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Effects of Mindfulness Skills Training on Academic Self-Regulation and Self-Restraint among Adolescent English Language Learners

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ABSTRACT

Purpose: This study aimed to investigate the effectiveness of mindfulness skills training in improving academic self-regulation and behavioral inhibition among adolescent English language learners.

Method: This quasi-experimental study employed a pretest-posttest design with a control group. Participants were 40 English language learners aged 15–18 years from two existing classes at Meraj Andisheh English Language Institute in Mashhad, selected through convenience sampling and assigned to experimental and control groups, each comprising 20 participants. The experimental group received mindfulness skills training in 18 sessions, with each session lasting 15 minutes and conducted three times per week. Data were collected using the Motivated Strategies for Learning Questionnaire and the Behavioral Inhibition/Behavioral Activation Scales. Data were analyzed using multivariate analysis of covariance (MANCOVA), controlling for pretest scores.

Findings: The multivariate effect of group was statistically significant (Wilks' $\Lambda = 0.65$, $F(2, 35) = 9.42$, $p < .001$, $\eta p^2 = 0.35$). Significant group effects were also found for academic self-regulation ($F = 16.65$, $p < .001$, $\eta p^2 = 0.316$) and behavioral inhibition ($F = 12.676$, $p = .001$, $\eta p^2 = 0.260$).

Conclusion: Mindfulness skills training may be associated with improvements in academic self-regulation and higher behavioral inhibition scores among adolescent English language learners. However, given the limited sample size, the findings should be generalized with caution.

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1. Introduction

In contemporary educational discourse, learning English has gone beyond being an educational choice and has become a form of "symbolic capital" and a means of participating in global arenas of knowledge, economics, and technology (Crystal, 2012). In the Iranian context, this growing demand has created a competitive and high-pressure environment in which family expectations and the psychological pressures arising from them have linked language learning to anxiety and concerns about academic achievement (Elhambakhsh et al., 2026). Moreover, because opportunities for exposure to English outside the classroom and formal instructional time are limited, learners' progress depends on active engagement and independent regulation of their learning (Kormos & Csizér, 2014). This need has also been supported by evidence from Iran, where self-regulation has been found to be a significant predictor of English language learning outcomes in university classrooms (Nejati, 2023). Therefore, learning English involves more than acquiring linguistic knowledge; it is closely associated with learners' cognitive, emotional, and behavioral factors.

Nevertheless, language learning is not a purely linear or linguistic process; rather, it is a dynamic, multidimensional process shaped by interactions with learners' individual, cognitive, and psychological factors (Dörnyei, 2020). One important psychological factor in foreign language learning is foreign language anxiety (FLA), which can affect learners' experiences and performance during the learning process (MacIntyre, 2017). This anxiety may be accompanied by disruptions in cognitive processes and the development of avoidance responses and behaviors in language-learning situations. From this perspective, attention to self-regulatory processes in language learning is particularly important because learners' self-regulation involves managing cognition, behavior, and emotions in pursuit of learning goals and may be associated with learning outcomes and well-being (Huang, 2022). Accordingly, incorporating strategies to strengthen self-regulated learning into English language instruction may help support learners' language-learning processes (Arabloo et al., 2021).

These processes become particularly important during adolescence, when learners encounter situations that require them to manage attention, emotions, behavior, and effort in pursuit of educational goals. Under such circumstances, the ability to regulate cognitive and behavioral processes may influence how language learners respond to educational situations and the pressures associated with language learning. Accordingly, researchers have sought intervention approaches that can strengthen the underlying processes of self-regulation and inhibitory control in adolescents. Mindfulness, an approach based on attending to present-moment experience with an attitude of acceptance and nonjudgment, may be relevant in this regard (Kabat-Zinn, 2013).

Research evidence suggests that mindfulness-based interventions may affect several cognitive, emotional, and behavioral outcomes in children and adolescents, including attention, executive functions, and anxiety and stress (Dunning et al., 2019). In addition, extensive research has demonstrated

associations between foreign language anxiety and learners' performance and experiences (Zhang, 2019; Teimouri et al., 2019). These findings suggest that examining psychological factors influencing the experience and process of language learning, alongside linguistic and educational components, may be important for a better understanding of foreign language learning. Therefore, the connection between psychological interventions and the cognitive and behavioral processes involved in language learning may provide a basis for investigating approaches that support learners' educational experiences.

Despite existing research on mindfulness and foreign language anxiety, the effectiveness of mindfulness interventions in English language-learning contexts, particularly among adolescent learners and with simultaneous attention to self-regulation and inhibitory control, requires further investigation. Accordingly, the present study focuses not merely on examining the relationship between mindfulness and language learning, but on investigating the effectiveness of a psychological intervention in the real-world context of English language instruction. Thus, this study aimed to examine the effectiveness of group mindfulness skills training on academic self-regulation and self-restraint among adolescent English language learners, with the aim of determining whether this intervention could strengthen cognitive and behavioral processes associated with their learning.

