapy. Mindfulness, theoretically, refers to paying attention in a specific way: purposefully, in the present moment, and non-judgmentally. This model involves deliberately focusing attention on the current experience with non-judgmental acceptance (Lindsay & Creswell, 2017). The main mechanisms of mindfulness appear to be self-control and attention, as repeatedly focusing attention on a neutral stimulus, such as breathing, creates an appropriate attentional environment (Crosswell et al., 2017). Through mindfulness, individuals become aware of the sensations of anxiety and stress in their bodies and their causes, discovering and isolating schemas related to these feelings. They also learn how to cope with these problems through self-talk. Mindfulness-based training relies on meditation techniques like body scanning to increase understanding and awareness of thoughts (Biglari et al., 2022). This technique is designed to perceive voluntary body sensations, such as eating and moving, and involuntary bodily sensations, such as breathing, to exert more control over involuntary

responses like tension (Lovas & Schuman-Olivier, 2018). Meditation and mindfulness practices enhance individuals' self-awareness and self-acceptance (Ames et al., 2014).

Research findings (Ames et al., 2014; Asli Azad et al., 2019; Baharvand & sodani, 2020; Biglari et al., 2022; Crosswell et al., 2017; Farhadi et al., 2018; Galla et al., 2020; Hashemi et al., 2019; Lindsay & Creswell, 2017; Lovas & Schuman-Olivier, 2018; Lu et al., 2017; Musa et al., 2020; Porparizi et al., 2018; Puthusserry & Delariarte, 2023; Sheikhalizadeh et al., 2019; Soltani Panah et al., 2021; Tajoldini et al., 2018; Vajdian et al., 2020; Yu et al., 2021) have shown that adolescent-centered mindfulness therapy effectively improves students' cognitive, psychological, and emotional components. Specifically, findings (Asli Azad et al., 2019; Baharvand & sodani, 2020; Farhadi et al., 2018; Galla et al., 2020; Hashemi et al., 2019; Lu et al., 2017; Porparizi et al., 2018; Sheikhalizadeh et al., 2019; Tajoldini et al., 2018) indicate that mindfulness can enhance academic performance in students.

Given the necessity of this research, it should be noted that attention to factors influencing students' academic, emotional, psychological, and cognitive success has increasingly drawn the attention of researchers and educational planners worldwide. By identifying and improving these factors, researchers and educational planners aim to enhance student success, consequently contributing to their country's social, economic, political, and cultural development. One of these influential factors on students' future social and professional outcomes is their academic performance, naturally affected by components such as academic engagement and buoyancy. Thus, improving academic engagement and buoyancy can lead to greater academic performance and success. Attention to these academic components encourages researchers to investigate the factors that enhance their levels. One significant factor that can severely negatively impact students' academic performance is anxiety. Anxiety is one of the processes negatively correlated with the academic performance and progress of millions of students in educational centers, highlighting the need for effective psychological interventions for anxious students. Therefore, the primary research question of this study is to examine the effect of adolescent-centered mindfulness therapy on the academic engagement and buoyancy of anxious middle school students.

2. Methods and Materials

2.1. Study Design and Participants

The research method was quasi-experimental with a pre-test, post-test design, including a control group and a two-month follow-up period. The statistical population of this study consisted of anxious middle school students in Isfahan during the 2023-2024 academic year. Purposive sampling was used to identify students referred to the counseling center of District 6 Education and Psychological Services in Isfahan by school counselors due to anxiety symptoms from boys' and girls' middle schools in the fall semester of the 2023-2024 academic year. A total of 89 students were identified. The Anxiety Inventory (Beck et al., 1988) was administered to these students. After collecting and scoring the questionnaires, students with anxiety (scores above 32 on the Anxiety Inventory) were identified. At this stage, 84 students scored above the average on the Anxiety Inventory. Clinical interviews based on the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) were conducted with these students. Finally, 40 students with the highest scores on the Anxiety Inventory (scores above the average, sorted) were randomly assigned to experimental and control groups (20 students in the experimental group and 20 students in the control group). After starting the intervention, 2 students from the experimental group and 4 students from the control group withdrew, leaving 34 students in the study (18 in the experimental group and 16 in the control group). Inclusion criteria included scoring above the average (score of 32) on the Anxiety Inventory, anxiety diagnosis based on the clinical interview, age between 13 and 16 years, willingness and consent to participate in the study, absence of other acute or chronic physical and psychological disorders (based on health and counseling records), and not receiving simultaneous psychological and psychiatric interventions. Exclusion criteria included more than two absences, irregular attendance, lack of cooperation with the researcher, and not completing the questionnaires at any stage of pre-test, post-test, or follow-up. Demographic data showed that the mean age of students was 14.10 in the experimental group and 14.80 in the control group. Eighth-grade education had the highest frequency in both the experimental group (8 students, 44.44%) and the control group (8 students, 50%). Additionally, of the 35 students in the study, 12 were boys (34.28%) and 23 were girls (65.72%).

