

The Mediating Role of Resilience in the Relationship Between Mindfulness and Academic Stress Among High School Students

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Abstract

The rigorous academic and disciplinary demands of the boarding school system may increase students' academic stress. Within the framework of positive psychology, mindfulness and resilience are considered protective factors that help students cope with academic challenges. However, limited research has examined the mediating role of resilience in the relationship between mindfulness and academic stress among boarding school students. This study aimed to investigate the effect of mindfulness on academic stress, with resilience serving as a mediating variable. A quantitative approach was employed involving 330 students from Madrasah Aliyah Yayasan Islamic Centre Sumatera Utara. Data were collected using validated scales measuring mindfulness, resilience, and academic stress, and were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS). The findings revealed that mindfulness positively predicted resilience and negatively predicted academic stress. Resilience also showed a significant negative association with academic stress and partially mediated the relationship between mindfulness and academic stress. These results suggest that students with higher levels of mindfulness tend to develop greater resilience, which in turn helps reduce academic stress. The study highlights the importance of promoting mindfulness and resilience as psychological resources to support students' well-being and adaptation in demanding boarding school environments.

Keywords: mindfulness, academic stress, resilience, boarding school students, positive psychology.

Abstrak

Tuntutan akademik dan disiplin yang ketat di lingkungan sekolah berasrama berpotensi meningkatkan stres akademik pada siswa. Dalam perspektif psikologi positif, mindfulness dan resiliensi dipandang sebagai faktor protektif yang membantu siswa menghadapi tekanan akademik. Namun, penelitian mengenai peran resiliensi sebagai mediator dalam hubungan antara mindfulness dan stres akademik pada siswa sekolah berasrama masih terbatas. Penelitian ini bertujuan untuk menguji pengaruh mindfulness terhadap stres akademik dengan resiliensi sebagai variabel mediasi. Penelitian menggunakan pendekatan kuantitatif dengan melibatkan 330 siswa Madrasah Aliyah Yayasan Islamic Centre Sumatera Utara. Data dikumpulkan menggunakan skala mindfulness, resiliensi, dan stres akademik, kemudian dianalisis menggunakan Structural Equation Modeling–Partial Least Squares (SEM-PLS). Hasil penelitian menunjukkan bahwa mindfulness berpengaruh

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positif terhadap resiliensi dan berpengaruh negatif terhadap stres akademik. Resiliensi juga berpengaruh negatif terhadap stres akademik serta terbukti memediasi secara parsial hubungan antara mindfulness dan stres akademik. Temuan ini menunjukkan bahwa siswa dengan tingkat mindfulness yang lebih tinggi cenderung memiliki resiliensi yang lebih baik sehingga mampu mengurangi stres akademik yang dialami.

Kata kunci: mindfulness, stres akademik, resiliensi, siswa sekolah berasrama, psikologi positif.

Introduction

Academic stress has emerged as one of the most prevalent psychological challenges among adolescents, particularly within educational environments characterized by high performance expectations and intensive learning demands. Previous studies have consistently demonstrated that excessive academic stress is associated with emotional exhaustion, decreased academic engagement, anxiety, depression, and lower overall well-being (Jayanthi et al., 2015; Pascoe et al., 2020). According to Lazarus and Folkman's Stress and Coping Theory, stress occurs when individuals perceive environmental demands as exceeding their available coping resources. Consequently, identifying psychological factors that enhance students' adaptive coping capacities remains a critical issue in educational psychology.

The phenomenon of academic stress may be particularly pronounced in boarding school settings. Unlike conventional schools, boarding schools combine academic responsibilities with structured residential life, religious obligations, strict disciplinary regulations, and continuous social interaction among peers. Students are therefore required to adapt not only to academic expectations but also to communal living arrangements and institutional rules. Such conditions may increase vulnerability to academic stress through multiple pathways, including academic workload, reduced privacy, interpersonal conflicts, and limited opportunities for psychological recovery. Previous research suggests that stressors in boarding school environments are often more complex and multidimensional than those experienced by students in regular day schools (Santrock, 2010).

Within the positive psychology framework, mindfulness has been increasingly recognized as a protective psychological resource that may reduce academic stress. Mindfulness refers to an individual's capacity to maintain present-moment awareness with openness and non-judgmental acceptance of ongoing experiences (Kabat-Zinn, 2010). A growing body of evidence indicates that mindfulness is associated with lower levels of stress, anxiety, and emotional distress while simultaneously enhancing emotional regulation, concentration, and psychological well-being among adolescents and students (Alsubaie et al., 2021; Liu et al., 2023). Through enhanced awareness and self-regulation, mindfulness may help students respond more adaptively to academic and environmental challenges.