2. Theoretical Background

The theoretical framework of the present study is based on three related areas: first, the theoretical foundations of mindfulness as the primary intervention in the study; second, the social-cognitive model of self-regulated learning as the basis for explaining academic self-regulation; and third, the theoretical framework of executive functions as the basis for explaining self-restraint. These three areas are interconnected in the context of learning English as a foreign language. Accordingly, mindfulness, as a psychological intervention, may be associated with attentional processes, cognitive monitoring, and reduced automatic reactivity, thereby influencing learners' academic self-regulation and inhibitory control.

2.1. Mindfulness

Mindfulness refers to a state of awareness in which individuals observe their ongoing experiences with attention and an accepting, nonjudgmental attitude. This construct involves the self-regulation of attention and the acceptance of internal and external experiences. It helps individuals observe their thoughts, emotions, and impulses without reacting immediately and select more goal-directed responses. From this perspective, mindfulness may be associated with self-regulatory processes and cognitive control through increased awareness, attentional regulation, and reduced automatic reactivity (Bishop et al., 2004).

One of the key mechanisms associated with mindfulness is the enhancement of metacognitive monitoring, defined as the ability to monitor one's own knowledge and performance in real time. Ranalli (2018) demonstrates that, in second language learning, accurate metacognitive monitoring is a

prerequisite for effective self-regulation, as inaccurate monitoring can lead to inappropriate control decisions and, consequently, poorer performance on language tasks. By fostering attention to present-moment experiences and nonjudgmental acceptance, mindfulness may help language learners observe intrusive thoughts, unpleasant emotions, and automatic response patterns without immediately reacting to them or avoiding the situation (Lindsay & Creswell, 2017). In language learning environments, this receptive awareness enables learners to make more deliberate and goal-directed choices rather than responding impulsively or avoidantly when faced with challenges such as grammatical errors, pronunciation difficulties, performance-related concerns, or demanding cognitive tasks.

Research evidence suggests that mindfulness-based interventions in children and adolescents may be associated with certain cognitive and behavioral outcomes, including attention, executive functions, and emotion regulation, although effect sizes and the certainty of the evidence vary across studies (Dunning et al., 2019; Dunning et al., 2022). Theoretical and empirical research has also emphasized the potential role of mindfulness in strengthening self-regulatory processes and attentional control in children and adolescents (Kaunhoven & Dorjee, 2017).

In the context of learning English, mindfulness may help learners select more goal-directed responses to learning difficulties by increasing their awareness of thoughts and emotions associated with the learning process. Therefore, mindfulness training may theoretically be associated with processes that are important for managing attention, emotions, and behavior during language learning. This is particularly relevant during adolescence, when learners need to regulate and control their behavior to complete educational tasks, cope with assessment, and sustain their learning activities.

2.2. Academic Self-Regulation

Self-regulated learning is a process through which learners actively regulate their thoughts, motivation, emotions, and behavior to achieve learning goals. According to Zimmerman's social-cognitive model, self-regulated learning is a cyclical process consisting of three main phases: forethought, performance, and self-reflection (Zimmerman, 2015).

In the present study, academic self-regulation is conceptualized as the manifestation of self-regulated learning in the context of educational activities and goals. Accordingly, Zimmerman's model of self-regulated learning is used as the theoretical framework for explaining the construct of academic self-regulation. During the forethought phase, learners set goals and plan how to complete a task; during the performance phase, they employ appropriate strategies and monitor their performance; and during the self-reflection phase, they evaluate their performance and adjust their subsequent strategies based on the outcomes (Zimmerman, 2015).

This process is particularly important in learning English because learners need to set learning goals, monitor their progress, select appropriate strategies, revise them when necessary, and evaluate their performance. This need becomes even more important when learning English as a foreign language, as

opportunities to encounter the language outside educational settings are limited in many contexts. Under these circumstances, a substantial part of learners' progress depends on active participation, sustained practice, and the ability to manage the learning process independently. Research on self-regulation in ESL/EFL contexts has examined this construct in relation to various language-learning skills and components, including reading, writing, and speaking (Mazandarani, 2024). Self-regulation may also help learners plan, evaluate, and modify their performance during language-learning activities (De Vrind et al., 2024).

Therefore, academic self-regulation in the present study is not merely a general educational construct; rather, in the context of learning English, it represents a process that can help learners independently manage activities and behaviors related to language learning. Mindfulness may also be theoretically associated with self-regulatory processes. Attention to present-moment experience, awareness of thoughts and emotions, and reduced automatic reactivity may help learners monitor their cognitive and emotional states more effectively and align their behavior with learning goals. From this perspective, academic self-regulation is one of the expected outcomes of mindfulness training in the present study.

2.3. Executive Functions and Self-Restraint

Executive functions are a set of cognitive processes that enable individuals to regulate and control their attention, thoughts, and behavior in pursuit of goals. Their three core components are inhibitory control, working memory, and cognitive flexibility (Diamond, 2013). Inhibitory control refers to the ability to suppress dominant or inappropriate responses and resist distraction. In the present study, it provides the theoretical basis for explaining self-restraint.

