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Comparison of the Effectiveness of Self-Efficacy Training and Mindfulness Training on Academic Motivation and Anxiety of Students

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A B S T R A C T

Objective: The present study was conducted with the aim of comparing the effectiveness of self-efficacy training and mindfulness training on students' academic motivation and anxiety.

Methods and Materials: The research method was applied in nature and employed a quasi-experimental design with a pretest–posttest format including one control group and two experimental groups. The statistical population consisted of female students in the second level of secondary education in District 13 of Tehran during the 2024–2025 academic year. The sample included 60 students who were selected through convenience sampling and randomly assigned to three groups of 20 participants (two experimental groups and one control group). For data collection, the Harter Academic Motivation Questionnaire (AMQ, 2002) and the Depression, Anxiety, and Stress Scale—21 items (DASS-21; Lovibond & Lovibond, 1995) were used. The intervention programs included self-efficacy training based on Bandura's theory (Bandura, 1997) and adolescent-centered mindfulness training developed by Bordiak (2014). The research data were analyzed using multivariate analysis of covariance (MANCOVA).

Findings: The findings indicated that both self-efficacy and mindfulness interventions had a positive and statistically significant effect on increasing academic motivation (particularly intrinsic motivation) and reducing anxiety in the experimental groups ($p < .001$). Bonferroni post hoc test results revealed that at the posttest stage, for the academic motivation variable, the control group scores differed significantly from both the self-efficacy and mindfulness groups ($p < .001$), whereas no significant difference was observed between the two experimental groups ($p > .05$). Similarly, for the anxiety variable, the control group scores showed a significant difference from those of both the self-efficacy and mindfulness groups ($p < .001$), while no statistically significant difference was found between the two experimental groups ($p > .05$).

Conclusion: It can therefore be concluded that both approaches, by enhancing cognitive and psychological skills, help students improve their academic performance and mental health through better concentration, non-judgmental acceptance of thoughts, and increased self-confidence.

Keywords: *Self-efficacy training, mindfulness training, academic motivation, anxiety, female secondary school students.*

1. Introduction

Academic motivation and anxiety constitute two of the most influential psychological determinants of students' educational success, emotional well-being, and long-term developmental outcomes. Academic motivation shapes the intensity, persistence, and quality of students' engagement with learning activities, while anxiety directly interferes with cognitive processing, emotional regulation, and academic performance (Patierez, 2024; Šakan et al., 2024; Salter et al., 2024). Contemporary educational psychology increasingly recognizes that these constructs are dynamically interconnected and jointly determine students' academic trajectories across developmental stages (Bembenutty et al., 2023; Chen et al., 2023; Kramer et al., 2024). Understanding how to effectively enhance academic motivation while simultaneously reducing anxiety has therefore become a central priority in both educational research and applied psychological interventions.

Academic motivation is a multidimensional construct encompassing intrinsic interest, extrinsic incentives, self-regulation, goal orientation, and effort investment (Bembenutty et al., 2023; Kočvarová et al., 2024). Recent cross-cultural investigations demonstrate that motivation profiles differ substantially across educational systems and sociocultural contexts, particularly during adolescence when motivational beliefs undergo major restructuring (Kočvarová et al., 2024; Šakan et al., 2024). Moreover, daily fluctuations in adolescents' academic motivation reveal the fragile and context-sensitive nature of students' motivational states, which are shaped by classroom experiences, teacher relationships, peer interactions, and emotional conditions (Kramer et al., 2024; Mtshweni, 2025). When academic motivation is weakened, students become increasingly vulnerable to disengagement, academic burnout, and emotional distress (Healey, 2023; Patierez, 2024).

Anxiety, in parallel, has emerged as one of the most prevalent psychological difficulties among secondary school and university students worldwide (Amiri et al., 2024; Salter et al., 2024; Sari & Ningsih, 2023). Educational anxiety manifests in various forms, including test anxiety, performance anxiety, social-evaluative anxiety, and generalized academic worry, all of which undermine concentration, working memory, self-confidence, and emotional stability (Bajnordi et al., 2020; Özdemir & Kuru, 2023). Empirical evidence consistently demonstrates that elevated anxiety levels significantly predict poorer academic outcomes, lower motivation, and reduced psychological well-being (Rasouli et al., 2024; Salter et al., 2024; Sari & Ningsih, 2023). The negative feedback loop between anxiety and academic motivation creates a self-perpetuating cycle of academic difficulty and emotional suffering (Chen et al., 2023; Healey, 2023).

From a theoretical perspective, contemporary learning theories emphasize the central role of cognitive appraisals, emotional regulation, and perceived competence in shaping students' academic engagement (Olson & Hergenhan, 2023). Among these, self-efficacy—defined as individuals' beliefs in their capacity to organize and execute actions required to manage prospective situations—has been identified as one of the strongest predictors of motivation, resilience, and academic success (Bandura, 2006). Students with high self-efficacy display greater persistence, adaptive coping, and intrinsic motivation, even when confronted with academic challenges (Alaei Kharaim et al., 2012; Hadley et al., 2017). Conversely, low self-efficacy amplifies vulnerability to anxiety, avoidance behaviors, and academic disengagement (Jenabadi & Sarani, 2019; Khoynezhad et al., 2020).