After obtaining necessary permissions from District 6 Education, the selected students (40 students) were randomly assigned to experimental and control groups (20

students each). The experimental group received adolescent-centered mindfulness therapy in ten weekly 90-minute sessions over ten weeks, while the control group received no intervention during the study. Following the start of the intervention, 2 students from the experimental group and 4 from the control group withdrew, leaving 34 students (18 in the experimental group and 16 in the control group). Ethical considerations included obtaining students' consent, informing them about the intervention process, and ensuring confidentiality. Control group students were assured they would receive the intervention after the study. To motivate participation, the therapeutic and educational benefits were explained, and the intervention was provided free of charge. The intervention was conducted by the researcher and a specialist.

2.2. Measures

2.2.1. Anxiety

The Anxiety Inventory, developed by Beck, Epstein, Brown, and Steer (1988), measures anxiety symptoms. It is a 21-item self-report questionnaire designed to assess anxiety severity over the past week on a scale from "not at all" to "severely." Each item is rated on a four-point Likert scale from 0 to 3. The total score ranges from 0 to 63, with higher scores indicating greater anxiety. Each item reflects common anxiety symptoms (mental, physical, phobia-related). Beck et al. reported an internal consistency of 0.92 and a one-week test-retest reliability of 0.75, with item correlations ranging from 0.30 to 0.76 (Beck et al., 1988). Kaviani and Mousavi (2008) reported a Cronbach's alpha of 0.92 and a test-retest reliability of 0.83 for the Persian version. The questionnaire demonstrated high validity and reliability. The internal consistency coefficient was 0.92, and the reliability was 0.75, with item correlations ranging from 0.30 to 0.76. Five types of validity (content, concurrent, construct, diagnostic, and factorial) were assessed, indicating the tool's high efficiency in measuring anxiety severity (Biglari et al., 2022). In this study, the Cronbach's alpha coefficient was 0.77.

2.2.2. Academic Engagement

The AEQ, developed by Fredericks, Blumenfeld, and Paris (2004), measures academic engagement with 15 items on a five-point Likert scale (from "never" to "always"). Scores range from 15 to 75, with higher scores indicating greater academic engagement. Fredericks et al. reported a construct validity of 0.89 and a Cronbach's alpha reliability of 0.91 (Fredricks et al., 2004). In Abbasi, Dargahi, Pirani, and Bonyadi's (2015) study, the Cronbach's alpha reliability was above 0.70, and content validity was 0.89. The reliability of the AEQ in Ganji, Torki, Bani Asadi Shahrebabak, and Asadi's (2016) study was 0.77, and in Farajzadeh et al.'s (2020) study, it was 0.80. In this study, the Cronbach's alpha coefficient was 0.78 (Farajzadeh et al., 2020).

2.2.3. Academic Buoyancy

The ABS, developed by Martin and Marsh (2008), measures academic buoyancy with nine items on a seven-point Likert scale. Scores range from 9 to 63, with higher scores indicating greater buoyancy. Martin and Marsh reported satisfactory internal consistency (Cronbach's alpha of 0.80) and test-retest reliability (0.67). In the Iranian context, Hossein Chari and Dehghani Zadeh (2012) reported a Cronbach's alpha of 0.80 (after removing item 8) and a test-retest reliability of 0.73. Item-total correlations ranged from 0.51 to 0.68, with satisfactory internal consistency and stability. Factorial validity was confirmed through principal component analysis with varimax rotation (KMO=0.83, Bartlett's test=360.611). The reliability coefficient was 0.87 (Comerford et al., 2015; Martin & Marsh, 2008; Putwain et al., 2012). In this study, the Cronbach's alpha coefficient was 0.84.

