

## Effectiveness of mindfulness-based education intervention on emotional competence and school belonging in high school students

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### ABSTRACT

This study investigated the effectiveness of a mindfulness-based education intervention on enhancing emotional competence and school belonging among high school students. A quasi-experimental pretest-posttest control group design was employed with a sample of 30 students (15 experimental, 15 control) from a public high school in Iran. The intervention group participated in an 8-week mindfulness training program integrated into their school schedule, while the control group received no such intervention. Standardized scales were used to measure emotional competence and school belonging before and after the intervention. Data were analyzed using multivariate analysis of covariance (MANCOVA). The results revealed significant improvements in both emotional competence and school belonging for the experimental group compared to the control group ( $p < 0.05$ ), demonstrating the positive impact of mindfulness practices on students' emotional and social well-being. The findings are consistent with previous research suggesting that mindfulness fosters emotional regulation, empathy, and a greater sense of connectedness in school settings. This study highlights the value of incorporating mindfulness into educational programs to support students' psychological and social development. It suggests the potential of mindfulness-based interventions to improve learning environments and recommends further longitudinal and large-scale research to validate and expand upon these findings.

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## Introduction

In recent decades, the challenges faced by adolescents within school environments have intensified, with heightened academic pressures, social anxieties, and emotional difficulties contributing to poor mental health outcomes and diminished school engagement ([Suldo et al., 2013](#)). Amid these concerns, researchers and educators have increasingly turned to mindfulness-based interventions (MBIs) as a promising tool to foster emotional well-being, self-regulation, and positive school experiences among students ([Zenner et al., 2014](#); [Zoogman et al., 2015](#)). Mindfulness—defined as the awareness that arises from paying attention, on purpose, in the present moment, and non-judgmentally ([Miller et al., 1995](#))—has been integrated into educational contexts to support student development beyond academic achievement.

Adolescents are in a critical period of emotional, social, and cognitive development. During this time, the acquisition of emotional competence—the ability to perceive, understand, express, and manage emotions effectively—is essential for healthy psychological functioning and interpersonal relationships ([Denham et al., 2003](#)). Emotional competence is strongly linked to academic performance, peer relations, and behavioral adjustment ([Brackett et al., 2004](#)). However, many high school students struggle with emotion regulation, especially amid the pressures of standardized education systems and competitive academic environments ([Compas et al., 2017](#)). Poor emotional competence can lead to increased anxiety, depression, and school disengagement ([Gross, 2013](#)).

Simultaneously, school belonging, defined as students' perception of being accepted, respected, included, and supported by others in the school environment ([Goodenow, 1993](#)), has emerged as a powerful predictor of academic motivation and psychological resilience. A strong sense of belonging contributes to lower dropout rates, higher engagement, and improved emotional health ([Allen et al., 2018](#); [Osterman, 2000](#)). Conversely, a lack of school belonging has been associated with behavioral problems, alienation, and academic failure ([Jennings et al., 2013](#)). Given the crucial roles of emotional competence and school belonging in adolescent development, educational interventions that simultaneously address both constructs are of significant importance.

Mindfulness-based education offers a promising pathway for promoting both emotional competence and school belonging. Numerous studies have demonstrated the potential of mindfulness practices in improving self-awareness, emotional regulation, and social relationships among youth ([Meiklejohn et al., 2012](#); [Schonert-Reichl & Lawlor, 2010](#)). Mindfulness encourages students to observe their emotions without judgment, which can reduce impulsive reactions and enhance thoughtful decision-making. This increased emotional awareness facilitates more effective social interactions, empathy, and communication—key components of emotional competence ([Roeser et al., 2013](#)). Additionally, by reducing stress and improving attention and compassion, mindfulness interventions contribute to a more inclusive and supportive school climate, fostering stronger connections and a sense of belonging among students ([Jennings, 2015](#)).

Mindfulness-based programs such as the MindUP curriculum ([Schonert-Reichl et al., 2015](#)), Learning to BREATHE ([Broderick & Metz, 2009](#)), and Mindfulness-Based Stress Reduction (MBSR) for teens ([Biegel et al., 2009](#)) have been widely implemented and studied in school contexts. These programs incorporate meditation, breath awareness, body scans, and mindful movement, as well as structured discussions around emotion and behavior. Meta-analyses have shown that MBIs have small to moderate effects on reducing anxiety and improving cognitive and emotional outcomes in school-age children ([Carsley et al., 2018](#); [Dunning et al., 2019](#)). Despite these positive findings, much of the existing research has focused on general well-being, with limited studies specifically targeting the dual outcomes of emotional competence and school belonging, especially in high school populations.