Extensive empirical evidence confirms the effectiveness of self-efficacy-based interventions in improving academic outcomes and emotional adjustment. Self-efficacy training programs have been shown to enhance academic enthusiasm, help-seeking behavior, cognitive-emotional regulation, social skills, and stress management among secondary school students (Gorjinpour & Barzegar, 2022; Jenabadi & Sarani, 2019; Koushki et al., 2018). Furthermore, self-efficacy interventions significantly reduce academic stress and anxiety while fostering students' confidence in their learning capabilities (Amiri & Mousavi Pour, 2024; Khoynezhad et al., 2020). These findings underscore self-efficacy as a critical psychological mechanism for promoting adaptive academic functioning.

Parallel to self-efficacy, mindfulness has gained substantial recognition as an evidence-based psychological

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approach for enhancing emotional regulation, attentional control, and psychological well-being. Mindfulness refers to the intentional, non-judgmental awareness of present-moment experiences, including thoughts, emotions, bodily sensations, and environmental stimuli (Brown et al., 2007). Theoretical and empirical literature demonstrates that mindfulness cultivates meta-cognitive awareness, reduces cognitive reactivity, and strengthens executive control processes that are essential for academic learning and emotional stability (Brown et al., 2007; Fumero et al., 2020).

A rapidly expanding body of research supports the efficacy of mindfulness-based interventions in reducing anxiety, depression, stress, and psychological distress across diverse populations, including adolescents, university students, medical trainees, and clinical groups (da Silva et al., 2023; Fumero et al., 2020; Kriakous et al., 2021; Liu et al., 2023; Liu et al., 2025). In educational settings, mindfulness training has been associated with increased academic motivation, enhanced emotional resilience, improved attention, and greater academic engagement (Ataei et al., 2019; Ghomari et al., 2021; Joudaki & Dibazar, 2021). Meta-analytic evidence further confirms that mindfulness programs yield significant and durable improvements in psychological well-being and learning-related outcomes (da Silva et al., 2023; Fumero et al., 2020).

Recent investigations have extended these findings by demonstrating that mindfulness interventions not only reduce anxiety but also indirectly strengthen academic motivation by fostering self-regulation, emotional balance, and intrinsic interest in learning (Ataei et al., 2019; Ghomari et al., 2021; Safri et al., 2023). In addition, mindfulness-based cognitive approaches have shown substantial effectiveness in improving quality of life and emotional functioning in vulnerable populations (Shakibayi & Qiaumi, 2022). These outcomes suggest that mindfulness training may operate through multiple psychological pathways, including attentional control, emotional awareness, cognitive flexibility, and stress resilience (Liu et al., 2023; Rasouli et al., 2024).

Despite the robust evidence supporting both self-efficacy and mindfulness interventions independently, comparative research examining their relative effectiveness on academic motivation and anxiety—particularly among secondary school students—remains limited. Existing studies have typically focused on one intervention modality in isolation (Ataei et al., 2019; Ghomari et al., 2021; Gorjinpour & Barzegar, 2022), leaving an important gap in understanding how these two theoretically distinct yet practically complementary approaches differ in their impact on students' motivational and emotional outcomes. Given the increasing prevalence of academic anxiety and motivational difficulties among adolescents (Salter et al., 2024; Sari & Ningsih, 2023), there is an urgent need for comparative intervention research to inform evidence-based educational practices.

Furthermore, sociocultural and contextual factors play a critical role in shaping students' motivation and anxiety. Friendship support, sense of belonging, and classroom climate significantly moderate the relationship between academic motivation and emotional adjustment (Chen et al., 2023; Mtshweni, 2025). Health-related lifestyle factors and stress exposure further contribute to anxiety vulnerability among student populations (Amiri et al., 2024; Bajnordi et al., 2020). The integration of self-efficacy and mindfulness interventions within educational systems therefore requires contextually sensitive evaluation.

Theoretical integration of social cognitive theory and mindfulness-based frameworks provides a comprehensive model for addressing both the cognitive-behavioral and experiential-emotional dimensions of students' academic functioning. While self-efficacy interventions primarily target students' beliefs about competence, agency, and goal attainment (Bandura, 2006; Hadley et al., 2017), mindfulness interventions emphasize present-moment awareness, emotional acceptance, and cognitive decentering (Brown et al., 2007; Fumero et al., 2020). Comparative evaluation of these approaches offers valuable insights into their unique and overlapping mechanisms of action.

In light of the increasing psychological pressures faced by adolescents in contemporary educational systems, particularly in the post-pandemic context where anxiety levels remain elevated (Amiri et al., 2024; Bajnordi et al., 2020), identifying the most effective intervention strategies for enhancing academic motivation and reducing anxiety has become a critical scientific and practical objective. Empirical clarity on this issue will enable educators, school psychologists, and policy makers to implement targeted programs that optimize both academic achievement and mental health.