Inhibitory control is particularly important during adolescence because cognitive control processes are still developing during this period. In educational situations, this ability helps adolescents inhibit immediate and irrelevant responses and maintain their attention and behavior in line with learning goals. Research evidence also suggests that mindfulness-based interventions may be associated with certain components of executive functioning in children and adolescents, although the magnitude of these effects varies across studies (Dunning et al., 2022).

On the basis of the theoretical foundations discussed above, mindfulness, academic self-regulation, and self-restraint are distinct but related constructs. Through increased awareness, attentional regulation, and reduced automatic reactivity, mindfulness may help individuals manage their thoughts, emotions, and behavior in a goal-directed manner. Academic self-regulation involves setting goals, monitoring performance, and adjusting learning strategies, whereas self-restraint refers to the ability to inhibit immediate and irrelevant responses and maintain attention in pursuit of learning goals. These processes are particularly important in learning English as a foreign language because language learning requires sustained practice, engagement with linguistic difficulties, and continuous management of attention and

behavior. Thus, in the present study, English language learning is not merely the setting in which the intervention is implemented; it is also the context in which the role of self-regulation and cognitive control in the learning process becomes evident. Accordingly, mindfulness training is expected to improve academic self-regulation and self-restraint among adolescent language learners by strengthening attentional regulation and reducing automatic reactivity.

3. Research Background

The research literature relevant to the present study is presented in two sections: domestic evidence and international evidence.

3.1. Domestic Evidence

In Iran, attention to mindfulness-based interventions in educational settings and their role in improving students' psychological processes has increased in recent years. Gholami and Abdi (2025), in a study examining the effectiveness of a mindfulness intervention on children's self-regulation skills and psychological well-being, found that mindfulness training could be associated with improvements in self-regulation skills. This finding is consistent with the framework of the present study and suggests that mindfulness may be associated with processes related to behavioral regulation and learning.

Similarly, Rezaei-Rad and Asghari Qajari (2024), in a study involving secondary school students, examined the effectiveness of mindfulness training on impulsive behaviors and emotion regulation and reported improvements in these components following the intervention. Sedaghat et al. (2023) also investigated the role of mindfulness in reducing the psychological burden of tasks and strengthening learners' self-restraint. Earlier, Saberi and Tajeddini (2019) examined the effectiveness of mindfulness training on concentration and test anxiety and reported beneficial effects.

Overall, domestic studies suggest that mindfulness in educational settings may be associated with improvements in self-regulation, attention, emotion regulation, and behavioral control. However, most of these studies have addressed general psychological or academic outcomes, and evidence regarding the simultaneous effects of mindfulness interventions on academic self-regulation and self-restraint among adolescent language learners remains limited. Furthermore, the specific context of learning English as a foreign language has received relatively little attention in these studies.

3.2. International Evidence

International studies have examined mindfulness as a psychological intervention for strengthening certain cognitive and emotional processes in children and adolescents. Dunning et al. (2019), in a meta-analysis of mindfulness-based interventions in children and adolescents, reported evidence of effects on several cognitive and psychological outcomes. In another meta-analysis, Dunning et al. (2022) examined the effectiveness of mindfulness interventions across 33 randomized controlled trials involving 3,666 participants. They reported improvements in several psychological and cognitive indicators, including anxiety, stress, and certain components of attention and executive functioning.

At the level of underlying mechanisms, Goodman et al. (2026) examined the roles of "attentional monitoring" and "acceptance" in the effectiveness of mindfulness-based interventions in children and adolescents by reviewing 63 randomized controlled trials. The results indicated that the effect of these interventions on acceptance was statistically significant but relatively small, whereas sufficient evidence of a significant effect on attentional monitoring was not found. These findings highlight the need for more precise investigations of the cognitive and behavioral mechanisms of mindfulness across different age groups and educational contexts.

Research in educational settings has also suggested that mindfulness may be associated with cognitive and behavioral processes relevant to learning. Kaunhoven and Dorjee (2017), in their review, emphasized the potential role of mindfulness in self-regulatory processes and attentional control. In addition, research conducted in educational settings has indicated that mindfulness interventions may be associated with attention, executive functions, and certain academic and psychological outcomes among students (Zenner et al., 2014; Dunning et al., 2019).

More direct evidence in the field of foreign language learning has also expanded in recent years. Babanoğlu and Atalmış (2025), in a meta-analysis, examined 14 intervention studies involving 1,039 participants and nine correlational studies involving 2,232 participants. The results indicated that mindfulness-based interventions had a positive and statistically significant effect on foreign language achievement and that mindfulness was positively associated with learners' achievement. These findings suggest that the role of mindfulness is not limited to general mental health outcomes but may also be important in the specific context of foreign language learning.