2.3. Intervention

2.3.1. Adolescent-Centered Mindfulness Therapy

The adolescent-centered mindfulness therapy protocol was based on Burdick's (2014) protocol, with content validity confirmed by several researchers (Ames et al., 2014; Asli Azad et al., 2019; Biglari et al., 2022; Farhadi et al., 2018; Lovas & Schuman-Olivier, 2018; Musa et al., 2020; Soltani Panah et al., 2021) for the adolescent population.

This session introduces mindfulness training and its definition, explaining the rationale behind this educational course for participants. The session covers how to plan mindfulness exercises and incorporate them into daily life. It includes engaging parents and maintaining daily mindfulness journals. Participants learn and practice mindfulness meditation postures (sitting on a chair, lying down, cross-legged sitting, full lotus position, hand positions). Homework is assigned to reinforce these practices.

Session 2: Gaining Awareness of Mindful Breathing

Participants discuss their experiences with mindfulness from the first session. They engage in mindful breathing exercises and learn abdominal breathing techniques. An activity using a glitter bottle illustrates the difference between a calm mind and a chaotic mind. Homework is assigned to continue practicing mindful breathing.

Session 3: Body Scan Training

Participants share their mindfulness experiences and practice mindful breathing again. They are introduced to the body scan exercise, which promotes awareness of different body parts and sensations. Homework is assigned to practice the body scan at home.

Session 4: Gaining Awareness of the Present Moment

Basic breathing exercises are repeated, and participants are taught present-moment awareness using a water glass exercise. Mindful movements are introduced to further enhance present-moment awareness. Homework is assigned to practice these exercises.

Session 5: Gaining Awareness of the Five Main Senses

Participants discuss their experiences with mindfulness exercises and learn to practice mindfulness with the five senses (mindful eating, mindful listening, mindful touching, mindful smelling, mindful seeing). Mindful breathing exercises are also repeated. Homework is assigned to incorporate these sensory mindfulness practices.

Session 6: Gaining Awareness of Emotions

The session begins with preliminary relaxation breathing exercises. Participants practice mindfulness related to emotions and are encouraged to journal about their experiences. Scenarios such as "Helpful Inspector vs. Unhelpful Inspector" are used to facilitate understanding of emotional mindfulness. Homework is assigned to continue these practices.

Session 7: Reviewing Breathing Exercises

Participants review breathing and body scan exercises. They engage in mindfulness exercises related to thoughts,

specifically the "Flowing River Meditation." Homework is assigned to reinforce these practices.

Session 8: Gaining Awareness of Muscle Function

Basic breathing exercises (relaxation breathing) are repeated, and participants practice progressive muscle relaxation techniques. The "Channel Switching" game is introduced to enhance muscle awareness. Homework is assigned to practice these techniques.

Session 9: Gaining Awareness of Body Movements

Participants engage in foundational breathing exercises ("Breath Meditation") and mindful movements. The "Helpful Inspector vs. Unhelpful Inspector" scenario is repeated for reinforcement. Homework is assigned to continue practicing these movements and scenarios.

Session 10: Applying Mindfulness in Daily Life

This session reviews all mindfulness exercises taught in previous sessions and introduces "Mindfulness in Daily Activities." Participants practice loving-kindness meditation ("Friendly Wishes"). Homework is assigned to integrate mindfulness into everyday routines.

2.4. Data analysis

Descriptive and inferential statistics were used for data analysis. Descriptive statistics included mean and standard deviation. Inferential statistics included the Shapiro-Wilk test for normality, Levene's test for homogeneity of variances, and Mauchly's test for sphericity. Hypotheses were tested using mixed ANOVA and Bonferroni post hoc test, analyzed with SPSS-23 software.

3. Findings and Results

The mean and standard deviation of the dependent variables (academic engagement and buoyancy) in the pre-test, post-test, and follow-up stages for both the experimental and control groups are presented in Table 1.