Therefore, the aim of the present study was to compare the effectiveness of self-efficacy training and mindfulness training on academic motivation and anxiety among secondary school students.

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2. Methods and Materials

2.1. Study Design and Participants

This applied study was conducted using a quasi-experimental design with a pretest–posttest format including one control group and two experimental groups. First, the pretest was administered to all groups, and after the intervention, the posttest was conducted in order to evaluate the effectiveness of the two therapeutic approaches. The statistical population consisted of female students at the upper secondary level in District 13 of Tehran during the 2024–2025 academic year. The sample included 60 participants who were selected through convenience sampling and were randomly assigned to three groups of 20 (two experimental groups and one control group). The experimental groups respectively received self-efficacy training and mindfulness training, while the control group received no intervention. Inclusion criteria included no simultaneous use of medical drugs, no history of hospitalization or chronic psychological treatment, no concurrent participation in other treatments, and full informed consent of the participants. Exclusion criteria included lack of cooperation or willingness to continue, severe physical problems, participation in other psychological interventions, and failure to complete the therapist-assigned tasks. The following questionnaires were used for data collection.

2.2. Measures

Academic Motivation Questionnaire (AMQ). Academic motivation was assessed using the standardized Academic Motivation Questionnaire developed by Harter (2002), which aims to evaluate students' academic motivation related to learning and academic achievement. The scale consists of 33 items and includes two components: intrinsic motivation (items 1, 2, 6, 7, 8, 12, 13, 14, 18, 19, 20, 24, 25, 26, 29, 30, 33) and extrinsic motivation (items 3, 4, 5, 9, 10, 11, 15, 16, 17, 21, 22, 23, 27, 28, 31, 32). One pole of the scale represents intrinsic motivation (internal interest in academic subjects) and the other represents extrinsic motivation (satisfaction of the teacher and others), and each item requires the respondent to select only one of these two types of reasons. The questionnaire is scored on a five-point Likert scale ranging from almost never (1) to almost always (5), yielding a total score range of 33 to 165. Higher scores indicate greater academic motivation. The questionnaire includes reverse-scored items (3, 4, 5, 9, 10, 15, 16, 19, 21, 27, and 31). The validity and reliability of the instrument have been confirmed. In the study by Bahrani (2009), Cronbach's alpha and test–retest coefficients for intrinsic motivation were reported as .85 and .86, for extrinsic motivation as .69 and .72, and for the total scale as .92. In the present study, Cronbach's alpha for each component was .89.

Depression, Anxiety, and Stress Scale–21 (DASS-21). Anxiety was measured using the 21-item Depression, Anxiety, and Stress Scale developed by Lovibond and Lovibond (1995). The original version contained 42 items, which was later shortened to the DASS-21. This instrument assesses three subscales: anxiety (items 2, 4, 7, 9, 15, 19, 20), stress (items 1, 6, 8, 11, 12, 14, 18), and depression (items 3, 5, 10, 13, 16, 17, 21), each consisting of seven items. Responses are rated on a four-point Likert scale ranging from does not apply to me at all (0) to applies to me very much (3). The total score ranges from 0 to 64, with higher scores indicating higher levels of the respective construct. The subscale scores are analyzed separately and are not summed. Antony et al. (1998) reported that 68% of the total variance of the scale is explained by these three factors, with Cronbach's alpha coefficients of .97, .92, and .95, respectively. Henry and Crawford (2005), using a large English sample (N = 1,794), reported Cronbach's alpha coefficients of .93 for the total scale and .88, .82, and .90 for the depression, anxiety, and stress subscales, respectively, and confirmatory factor analysis supported the three-factor structure. In Iran, the validity and reliability of the scale were examined by Samani and Jokar (2007), who reported test–retest reliability coefficients of .80, .76, and .77 and Cronbach's alpha coefficients of .81, .74, and .78 for the three subscales. In addition, Asgari Moghaddam et al. (2010) reported internal consistency coefficients of .93, .90, and .92 and test–retest reliability coefficients (over a three-week interval) of .84, .89, and .90 for the depression, anxiety, and stress subscales, respectively, as well as intraclass correlation coefficients of .78, .78, and .80. In the present study, Cronbach's alpha for each component was .91.

2.3. Interventions

The self-efficacy intervention was implemented in nine 90-minute sessions based on Bandura's self-efficacy theory (Bandura, 1997) with the primary objective of enhancing students' confidence, coping skills, and positive beliefs regarding their personal abilities in order to improve both academic and psychological functioning. The program

began with a pretest and an orientation session introducing the goals and structure of the workshop and the core concept of self-efficacy, followed by sessions focusing on conceptual understanding of self-efficacy and the characteristics of highly self-efficacious individuals, identification and strengthening of positive personal attributes, systematic goal setting and formulation of short- and long-term goals, observational learning through modeling successful individuals and analyzing success factors, stress recognition and stress-management strategies including relaxation exercises, mental imagery and self-soothing techniques, identification and modification of negative mood states and depressive and automatic thoughts through cognitive exercises and daily monitoring, and finally education on healthy lifestyle and nutrition combined with the development of a personalized self-care plan, culminating in implementation of the personal program and administration of the posttest.

