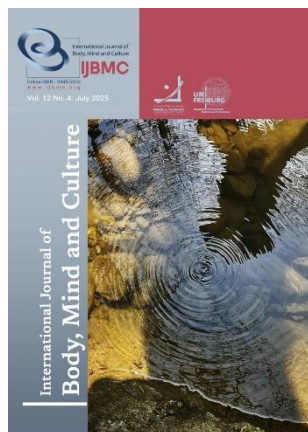1 M.A. in Clinical Psychology, Department of Psychology, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran.

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Effects of Mindfulness-Based Cognitive Therapy on Academic Motivation, Self-Efficacy, and Procrastination in High School Students

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ABSTRACT

Objective: This study aimed to evaluate the impact of MBCT on academic motivation, self-efficacy, and academic procrastination among high school students.

Methods and Materials: A quasi-experimental design with a pre-test, post-test, and control group was used. The study included 30 high school students selected through a multi-stage cluster sampling method. Participants were randomly assigned to either the experimental group (n = 15), which received an eight-week MBCT intervention, or the control group (n = 15), which received no treatment. Data were collected using validated scales: the Academic Motivation Scale (Vallerand et al., 1992), the Self-Efficacy Scale (Sherer et al., 1982), and the Procrastination Assessment Scale – Student Version (PASS). Analysis of covariance (ANCOVA) was performed to assess between-group differences.

Findings: The experimental group demonstrated significant improvements in intrinsic and extrinsic motivation ($p < 0.01$) and self-efficacy ($p < 0.01$), along with a reduction in academic procrastination ($p < 0.01$). Effect sizes were highest for reducing procrastination ($\eta^2 = 0.773$) and improving self-efficacy ($\eta^2 = 0.686$).

Conclusion: MBCT is an effective intervention for enhancing academic motivation and self-efficacy while reducing procrastination in students. However, future studies should explore long-term effects and compare MBCT with alternative educational interventions.

Keywords: Mindfulness-Based Cognitive Therapy, Academic Motivation, Self-Efficacy, Academic Procrastination, High School Students.

Introduction

Academic motivation is a crucial determinant of students' engagement, persistence, and achievement in education. It influences how students approach learning tasks, their level of effort, and their ability to overcome academic challenges (Torres et al., 2025). Various psychological theories have attempted to explain motivation, including Self-Determination Theory (SDT) and Social Cognitive Theory (SCT). SDT, proposed by Ryan and Deci (2020), conceptualizes motivation as a continuum, ranging from intrinsic motivation (engagement in learning for personal satisfaction) to extrinsic motivation (driven by rewards or external pressures), and amotivation (a lack of interest or perceived control) (Sengupta & Guchhait, 2024). SCT, developed by Bandura (200), emphasizes self-efficacy—the belief in one's ability to succeed—as a critical

determinant of motivation and academic persistence. While these theories provide valuable insights, they do not fully address the role of cognitive-emotional regulation strategies, such as mindfulness, in fostering motivation and reducing academic procrastination (Bandura, 2000).

Procrastination is a widespread issue among students, characterized by the intentional delay of academic tasks despite awareness of negative consequences (Troia, 2009). Research suggests that procrastination is strongly linked to low self-efficacy, poor emotional regulation, and heightened stress levels (Shahni Yeylagh et al., 2006). Traditional cognitive-behavioral interventions have been employed to mitigate procrastination; however, emerging evidence highlights the potential of mindfulness-based approaches in addressing its underlying emotional and cognitive mechanisms (Zamani Amir Zakaria et al., 2021).

Mindfulness-Based Cognitive Therapy (MBCT) is an intervention that integrates cognitive-behavioral strategies with mindfulness training, initially developed for the prevention of relapse in depression (Hosseini & Namjoo, 2022). Recent studies suggest that MBCT may enhance self-regulation, cognitive flexibility, and attentional control, which are essential for academic motivation and self-efficacy (Connell & Wellborn, 2019). MBCT encourages individuals to observe their thoughts and emotions without immediate reaction, reducing the impact of negative self-perceptions that contribute to procrastination and low academic motivation (Golestani Bakht & Shokri, 2020).