Along the same lines, Fathi and Aghamirzaei (2026) conducted a mixed-methods study of learners of English as a foreign language to examine the roles of mindfulness, motivational behavior, and self-regulation in predicting second-language achievement. The findings indicated that mindfulness and motivational behavior were associated with second-language achievement and that self-regulation mediated these relationships. This finding highlights the importance of self-regulation as a process potentially involved in translating psychological resources into effective learning behaviors.

Despite this evidence, a substantial proportion of international studies in the field of foreign language learning have focused on outcomes such as language achievement, motivation, anxiety, resilience, and well-being. Less attention has been paid to the direct effects of mindfulness interventions on the cognitive and behavioral processes underlying learning, particularly academic self-regulation and self-restraint among adolescent language learners. Furthermore, differences in intervention types, sample characteristics, and educational contexts indicate that more focused research is still needed to determine the effectiveness of mindfulness in specific educational settings.

Taken together, although domestic and international evidence supports associations between mindfulness and self-regulation, attention, executive functions, and certain learning outcomes, it

remains unclear to what extent a brief and sustained mindfulness intervention that can be integrated into regular language classes can improve academic self-regulation and self-restraint among adolescent language learners. This gap is particularly important given the characteristics of learning English as a foreign language and the need to sustain attention, manage distraction, maintain regular practice, and inhibit irrelevant responses. Accordingly, the present study addresses this gap by examining the effectiveness of group mindfulness training on academic self-regulation and self-restraint among adolescent learners of English.

4. Method

4.1. Research Design

The present study was applied in terms of its purpose and quasi-experimental in terms of its method, using a pretest–posttest design with a control group. Convenience sampling was employed. Participants were selected from adolescent English language learners at Meraj Andisheh Language Institute in Mashhad, Iran. Two existing classes, which had been formed before the study began according to the institute's educational schedule and the learners' selected class times, participated in the study. One class was assigned to the experimental group and the other to the control group. Because the classes had been formed in advance, the researcher was unable to randomly assign individual participants or match participants across groups. The intervention consisted of mindfulness skills training and was delivered within the regular English language classroom setting. The intervention was not intended to teach English, and the language-learning content remained the same in both groups. Mindfulness training was provided over one academic term in 18 sessions, each lasting 15 minutes.

4.2. Participants and Sampling Method

The target population consisted of adolescent English language learners at Meraj Andisheh Language Institute in Mashhad, Iran. The study sample included 40 learners, with 20 participants in the experimental group and 20 in the control group. Participants were between 15 and 18 years of age, and all were at the same English proficiency level according to the placement criteria used by the institute. The inclusion criteria were being 15–18 years old, being enrolled in an English language course at the institute, belonging to one of the two selected classes, and providing informed consent from a parent or legal guardian as well as assent from the learner. The exclusion criteria were absence from more than two sessions, withdrawal from participation, concurrent participation in a similar course, and simultaneous receipt of related psychological interventions. Participants' demographic and educational characteristics, including age, gender, school grade, and duration of English language learning, are reported in the Results section. Because all participants were at the same English proficiency level, this variable was not included in the statistical comparison of the two groups.

4.3. Research Instruments

Data were collected using a demographic questionnaire and two standardized instruments: the Motivated Strategies for Learning Questionnaire and the Behavioral Inhibition/Behavioral Activation Systems Scale.

4.3.1. Demographic Questionnaire

A questionnaire was developed and administered to collect participants' basic information, including age, gender, school grade, English proficiency level, duration of English language learning, and participation in similar training courses. Information about English proficiency was also recorded based on the learners' educational level registered at the institute and the information available in their educational records.

4.3.2. Motivated Strategies for Learning Questionnaire

Academic self-regulation was assessed using the Motivated Strategies for Learning Questionnaire developed by Pintrich and De Groot (1990). This instrument assesses motivational components and self-regulated learning strategies. Items are rated on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The instrument assesses components including motivational beliefs, intrinsic value, test anxiety, use of cognitive strategies, and self-regulation. In the present study, the instrument's reliability was examined using Cronbach's alpha. Cronbach's alpha was .86 for the total questionnaire and .82, .75, .84, .85, and .73 for motivational beliefs, intrinsic value, test anxiety, use of cognitive strategies, and self-regulation, respectively.

4.3.3. Behavioral Inhibition/Behavioral Activation Systems Scale

To assess self-restraint, the Behavioral Inhibition System (BIS) subscale of the Behavioral Inhibition/Behavioral Activation Systems Scale was used. The scale was developed by Carver and White (1994) and consists of 24 self-report items. The BIS subscale contains seven items and assesses an individual's sensitivity to threat cues, punishment, conflict, and anxiety-provoking situations.

In the present study, the score on the BIS subscale was used as an indicator of self-restraint in accordance with the study's objective. The reliability of the instrument in the study sample was examined using Cronbach's alpha. The coefficient was .83 for the full scale and .87 for the subscale used in this study.