The mindfulness intervention was delivered in ten 60-minute weekly sessions following the adolescent-centered mindfulness program developed by Bordiak (2014; Persian translation by Manshaei, Asli-Azad, Hosseini, & Tayebi, 2017) and emphasized systematic cultivation of present-moment awareness, emotional regulation, and non-judgmental acceptance. The program commenced with an introduction to mindfulness, its rationale, and integration of daily practice with parental involvement, along with training in foundational meditation postures, followed by sessions devoted to sharing participants' experiences, practicing mindful and diaphragmatic breathing, using experiential tools to contrast agitated and calm mind states, conducting body-scan exercises, developing present-moment awareness through sensory-based exercises such as the "glass of water" activity, training in mindful eating, mindful smelling, touching, and stretching, reinforcing core practices through repetition, cultivating mindful listening, observing thoughts through metaphors such as "river meditation," "blank whiteboard," and "entering the gap between thoughts," learning cognitive defusion strategies including "changing the channel" and working with negative automatic thoughts, developing mindfulness toward emotions through experiential games such as "I feel" and expressive writing or drawing, and finally enhancing awareness of bodily sensations and consolidating skills through guided meditation and continuous daily practice.

2.4. Data Analysis

The research data were examined using descriptive statistics including frequency distribution tables, means, and standard deviations. To test the hypotheses, multivariate analysis of covariance and Bonferroni post hoc tests were conducted using SPSS version 26.

3. Findings and Results

The demographic findings of the present study indicated that in the self-efficacy group, 25% of participants were 15 years old, 45% were 16 years old, and 30% were 17 years old, and 40% were in the 10th grade, 30% in the 11th grade, and 30% in the 12th grade; in the mindfulness group, 50% were 15 years old, 15% were 16 years old, and 35% were 17 years old, and 30% were in the 10th grade, 45% in the 11th grade, and 25% in the 12th grade; and in the control group, 50% were 15 years old, 35% were 16 years old, and 15% were 17 years old, and 20% were in the 10th grade, 25% in the 11th grade, and 55% in the 12th grade. Subsequently, the means and standard deviations of the research variables are presented in Table 1.

Table 1

Means and Standard Deviations of Research Variables

Variable	Stage	Self-Efficacy Group (M)	SD	Mindfulness Group (M)	SD	Control Group (M)	SD
Academic Motivation	Pretest	82.55	3.25	82.55	2.41	82.25	3.71
	Posttest	145.15	5.10	147.50	3.30	81.75	3.76
Anxiety	Pretest	17.20	1.90	16.85	1.66	16.90	1.55
	Posttest	10.75	1.33	10.35	1.26	17.25	1.40

Initially, four main assumptions were examined, and the results indicated that the Kolmogorov–Smirnov Z test was not significant for students at any stage of measurement and that the data followed a normal distribution ($p > .05$). Levene's test also indicated homogeneity of variances at both measurement points across all groups ($p > .05$), confirming the satisfaction of this statistical assumption. The results of Box's M test for the assumption of equality of covariance matrices were not significant, further supporting this assumption. The results of the multivariate analysis of covariance are presented in Table 2.

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Table 2

Multivariate Analysis of Covariance: Significance Tests for Group Mean Differences

Test	Value	F	Significance	Effect Size
Pillai's Trace	1.07	7.63	p < .001	.35
Wilks' Lambda	.02	37.97	p < .001	.71
Hotelling's Trace	35.89	150.21	p < .001	.92
Roy's Largest Root	35.78	489.00	p < .001	.97

The results of the MANCOVA significance tests indicated that after controlling for pretest effects, there was a statistically significant difference in at least one of the dependent variable posttest means between the experimental and control groups ($p < .01$). The effect size (eta squared) for Wilks' Lambda indicated that 71% of the variance in the dependent variables was accounted for by the independent variables (two experimental groups), demonstrating the adequacy of the sample size.

Table 3

Summary of ANCOVA Results for Dependent Variables in Experimental and Control Groups

Group	Variable	Subscale	SS	df	MS	F	p	η^2
Self-Efficacy	Motivation	Intrinsic Motivation	100.13	1	100.13	26.08	< .001	.42
		Extrinsic Motivation	26.21	1	26.21	6.38	< .01	.15
	Anxiety	—	32.34	1	16.17	14.86	< .001	.45
Mindfulness	Motivation	Intrinsic Motivation	113.91	1	56.95	16.44	< .001	.47
		Extrinsic Motivation	223.97	1	111.98	12.71	< .001	.41
	Anxiety	—	308.18	1	154.09	24.29	< .001	.57