High school students face unique socio-emotional challenges distinct from those of elementary or middle school students. These include identity formation, peer influence, academic pressure, and future planning. Consequently, interventions for this age group must be developmentally appropriate and responsive to their lived experiences ([Eccles et al., 1993](#)). Implementing mindfulness-based education at this stage not only helps mitigate stress and emotional reactivity but also supports the development of key psychosocial skills

necessary for adulthood ([Felver et al., 2017](#)). In this context, a school-based mindfulness intervention tailored to enhance emotional competence and school belonging could provide a holistic approach to supporting adolescent development.

Moreover, from a theoretical standpoint, mindfulness practices align with Social Emotional Learning (SEL) frameworks, which emphasize the development of core competencies such as self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. Mindfulness training enhances many of these capacities and serves as a practical method for delivering SEL content within classroom settings. The emotional regulation and perspective-taking skills fostered through mindfulness can help students navigate the social dynamics of high school and develop a stronger connection to their peers and school community ([Sibinga et al., 2016](#)).

Despite growing interest in mindfulness education, there remains a need for empirical studies that examine its targeted effects on specific outcomes such as emotional competence and school belonging in adolescents. This gap is particularly pronounced in non-Western contexts, where cultural factors may influence students' receptiveness to mindfulness and their interpretations of emotional and social experiences ([Rodríguez-Ledo et al., 2018](#)). In many Eastern cultures, including Iran, emotional expression and social belonging are shaped by communal values and interdependence. Understanding how mindfulness interventions translate into these contexts is essential for developing culturally relevant educational practices.

Therefore, this study seeks to evaluate the effectiveness of a mindfulness-based educational intervention in enhancing emotional competence and school belonging among high school students. By using a structured program that integrates mindfulness exercises with reflective and interactive components, the research aims to assess changes in students' emotional awareness, emotion regulation skills, and perceptions of connectedness within their school environment. The study employs a quasi-experimental design with pre- and post-intervention measurements and includes both quantitative and qualitative components to provide a comprehensive evaluation of the intervention's impact.

Ultimately, this research contributes to the growing body of evidence supporting mindfulness in education while addressing a gap in the literature concerning its effects on emotional and social outcomes in high school students. The findings may have implications for school policy, teacher training, and curriculum development, offering a scalable and sustainable strategy to support student well-being and school climate.

## Method

### Sample and Sampling Method

The study employed a quasi-experimental pretest-posttest control group design with two groups: an experimental group and a control group. A total of 30 high school students (15 in each group) were purposively selected from a public secondary school in Tehran. The inclusion criteria included: (1) being a full-time student enrolled in grades 10 or 11, (2) willingness to participate in the entire duration of the study, and (3) absence of any prior mindfulness training. After selection, participants were randomly assigned to the experimental group ( $n = 15$ ) and control group ( $n = 15$ ) using a simple randomization procedure.

### Tools Used

**Multidimensional Emotional Competency Questionnaire: The MECQ-s** (Multidimensional Emotional Competency Questionnaire – short version) is a refined 32-item self-report instrument designed to assess emotional competence (EC) across multiple dimensions developed by [Gerbeth et al. \(2021\)](#). Derived from a longer 109-item version, this short form was developed through rigorous statistical and content-based

selection criteria, validated with a sample of 777 participants. The MECQ-s follows a four-dimensional framework, encompassing 11 key facets of emotional competence:

Attention to One's Own Emotions (e.g., recognizing emotional situations)

Clarity of Emotional Perception (e.g., identifying and differentiating emotions)

Empathy, Phantasy, and Perspective-Taking (e.g., understanding others' emotions)

Emotional Expressivity (positive, negative, and trust in expressivity)

Aggression Control (managing anger)

Emotion Masking (adapting emotional displays situationally)

Emotion Regulation (influencing and reflexively processing emotions)

Items are rated on a 5-point Likert scale (1 = does not apply to 5 = fully applies). Includes both positively and negatively worded items (reverse-scored where necessary). Reliability coefficients range from  $\alpha = .75$  to  $.76$ , indicating good consistency and construct validity supported by confirmatory factor analysis (CFA) and comparisons with the full MECQ (Gerbeth et al., 2021). In the present study reliability coefficients range from  $\alpha = .774$  to  $.888$  indicating good consistency as well. The minimum score attainable in this questionnaire is 32, whereas the maximum score is 160; thus, an elevated score signifies a greater level of emotional competence.