4.4. Research Procedure

After the research proposal was approved and the necessary permissions were obtained, arrangements were made with Meraj Andisheh Language Institute. Two existing classes at the institute, which had previously been formed according to the educational schedule and the class times selected by the learners, were selected for participation in the study. No class transfers, participant matching, or individual random assignment were carried out during participant selection. Before the intervention began, the study objectives and procedures were explained to the learners and their parents. Participation began after informed consent had been obtained from parents and assent had been obtained from the

learners. At pretest, participants in both groups completed the research instruments. The experimental group then received mindfulness skills training over one academic term. The training consisted of 18 brief sessions delivered three times per week, with each session lasting 15 minutes. The exercises were designed to strengthen attention to present-moment experience, observation of thoughts and emotions, reduction of automatic reactions, and the ability to manage attention and behavioral responses. The training was designed to be incorporated into the classroom schedule without disrupting regular English language instruction. The control group continued to receive the institute's regular English language instruction and did not receive mindfulness skills training. At the end of the intervention period, participants in both groups completed the research instruments again at posttest.

Table 1. Details of the Mindfulness Skills Training Sessions Based on Kabat-Zinn's (1990) Training Program

Session	Title	Training objectives	Activities	Instructor's guidance	Homework
1	Introduction to mindfulness	Familiarization with being present in the moment	4-7-8 breathing exercise	Emphasizing a nonjudgmental attitude	Practice 4-7-8 breathing once daily
2	Mindful breathing	Stabilizing attention on the breath	Counting inhalations and exhalations	Correcting sitting posture	Counting breaths for 3 minutes
3	Body scan	Reducing bodily tension	Head-to-toe body scan	Pausing between instructions	Body scan at bedtime for 5 minutes
4	Raisin exercise	Strengthening the five senses	Observing, touching, and tasting	Emphasizing sensory experience	Mindful eating during one meal
5	Mindful movement 1	Coordinating mind and body	Slow stretches	Demonstrating the movements	Mindful walking for 5 minutes
6	Mindful movement 2	Muscle regulation	A sequence of simple movements	Monitoring safety	Checking bodily tension twice daily
7	Observing thoughts	Enhancing metacognition	"Passing clouds" exercise	Emphasizing non-engagement with thoughts	Recording three intrusive thoughts daily
8	Accepting emotions	Nonjudgmental acceptance	Labeling emotions	Providing academic examples	Labeling emotions throughout the day

9	Working with difficult emotions and the reaction chain	Increasing emotional awareness and preventing automatic reactions	Identifying the situation, thought, bodily sensation, and emotion; nonjudgmental labeling; and focusing on the breath	Teaching emotion observation and practicing three mindful breaths before reacting	Recording one challenging situation and practicing three mindful breaths
10	Mindful pause	Impulse control	Stop–breathe–choose practice	Teaching classroom applications	Using the pause technique in relevant situations
11	Mindful listening	Improving listening concentration	Active listening practice	Group feedback	Mindful listening during one conversation
12	Mindful speaking	Verbal self-regulation	Practicing silence before responding	Instructor modeling	Practicing silence before responding
13	Stress management	Regulating test anxiety	Practice under simulated conditions	Creating realistic scenarios	Mindful breathing before beginning to study
14	Focused studying	Transferring the skill to learning	Five minutes of mindful studying	Using an accurate timer	Focusing fully on a language-learning task for 10 minutes
15	Managing distractions	Sustaining attention	Mindfully returning to the task	Avoiding self-blame	Labeling distractions and returning to the task
16	Self-compassion	Reducing self-criticism	Practicing supportive statements	Emphasizing acceptance of mistakes	Replacing self-critical statements with positive ones
17	Integration	Combining skills	A 10-minute combined exercise	Structured guidance	Combined practice (breathing and body awareness)

18	Review and consolidation	Strengthening continued practice	Reviewing progress	Brief individual feedback	Reviewing successful experiences and challenges

4.5. Ethical Considerations

The study was conducted after the necessary permissions had been obtained and approval had been granted by the university's Research Ethics Committee (Ethics Code: IR.IMAMREZA.REC.1404.009). Because the participants were adolescents, written informed consent was obtained from their parents or legal guardians, and assent was obtained from the learners themselves before they entered the study. Participation was voluntary, and participants could withdraw at any stage without any consequences. The confidentiality of information and the anonymity of participants' data were maintained throughout all stages of the study, and the data were used solely for research purposes.

4.6. Data Analysis

After the data were checked and prepared, they were analyzed using statistical methods appropriate to the research design. Given the presence of pretest scores, analysis of covariance (ANCOVA) was used to examine differences between the two groups on the dependent variables. Before conducting the main analyses, the statistical assumptions relevant to the selected analytical method were examined. The significance level for the tests was set at .05.

5. Results

The study sample consisted of 40 adolescent English language learners aged 15–18 years, with 20 participants in the experimental group and 20 in the control group. The mean age was 16.45 years (SD = 0.82) in the experimental group and 16.55 years (SD = 0.87) in the control group. In the experimental group, 11 participants (55%) were girls, compared with 12 participants (60%) in the control group. The mean duration of English language learning was 4.10 years (SD = 1.15) in the experimental group and 4.20 years (SD = 1.21) in the control group. The results of independent-samples t-tests indicated that the groups did not differ significantly in age or duration of English language learning ($p > .05$).