The results in Table 3 show that in the first experimental group (self-efficacy training), MANCOVA revealed significant differences between the groups in intrinsic motivation ($\eta^2 = .42$, $F = 26.08$, $p < .001$) and extrinsic motivation ($\eta^2 = .15$, $F = 6.38$, $p < .01$), indicating higher scores for the experimental group compared to the control group. For anxiety, ANCOVA also showed a significant group difference ($\eta^2 = .45$, $F = 14.86$, $p < .001$), with the experimental group exhibiting lower anxiety levels. In the second experimental group (mindfulness training), MANCOVA results also indicated significant differences in intrinsic motivation ($\eta^2 = .47$, $F = 16.44$, $p < .001$) and extrinsic motivation ($\eta^2 = .41$, $F = 12.71$, $p < .001$). Additionally, ANCOVA for anxiety revealed an even larger effect size ($\eta^2 = .57$, $F = 24.29$, $p < .001$). Overall, the findings demonstrate that both self-efficacy and mindfulness interventions had positive and statistically significant effects on increasing academic motivation—particularly intrinsic motivation—and reducing anxiety in the experimental groups. Subsequently, the covariance analysis table for the dependent variables across groups is presented. To examine differences between the two interventions, the Bonferroni test was used, and the results are reported in Table 4.

Table 4

Bonferroni Post Hoc Pairwise Comparisons Between Groups

Component	Group 1	Group 2	Mean Difference	Standard Error	p
Academic Motivation	Self-Efficacy	Mindfulness	2.46	1.07	.07
	Self-Efficacy	Control	63.14	0.07	< .001
	Mindfulness	Control	65.60	1.07	< .001
Anxiety	Self-Efficacy	Mindfulness	0.30	0.34	1.00
	Self-Efficacy	Control	6.61	0.34	< .001
	Mindfulness	Control	6.91	0.34	< .001

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The Bonferroni post hoc test results presented in Table 6 indicate that at the posttest stage, for academic motivation, the control group scores differed significantly from those of both the self-efficacy and mindfulness groups ($p < .001$), whereas no significant difference was observed between the two experimental groups ($p > .05$). Similarly, for anxiety, the control group scores differed significantly from both the self-efficacy and mindfulness groups ($p < .001$), while no statistically significant difference was found between the two experimental groups ($p > .05$).

4. Discussion

The present study aimed to compare the effectiveness of self-efficacy training and mindfulness training on academic motivation and anxiety among secondary school students. The findings demonstrated that both interventions produced statistically significant improvements in academic motivation—particularly intrinsic motivation—and significant reductions in anxiety compared with the control group. However, no statistically significant difference was observed between the self-efficacy and mindfulness groups in either outcome. These results indicate that both interventions are comparably effective and provide robust support for the application of psychologically grounded training programs within educational settings.

The significant increase in academic motivation observed in both experimental groups is consistent with contemporary motivational theory and empirical evidence emphasizing the central role of cognitive-emotional resources in academic engagement. Self-efficacy theory posits that students' beliefs in their own competence strongly influence their willingness to initiate learning activities, persist in the face of difficulty, and sustain academic effort (Bandura, 2006). The observed improvement in intrinsic motivation among students receiving self-efficacy training aligns closely with previous findings showing that strengthening efficacy beliefs enhances learning enthusiasm, academic persistence, and help-seeking behaviors (Gorjinpour & Barzegar, 2022; Jenabadi & Sarani, 2019; Khoynezhad et al., 2020). Furthermore, the observed growth in extrinsic motivation supports earlier research suggesting that students with stronger efficacy beliefs are better able to respond adaptively to external academic demands and feedback (Alaei Kharaim et al., 2012; Hadley et al., 2017).

Similarly, the mindfulness intervention produced substantial gains in both intrinsic and extrinsic motivation. These findings are consistent with earlier research demonstrating that mindfulness training enhances attention regulation, emotional balance, and self-regulation, which in turn support academic engagement and learning motivation (Ataei et al., 2019; Ghomari et al., 2021; Joudaki & Dibazar, 2021). Meta-analytic evidence further confirms that mindfulness-based interventions significantly improve psychological functioning and well-being, which indirectly fosters academic motivation and performance (da Silva et al., 2023; Fumero et al., 2020). The present findings therefore corroborate the theoretical framework that mindfulness cultivates cognitive and emotional resources essential for sustained academic engagement (Bembenutty et al., 2023; Brown et al., 2007).

The significant reduction in anxiety observed in both experimental groups represents one of the most important outcomes of the study. Anxiety has been consistently identified as a major impediment to academic success and psychological health among adolescents (Salter et al., 2024; Sari & Ningsih, 2023). The results indicate that both self-efficacy and mindfulness interventions effectively attenuated students' anxiety levels, supporting prior research demonstrating that enhanced self-beliefs and emotional regulation skills reduce vulnerability to stress and anxiety (Amiri et al., 2024; Gorjinpour & Barzegar, 2022; Khoynezhad et al., 2020). These findings are also congruent with studies showing that mindfulness training substantially reduces anxiety symptoms across educational and clinical populations (Fumero et al., 2020; Kriakous et al., 2021; Liu et al., 2023; Liu et al., 2025).