However, the relationship between mindfulness and academic stress may not be entirely direct. Resilience, defined as the capacity to adapt positively and recover from adversity, has been identified as a key psychological mechanism underlying successful stress management (Masten, 2021). Resilient individuals are more likely to perceive challenges as manageable and maintain psychological

functioning despite exposure to stressors. Recent studies have shown that mindfulness contributes positively to resilience development, while resilience serves as a significant predictor of lower academic stress and better psychological adjustment among adolescents (Zhou et al., 2023). These findings suggest that resilience may function as an important mediating mechanism through which mindfulness influences academic stress.

Although the relationships among mindfulness, resilience, and academic stress have received considerable scholarly attention, empirical evidence remains limited within Islamic boarding school contexts. Most previous studies have focused on general secondary schools or university students, whereas boarding schools present unique educational environments characterized by the simultaneous integration of academic, religious, and residential demands. Such contextual differences may influence both the development of resilience and the effectiveness of mindfulness in reducing stress. Furthermore, limited research has examined resilience as a mediating variable linking mindfulness and academic stress among boarding school students.

Therefore, this study aims to examine the direct effect of mindfulness on academic stress and the indirect effect through resilience among students enrolled in an Islamic boarding school. By investigating this mediation model, the study contributes to the growing literature on positive psychological resources in educational settings and provides evidence for developing preventive and school-based psychological interventions designed to enhance student well-being and adaptive functioning in high-demand educational environments.

Method

Research Design

This study employed a quantitative explanatory correlational design to examine the direct and indirect effects of mindfulness on academic stress through resilience among students enrolled in a boarding school system. The study was conducted between January and February 2026 at Madrasah Aliyah Yayasan Islamic Centre Sumatera Utara, Indonesia.

Participants

The population consisted of 330 students enrolled in the boarding school program. Because the population size was manageable, a total sampling technique was applied, resulting in 330 participants being included in the study. Participants represented students from different grade levels and had experienced both academic and residential demands associated with boarding school life.

Instruments

Three self-report psychological scales were administered using a five-point Likert response format ranging from 1 (strongly disagree) to 5 (strongly agree). Mindfulness Scale. Mindfulness was measured using a scale based on the dimensions of attention and awareness, reflecting students' ability to maintain conscious attention to present experiences. Academic Stress Scale, academic stress was assessed through four dimensions: affective, physiological, cognitive, and

behavioral responses to academic demands. Resilience Scale, Resilience was measured based on the Connor–Davidson resilience framework, which includes personal competence, trust in one's instincts, positive acceptance of change, control, and spiritual influences. Prior to data collection, all instruments underwent content validation by psychology experts and reliability testing to ensure measurement adequacy.

Procedure

Data were collected during regular school activities with permission from the school administration. Participants were informed about the purpose of the study and provided voluntary consent before completing the questionnaires. Confidentiality and anonymity were maintained throughout the research process.

Data Analysis

Data were analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS). The analysis consisted of two stages: evaluation of the measurement model (outer model) and evaluation of the structural model (inner model). The outer model assessment included indicator reliability, composite reliability, Cronbach's alpha, average variance extracted (AVE), and discriminant validity. The inner model assessment examined path coefficients, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and mediation effects through bootstrapping procedures. Statistical significance was determined at the 0.05 level.

Ethical Considerations

This study adhered to ethical principles in psychological research. Participation was voluntary, informed consent was obtained from all participants, and all responses were treated confidentially and used solely for research purposes.

Results

Measurement Model Assessment

The measurement model was evaluated by examining indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. All indicators demonstrated standardized outer loadings above the recommended threshold of 0.70, indicating satisfactory indicator reliability.

Table 1 presents the summary of convergent validity and reliability statistics. All constructs achieved Average Variance Extracted (AVE) values exceeding 0.50, confirming adequate convergent validity. Furthermore, Cronbach's Alpha (CA) and Composite Reliability (CR) values ranged from 0.850 to 0.969, surpassing the recommended threshold of 0.70 and indicating excellent internal consistency.