Despite promising findings, the effectiveness of MBCT in academic settings remains underexplored, particularly concerning its impact on motivation, self-efficacy, and procrastination among high school students. While some studies have examined mindfulness interventions in university populations (Golestani Bakht & Shokri, 2020), there is limited research focusing on younger students, who may experience different cognitive and emotional developmental challenges (Ford & Dickson, 2017). Furthermore, most existing research lacks longitudinal follow-ups, making it unclear whether the benefits of MBCT persist over time.

Given these gaps, this study aims to investigate whether an eight-week MBCT intervention can significantly enhance academic motivation and self-efficacy while reducing academic procrastination among high school students. By addressing these psychological variables, the study makes a significant contribution to educational psychology and intervention research, providing practical implications for integrating mindfulness-based approaches into school-based mental health programs. Thus, considering these concepts, the current study seeks to answer the following question: Does Mindfulness-Based Cognitive Therapy (MBCT) effectively enhance academic motivation, self-efficacy, and reduce academic procrastination in students?

Methods and Materials

Study Design and Participants

This study employed a quasi-experimental design with a pre-test, post-test, and control group to assess the effects of Mindfulness-Based Cognitive Therapy (MBCT) on academic motivation, self-efficacy, and academic procrastination among high school students.

The target population included all senior high school students in Ramsar County during the 2023–24 academic year. A multi-stage cluster sampling method was employed to select participants: Three public high schools were randomly chosen from a list of all schools in the county to ensure representativeness. From each school, two classes (one for each grade level: 10th and 11th) were randomly selected. A total of 120 students from the selected classes completed the Academic Motivation Scale (AMS), Self-Efficacy Scale (SES), and Procrastination Assessment Scale – Student Version (PASS). From the 120 students, 30 participants were selected based on the following criteria: Scored one standard deviation below the mean on academic motivation and self-efficacy, scored one standard deviation above the mean on academic procrastination.

Random Assignment: The 30 selected students were randomly assigned into two groups: an Experimental Group (n = 15), which received the MBCT intervention, and a Control Group (n = 15), which did not receive the MBCT intervention. Control Group (n=15): Did not receive any intervention.

Inclusion Criteria: High school students (ages 15–18) enrolled in the 2023–24 academic year, no prior experience with formal mindfulness training, and no diagnosed clinical psychological disorders (as self-reported). Exclusion Criteria: Students with irregular

attendance during the intervention and participants who missed more than two MBCT sessions.

Instruments

Academic Motivation Scale (Vallerand et al., 1992): The Academic Motivation Scale is a self-report tool developed by Vallerand et al. (1992) to assess academic motivation among students, based on Deci & Ryan's (1980) Self-Determination Theory. The scale consists of 28 items across three subscales: Intrinsic Motivation (12 items) – Measures motivation driven by interest and enjoyment (items: 2, 4, 6, 9, 11, 13, 16, 18, 20, 23, 25, 27). Extrinsic Motivation (12 items) – Measures motivation influenced by external rewards or pressures (items: 1, 3, 7, 8, 10, 14, 15, 17, 21, 22, 24, 28). Amotivation (4 items) – Measures lack of motivation (items: 5, 12, 19, 26). Participants respond using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The minimum score for intrinsic and extrinsic motivation is 12, with a maximum of 60, while the amotivation subscale ranges from 4 to 20. Vallerand et al. (1992) reported a Cronbach's alpha of 0.80 and a test-retest reliability of 0.79. Confirmatory factor analysis indicated construct validity between 0.91 and 0.94.

Self-Efficacy Scale (Sherer et al., 1982): The original Self-Efficacy Scale consisted of 36 items, but after analysis, items with factor loadings below 0.40 were removed, resulting in a final version with 23 items. Seventeen items assess general self-efficacy (Mean score: 12.08). Reliability (Cronbach's alpha): General Self-Efficacy = 0.86, Social Self-Efficacy = 0.71 (Mirmehdi & Rezaali, 2021; Mohammadi, 2023). Each item is rated on a 5-point scale (1 = Strongly Disagree to 5 = Strongly Agree)—reverse-scored items: 3, 8, 9, 13, 15. Total scores range from 17 to 85. Barati (1997) employed split-half reliability to validate the scale, reporting a Spearman-Brown coefficient of 0.76 and a Cronbach's alpha of 0.79, which indicates satisfactory internal consistency.