Before conducting the multivariate analysis of covariance, the required assumptions were examined. The results of the Kolmogorov–Smirnov test indicated that the distributions of academic self-regulation and behavioral inhibition scores at pretest and posttest did not differ significantly from a normal distribution in either group ($p > .05$). For academic self-regulation, the Kolmogorov–Smirnov statistics at pretest were 0.105 and 0.116 for the control and experimental groups, respectively, and at posttest were 0.132 and 0.123, respectively. For behavioral inhibition, the corresponding values were 0.115 and 0.140 at pretest and 0.155 and 0.164 at posttest. In all cases, p was greater than .05. In addition, Box's test of equality of covariance matrices was not significant (Box's $M = 3.882$, $F = 1.220$, $p = .301$), indicating that this assumption was also satisfied.

To examine the homogeneity of regression slopes more closely, both academic self-regulation and behavioral inhibition pretest scores were entered simultaneously as covariates, and the four group × covariate interactions were examined. The results are presented in Table 2.

Table 2. Examination of the Homogeneity of Regression Slopes with Both Pretest Scores Entered Simultaneously as Covariates

Dependent variable	Effect source (interaction)	Sum of squares	df	Mean square	F	p	Partial η^2
Academic self-regulation posttest	Group × academic self-regulation pretest	1.245	1	1.245	1.119	.298	.032
Academic self-regulation posttest	Group × behavioral inhibition pretest	0.876	1	0.876	0.842	.365	.024
Behavioral inhibition posttest	Group × academic self-regulation pretest	0.612	1	0.612	0.963	.333	.028
Behavioral inhibition posttest	Group × behavioral inhibition pretest	0.475	1	0.475	0.747	.394	.021

As shown in Table 2, none of the interactions between group and the pretest scores was statistically significant. The interaction between group and academic self-regulation pretest scores was not significant for academic self-regulation posttest scores, $F(1, 34) = 1.119$, $p = .298$, partial $\eta^2 = .032$. Similarly, the interaction between group and behavioral inhibition pretest scores was not significant for academic self-regulation posttest scores, $F(1, 34) = 0.842$, $p = .365$, partial $\eta^2 = .024$. The interaction between group and academic self-regulation pretest scores was not significant for behavioral inhibition posttest scores, $F(1, 34) = 0.963$, $p = .333$, partial $\eta^2 = .028$. The interaction between group and behavioral inhibition pretest scores was also not significant for behavioral inhibition posttest scores, $F(1, 34) = 0.747$, $p = .394$, partial $\eta^2 = .021$. Therefore, the assumption of homogeneity of regression slopes was satisfied for both dependent variables.

After the assumptions had been examined, a multivariate analysis of covariance (MANCOVA) was conducted to investigate the effect of mindfulness skills training on the set of dependent variables, namely academic self-regulation and behavioral inhibition, while simultaneously controlling for pretest scores. The results indicated that the multivariate effect of group on the linear combination of the two dependent variables was statistically significant (Wilks' $\Lambda = .65$, $F(2, 35) = 9.42$, $p < .001$, partial $\eta^2 =$

.35). The result based on Pillai's Trace was also statistically significant (Pillai's Trace = .35, $F(2, 35) = 9.42$, $p < .001$, partial $\eta^2 = .35$).

Following the significant multivariate effect, univariate tests were conducted to examine the effect of group on each dependent variable. The results showed that, after controlling for pretest scores, the group effect was significant for academic self-regulation, $F(1, 36) = 16.650$, $p < .001$, partial $\eta^2 = .316$. The group effect on behavioral inhibition was also significant, $F(1, 36) = 12.676$, $p = .001$, partial $\eta^2 = .260$.

Table 3. Results of the Univariate Analysis of Covariance Tests

Dependent variable	Source of effect	Sum of squares	df	Mean square	F	p	Partial η^2
Academic self-regulation	Academic self-regulation pretest	22.432	1	22.432	28.647	< .001	.443
Academic self-regulation	Behavioral inhibition pretest	0.019	1	0.019	0.025	.876	.001
Academic self-regulation	Group	13.042	1	13.042	16.650	< .001	.316
Academic self-regulation	Error	28.198	36	0.783	—	—	—
Behavioral inhibition	Academic self-regulation pretest	0.036	1	0.036	0.057	.813	.002
Behavioral inhibition	Behavioral inhibition pretest	4.333	1	4.333	6.913	.013	.161
Behavioral inhibition	Group	7.944	1	7.944	12.676	.001	.260
Behavioral inhibition	Error	22.562	36	0.627	—	—	—

As shown in Table 3, academic self-regulation pretest scores had a significant effect on academic self-regulation posttest scores, $F(1, 36) = 28.647$, $p < .001$, partial $\eta^2 = .443$; however, their effect on behavioral inhibition posttest scores was not significant, $F(1, 36) = 0.057$, $p = .813$, partial $\eta^2 = .002$. Behavioral inhibition pretest scores had a significant effect on behavioral inhibition posttest scores, $F(1, 36) = 6.913$, $p = .013$, partial $\eta^2 = .161$; however, their effect on academic self-regulation posttest scores was not significant, $F(1, 36) = 0.025$, $p = .876$, partial $\eta^2 = .001$.

