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A Comparison of the Effectiveness of Emotion Regulation Training and Mindfulness Skills Training on Academic Burnout among Female Secondary School Students in Tehran

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ABSTRACT

This study aimed to compare the effectiveness of emotion regulation training and mindfulness skills training on reducing academic burnout in female secondary school students in Tehran. The research employed a quasi-experimental design with a pretest-posttest-follow-up structure and a control group. A total of 45 female students, selected through purposive sampling based on elevated aggression scores, were randomly assigned to three groups: emotion regulation training, mindfulness training, and control (15 participants each). The intervention programs were delivered over several sessions, with no intervention given to the control group. The Academic Burnout Questionnaire by Bresó et al. (1997) was used to measure outcomes across three time points: pretest, posttest, and one-month follow-up. The data were analyzed using repeated measures ANOVA and multivariate analysis of covariance with SPSS-24 to examine both within- and between-group differences. The results indicated significant reductions in academic burnout over time in both experimental groups compared to the control group. Multivariate analysis showed significant main effects for time (Wilks' Lambda = 0.56, $F(2,27) = 10.3$, $p < 0.001$) and a significant interaction between time and group (Wilks' Lambda = 0.70, $F(2,27) = 5.62$, $p = 0.009$). Univariate repeated measures analysis revealed that both emotion regulation and mindfulness training groups experienced significant reductions in academic burnout scores at posttest and follow-up. The mindfulness group demonstrated slightly greater and more stable effects across the measurement points. Both emotion regulation training and mindfulness skills training were effective in reducing academic burnout among female students, with mindfulness showing marginally superior outcomes. These interventions can serve as viable school-based strategies for addressing student burnout and promoting emotional resilience in academic settings.

Keywords: Academic burnout; Emotion regulation training; Mindfulness; Female adolescents; Psychological intervention; Secondary education

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Introduction

In recent years, academic burnout has emerged as a critical concern among adolescents, particularly female secondary school students, who face a growing array of psychological and academic stressors. Academic burnout is characterized by emotional exhaustion, a sense of cynicism toward school, and feelings of academic inefficacy, and it can significantly impair motivation, performance, and overall psychological well-being (1). The complexity of academic burnout lies in its multifaceted etiology, which encompasses emotional, cognitive, and behavioral dimensions. Adolescents navigating the transition into late adolescence often confront internal and external pressures—ranging from academic expectations and perfectionistic standards to interpersonal challenges and identity-related struggles. These pressures are particularly salient in competitive educational environments such as those found in metropolitan centers like Tehran, where academic achievement is closely tied to social status and future opportunities.

Emotion regulation has been identified as a central psychological process in determining adolescents' resilience to academic stress. The ability to manage, express, and modulate emotional responses plays a vital role in coping with school-related demands. Numerous studies have confirmed that maladaptive emotional regulation strategies, such as rumination, suppression, and catastrophizing, predict higher levels of academic burnout (2, 3). Conversely, training students in adaptive emotional regulation strategies—such as cognitive reappraisal and emotional awareness—has shown promising results in reducing burnout and improving students' psychological and academic functioning (4, 5). These findings highlight the importance of interventions focused on emotional competence as a preventive and therapeutic tool in the academic context.

Complementary to emotion regulation, mindfulness has gained increasing attention in educational psychology as an effective approach to managing academic burnout. Mindfulness is commonly defined as purposeful, non-judgmental attention to the present moment. Research indicates that students with higher levels of dispositional mindfulness tend to experience lower levels of stress, depression, and academic disengagement (6, 7). Mindfulness practices enhance metacognitive awareness and emotional clarity, allowing students to observe stress-inducing thoughts without being overwhelmed by them. As demonstrated in both Western and Eastern educational contexts, mindfulness-based interventions have significantly improved students' emotional regulation, reduced burnout symptoms, and enhanced overall academic engagement (8-10).