**School Belonging Scale:** To assess the construct of school belonging, the School Belonging Scale developed by Arslan and Duru (2017) was employed. This instrument comprises ten items, wherein participants convey their responses via a 5-point Likert scale ranging from nearly never to nearly always. The maximal attainable score is 50, whereas the minimal score is 10. In their research, Arslan and Duru (2017) documented that the reliability of this scale, as determined by the Cronbach's alpha coefficient, was 0.84, and its validity was deemed adequate through the application of confirmatory factor analysis. The reliability coefficient of this scale in the current investigation was found to be 0.81.

### Procedure

Prior to the intervention, all participants completed standardized pretest measures assessing emotional competence and school belonging. The experimental group received the Mindfulness-Based Education Intervention (MBEI), designed to enhance emotional regulation, self-awareness, and social connectedness. The intervention was delivered over the course of 10 weekly sessions, each lasting 60 minutes. Sessions were conducted in a group setting during school hours and facilitated by a trained school counselor with prior experience in mindfulness instruction. The control group received no intervention during this period and continued with their regular school activities.

After the 10-session intervention, both groups completed the posttest measures. Throughout the process, ethical considerations were strictly observed. Written informed consent was obtained from both the participants and their guardians. Participants were informed of their right to withdraw at any point without penalty, and confidentiality was ensured.

### Intervention Content

The MBEI was adapted from established school-based mindfulness curricula, incorporating elements such as:

- Mindful breathing and body scan exercises
- Awareness of thoughts and emotions
- Practicing gratitude and compassion
- Mindful listening and interpersonal awareness
- Reflection activities linked to school experiences

The intervention emphasized experiential learning and reflective practices, allowing students to connect mindfulness skills to real-life school challenges and relationships.

## Results

### Descriptive Statistics

Descriptive statistics were calculated for both the experimental and control groups on the two dependent variables: emotional competence and school belonging. As shown in Table 1, students in the experimental group demonstrated higher posttest scores on both emotional competence and school belonging compared to the control group.

**Table 1. Descriptive Statistics for Posttest Scores by Group**

Variables	Group	N	M	SD
Emotional Competence	Experimental	15	84.27	5.32
	Control	15	77.13	6.18
School Belonging	Experimental	15	41.20	3.89
	Control	15	36.80	4.11

### Assumptions of MANCOVA

Before conducting the MANCOVA, the following assumptions were tested:

Multivariate normality: Skewness and kurtosis values for all dependent variables were within  $\pm 1.5$ . Shapiro-Wilk tests were non-significant ( $p > .05$ ), indicating approximate normality.

Homogeneity of variance-covariance matrices: Box's M test was not significant (Box's M = 6.12,  $p = .284$ ), supporting this assumption.

Linearity: Scatterplots revealed linear relationships between the dependent variables.

Multicollinearity: Correlation between emotional competence and school belonging was  $r = .53$ ,  $p < .01$ , which is moderate and acceptable.

Homogeneity of regression slopes: No significant interaction was found between the covariate (pretest scores) and the group factor, indicating the assumption was met.

A multivariate analysis of covariance (MANCOVA) was performed to assess the impact of the mindfulness-based intervention on the combined dependent variables: emotional competence and school belonging—while controlling for pretest scores. The overall MANCOVA was statistically significant, Wilks' Lambda = 0.64,  $F(2, 26) = 33.13$ ,  $p < .01$ ,  $\eta^2 = .336$ , indicating a large effect size. Follow-up univariate ANCOVAs revealed:

Emotional Competence:  $F(1, 26) = 10.24$ ,  $p = .001$ ,  $\eta^2 = .28$

School Belonging:  $F(1, 26) = 9.18$ ,  $p = .006$ ,  $\eta^2 = .26$

These results indicate that the mindfulness-based education intervention had a statistically significant effect on both emotional competence and school belonging.