After controlling for pretest scores, the adjusted mean for academic self-regulation was higher in the experimental group ($M = 78.30$, $SE = 0.98$) than in the control group ($M = 69.05$, $SE = 0.98$). In addition, the mean academic self-regulation score in the experimental group increased from 67.85 at pretest to 78.25 at posttest, whereas the corresponding score in the control group changed from 68.40 to 69.10.

For behavioral inhibition, the adjusted mean was also higher in the experimental group (M = 37.55, SE = 0.67) than in the control group (M = 31.65, SE = 0.67). The mean behavioral inhibition score in the experimental group increased from 30.95 at pretest to 37.40 at posttest, whereas the corresponding score in the control group changed from 31.20 to 31.80.

Overall, after simultaneously controlling for pretest scores, the group effect on the combined dependent variables was statistically significant. The univariate tests also indicated that the experimental group had higher posttest scores than the control group on both academic self-regulation and behavioral inhibition.

6. Discussion

The present study aimed to examine the effectiveness of group mindfulness skills training on academic self-regulation and self-restraint among adolescent English language learners. The results showed that mindfulness skills training delivered through brief, regular sessions led to significant improvements in academic self-regulation and self-restraint in the experimental group. This finding suggests that a brief intervention that can be integrated into the language teaching process may be associated with certain cognitive and behavioral processes relevant to English language learning.

The finding concerning academic self-regulation can be explained in terms of Zimmerman's social-cognitive model of self-regulated learning. According to this model, a self-regulated learner is an active individual who sets goals, monitors performance, and modifies learning strategies based on the feedback obtained (Zimmerman, 2015). By increasing awareness of thoughts, emotions, and attentional states, mindfulness may provide the conditions necessary for such monitoring. Consequently, when faced with distractions, concerns about performance, or a difficult task, language learners may rely less on automatic reactions and may be better able to align their behavior with their learning goals.

This explanation is particularly relevant in the context of learning English as a foreign language. Language learning requires sustained practice, exposure to errors, feedback, maintenance of attention during language activities, and persistence in completing tasks. Therefore, self-regulation is not merely a general academic ability; it may be directly related to how learners participate in language activities. From this perspective, mindfulness in the present study was not an independent psychological intervention detached from language instruction. Rather, it was implemented in a setting in which managing attention, regulating learning behavior, and maintaining engagement in educational activities are essential requirements of the language-learning process.

The finding concerning self-restraint can also be explained within the theoretical framework of executive functions. In this framework, inhibitory control is one of the core components of executive functions and refers to the ability to suppress dominant responses, resist distractions, and maintain goal-directed behavior (Diamond, 2013). Mindfulness exercises, through focusing on present-moment experience and repeatedly redirecting attention to the focus of practice, may provide opportunities to

exercise this process. In the language classroom, this capacity may help learners better ignore irrelevant stimuli, inhibit immediate responses, and maintain attention on language activities.

This finding is also consistent with existing research evidence. In their meta-analysis, Dunning et al. (2022) reported evidence of associations between mindfulness interventions and certain cognitive and executive-function outcomes in children and adolescents. Domestic studies have also supported associations between mindfulness training and self-regulation, behavioral control, concentration, and emotion regulation in educational settings (Gholami & Abdi, 2025; Rezaei-Rad & Asghari Qajari, 2024; Sedaghat et al., 2023; Saberi & Tajeddini, 2019). In foreign language education, recent evidence has also indicated that mindfulness is associated with language achievement and self-regulatory processes (Babanoğlu & Atalmış, 2025; Fathi & Aghamirzaei, 2026). Therefore, the present findings contribute to a body of evidence emphasizing the importance of cognitive and psychological factors alongside linguistic and educational components.

However, this consistency does not imply that the mechanisms underlying the effects are identical across all settings. Differences in learners' age, intervention type and intensity, duration of practice, program delivery, and educational environment may influence the degree of effectiveness. Existing evidence also indicates that the effects of mindfulness interventions in children and adolescents are not uniform across studies and that effect sizes may depend on intervention characteristics and implementation context (Dunning et al., 2022). Accordingly, the findings of the present study should be interpreted in light of the specific characteristics of the sample and the implemented program.