Despite this growing body of evidence, few empirical studies have directly compared the effects of emotion regulation training and mindfulness skills training in adolescent populations, particularly within the sociocultural context of Iranian schools. Most existing research has examined these interventions in isolation, making it difficult to determine which approach yields more sustainable improvements in academic burnout. A notable exception is the work by Jalalvand et al. (2020), which revealed that mindfulness and perfectionism are both strongly correlated with academic burnout, suggesting a shared underlying mechanism through which cognitive-emotional interventions exert their influence (11). Similarly, Saati-Masoomi et al. (2021) presented a model demonstrating the interplay of self-regulation, academic emotions, and academic self-handicapping as predictors of burnout, emphasizing the necessity of multifaceted approaches (12).

The increasing prevalence of academic burnout among female students is especially troubling. According to Podineh Ebrahimi et al. (2022), female students are more vulnerable to academic burnout due to higher levels of emotional dysregulation and academic procrastination, often linked to family dynamics and sociocultural expectations (13). This vulnerability underscores the need for gender-sensitive, school-based interventions that address both the emotional and cognitive dimensions of stress management. Roghani and Afrokhte (2023) provided further support for this approach by showing the efficacy of teaching emotional intelligence skills in reducing academic burnout and enhancing self-regulation among girls with attention-deficit disorders (14).

Furthermore, emotion regulation and mindfulness not only reduce burnout symptoms but also foster positive academic behaviors. According to Haseli Songhori and Salamti (2024), academic engagement is significantly predicted by psychological capital, which includes emotional resilience and self-efficacy—traits that can be cultivated through emotion regulation and mindfulness training (15). Likewise, Seibert et al. (2017) emphasized that ineffective emotion regulation is a major contributor to school burnout and associated academic underperformance, particularly when students are unable to manage their emotional responses to failure and pressure (16).

The theoretical foundations of these interventions are rooted in cognitive-behavioral and positive psychology frameworks. Emotion regulation training focuses on modifying maladaptive cognitive appraisals and enhancing emotional flexibility, whereas mindfulness training cultivates meta-awareness, self-compassion, and acceptance-based coping strategies. These distinct mechanisms offer unique benefits: emotion regulation fosters deliberate cognitive reframing, while mindfulness strengthens attentional control and reduces emotional reactivity (17). Both interventions are experiential and skill-based, allowing for the internalization of adaptive patterns through repeated practice and reflection.

The relevance of these approaches is further supported by studies targeting special student populations. For example, Tarazi et al. (2020) demonstrated the effectiveness of emotion regulation and social cognitive problem-solving training in reducing academic burnout among students with learning disabilities (18). Likewise, Dehghani et al. (2018) reported that emotion regulation training led to significant reductions in academic burnout, increased social acceptance, and improved affective control in students with learning disorders (5). These findings suggest that both emotion regulation and mindfulness may be particularly effective in addressing burnout in students who are already at heightened risk for psychological and academic challenges.

In the Iranian educational context, characterized by a strong emphasis on exam performance and rigid academic expectations, such interventions are not merely beneficial—they are essential. Cultural and systemic factors contribute to a schooling experience that often lacks emotional support structures. As Viskarmi and Khalili Ghasnigani (2018) found, students' use of maladaptive cognitive emotion regulation strategies and low academic resilience were significant predictors of academic burnout in Iranian universities (19). Addressing these vulnerabilities early—during the secondary school years—could play a key role in fostering a healthier academic environment.

In sum, although existing research highlights the effectiveness of both emotion regulation and mindfulness interventions for reducing academic burnout, the literature lacks direct comparative studies that evaluate their relative impact, especially in adolescent female populations. The present study aims to

address this gap by comparing the effectiveness of emotion regulation training and mindfulness skills training on academic burnout in female secondary school students in Tehran.