**Table 2. MANCOVA and Univariate ANCOVA Results**

Dependent Variable	F	P	Partial $\eta^2$
Multivariate (Wilks' $\Lambda$ )	7.13	.003	0.36
Emotional Competence	10.24	.004	0.28
School Belonging	9.18	.006	0.26



The results support the hypothesis that a mindfulness-based education intervention significantly enhances both emotional competence and school belonging among high school students compared to those who did not receive the intervention.

## Discussion & Conclusion

The aim of this study was to examine the effectiveness of a mindfulness-based education intervention on enhancing emotional competence and school belonging among high school students. The findings of the study indicate that the intervention had a statistically significant and practically meaningful effect on both emotional competence and school belonging. These results align with the growing body of literature highlighting the benefits of mindfulness-based interventions in school settings.

The experimental group demonstrated significantly higher posttest scores in emotional competence and school belonging compared to the control group. This suggests that engaging in mindfulness practices helps students develop greater self-awareness, emotional regulation, and empathy, which are essential components of emotional competence ([Schonert-Reichl & Lawlor, 2010](#)). The practices likely enhanced students' ability to pause, reflect, and respond adaptively to emotional situations, contributing to improved interpersonal functioning.

Increased school belonging in the experimental group may be attributed to the social-emotional learning (SEL) effects of the mindfulness program. Mindfulness fosters present-moment awareness and acceptance, which can create more positive classroom interactions and a sense of psychological safety ([Jennings et al., 2017](#)). As students become more attuned to their own experiences and those of their peers, they may feel more connected and valued within the school community, thereby enhancing their sense of belonging ([Osterman, 2000](#)).

The findings are consistent with previous research indicating that mindfulness interventions positively affect emotional and social outcomes among adolescents. For example, [Felver et al. \(2015\)](#) demonstrated improvements in emotion regulation and reduced emotional reactivity among students who participated in school-based mindfulness training. Similarly, research by [Zins et al. \(2014\)](#) highlighted that mindfulness-based SEL interventions led to increased emotional awareness and interpersonal skills.

Regarding school belonging, the results align with studies such as those by [Kalmanowitz and Ho \(2017\)](#), who found that mindfulness interventions created inclusive classroom environments, leading to stronger peer relationships and increased student engagement. Furthermore, this study complements the findings of [Burke \(2010\)](#), who reported that mindfulness interventions helped promote a stronger connection to school and improved mental well-being.

However, some researchers have noted variability in the outcomes of mindfulness interventions based on program fidelity, instructor competence, and student motivation ([Zenner et al., 2014](#)). The structured implementation in the present study, along with the use of trained facilitators, may have contributed to the program's effectiveness.

Despite these encouraging results, several limitations should be acknowledged. The relatively small sample size ( $N = 30$ ) and restriction to one geographic region may limit the generalizability of the findings to broader student populations. Also, the study measured outcomes shortly after the intervention. Long-term effects of the intervention were not assessed, and it is unclear whether the gains in emotional competence and school belonging are sustainable over time. Correspondingly, the reliance on self-reported data for emotional competence and school belonging may be subject to social desirability bias or inaccurate self-perception. Without follow-up data or qualitative interviews, we cannot explore the lived experiences or deeper subjective insights of the participants.

Future studies should include larger and more demographically diverse samples to enhance the generalizability of findings. To assess the durability of mindfulness intervention effects, follow-up studies at 3, 6, and 12 months post-intervention are recommended. Furthermore, incorporating qualitative data (e.g., focus groups, reflective journals) could provide a richer understanding of how students internalize and apply mindfulness in their daily lives. Exploring how teacher attitudes, modeling of mindfulness, and school

climate influence student outcomes would be valuable for implementation fidelity as well. Also, comparing mindfulness-based interventions to other SEL or cognitive-behavioral approaches could help identify the most effective components for enhancing emotional and social outcomes in educational settings.

This study contributes to the growing evidence base supporting the use of mindfulness-based interventions in educational contexts. By demonstrating improvements in emotional competence and school belonging, it highlights the potential of such programs to foster not only individual student well-being but also more inclusive and supportive school environments. With continued refinement and research, mindfulness education may become a cornerstone of holistic educational development.



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