Table 1. Reliability and Convergent Validity Results

Construct	AVE	Cronbach's Alpha	Composite Reliability
Mindfulness	0.901	0.959	0.965
Resilience	0.858	0.964	0.969
Academic Stress	0.898	0.960	0.966

Discriminant validity was assessed using the Heterotrait–Monotrait Ratio (HTMT) and Fornell–Larcker criterion. As shown in Table 2, all HTMT values were below the recommended cutoff of 0.90, indicating adequate discriminant validity.

Table 2. HTMT Results

Constructs	HTMT
Resilience – Academic Stress	0.461
Resilience – Mindfulness	0.595
Academic Stress – Mindfulness	0.482

The Fornell–Larcker criterion further confirmed discriminant validity, as the square root of AVE for each construct exceeded its correlations with other constructs.

Structural Model Assessment

Prior to hypothesis testing, multicollinearity was assessed using Variance Inflation Factor (VIF). All VIF values ranged from 1.000 to 1.443, well below the threshold of 5.00, indicating the absence of multicollinearity issues. The structural model demonstrated satisfactory fit, with an SRMR value of 0.039, which is below the recommended cutoff of 0.08. The model explained 30.7% of the variance in resilience ($R^2 = 0.307$) and 25.8% of the variance in academic stress ($R^2 = 0.258$). Both endogenous constructs also showed acceptable predictive relevance ($Q^2 > 0$).

Table 3. Structural Model Evaluation

Endogenous Construct	R^2	Q^2
Resilience	0.307	0.261
Academic Stress	0.258	0.227

Figure 1 presents the final Structural Equation Model (SEM) examining the relationships among mindfulness, resilience, and academic stress among boarding school students. The model demonstrates that mindfulness has a significant positive effect on resilience ($\beta = 0.554$, $p < .001$) and a significant negative effect on academic stress ($\beta = -0.292$, $p < .001$). Resilience also shows a significant negative effect on academic stress ($\beta = -0.284$, $p < .001$).

The coefficient of determination indicates that mindfulness explains 30.7% of the variance in resilience ($R^2 = 0.307$), while mindfulness and resilience jointly explain 25.8% of the variance in academic stress ($R^2 = 0.258$). These findings suggest that students with higher levels of mindfulness tend to possess stronger resilience and experience lower levels of academic stress.

The measurement model demonstrates satisfactory psychometric properties. Mindfulness is represented by two dimensions, namely Attention (loading = 0.957) and Awareness (loading = 0.941). Resilience is reflected by five dimensions: Personal Competence (0.933), Positive Acceptance of Change (0.926), Secure Relationships (0.908), Control (0.920), and Spiritual Influences (0.943). Academic Stress is measured through four dimensions: Affective (0.939), Physiological (0.928), Cognitive (0.975), and Behavioral (0.948). All indicator loadings exceed the recommended threshold of 0.70, confirming strong construct validity.