The absence of a statistically significant difference between the self-efficacy and mindfulness interventions suggests that both approaches exert their effects through complementary psychological mechanisms. While self-efficacy training primarily strengthens cognitive appraisals of competence and agency (Bandura, 2006), mindfulness training fosters non-judgmental awareness and emotional acceptance that mitigate maladaptive cognitive reactions to academic stress (Brown et al., 2007; Rasouli et al., 2024). These distinct yet interrelated pathways appear to converge on common outcomes: increased academic motivation and reduced anxiety. This convergence supports integrative models of learning and emotional functioning that emphasize the reciprocal interaction between cognitive beliefs, emotional regulation, and motivational processes (Olson & Hergenhan, 2023; Šakan et al., 2024).

The magnitude of the observed effects further highlights the educational relevance of these interventions. The substantial effect sizes for both motivation and anxiety align

with international findings indicating that psychological skills training can meaningfully enhance students' academic and emotional functioning (Chen et al., 2023; Healey, 2023; Patierez, 2024). Moreover, the strong post-intervention differences between experimental and control groups demonstrate that structured psychological interventions can counteract the negative effects of academic stressors and foster adaptive learning trajectories.

Importantly, the present findings contribute to the growing literature emphasizing the importance of early preventive interventions during adolescence. Adolescence represents a critical developmental period characterized by heightened emotional reactivity, academic pressure, and vulnerability to anxiety disorders (Özdemir & Kuru, 2023; Salter et al., 2024). The ability of both self-efficacy and mindfulness interventions to simultaneously enhance motivation and reduce anxiety underscores their value as universal school-based programs. This is particularly relevant given recent evidence that social support, sense of belonging, and emotional skills moderate the relationship between academic motivation and psychological well-being (Chen et al., 2023; Mtshweni, 2025).

Furthermore, the findings complement research demonstrating that academic motivation fluctuates substantially in response to daily emotional and contextual influences (Kramer et al., 2024). By strengthening students' internal psychological resources, both interventions may stabilize motivational patterns and promote long-term academic resilience. The present results are also consistent with studies indicating that health-promoting lifestyles and psychological coping strategies play crucial roles in buffering anxiety among students (Amiri et al., 2024; Bajnordi et al., 2020).

5. Conclusion

Taken together, the results provide compelling evidence that both self-efficacy and mindfulness training constitute effective, theoretically grounded, and practically feasible interventions for enhancing academic motivation and reducing anxiety in secondary school students. The absence of superiority of one intervention over the other suggests that educational practitioners may select either approach based on contextual factors, student preferences, and resource availability while still achieving meaningful psychological and educational benefits.

6. Limitations & Suggestions

The present study has several limitations that should be acknowledged. First, the sample consisted solely of female secondary school students from one educational district, which limits the generalizability of the findings to other populations, age groups, and cultural contexts. Second, the study relied on self-report measures, which may be subject to response biases and social desirability effects. Third, the lack of long-term follow-up restricts conclusions regarding the durability of the intervention effects over time. Fourth, potential moderating variables such as family environment, teacher support, and socioeconomic status were not examined, which may have influenced the observed outcomes.

Future studies should replicate this research using larger and more diverse samples, including male students and students from different educational levels and cultural backgrounds. Longitudinal designs are recommended to evaluate the long-term stability of intervention effects. Researchers should also explore potential mediators and moderators, such as emotional regulation, self-regulation skills, and classroom climate, to clarify the mechanisms through which these interventions influence academic motivation and anxiety. Comparative studies incorporating combined or hybrid intervention models may further optimize educational outcomes.

Educational institutions are encouraged to integrate self-efficacy and mindfulness training programs into regular school curricula as preventive mental health and academic support strategies. Teachers and school counselors should receive professional development to implement these interventions effectively. Schools may also involve parents in reinforcing psychological skills at home. Implementing structured psychological skills programs at earlier educational stages could help foster lifelong academic resilience and emotional well-being.

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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 Helsinki Declaration, which provides guidelines for ethical research involving human participants. his study was reviewed and approved by the Ethics Committee of Islamic Azad University, North Tehran Branch, in accordance with institutional and international research ethics standards. The ethical approval code for this research is IR.IAU.TNB.REC.1404.036.

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.

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Authors' Contributions

Z.A. conceived the study and coordinated data collection; M.A.T.S. designed the methodology and supervised the statistical analysis; and F.K. contributed to interpretation of results and manuscript preparation. All authors jointly participated in drafting, critical revision, and final approval of the manuscript and accept full responsibility for the content.