Table 1

Mean and Standard Deviation of Academic Engagement and Buoyancy in Experimental and Control Groups

Variable	Group	Pre-test (M)	Pre-test (SD)	Post-test (M)	Post-test (SD)	Follow-up (M)	Follow-up (SD)
Academic Engagement	Experimental	30.38	6.62	38.77	10.20	37.72	9.91
	Control	32.81	5.37	32.32	5.47	32.43	5.48
Academic Buoyancy	Experimental	33.61	8.98	40.38	9.83	39.61	9.57
	Control	32.00	6.36	30.93	6.40	31.37	6.27

The descriptive results indicate that the levels of academic engagement and buoyancy among students in the

experimental group improved compared to the control group. This significance will be examined using inferential

statistics. Before presenting the results of the mixed ANOVA, the assumptions of parametric tests were assessed. The Shapiro-Wilk test results indicated that the assumption of normal distribution of sample data for academic engagement and buoyancy variables in the experimental and control groups during the pre-test, post-test, and follow-up stages was met (p > .05). Additionally, Levene's test results were not significant, indicating that the assumption of

homogeneity of variances for academic engagement and buoyancy variables was met (p > .05). Furthermore, the t-test results showed that the differences in pre-test scores between the experimental and control groups for the dependent variables (academic engagement and buoyancy) were not significant (p > .05). The Mauchly's test results also indicated that the assumption of sphericity for academic engagement and buoyancy data was met (p > .05).

Table 2

Mixed ANOVA for Examining Within-Group and Between-Group Effects on Academic Engagement and Buoyancy

Variable	Source	SS	df	MS	F	p	η²	Power
Academic Engagement	Time	299.86	2	149.93	30.26	.0001	.48	1
	Group Membership	262.33	1	262.33	27.36	.0001	.41	1
	Time x Group Interaction	413.12	2	206.56	41.68	.0001	.56	1
	Error	317.11	64	4.95				
Academic Buoyancy	Time	174.13	2	87.06	25.52	.0001	.44	1
	Group Membership	1051.58	1	1051.58	29.25	.0001	.46	1
	Time x Group Interaction	301.66	2	150.83	44.22	.0001	.58	1
	Error	218.28	64	3.41				

The mixed ANOVA results in Table 2 show that the time factor or assessment stage had a significant effect on the academic engagement and buoyancy scores of anxious students, explaining 48% and 44% of the variance in academic engagement and buoyancy scores, respectively. Additionally, the group membership factor (adolescent-centered mindfulness therapy) had a significant effect on academic engagement and buoyancy scores, explaining 41% and 46% of the variance, respectively. Furthermore, the results indicated that the type of treatment received

(adolescent-centered mindfulness therapy) had a significant effect on academic engagement and buoyancy scores at different assessment stages, explaining 56% and 58% of the variance, respectively. The 100% statistical power indicates high statistical accuracy and adequate sample size to evaluate the interaction effect of group and time on the academic engagement and buoyancy of anxious students. Next, Table 3 presents the paired comparison of the mean academic engagement and buoyancy scores based on the assessment stage using the Bonferroni post hoc test.

Table 3

Paired Comparison of Mean Academic Engagement and Buoyancy Scores by Assessment Stage

Variable	Baseline Stage (M)	Comparison Stage (M)	Mean Difference	Standard Error	Significance
Academic Engagement	Pre-test	Post-test	-3.79	0.68	.0001
		Follow-up	-3.48	0.62	.001
	Post-test	Pre-test	3.79	0.68	.0001
		Follow-up	0.31	0.18	.28
Academic Buoyancy	Pre-test	Post-test	-2.85	0.58	.0001
		Follow-up	-2.68	0.48	.0001
	Post-test	Pre-test	2.85	0.58	.0001
		Follow-up	0.17	0.17	.86

The results in Table 3 show a significant difference between the pre-test mean scores and the post-test and follow-up mean scores for the variables of academic engagement and buoyancy. This indicates that adolescent-centered mindfulness therapy significantly changed post-test and follow-up scores compared to the pre-test stage.

Additionally, there was no significant difference between the post-test and follow-up mean scores for academic engagement and buoyancy. This finding suggests that the significant changes in post-test scores for academic engagement and buoyancy were maintained during the follow-up period.

4. Discussion and Conclusion

This study aimed to examine the effectiveness of adolescent-centered mindfulness therapy on the academic engagement and buoyancy of anxious students. The results indicated that adolescent-centered mindfulness therapy had a significant impact on the academic engagement and buoyancy of anxious students. The first finding, regarding the effectiveness of adolescent-centered mindfulness therapy on academic engagement, aligns with the results of prior studies (Azhdari & Yousefi, 2021; Kokabi Rahman et al., 2023; Mahvash et al., 2024; Rahmani et al., 2024; Rahmati et al., 2024; Shoghi et al., 2023; Yao et al., 2024). These researchers have shown that adolescent-centered mindfulness therapy effectively improves cognitive, psychological, and emotional components in students. Additionally, prior studies (Asli Azad et al., 2019; Baharvand & sodani, 2020; Farhadi et al., 2018; Galla et al., 2020; Hashemi et al., 2019; Lu et al., 2017; Porparizi et al., 2018; Sheikhalizadeh et al., 2019; Tajoldini et al., 2018) have demonstrated that mindfulness can improve academic progress, adjustment, and resilience while reducing procrastination and academic burnout in students.