Methods and Materials

Study Design and Participants

This study employed an experimental design using a pretest-posttest format with a control group. The independent variables were two separate interventions: emotion regulation training and mindfulness skills training, while the dependent variable was academic burnout. To maintain internal validity, the variables of age, gender, and educational level were held constant across the sample and treated as control variables. Participants were randomly assigned to three groups: experimental group 1 (receiving emotion regulation training), experimental group 2 (receiving mindfulness skills training), and a control group (receiving no intervention). Prior to any intervention, a pretest was administered to all participants in the three groups to assess baseline levels of academic burnout. Subsequently, experimental group 1 underwent emotion regulation training and experimental group 2 received mindfulness skills training, while the control group received no intervention. At the end of the intervention period, a posttest was administered to all three groups. Additionally, a follow-up test was conducted one month later to assess the stability of the intervention effects. The study population consisted of all female students enrolled in secondary schools in Tehran. The sample was drawn using purposive sampling. Initially, a set of classrooms was selected through cluster sampling within one school, and students with higher aggression scores—measured using the Buss and Perry Aggression Questionnaire—were identified. Out of 99 eligible students, 66 consented to participate. However, 17 dropped out midway and 2 did not complete the posttest. To maintain balance across the groups, participants were also removed from the control group, resulting in three equal groups of 15 students each. Inclusion criteria required participants to be female, score high on aggression (without necessarily having a diagnosed disorder), and have no history of psychiatric disorders such as psychosis, in order to preserve experimental integrity. Exclusion criteria included unwillingness to continue, failure to complete final assessments, or prior participation in similar programs within recent years.

Data Collection

The data collection tool used in this study was the Academic Burnout Questionnaire developed by Bresó and colleagues (1997), which evaluates three dimensions of academic burnout: emotional exhaustion, academic disinterest (cynicism), and academic inefficacy. The instrument consists of 15 items rated on a 5-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). Items 1, 4, 7, 10, and 13 correspond to emotional exhaustion; items 2, 5, 11, and 14 assess cynicism; and items 3, 6, 8, 9, 12, and 15 pertain to academic inefficacy. Notably, the items measuring academic inefficacy are positively worded and therefore reverse-scored, ranging from 5 ("Strongly Disagree") to 1 ("Strongly Agree"). A total burnout score is computed by summing the item scores, yielding a potential score range from 15 to 75, where lower scores indicate less academic burnout and higher scores indicate greater burnout. The original developers validated the questionnaire using factor analysis, and reported Cronbach's alpha values of 0.70 for emotional exhaustion, 0.82 for cynicism, and 0.50 for inefficacy. In subsequent Iranian studies, Cronbach's alpha coefficients were reported to be 0.79 (emotional exhaustion), 0.82 (cynicism), and 0.75 (inefficacy), with

overall internal consistency as high as 0.87. In the current study, the Cronbach's alpha coefficients for emotional exhaustion, cynicism, inefficacy, and the overall scale were 0.77, 0.79, 0.76, and 0.82 respectively, confirming the reliability of the instrument for this population.

Interventions

The emotion regulation training was delivered in eight structured sessions designed to help students develop emotional awareness, reframe maladaptive beliefs, and enhance regulation strategies through cognitive-behavioral and experiential techniques. In the first session, the focus was on introducing the structure and purpose of the training, building a safe and collaborative group atmosphere, and offering psychoeducation about emotion regulation and the construct of "worry." Participants were encouraged to share their goals and build group cohesion. The second session introduced awareness of positive emotions, such as joy, interest, and love, using guided imagery and reflective journaling as students identified and recorded daily positive emotional experiences. In the third session, attention shifted to negative emotions, including anxiety, sadness, anger, and disgust. Students learned to acknowledge and visualize these emotions, identifying their cognitive and bodily correlates while completing homework assignments to track negative emotional patterns. The fourth session covered acceptance and experiential exposure to emotions without judgment, along with the implications of overusing or underusing positive emotions. Students were asked to solicit feedback from close friends about their emotional expressions. The fifth session introduced cognitive emotion regulation techniques, including identifying distorted beliefs and practicing non-reactivity through attention redirection. The sixth session explored advanced skills such as cognitive defusion, attentional decentering, and maintaining awareness during emotionally intense experiences. In session seven, participants practiced reciprocal responding and valued action through metaphorical exercises involving the "mind and heart." They also discussed how to appropriately express difficult emotions like anger and sadness without suppression or impulsivity. The final session reviewed all previous content, reinforced key strategies, and administered the post-test. The structure of the program emphasized experiential learning, peer interaction, and personal reflection to foster adaptive regulation capacities that could reduce academic burnout.