Procrastination Assessment Scale – Student Version (PASS) (Solomon & Rothblum, 1984): The PASS is a 27-item scale that assesses academic procrastination in three domains: exam preparation (Items 1–6), Homework completion (Items 9–17), and Term paper writing (Items 20–25). Additionally, the scale includes three items (26, 18, 7) that measure emotions and feelings related to procrastination, and three items (27,

19, 8) that assess willingness to change procrastination habits. Responses are rated on a 5-point Likert scale (1 = Never to 5 = Always)—reverse-scored items: 2, 4, 6, 11, 15, 16, 23, 25. The scale was translated into Persian by Jokar & Delavarpour (2007), with a reliability coefficient of 0.61 and validity of 0.88. After removing emotional and attitudinal subscales, reliability increased to 0.87 (Golestani Bakht & Shokri, 2020).

Intervention

The experimental group participated in an eight-week Mindfulness-Based Cognitive Therapy (MBCT) program, adapted from Segal, Williams, and Teasdale (2018), which consisted of weekly two-hour group sessions led by a trained facilitator. The intervention aimed to enhance self-regulation, cognitive flexibility, and attentional control through structured mindfulness exercises and cognitive techniques. Each session introduced specific themes, including self-guidance, managing emotional and cognitive barriers, mindfulness of breath and present-moment awareness, acceptance, cognitive defusion ("thoughts are not facts"), and self-care strategies. Core practices included body scan meditations, mindful breathing, sitting meditations, and real-life mindfulness applications (e.g., mindful eating, walking, and emotional tracking). Participants were assigned weekly homework, including daily mindfulness tasks, reflective journaling of both positive and negative experiences, and guided audio practices, to reinforce session content and promote skill generalization beyond the clinical setting.

Data Analysis

Data analysis was performed using SPSS v26. Repeated measures ANOVA was employed to examine changes across the three time points. Bonferroni post-hoc tests were used to identify significant group differences. Assumptions of normality (Shapiro-Wilk test) and sphericity (Mauchly's test) were tested, and appropriate corrections (e.g., Greenhouse-Geisser) were applied where necessary. To control for potential confounding variables, ANCOVA was used with baseline scores as covariates. Effect sizes (η^2) and statistical power were reported to determine the magnitude and reliability of observed effects.

Findings and Results

Table 1 presents the mean (M), standard deviation (SD), and pre-test/post-test scores for the experimental and control groups across academic motivation, self-efficacy, and academic procrastination.

Table 1

Descriptive Statistics for Study Variables

Variable	Group	N	Pre-test (M ± SD)	Post-test (M ± SD)
Intrinsic Motivation	Experimental	15	20.06 ± 4.83	39.93 ± 10.30
	Control	15	22.80 ± 5.88	24.33 ± 6.71
Extrinsic Motivation	Experimental	15	25.20 ± 5.49	33.66 ± 6.55
	Control	15	22.20 ± 6.97	22.40 ± 7.13
Amotivation	Experimental	15	14.46 ± 2.06	9.40 ± 2.79
	Control	15	13.86 ± 3.15	14.26 ± 3.19
Self-Efficacy	Experimental	15	27.33 ± 7.01	39.26 ± 9.98
	Control	15	25.73 ± 4.99	26.20 ± 5.58
Academic Procrastination	Experimental	15	69.06 ± 9.12	44.73 ± 10.72
	Control	15	63.53 ± 6.47	65.53 ± 7.06
Procrastination in Exams	Experimental	15	27.20 ± 4.75	16.93 ± 4.80
	Control	15	25.26 ± 4.14	26.93 ± 4.13
Procrastination in Assignments	Experimental	15	41.86 ± 5.73	27.80 ± 7.21
	Control	15	38.26 ± 4.18	38.60 ± 4.68

As seen in Table 1, pre-test scores across all variables did not show significant differences between the experimental and control groups. However, post-test scores in the experimental group revealed an increase in intrinsic and extrinsic motivation, self-efficacy, and a decrease in amotivation and academic procrastination compared to pre-test scores. Conversely, in the control group, there was no significant change in any of the variables. The significance levels of the Shapiro-Wilk test are all greater than 0.05, indicating that the distributions of all research variables are normal.