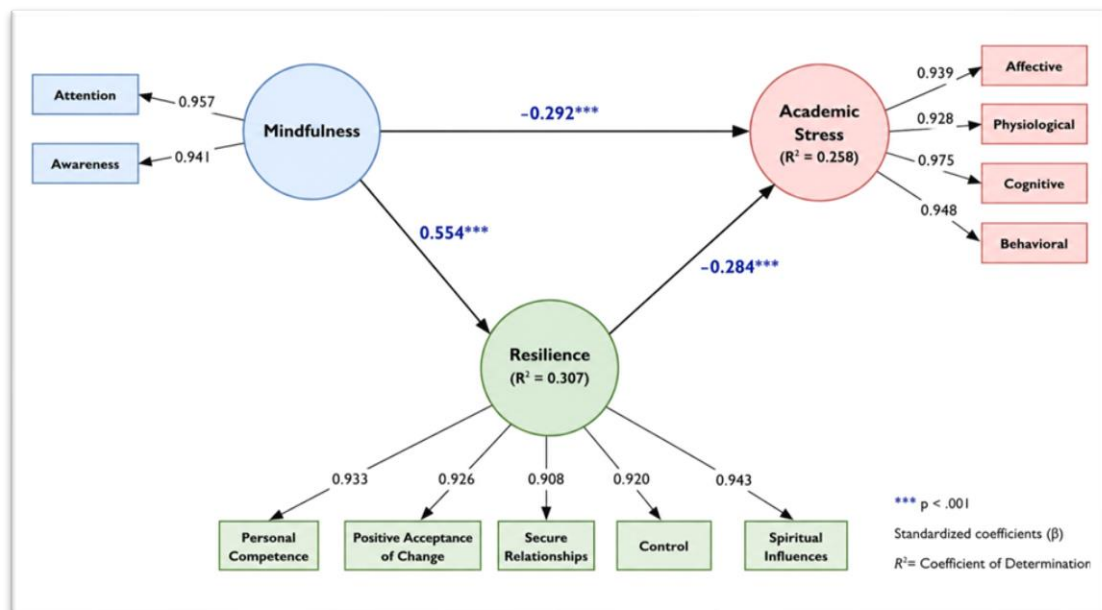


Figure 1. Final Structural Equation Model

Hypothesis Testing

The bootstrapping results indicated that all proposed direct relationships were statistically significant.

Table 4. Direct Effects

Path	β	p-value	Result
Mindfulness $\rightarrow$ Resilience	0.554	< .001	Supported
Mindfulness $\rightarrow$ Academic Stress	-0.292	< .001	Supported
Resilience $\rightarrow$ Academic Stress	-0.284	< .001	Supported

Mindfulness positively predicted resilience ($\beta = 0.554$, $p < .001$), indicating that students with higher levels of mindfulness tended to demonstrate greater psychological resilience. In addition, mindfulness negatively predicted academic stress ($\beta = -0.292$, $p < .001$), suggesting that mindful students experienced lower levels of academic stress. Resilience was also negatively associated with academic stress ($\beta = -0.284$, $p < .001$).

Mediation Analysis

The indirect effect of mindfulness on academic stress through resilience was statistically significant ($\beta = -0.158$, $p < .001$), indicating that resilience partially mediated the relationship between mindfulness and academic stress.

Table 5. Indirect Effect

Indirect Path	β	p-value	Mediation Type
Mindfulness → Resilience → Academic Stress	-0.158	< .001	Partial Mediation

The total effect analysis revealed that mindfulness exerted the strongest overall influence on both resilience and academic stress. Specifically, mindfulness showed a substantial positive effect on resilience ($\beta = 0.554$) and a moderate negative effect on academic stress ($\beta = -0.449$). These findings suggest that mindfulness functions both as a direct protective factor against academic stress and as an indirect resource that strengthens resilience, which subsequently reduces stress levels among boarding school students.

Table 6. Effect Size (f^2)

Path	f^2	Interpretation
Mindfulness → Resilience	0.44	Large
Mindfulness → Academic Stress	0.11	Small–Medium
Resilience → Academic Stress	0.09	Small

Discussion

This study aimed to examine the role of mindfulness in reducing academic stress, with resilience serving as a mediating variable among students in an Islamic boarding school. The findings revealed that all proposed hypotheses were supported. Mindfulness significantly reduced academic stress, positively predicted resilience, and resilience partially mediated the relationship between mindfulness and academic stress. These results suggest that mindfulness and resilience are important psychological resources that help students cope with the demanding academic environment of boarding schools.

The findings are consistent with Mindfulness Theory proposed by Kabat-Zinn (2010), which conceptualizes mindfulness as the ability to maintain moment-to-moment awareness of present experiences with openness, acceptance, and non-judgment. Students with higher levels of mindfulness are more capable of observing their thoughts, emotions, and academic challenges without becoming overwhelmed by them. Consequently, they are less likely to engage in maladaptive cognitive processes such as rumination, catastrophizing, or excessive worry about academic performance. This psychological mechanism explains why mindfulness directly contributes to lower levels of academic stress.

The present findings also support previous studies conducted by Lomas et al. (2021) and Regehr et al. (2013), which demonstrated that mindfulness interventions effectively reduce stress, anxiety, and psychological distress among students. According to Shapiro et al. (2006), mindfulness enhances emotional regulation and reduces automatic reactivity toward stressors. Therefore, students

who practice mindfulness are more likely to respond adaptively to academic pressures rather than perceiving them as overwhelming threats.

An important contribution of this study lies in its context. Unlike many previous studies conducted in conventional schools or universities, this research was conducted in an Islamic boarding school setting characterized by strict discipline, intensive academic demands, religious obligations, communal living arrangements, and limited personal space. These conditions create unique stressors that may intensify students' psychological burden. The fact that mindfulness remained a significant predictor of academic stress in this context extends the external validity of Mindfulness Theory and suggests that mindfulness is beneficial even in highly structured educational environments.