References

Alaei Kharaim, R., Narimani, M., & Alaei Kharaim, S. (2012). Comparison of self-efficacy beliefs and achievement motivation among students with and without learning disabilities. *Journal of Learning Disabilities*, *1*(3), 104-185. https://doi.org/10.22098/jld-1-3-91-4-5

Amiri, F., & Mousavi Pour, S. (2024). The effectiveness of self-compassion training on academic motivation and resilience in students. *Positive Psychology: Research and Applications*, *1*(2), 56-39. https://rpp.araku.ac.ir/article_712986.html

Amiri, M., Mikal, Z. M., Sadeghi, E., & Khosravi, A. (2024). Health-promoting lifestyle and predicting anxiety caused by covid-19 in medical sciences students. *The Open Public Health Journal*, *17*(1). https://www.openpublichealthjournal.com/VOLUME/17/ELOCATOR/e18749445281413/FULLTEXT/

Ataei, F., Ahmadi, A. J., Kiamanesh, A., & Seif, A. K. (2019). The effectiveness of mindfulness training in increasing motivation towards education in male and female high school students. *School and Educational Psychology*, *8*(4), 199-176. https://doi.org/10.22098/jsp.2020.871

Bajnordi, A., Alimira, P., Ghadampour, S., Moradi Shakib, A., & Ghazbanzadeh, R. (2020). Predicting COVID-19 anxiety based on cognitive emotion regulation strategies, health resilience, and death anxiety in diabetic patients. *Psychiatric Nursing*, *8*(2), 44-43. https://doi.org/10.22051/jontoe.2020.31199.3035

Bandura, A. (2006). Guide for constructing self-efficacy scales. *Self-efficacy beliefs of adolescents*, *5*(1), 307-337. https://books.google.com/books?hl=fa&lr=&id=P_onDwAAQBAJ&oi=fnd&pg=PA307&dq=Guide+for+constructing+self-efficacy+scales&ots=rkOKv6CjBO&sig=qtENfg-6ao6yDNucjQ4dt4HXSJE

Bembenutty, H., Liem, G. A. D., Allen, K. A., King, R. B., Martin, A. J., Marsh, H. W., & Datu, J. A. D. (2023). Culture, motivation, self-regulation, and the impactful work of Dennis M. McInerney. *Educational psychology review*, *35*(1), 28. https://doi.org/10.1007/s10648-023-09743-3

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry*, *18*(4), 211-237. https://doi.org/10.1080/10478400701598298

Chen, C., Bian, F., & Zhu, Y. (2023). The relationship between social support and academic engagement among university students: the chain mediating effects of life satisfaction and academic motivation. *BMC public health*, *23*(1), 2368. https://doi.org/10.1186/s12889-023-17301-3

da Silva, C. C. G., Bolognani, C. V., Amorim, F. F., & Imoto, A. M. (2023). Effectiveness of training programs based on mindfulness in reducing psychological distress and promoting well-being in medical students: a systematic review and meta-analysis. *Systematic Reviews*, *12*(1), 79. https://doi.org/10.1186/s13643-023-02244-y

Fumero, A., Peñate, W., Oyanadel, C., & Porter, B. (2020). The effectiveness of mindfulness-based interventions on anxiety disorders. A systematic meta-review. *European Journal of Investigation in Health, Psychology and Education*, *10*(3), 704-719. https://doi.org/10.3390/ejihpe10030052

Ghomari, M., Qasemzadeh, A., & Hosseinian, S. (2021). The effectiveness of mindfulness education in reducing anxiety and increasing psychological well-being in university students. *Educational Strategies in Medical Sciences*, *14*(1), 87-77. https://doi.org/10.22098/edcbmj.2021.2134

Gorjinpour, F., & Barzegar, M. (2022). The effectiveness of self-efficacy training on cognitive emotional regulation and academic stress in female secondary school students. *Women and Society*, *13*(49), 118-105. https://doi.org/10.22098/jsp.2020.871

Hadley, J., Mowbray, T., & Jacobs, N. (2017). Examining the mediating effect of self-efficacy on approval of aggression and proactive aggression. *Journal of School Violence*, *16*(1), 86-103. https://doi.org/10.1080/15388220.2015.1116993

Healey, L. S. (2023). The Role of Social Emotional Learning Programs on Intrinsic Motivation and Academic Achievement in High School Students: A Self-Determination Approach. *Doctoral dissertation, University of Georgia*. https://search.proquest.com/openview/0b4765239d6587ca1052aeb66902f0e9/1?pq-origsite=gscholar&cbl=18750&diss=y

Jenabadi, H., & Sarani, F. (2019). The effectiveness of self-efficacy training on academic help-seeking and academic enthusiasm in students. *Journal of Educational Psychology Studies*, *16*(36), 1-28. https://doi.org/10.22111/jeps.2019.5211

Joudaki, T., & Dibazar, S. (2021). The effectiveness of mindfulness-based training on students' academic motivation. First National Conference on Psychotherapy in Iran, Ardabil.