From an educational perspective, the nature of the present intervention is also noteworthy. The exercises were not intended to treat a clinical problem; rather, they consisted of simple skills involving mindful awareness, concentration, mindful breathing, and redirecting attention, delivered within the natural language classroom setting. This feature makes the intervention structurally closer to the language-learning environment and allows it to be implemented without removing learners from their regular classroom activities. Another notable feature was the brief and regular nature of the sessions. Mindfulness exercises were delivered at the beginning of class in 15-minute sessions over one academic term. This format is more compatible with the usual structure of language classes and, compared with longer programs, increases the feasibility of integrating the intervention into the educational schedule. In addition, the exercises were delivered by the classroom teacher after receiving appropriate training from the researcher, suggesting that these activities do not necessarily require the direct presence of a therapist or mental health professional. However, this does not mean that any language teacher can implement the intervention without specialized training. Structured implementation requires appropriate training, clear instructions, and adequate supervision.

Overall, the findings suggest that, in the context of English language instruction, mindfulness may be associated not only with certain psychological outcomes but also with cognitive and behavioral

processes relevant to learning, including academic self-regulation and self-restraint. From this perspective, attention to these processes may complement a focus on purely linguistic components when designing foreign language learning environments.

7. Conclusion

The findings of the present study showed that group mindfulness skills training may be effective in improving academic self-regulation and self-restraint among adolescent English language learners. The significance of this finding for language education lies in the fact that the intervention was brief, regular, skills-based, and compatible with the usual structure of the classroom. Nevertheless, the results should be interpreted as evidence pertaining to this particular sample, educational context, and intervention format and should not be generalized to the effectiveness of mindfulness across all language-learning settings.

The present study had several limitations that should be considered when interpreting the findings. The study was conducted at a single language institute in Mashhad, Iran, with a relatively small sample of adolescent learners; therefore, generalizing the results to other age groups, institutes, and educational contexts requires caution. In addition, participants belonged to two pre-existing classes, and individual random assignment or participant matching was not possible. The use of self-report instruments also entails the possibility of social desirability effects and response bias. Furthermore, no interviews were conducted with the learners; consequently, no direct qualitative information was available about their experiences of the intervention, their acceptance of the exercises, or their perceptions of changes in the learning process. The research instruments were also not administered in a preliminary or pilot study before the main study to examine item comprehensibility, vocabulary suitability, and how adolescent learners understood the questions. Finally, the absence of a follow-up assessment limits the ability to determine whether the effects of the intervention were sustained over the long term.

In light of these limitations, future research should be conducted with larger and more diverse samples across different educational institutes and regions, using randomized assignment designs where feasible. Combining questionnaires with behavioral observations, teacher reports, and performance-based indicators related to language learning may also provide a more comprehensive assessment of intervention outcomes. Qualitative or mixed-methods studies involving interviews with learners and teachers could help identify participants' experiences and the possible mechanisms of change. It is also recommended that research instruments be evaluated in a preliminary study involving learners of similar age and proficiency levels before the main study, so that item comprehensibility and linguistic suitability can be assessed. In addition, longitudinal designs with follow-up assessments could provide a clearer understanding of the sustainability of mindfulness training effects.

From an applied perspective, given the brief and regular nature of the intervention, language institutes and teachers may consider incorporating simple mindfulness exercises as a supplementary

classroom activity, provided that appropriate training and supervision are available. Delivering these exercises at the beginning of class or during brief, designated periods may provide opportunities to strengthen learners' attention, self-regulation, and self-restraint without replacing core language instruction. However, the program should be implemented according to clear guidelines and with appropriate teacher training, and it should not be considered a substitute for specialized psychological interventions when professional mental health services are needed.

Ethical Considerations

This study was derived from a master's thesis in General Psychology conducted by the first author at the Faculty of Humanities, Imam Reza International University, under the guidance and supervision of the second and third authors. The study was conducted after obtaining ethical approval from the Research Ethics Committee of Imam Reza International University (Ethics Code: IR.IMAMREZA.REC.1404.009). All stages of the intervention and data collection were carried out in full compliance with research ethics principles, including obtaining informed consent from participants and their parents, maintaining the confidentiality of information, and ensuring voluntary participation.

Conflict of Interest

The authors declare that they have no conflicts of interest regarding the conduct of the study, data analysis, or preparation of the reported findings.

Financial Support

The authors declare that this study received no specific financial or institutional support and that neither the researchers nor the host institution received any financial benefit from its conduct.

Authors' Contributions

First author: Writing the thesis; preparing the research instruments and materials; implementing the intervention; collecting data; performing calculations; conducting statistical analyses; analyzing and interpreting the findings; and preparing the initial manuscript draft.

Second author: First supervisor; designing the study; supervising the research process; reviewing and verifying the results; and revising, reviewing, and finalizing the manuscript.

Third author: Second supervisor; contributing to the study design; supervising the research; and reading and reviewing the manuscript.

In addition, all authors contributed collectively to the study design, implementation of the intervention, data collection, analysis and interpretation of the findings, and review and finalization of the manuscript.

Declaration on Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this manuscript, the authors used ChatGPT for language editing and improving the coherence of the text. Following the use of this tool, the authors thoroughly reviewed, revised, and finalized all scientific content and accept full responsibility for the content of the article.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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