To explain the first finding, it can be stated that mindfulness-based therapy positively impacts sensory, cognitive, and emotional processes, thereby affecting an individual's psychological processes (Yu et al., 2021). This can, in turn, influence emotional-cognitive performance. Moreover, mindfulness therapy leads to cognitive changes in students' thinking and actions. Thus, adolescent-centered mindfulness therapy, by shaping cognitive changes in anxious students within the educational environment, enables them to exhibit a more positive cognitive attitude towards academic processes, leading to higher academic engagement. Furthermore, mindfulness therapy, as a non-judgmental attention to internal experiences (e.g., feelings and cognition), allows anxious students to reduce automatic responses to stressful experiences, such as environmental learning challenges. Over time, increased awareness and acceptance of academic life events (which can change) reduce the activation of stress response systems and psychological distress symptoms. Consequently, anxious students can exhibit normalized responses without tension in their academic environment, thereby improving performance and displaying higher academic engagement. Additionally, mindfulness therapy techniques teach anxious students the cognitive and behavioral skills needed to manage stress, anxiety, and psychological and emotional

symptoms (Musa et al., 2020). These skills can reduce the fear and anxiety associated with stress, anxiety, and psychological symptoms, helping students adopt a healthy approach to academic activities and manage emotions in the learning environment, thereby improving performance and displaying higher academic engagement.

The second finding, regarding the effectiveness of adolescent-centered mindfulness therapy on academic buoyancy, aligns with the results of prior studies (Rahmati et al., 2024; Sheikhalizadeh et al., 2019; Tajoldini et al., 2018). These researchers have shown that adolescent-centered mindfulness therapy effectively improves cognitive, psychological, and emotional components in adolescents.

To explain this finding, it can be stated that adolescent-centered mindfulness therapy can protect adolescents against mood and psychological disorders when experiencing emotional distress, such as anxiety, by enhancing cognitive coping processes and increasing emotion regulation, problem-solving, and awareness skills. Furthermore, adolescent-centered mindfulness therapy can strengthen cognitive coping processes and emotion regulation skills, problem-solving training, and ignore techniques when experiencing emotional distress, such as academic performance deficiencies, protecting individuals against mood and cognitive dysfunctions. Regular mindfulness practice can bring positive changes to some psychological and cognitive functions (Lu et al., 2017), leading to the acquisition of self-regulation, flexibility, and constructive new cognitive skills. This allows anxious students to exhibit higher cognitive flexibility and control skills in the learning environment, improving academic performance and displaying higher academic buoyancy. Another mindfulness technique is acceptance. Acceptance and readiness for change increase positive emotions, leading to a reduction in psychological, behavioral, emotional, and academic problems (Galla et al., 2020; Tajoldini et al., 2018). Another explanation is that adolescent-centered mindfulness therapy, by teaching mindfulness techniques and present-moment action, can moderate the emotional and cognitive sensitivities resulting from behavioral and psychological problems, such as anxiety. Consequently, psychological, behavioral, and cognitive problems in anxious students decrease, enabling them to exhibit organized and normalized behaviors in educational settings and display higher academic buoyancy.

5. Limitations & Suggestions

This study, like others, has limitations. The limited research population to anxious students referred to the District 6 Education Counseling Center in Isfahan was the first limitation. Additionally, the psychological and academic conditions of these students' parents were not assessed or controlled. Given the characteristics of the statistical population, random sampling was not used in this study. Therefore, to increase the generalizability of the results, it is recommended that future research be conducted in other cities, monitor the psychological and academic conditions of anxious students' parents, and use random sampling methods. Given the effectiveness of adolescent-centered mindfulness therapy on academic engagement and buoyancy, it is recommended that education authorities and planners activate counselors and specialists in counseling centers and psychological services and employ experienced psychologists in anxiety to use adolescent-centered mindfulness therapy to improve the academic engagement and buoyancy of anxious students. This can positively impact their individual performance and learning.