Khoynezhad, G., Rajayi, A., & Nazemi, S. M. (2020). The effectiveness of academic self-efficacy training on the

JAYPS Adolescent and Youth Psychological Studies
E-ISSN: 2981-2526

challenges and academic success of second-cycle secondary school students. *Novel Educational Insights*, *16*(3), 212-191. https://doi.org/10.22051/jontoe.2020.31199.3035

Kočvarová, I., Kalenda, J., Vaculíková, J., Neupauer, Z., Černak, R. Š., & Włoch, A. (2024). Adaptation and validation of the academic motivation scale for higher education across four Eastern European countries. *Higher Education Quarterly*, *78*(3), 1048-1066. https://doi.org/10.1111/hequ.12510

Koushki, M., Karamati, H., & Hasani, J. (2018). The effectiveness of self-efficacy training on academic stress and social skills in female students. *School Psychology*, *7*(2), 213-196. https://doi.org/10.22098/jsp.2018.700

Kramer, A. W., Huizenga, H. M., Van Duijvenvoorde, A. C., & Krabbendam, L. (2024). Do I want to learn today? Day-to-day variations in adolescents' academic motivation and effort. *Learning and Motivation*, *85*, 101957. https://doi.org/10.1016/j.lmot.2023.101957

Kriakous, S. A., Elliott, K. A., Lamers, C., & Owen, R. (2021). The effectiveness of mindfulness-based stress reduction on the psychological functioning of healthcare professionals: A systematic review. *Mindfulness*, *12*(1), 1-28. https://doi.org/10.1007/s12671-020-01500-9

Liu, H., Cai, K., Wang, J., & Zhang, H. (2023). The effects of mindfulness-based interventions on anxiety, depression, stress, and mindfulness in menopausal women: A systematic review and meta-analysis. *Frontiers in Public Health*, *10*, 1045642. https://doi.org/10.3389/fpubh.2022.1045642

Liu, Y., Yin, S., Hu, Q., Fei, Y., Zhong, Y., Ji, Q., & Zhu, F. (2025). The Efficacy of Mindfulness-Based Stress Reduction and Mindfulness-Based Cognitive Therapy on Cognitive Impairment in Post-Stroke Patients: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Mindfulness*, 1-14. https://doi.org/10.1007/s12671-025-02557-0

Mtshweni, B. V. (2025). Friendship Support and Academic Motivation in First Generation University Students: Academic Anxiety as a Moderator and Sense of Belonging as a Mediator. *Bulletin of Counseling and Psychotherapy*, *7*(2). https://www.semanticscholar.org/paper/Friendship-Support-and-Academic-Motivation-in-as-a-Mtshweni/07442b3bb6026195f32d35ebc1fb3a8dc2050e7e

Olson, M., & Hergenhan, K. (2023). *An Introduction to Learning Theories*. Doran. https://kadenbook.com/product/an-introduction-to-the-theories-of-learning/

Özdemir, İ., & Kuru, E. (2023). Investigation of cognitive distortions in panic disorder, generalized anxiety disorder and social anxiety disorder. *Journal of clinical medicine*, *12*(19), 6351. https://doi.org/10.3390/jcm12196351

Patierez, J. G. (2024). Effects of Learning Motivation and Engagement on the Academic Performance and Satisfaction of Senior High School Students. *Dinkum Journal of Social Innovations*, *3*(05), 251-266. https://www.researchgate.net/publication/388272815_Effects_of_Learning_Motivation_and_Engagement_on_the_Academic_Performance_and_Satisfaction_of_Senior_High_School_Students

Rasouli, S., Ghafurian, M., Nilsen, E. S., & Dautenhahn, K. (2024). University students' opinions on using intelligent agents to cope with stress and anxiety in social situations. *Computers in human Behavior*, 108072. https://doi.org/10.1016/j.chb.2023.108072

Safri, A. M., Mohammadzadeh, J., Ahmadi, V., & Mami, S. (2023). The effectiveness of mindfulness-based stress reduction therapy on self-efficacy, perceived stress, and depression symptoms in female heads of households in Ilam. *Scientific Journal of Medical Sciences, Alborz*, *12*(2), 168-157. https://doi.org/10.61186/aums.12.2.157

Šakan, D., Tóth-Király, I., & Morin, A. J. (2024). Nature, implications and determinants of academic motivation profiles among upper elementary and secondary students. *Current Psychology*, *43*(6), 4899-4917. https://doi.org/10.1007/s12144-023-04687-x

Salter, D., Neelakandan, A., & Wuthrich, V. M. (2024). Anxiety and teacher-student relationships in secondary school: a systematic literature review. *Child Psychiatry & Human Development*, 1-19. https://doi.org/10.1007/s10578-024-01665-7

Sari, M. N., & Ningsih, P. E. A. (2023). An Analysis of Students' Anxiety In Learning English At The Eleventh Grade Of SMA Negeri 10 Kerinci. *EDU RESEARCH*, *4*(3), 83-97. https://doi.org/10.47827/jer.v4i3.115

Shakibayi, P., & Qiaumi, P. (2022). The effectiveness of mindfulness-based cognitive therapy on anxiety levels and quality of life in women with opioid use disorder. *Substance Abuse Research*, *16*(63), 379-359. https://doi.org/10.52547/etiadpajohi.16.63.359