From an Islamic educational perspective, the findings are particularly meaningful. Daily religious practices commonly performed in Islamic boarding schools, such as congregational prayer (*shalat berjamaah*), *dhikr*, Qur'anic recitation, self-reflection (*muhasabah*), and contemplation (*tafakkur*), share several characteristics with mindfulness practices. These activities encourage focused attention, self-awareness, emotional regulation, and acceptance of present experiences. Consequently, the Islamic boarding school environment may naturally facilitate the development of mindfulness-related capacities. This finding highlights the potential integration of positive psychology and Islamic spiritual practices in promoting student well-being.

The results further indicated that mindfulness positively and significantly predicted resilience. This finding is consistent with the work of Keye and Pidgeon (2013), who reported that individuals with higher mindfulness tend to demonstrate stronger psychological resilience. The relationship can be explained through Broaden-and-Build Theory (Fredrickson, 2001), which proposes that positive psychological experiences broaden individuals' thought-action repertoires and build enduring psychological resources over time. Mindfulness fosters positive emotional experiences such as calmness, gratitude, acceptance, and optimism, which subsequently strengthen adaptive coping resources and resilience.

The findings also support Resilience Theory proposed by Masten (2021), which views resilience as a dynamic process of positive adaptation in the face of adversity rather than a fixed personality trait. In this study, mindfulness functioned as a protective factor that enhanced students' adaptive capacities, enabling them to manage academic challenges more effectively. For students living in boarding schools, resilience is particularly important because they must continuously adjust to academic expectations, social interactions, institutional regulations, and religious commitments.

Furthermore, resilience was found to have a significant negative effect on academic stress. This result aligns with previous findings by Wilks and Spivey (2010), who identified resilience as a protective factor against academic stress. Resilient students tend to perceive academic demands as manageable challenges rather than insurmountable threats. Consequently, they are better able to maintain psychological well-being despite experiencing considerable educational pressures.

One of the most important findings of this study is the partial mediating role of resilience in the relationship between mindfulness and academic stress. This result supports the theoretical model proposed by Shapiro et al. (2006), which suggests that mindfulness promotes psychological well-being through internal mechanisms such as emotional regulation, self-awareness, and adaptive coping capacities. However, the current findings indicate that mindfulness not only influences academic stress indirectly through resilience but also exerts a direct effect. This suggests that mindfulness operates through two complementary pathways: a direct pathway involving the regulation of stress responses and an indirect pathway through strengthening resilience.

The structural model further revealed that mindfulness exerted a stronger influence on academic stress than resilience. This finding suggests that self-awareness and present-moment attention may serve as foundational psychological capacities that facilitate the subsequent development of resilience. Therefore, mindfulness-based interventions may represent a particularly effective preventive strategy for reducing academic stress among boarding school students.

Overall, this study not only confirms previous theoretical and empirical findings but also extends understanding of the psychological mechanisms underlying academic stress within the context of Islamic boarding schools. By integrating Mindfulness Theory, Broaden-and-Build Theory, and Resilience Theory, the study provides a comprehensive explanation of how mindfulness and resilience interact to reduce academic stress. These findings contribute to the growing literature on positive psychology in education and offer practical implications for developing school-based interventions aimed at enhancing student well-being through mindfulness and resilience training integrated with Islamic values and spiritual practices.

Conclusion and Recommendations

This study concludes that mindfulness and resilience play significant roles in managing academic stress among boarding school students. Mindfulness was found to directly reduce academic stress while simultaneously enhancing resilience. Furthermore, resilience served as a partial mediator, strengthening the effect of mindfulness on the reduction of academic stress. These findings highlight that self-awareness and psychological resilience are key protective factors in helping students cope with the academic demands and challenges of a boarding school environment.

From a theoretical perspective, the results reinforce the relevance of Mindfulness Theory, Broaden-and-Build Theory, and Resilience Theory in explaining the psychological mechanisms underlying academic stress. Practically, the findings suggest that schools should integrate mindfulness-based programs and resilience development initiatives into student support and character-building activities. In addition, guidance and counseling services should adopt a more preventive approach by promoting emotional regulation, adaptive coping strategies, and psychological well-being among students.

Future research is encouraged to incorporate additional variables, such as social support, self-efficacy, emotional regulation, coping strategies, or spiritual well-being, to provide a more comprehensive understanding of academic stress in boarding school settings. Researchers are also advised to employ longitudinal or experimental designs to better capture causal relationships and examine the long-term effectiveness of mindfulness and resilience interventions in reducing academic stress among students.

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