Acknowledgments

We would like to express our appreciation and gratitude to all those who cooperated in carrying out this study. We extend our gratitude to all the families of the students involved in the study and the officials of the District 6 Education Counseling Center in Isfahan for their full cooperation in conducting this research.

Declaration

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

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics Considerations

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

Transparency of Data

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

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

Authors' Contributions

All authors contributed equally. This article is derived from the first author's doctoral dissertation at Islamic Azad University, Isfahan Branch.

References

Alfonso, S. V., & Lonigan, C. J. (2021). Trait anxiety and adolescent's academic achievement: The role of executive function. *Learning and Individual Differences*, *85*, 101941. https://doi.org/10.1016/j.lindif.2020.101941

Ames, C. S., Richardson, J., Payne, S., Smith, P., & Leigh, E. (2014). Mindfulness-based cognitive therapy for depression in adolescents. *Child and Adolescent Mental Health*, *19*(1), 74-78. https://doi.org/10.1111/camh.12034

Asli Azad, M., Manshaei, G., & Ghamarani, A. (2019). The Effect of Mindfulness Therapy on Tolerance of Uncertainty and Thought-Action Fusion in Patients with Obsessive-Compulsive Disorder. *childmh*, *6*(1), 83-94. https://doi.org/10.29252/jcmh.6.1.8

Azhdari, F., & Yousefi, F. (2021). The mediating role of self-efficacy in the relationship between mindfulness and academic engagement. *Journal of Education and Learning Studies*, *13*(2), 73-100. https://jsli.shirazu.ac.ir/article_6529.html

Baharvand, I., & sodani, M. (2020). the effectiveness of mindfulness - based stress reduction training on empathy and sympathy in single mother - headed adolescents. *Journal-of-Psychological-Science*, *19*(86), 183-191. http://psychologicalscience.ir/article-1-575-en.html

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of consulting and clinical psychology*, *56*(6), 893-897. https://doi.org/10.1037/0022-006X.56.6.893

Biglari, F., Asli Azad, M., & Miri Sangtarashani, S. A. (2022). Efficacy of Mindfulness-Based Cognition Therapy on Covid-19 Anxiety and Distress Tolerance in the Patients Recovered from Corona Virus. *Psychological Achievements*, *29*(2), 69-90. https://doi.org/10.22055/psy.2022.40247.2807

Closson, L. M., & Boutilier, R. R. (2017). Perfectionism, academic engagement, and procrastination among undergraduates: The moderating role of honors student status. *Learning and Individual Differences*, *57*, 157-162. https://doi.org/10.1016/j.lindif.2017.04.010

Comerford, J., Batteson, T., & Tormey, R. (2015). Academic Buoyancy in Second Level Schools: Insights from Ireland. *Procedia - Social and Behavioral Sciences*, *197*, 98-103. https://doi.org/10.1016/j.sbspro.2015.07.061

Crosswell, A. D., Moreno, P. I., Raposa, E. B., Motivala, S. J., Stanton, A. L., Ganz, P. A., & Bower, J. E. (2017). Effects of mindfulness training on emotional and physiologic recovery from induced negative affect. *Psychoneuroendocrinology*, *86*, 78-86. https://doi.org/10.1016/j.psyneuen.2017.08.003

Farajzadeh, P., Ghazanfari, A., Choramy, M., & Sharifi, T. (2020). The Effectiveness of Training Psychological Capitals on Academic Procrastination of Female Teacher-Students with Low Academic Engagement. *Research in School and Virtual Learning*, *7*(4), 31-42. https://etl.journals.pnu.ac.ir/article_6752_en.html

Farhadi, T., Asli Azad, M., & Shokrkhodaei, N. S. (2018). Effectiveness of mindfulness therapy on executive functions and cognitive fusion of adolescents with Obsessive-Compulsive Disorder. *Empowering Exceptional Children*, *9*(4), 81-92. https://doi.org/10.22034/ceciranj.2018.91194

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School Engagement: Potential of the Concept, State of the Evidence. *Review of Educational Research*, *74*(1), 59-109. https://doi.org/10.3102/00346543074001059

Galla, B. M., Esposito, M. V., & Fiore, H. M. (2020). Mindfulness predicts academic diligence in the face of boredom. *Learning and Individual Differences*, *81*, 101864. https://doi.org/10.1016/j.lindif.2020.101864