The mindfulness intervention followed the standardized eight-week Kabat-Zinn (2005) program and consisted of weekly two-hour group sessions, preceded by an introductory meeting for rapport building, explanation of the intervention framework, administration of pretests, and identification of individual challenges. The program began with body scan meditations during the first and second weeks, encouraging participants to systematically direct attention to different parts of their body for 45 minutes per day, six days a week, along with 10 minutes of focused breathing exercises. This phase aimed to enhance present-moment awareness and expose students to their wandering minds. During the third and fourth weeks, participants practiced alternating body scans and yoga sessions (each 45 minutes daily) and engaged in seated breathing meditation for 15–20 minutes, strengthening mental discipline and bodily awareness. The fifth and sixth weeks expanded the mindfulness practice by incorporating longer sitting meditations (30–45 minutes), mindful walking, and deeper attention to internal stimuli like bodily sensations, sounds, thoughts, and emotions. Students learned to observe these phenomena with non-reactive awareness, building psychological flexibility and emotional tolerance. In the seventh week, students were encouraged to practice

for 45 minutes daily using various techniques—body scans, yoga, and sitting meditations—without relying on recorded audio guidance, fostering independence and mindfulness in recognizing early signs of emotional distress. The final week revisited previous exercises and reintroduced guidance materials (recorded audios), with an emphasis on planning and performing mindful actions. Participants were instructed to conduct at least two full body scan sessions during this final week and continue integrating yoga and meditation into their routines. The program emphasized cultivating non-judgmental observation, emotional acceptance, and attentional stability to reduce academic burnout and foster psychological well-being.

Data analysis

To analyze the collected data, both descriptive and inferential statistical methods were applied. Descriptive statistics included frequency tables, graphs, means, standard deviations, variances, and ranges to summarize the data characteristics. Inferential statistical methods consisted primarily of repeated measures analysis of variance (ANOVA) to assess within-group and between-group differences over time. Additionally, both univariate and multivariate analyses of covariance (ANCOVA) were employed to control for potential pretest effects and to more accurately estimate the effectiveness of the interventions. All statistical analyses were conducted using SPSS version 24. The analytical approach was chosen to account for the experimental design structure and to test for interaction effects between time and intervention type.

Findings and Results

Table 1 presents the means and standard deviations of academic burnout across three measurement points—pretest, posttest, and follow-up—separately for each group: Emotion Regulation Training (Experimental Group 1), Mindfulness Training (Experimental Group 2), and Control Group. As shown in the table, the emotion regulation group had a mean score of 56.40 (SD = 9.86) on academic burnout in the pretest phase. After the intervention, their mean score reduced to 51.10 (SD = 9.44), and at follow-up, the mean score was 52.00 (SD = 9.44), indicating a moderate and relatively stable reduction in burnout. The mindfulness training group began with a slightly lower mean academic burnout score of 55.40 (SD = 11.60), which declined more substantially to 48.00 (SD = 11.67) in the posttest and remained relatively low at 49.00 (SD = 11.67) during the follow-up, reflecting a stronger and more consistent impact over time. In contrast, the control group exhibited only minimal changes: their mean academic burnout score was 47.40 (SD = 8.11) at pretest, slightly decreased to 46.60 (SD = 8.20) post-intervention, and increased marginally to 47.20 (SD = 8.20) at follow-up, suggesting no significant effect due to the absence of intervention. These findings descriptively indicate that both experimental interventions, particularly mindfulness training, were associated with a noticeable reduction in academic burnout over time, while the control group remained relatively stable.