Table 2

Summary of Homogeneity Tests and ANCOVA for Key Research Variables

Variable	Test Type	F	p-value
Academic Motivation	Homogeneity of Regression Slopes	0.616	0.549
	Box's M Test for Homogeneity of Covariance	0.657	0.684
	Levene's Test for Homogeneity of Variances	2.555	0.121
Self-Efficacy	Homogeneity of Regression Slopes	75.506	0.001
	Levene's Test for Homogeneity of Variances	4.061	0.054
Academic Procrastination	Homogeneity of Regression Slopes	24.489	0.001
	Levene's Test for Homogeneity of Variances	1.755	0.196

As presented in Table 2, all assumptions for conducting ANCOVA were met, as no violations were observed in homogeneity of regression slopes, equality of variances, or covariance homogeneity. Table 3 presents ANCOVA results, comparing the adjusted post-test scores of both groups while controlling for pre-test scores.

Table 3

ANCOVA Results for MBCT Effects on Key Variables

Variable	F	p-Value	Effect Size (η^2)
Intrinsic Motivation	51.28	<0.001	0.672
Extrinsic Motivation	35.88	<0.001	0.589
Amotivation	52.96	<0.001	0.679
Self-Efficacy	59.10	<0.001	0.686

Academic Procrastination	92.01	<0.001	0.773
Procrastination in Exams	77.08	<0.001	0.748
Procrastination in Assignments	85.02	<0.001	0.765

Table 3 shows that MBCT had a large effect on intrinsic motivation (η^2 = 0.672) and self-efficacy (η^2 = 0.686). MBCT's strongest effect was on academic procrastination (η^2 = 0.773), showing its significant role in reducing task delay.

Table 4

ANCOVA Results for the Effect of MBCT on Key Research Variables

Variable	F	p-value	Eta Squared	Effect Size (%)
Intrinsic Motivation	51.280	0.001	0.672	67.2
Extrinsic Motivation	35.879	0.001	0.589	58.9
Amotivation	52.961	0.001	0.679	67.9
Self-Efficacy	59.099	0.001	0.686	68.6
Academic Procrastination	92.009	0.001	0.773	77.3
Procrastination in Exams	77.078	0.001	0.748	74.8
Procrastination in Assignments	85.017	0.001	0.765	76.5

As shown in Table 4, MBCT had a statistically significant effect on all variables (p < 0.01). The most significant effects were observed in reducing academic procrastination (77.3%) and increasing self-efficacy (68.6%). MBCT significantly increased both intrinsic and extrinsic motivation while reducing amotivation in students. MBCT significantly enhanced students' self-efficacy. MBCT significantly reduced overall academic procrastination, including procrastination in exams and assignments. These findings suggest that MBCT is a highly effective intervention for improving academic motivation, self-efficacy, and reducing procrastination among students. To determine specific between-group differences, Bonferroni post-hoc tests were conducted (Table 5).

Table 5

Post-Hoc Pairwise Comparisons (Bonferroni)

Variable	Mean Difference (Exp. - Ctrl.)	95% CI	p-Value
Intrinsic Motivation	15.60	[11.42, 19.78]	<0.001
Self-Efficacy	10.73	[8.29, 13.17]	<0.001
Academic Procrastination	−22.88	[- −26.14, −19.62]	<0.001

Table 5 shows that MBCT significantly improved motivation and self-efficacy while reducing academic procrastination. All confidence intervals exclude zero, indicating that differences are not due to chance.

Discussion and Conclusion

The present study examined the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) in enhancing academic motivation, self-efficacy, and reducing academic procrastination among high school students. The findings provide strong empirical support for MBCT as an effective intervention for enhancing motivation and self-efficacy while significantly decreasing procrastination.

The results align with prior studies demonstrating the positive impact of mindfulness-based interventions on motivation and academic performance (Akbari & Rezaei, 2022; Balkis & Duru, 2019)

In terms of self-efficacy, the significant post-test improvement in the MBCT group aligns with studies suggesting that mindfulness-based interventions increase students' belief in their ability to succeed by reducing negative self-perceptions and enhancing self-regulation (Deci & Ryan, 2020). These findings also support Social Cognitive Theory (Bandura, 2000), which posits that self-efficacy is shaped by experiences that reinforce personal competence—a mechanism that mindfulness training facilitates by encouraging non-judgmental awareness of thoughts and emotions.