Hashemi, F., dortaj, f., Farrokhi, N., & Nasrolahi, B. (2019). Effectiveness of Mindfulness Training on Procrastination and Academic Stress. *Educational Psychology*, *15*(52), 1-13. https://doi.org/10.22054/jep.2019.24967.1948

Kokabi Rahman, E., Taghvaei, D., & Pirani, Z. (2023). The Effectiveness of Cognitive and Metacognitive Strategies Teaching on Academic Motivation, Academic Engagement and Quality of Life in School of Students with Specific Learning Disorder in Hamadan City. *Sociology of Education*, *8*(2), 257-266. https://doi.org/10.22034/ijes.2023.707262

Lindsay, E. K., & Creswell, J. D. (2017). Mechanisms of mindfulness training: Monitor and Acceptance Theory (MAT). *Clinical psychology review*, *51*, 48-59. https://doi.org/10.1016/j.cpr.2016.10.011

Liu, H., Yao, M., & Li, J. (2020). Chinese adolescents' achievement goal profiles and their relation to academic burnout, learning engagement, and test anxiety. *Learning and Individual Differences*, *83-84*, 101945. https://doi.org/10.1016/j.lindif.2020.101945

Lovas, D. A., & Schuman-Olivier, Z. (2018). Mindfulness-based cognitive therapy for bipolar disorder: A systematic review. *Journal of affective disorders*, *240*, 247-261. https://doi.org/10.1016/j.jad.2018.06.017

Lu, S., Huang, C.-C., & Rios, J. (2017). Mindfulness and academic performance: An example of migrant children in China. *Children and Youth Services Review*, *82*, 53-59. https://doi.org/10.1016/j.childyouth.2017.09.008

Mahvash, M., Yamini, M., & Mahdian, H. (2024). Comparing the Effectiveness of Instructional Mental Imagery and Tolerance of Ambiguity Training on Students' Academic Procrastination [Research Article]. *Iranian Journal of Educational Sociology*, *7*(1), 10-20. https://doi.org/10.61838/kman.ijes.7.1.2

Martin, A. J., & Marsh, H. W. (2008). Academic buoyancy: Towards an understanding of students' everyday academic resilience. *Journal of School Psychology*, *46*(1), 53-83. https://doi.org/10.1016/j.jsp.2007.01.002

Metzler, D. H., Mahoney, D., & Freedy, J. R. (2016). Anxiety Disorders in Primary Care. *Primary Care: Clinics in Office Practice*, *43*(2), 245-261. https://doi.org/10.1016/j.pop.2016.02.002

Musa, Z. A., Kim Lam, S., Binti Mamat @ Mukhtar, F., Kwong Yan, S., Tajudeen Olalekan, O., & Kim Geok, S. (2020).

Effectiveness of mindfulness-based cognitive therapy on the management of depressive disorder: Systematic review. *International Journal of Africa Nursing Sciences*, *12*, 100200. https://doi.org/10.1016/j.ijans.2020.100200

Porparizi, M., Towhidi, A., & Khezri Moghadam, N. (2018). The Effect of Mindfulness on Academic Achievement, and Academic Adjustment: The Mediation Role of Academic Self-concept. *Positive Psychology Research*, *4*(3), 29-44. https://doi.org/10.22108/ppls.2018.111795.1464

Prinz, J. N., Bar-Kalifa, E., Rafaeli, E., Sened, H., & Lutz, W. (2019). Imagery-based treatment for test anxiety: A multiple-baseline open trial. *Journal of affective disorders*, *244*, 187-195. https://doi.org/10.1016/j.jad.2018.10.091

Puthusserry, S. T., & Delariarte, C. F. (2023). Development and implementation of mindfulness-based psychological intervention program on premenstrual dysphoric symptoms and quality of life among late adolescents: A pilot study. *Journal of Affective Disorders Reports*, *11*, 100461. https://doi.org/10.1016/j.jadr.2022.100461

Putwain, D. W., Connors, L., Symes, W., & Douglas-Osborn, E. (2012). Is academic buoyancy anything more than adaptive coping? *Anxiety, Stress, & Coping*, *25*(3), 349-358. https://doi.org/10.1080/10615806.2011.582459