Table 1. Means and Standard Deviations of Academic Burnout in Pretest, Posttest, and Follow-up by Group

Group	Variable	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Follow-up Mean	Follow-up SD
Emotion Regulation	Academic Burnout	56.40	9.86	51.10	9.44	52.00	9.44
Mindfulness Training	Academic Burnout	55.40	11.60	48.00	11.67	49.00	11.67
Control Group	Academic Burnout	47.40	8.11	46.60	8.20	47.20	8.20

Prior to conducting inferential analyses, the assumptions underlying parametric tests were thoroughly examined and confirmed. The normality of the distribution of academic burnout scores in each group and across all three measurement points (pretest, posttest, and follow-up) was assessed using the Shapiro–Wilk test and supported by visual inspections of histograms and Q-Q plots, all of which indicated approximate normal distributions. Homogeneity of variances was evaluated using Levene's test, and the results showed no significant violations, indicating equal variances across groups. Additionally, the assumption of sphericity for repeated measures ANOVA was tested using Mauchly's test; where sphericity was violated, the Greenhouse–Geisser correction was applied. Linearity and homogeneity of regression slopes were also confirmed for the ANCOVA analyses, ensuring that the relationship between the covariate (pretest scores) and the dependent variable (posttest and follow-up scores) was consistent across groups. These diagnostics confirmed that all assumptions were sufficiently met, justifying the use of parametric procedures for the main analyses.

The results of the repeated measures analysis to assess the effectiveness of emotion regulation training on academic burnout are presented in Tables 2 and 3. As shown in Table 2, all multivariate tests for the main effect of time (repeated measurements) yielded statistically significant results: Pillai's Trace = 0.43, Wilks' Lambda = 0.56, Hotelling's Trace = 0.76, and Roy's Largest Root = 0.76, all with $F(2, 27) = 10.3$, $p < 0.001$. These findings indicate that the effect of time across the three measurement stages (pretest, posttest, follow-up) was significant, reflecting meaningful changes in academic burnout scores over time. Additionally, the interaction between time and group was also statistically significant across all tests: Pillai's Trace = 0.29, Wilks' Lambda = 0.70, Hotelling's Trace = 0.41, and Roy's Largest Root = 0.41, with $F(2, 27) = 5.62$, $p = 0.009$. This suggests that changes in academic burnout over time varied significantly between the emotion regulation group and the control group.

Table 2. Multivariate Test Results of Repeated Measures for the Effectiveness of Emotion Regulation Training on Academic Burnout

Effect	Test	Value	Hypothesis df	Error df	F	Sig.
Time (Repeated Measures)	Pillai's Trace	0.43	2	27	10.30	0.001
	Wilks' Lambda	0.56	2	27	10.30	0.001
	Hotelling's Trace	0.76	2	27	10.30	0.001
	Roy's Largest Root	0.76	2	27	10.30	0.001
Time × Group Interaction	Pillai's Trace	0.29	2	27	5.62	0.009
	Wilks' Lambda	0.70	2	27	5.62	0.009
	Hotelling's Trace	0.41	2	27	5.62	0.009
	Roy's Largest Root	0.41	2	27	5.62	0.009

The univariate analysis of repeated measures presented in Table 3 further confirms these findings. The main effect of time was significant, $F(2, 56) = 13.8$, $p < 0.001$, indicating that there were significant differences in academic burnout scores across the three time points. The main effect of group was also statistically significant, $F(1, 56) = 33.52$, $p < 0.001$, suggesting that the emotion regulation group and the control group differed significantly in terms of academic burnout. Most importantly, the interaction between time and group was significant, $F(2, 56) = 7.34$, $p < 0.001$, supporting the interpretation that the pattern of change in burnout scores differed between the two groups. As observed earlier in the descriptive data, the emotion regulation training led to a substantial reduction in academic burnout in both the posttest and follow-up phases, while the control group exhibited minimal changes. These results collectively confirm the effectiveness of emotion regulation training in reducing academic burnout among female secondary school students.