Perhaps the most striking finding of this study is MBCT's strong effect on reducing academic procrastination (η^2 = 0.773), which is higher than in most prior research. This suggests that MBCT is particularly effective in targeting procrastination-related cognitive distortions, such as fear of failure, perfectionism, and avoidance behaviors. Similar to findings by Sirois and Pychyl (2021), our study highlights how mindfulness reduces procrastination by enhancing emotional regulation and reducing stress-related task avoidance. However, while the results are broadly consistent with previous studies, the stronger effect sizes in this study may be attributed to the high baseline procrastination levels of participants (Mohammadi, 2023). The inclusion of students who initially scored one standard deviation above the mean on procrastination may have amplified the observed intervention effects, suggesting that MBCT may be particularly beneficial for students with severe tendencies towards procrastination.

While MBCT was effective, it is essential to consider alternative explanations for the findings. First, expectation effects may have played a role; students in the experimental group knew they were receiving an intervention, which could have influenced their self-reported improvements. Although the control group was informed they would receive training later, a placebo-controlled condition (e.g., relaxation exercises) might have provided a stronger test of MBCT's effects. Additionally, the social context of the intervention may have influenced results. MBCT was delivered in group-based sessions, allowing for peer support and group dynamics to contribute to improved motivation and reduced procrastination, potentially. Future studies should compare individual vs. group MBCT formats to isolate the specific contribution of mindfulness training itself. Finally, while the improvements in self-efficacy were statistically significant, it is possible that some of the observed effects were due to general psychological benefits, such as stress reduction, rather than direct changes in self-efficacy beliefs. Future research should investigate whether MBCT affects specific self-efficacy domains (e.g., academic confidence, test-taking ability) to understand its underlying mechanisms better.

The strong effects of MBCT on academic procrastination and motivation suggest that mindfulness training could be integrated into school-based interventions to support student well-being and academic performance. Incorporating MBCT into school curricula could provide students with tools to manage academic stress, enhance motivation, and develop self-regulation skills. Schools could implement teacher-led mindfulness programs, provided that educators receive proper training in mindfulness techniques. Future interventions could explore hybrid delivery models (in-person + digital mindfulness training) to increase accessibility. However, for MBCT to be effective in real-world educational settings, schools must consider student engagement levels, session frequency, and long-term reinforcement strategies to ensure lasting benefits.

Limitations and Future Research Directions

Despite its strengths, this study has several limitations: The study only examined immediate post-intervention effects, and it is unclear whether these benefits persist over time. Future research should conduct longitudinal follow-ups (e.g., 3-month and 6-month post-tests) to assess the long-term effects of MBCT. All outcome measures relied on self-reported questionnaires, which are susceptible to social desirability and memory recall bias. Future studies should incorporate behavioral measures (e.g., actual study habits, task completion rates) to validate findings. While the control group did not receive MBCT, they also did not engage in an alternative intervention (e.g., relaxation exercises). Future studies should use placebo or active control conditions to strengthen causal interpretations. The sample consisted of high school students in Ramsar County, and the results may not be generalizable to other age groups (e.g., university students) or different cultural contexts. Future research should investigate the effectiveness of MBCT in diverse educational populations. While the overall effects were strong, the study did not investigate whether the impact of MBCT differed by gender. Given that previous research suggests gender differences in procrastination patterns, future studies should examine whether male and female students respond differently to mindfulness interventions.

This study provides strong empirical evidence that Mindfulness-Based Cognitive Therapy (MBCT) is an effective intervention for enhancing academic motivation, increasing self-efficacy, and significantly reducing academic procrastination among high school students. The large effect sizes suggest that MBCT is

particularly beneficial for students who struggle with chronic procrastination and low motivation. While MBCT appears to be a powerful tool for academic self-regulation, future studies should investigate long-term sustainability, gender differences, and optimal implementation strategies for schools. Given the increasing academic pressures faced by students, mindfulness-based approaches offer a practical, non-pharmacological intervention to enhance educational outcomes. By integrating mindfulness training into school settings, educators can equip students with the cognitive and emotional tools necessary to develop resilience, improve time management, and cultivate lifelong self-motivation skills.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Declaration of Helsinki, which provides guidelines for ethical research involving human participants. Ethical considerations in this study included the fact that participation was entirely optional.

Transparency of Data

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

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Authors' Contributions

All authors equally contribute to this study.

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