Rahmani, M., Namvar, H., & Hashemi Razini, H. (2024). The Effectiveness of Rational Emotive Behavior Therapy on Executive Functions and Academic Procrastination of Children with Sluggish Cognitive Tempo. *Journal of Psychological Dynamics in Mood Disorders (PDMD)*, *2*(4), 82-90. https://doi.org/10.22034/pdmd.2024.434756.1038

Rahmati, F., Safaei Rad, I., & KhorramAbadi, Y. (2024). Structural Relationship of Teachers' Interaction Styles Based on Social Adaptability, Psychological Hardiness, and Academic Achievement Motivation with Mental Health Mediation in Eighth Grade Female Students [Research Article]. *Iranian Journal of Educational Sociology*, *7*(1), 103-112. https://doi.org/10.61838/kman.ijes.7.1.10

Rodríguez-Arce, J., Lara-Flores, L., Portillo-Rodríguez, O., & Martínez-Méndez, R. (2020). Towards an anxiety and stress recognition system for academic environments based on physiological features. *Computer methods and programs in biomedicine*, *190*, 105408. https://doi.org/10.1016/j.cmpb.2020.105408

Schellenberg, B. J. I., & Bailis, D. S. (2015). Predicting longitudinal trajectories of academic passion in first-year university students. *Learning and Individual Differences*, *40*, 149-155. https://doi.org/10.1016/j.lindif.2015.04.008

Sheikhalizadeh, S., bayrami, m., hashemi, t., & vahedi, s. (2019). The Effectiveness of Mindfulness Techniques Training on Academic vitality by moderating roles of Student Social Achievement Goals. *Biquarterly Journal of Cognitive Strategies in Learning*, *7*(12), 127-148. https://doi.org/10.22084/j.psychogy.2018.15713.1724

Shoghi, B., Mohammadi, A., & Pirkhaefi, A. (2023). The Mediating Role of Mindfulness in the Relationship between Cognitive Abilities and Wisdom in Students. *Sociology of Education*, *8*(2), 262-273. https://doi.org/10.22034/ijes.2023.707076

Solberg, P. A., Hopkins, W. G., Ommundsen, Y., & Halvari, H. (2012). Effects of three training types on vitality among older adults: A self-determination theory perspective. *Psychology of Sport and Exercise*, *13*(4), 407-417. https://doi.org/10.1016/j.psychsport.2012.01.006

Soltani Panah, M., Asgari, P., & Naderi, F. (2021). The Effectiveness of mindfulness exercises on positive youth development components in adolescents with anxiety

disorder. *icss*, *23*(3), 66-78. https://doi.org/10.30514/icss.23.3.66

Tajoldini, S., Tohidi, A., & Mousavinasab, H. (2018). The effect of mindfulness-based-stress reduction (MBSR) training on academic buoyancy and academic self-regulation in high shool students. *Journal of Educational Psychology Studies*, *15*(31), 59-88. https://doi.org/10.22111/jeps.2018.4267

Vajdian, M. r., Arefi, M., & Manshaei, G. (2020). The Effect of Adolescent-Based Mindfulness Training on the Depression and Anxiety of the Girls with Affective Failure. *medical journal of mashhad university of medical sciences*, *63*(Special Psychology), 51-61. https://doi.org/10.22038/mjms.2020.16178

Yao, C., Jun, H., & Dai, G.-S. (2024). Predicting Phonological Awareness: The Roles of Mind-Wandering and Executive Attention. *International Journal of Education and Cognitive Sciences*, *5*(2), 1-7. https://doi.org/10.22034/injoeas.2024.454689.1084

Yu, M., Zhou, H., Xu, H., & Zhou, H. (2021). Chinese adolescents' mindfulness and internalizing symptoms: The mediating role of rumination and acceptance. *Journal of affective disorders*, *280*, 97-104. https://doi.org/10.1016/j.jad.2020.11.021

Zhang, Y., Qin, X., & Ren, P. (2018). Adolescents' academic engagement mediates the association between Internet addiction and academic achievement: The moderating effect of classroom achievement norm. *Computers in human Behavior*, *89*, 299-307. https://doi.org/10.1016/j.chb.2018.08.018

Zhen, R., Li, L., Ding, Y., Hong, W., & Liu, R.-D. (2020). How does mobile phone dependency impair academic engagement among Chinese left-behind children? *Children and Youth Services Review*, *116*, 105169. https://doi.org/10.1016/j.childyouth.2020.105169