Table 3. Univariate Repeated Measures ANOVA Results for the Effectiveness of Emotion Regulation Training on Academic Burnout

Effect	Sum of Squares	df	Mean Square	F	Sig.
Time	145.27	2	72.63	13.8	0.001
Group	372.10	1	372.10	33.52	0.001
Time × Group	76.20	2	38.10	7.34	0.001
Error	116.71	56	2.08		

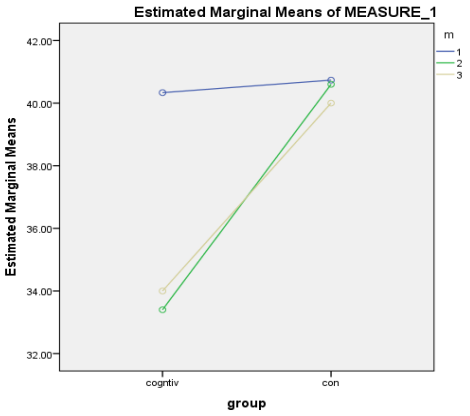

Figure 1. Trend of Academic Burnout Scores Over Time in Emotion Regulation Training Group

As shown in Figure 1, the academic burnout scores of participants in the emotion regulation training group declined noticeably from pretest to posttest and remained lower during the follow-up phase. This visual representation reinforces the statistical findings, clearly illustrating the significant and sustained reduction in academic burnout as a result of the emotion regulation intervention.

Discussion and Conclusion

The present study was conducted to compare the effectiveness of two psychological training programs—emotion regulation training and mindfulness skills training—on reducing academic burnout in female secondary school students in Tehran. The findings of the study revealed significant reductions in academic burnout scores among students who participated in either intervention program, with both experimental

groups showing meaningful improvements in comparison to the control group. Moreover, while both intervention groups demonstrated decreased burnout levels, the mindfulness group experienced a more substantial reduction, especially in the posttest phase, with the effects remaining stable in the follow-up. These results suggest that both emotion regulation and mindfulness skills training are effective approaches for mitigating academic burnout, with mindfulness demonstrating slightly superior long-term benefits in this sample.

These findings are consistent with previous research emphasizing the role of cognitive-emotional interventions in reducing academic burnout. For example, Dehghani et al. (2018) found that emotion regulation training significantly decreased burnout symptoms in students with learning disabilities, improving both their affective control and social integration (5). The current results replicate and extend these findings by demonstrating similar effects among general education students in Tehran. Furthermore, the significant time × group interaction observed in the repeated measures analysis aligns with the findings of Nemati et al. (2022), who demonstrated that emotional regulation strategies can predict academic burnout and buffer the effects of academic stress (2). The observed decline in burnout symptoms in the emotion regulation group from pretest to posttest and follow-up reinforces the notion that improving students' ability to manage and reframe their emotional experiences has a direct impact on reducing the emotional exhaustion, cynicism, and inefficacy components of academic burnout.

On the other hand, the stronger and more stable effects seen in the mindfulness group are also well supported in the literature. Tanveer (2023) highlighted that mindfulness is inversely related to burnout in young adults, showing that dispositional mindfulness contributes to better psychological well-being and academic engagement (6). Similarly, Wen et al. (2023) found that mindfulness had a significant effect on reducing academic burnout in elementary students, partly mediated by the perception of teacher support (9). In the present study, the mindfulness intervention likely increased the students' meta-awareness and non-judgmental observation of their stress responses, allowing them to distance themselves from negative automatic thoughts and emotional reactivity associated with academic pressure. This mechanism is further supported by the findings of Xu et al. (2017) and Yuan et al. (2018), who showed that mindfulness reduces academic burnout through enhanced regulatory emotional self-efficacy and cognitive clarity, even in adolescents exposed to traumatic stressors (7, 10).

The advantage of mindfulness training observed in this study may also be attributed to its ability to cultivate self-compassion and reduce perfectionistic tendencies. As shown by Lee and Lee (2019), students with high perfectionism and difficulty in emotional regulation are particularly susceptible to academic burnout, and mindfulness effectively reduces this vulnerability by enhancing emotional acceptance and self-soothing capacities (17). These results support the interpretation that mindfulness may be especially suitable for female adolescents who are often subjected to perfectionistic expectations and emotional suppression due to sociocultural norms. Furthermore, Jalalvand et al. (2020) identified a strong mediating role of unconditional self-acceptance and coping styles in the relationship between perfectionism and academic burnout, a pathway that mindfulness directly influences (11).

Additionally, the findings lend support to the theoretical models that view burnout as a product of deficient emotional resources and ineffective coping. According to Seibert et al. (2017), emotion regulation deficits can exacerbate academic underperformance and burnout by amplifying stress responses and

reducing resilience (16). This theoretical framework is consistent with the effectiveness of the emotion regulation training observed in the current study. Similarly, Saati-Masoomi et al. (2021) argued that academic emotions, self-regulation, and self-handicapping jointly contribute to burnout, and interventions targeting these cognitive-affective processes can effectively reverse the burnout trajectory (12). The emotion regulation curriculum employed in this study likely increased participants' cognitive reappraisal abilities and emotional awareness, allowing them to reinterpret academic stressors more adaptively.

The role of family and school-related stressors should not be overlooked in understanding the burnout experience among female students. As noted by Podineh Ebrahimi et al. (2022), academic burnout in adolescent girls is often exacerbated by emotional dysregulation and inflexible family environments (13). The school system, with its high-stakes examinations and limited attention to emotional development, further compounds this vulnerability. Thus, the effectiveness of both emotion regulation and mindfulness training in this study could also reflect their capacity to compensate for the lack of emotional scaffolding provided in students' natural environments. Moreover, Safaeinaeini et al. (2019) emphasized that emotion regulation training can significantly reduce burnout and bullying behaviors in adolescents who are active on virtual social networks, suggesting that these skills are transferable beyond the academic domain (4).

Notably, the current findings are aligned with international research. For instance, Messina et al. (2024) developed a protocol for group psychological counseling targeting academic burnout, emphasizing structured emotional and cognitive interventions as effective strategies (1). This supports the structure and rationale of the current training programs. Likewise, Tarazi et al. (2020) demonstrated that emotion regulation, when combined with attributional retraining, leads to significant reductions in burnout among students with learning disabilities, further confirming the relevance of emotional training in school settings (18). The present results echo these findings by showing that even students without clinical learning problems can benefit from such interventions.

Furthermore, the outcomes of the present study underscore the complementary mechanisms of mindfulness and emotion regulation. As Viskarmi and Khalili Ghasnigani (2018) highlighted, academic resilience and the use of adaptive cognitive emotion regulation strategies were inversely related to burnout symptoms (19). In the current sample, both interventions appeared to strengthen these resilience-related capacities, leading to sustained reductions in burnout symptoms across time. The fact that the control group showed no meaningful change during the same period confirms that the observed improvements were not due to the mere passage of time or assessment familiarity.

Despite the valuable insights gained, the present study is not without limitations. First, the sample consisted solely of female secondary school students in Tehran, limiting the generalizability of the findings to male students or adolescents in other regions or cultures. Second, the reliance on self-report questionnaires, although validated, may have introduced biases such as social desirability or inaccuracies in self-perception. Third, the follow-up period was limited to one month post-intervention, which constrains conclusions about the long-term durability of the observed effects. Fourth, the study did not include a placebo or alternative intervention for the control group, which would have allowed for a more nuanced understanding of non-specific treatment effects.

Future studies should aim to replicate and extend these findings across diverse student populations, including both genders, various socioeconomic backgrounds, and different educational systems. It would

also be beneficial to use mixed-methods designs that incorporate qualitative interviews or behavioral assessments to triangulate self-report data. Longitudinal studies with extended follow-up periods (e.g., six months to one year) are essential to determine the lasting impact of these interventions. Furthermore, future research could explore hybrid interventions that integrate both mindfulness and emotion regulation strategies, examining whether a combined approach yields synergistic effects. Investigating moderators such as baseline emotion dysregulation, parental involvement, or teacher support could also help tailor interventions to individual student needs.

Based on the results of this study, schools should consider incorporating structured psychological skills training into their curricula. Emotion regulation and mindfulness programs can be implemented as part of life skills education or extracurricular wellness initiatives. School counselors and psychologists should be trained to deliver these interventions in group formats to ensure scalability and sustainability. Educational policymakers should recognize academic burnout as a mental health priority and allocate resources for evidence-based prevention programs. Creating emotionally supportive school environments that reinforce these skills beyond the intervention period will further enhance student well-being and academic engagement.

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Authors' Contributions

All authors equally contributed to this study.

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.

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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