KMAN PUBLISHING INSTITUTE
Journal Website

Article history:
Received 13 August 2026
Revised 13 November 2026
Accepted 20 November 2026
Initial Publication 21 November 2026
Final Publication 01 January 2027

KMAN Counseling & Psychology Nexus

Volume 5, pp 1-16

E-ISSN: 3041-9026

Causal Modeling of Emotional Exhaustion Based on Cognitive Avoidance and Psychological Flexibility with the Mediating Role of Mindfulness

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A r t i c l e I n f o

Article type:
Original Research

Section:
Clinical Psychology

How to cite this article:
Safarzad Asl, S., Bakhshipoor, A., & Hosseininasab, S. D. (2027). Causal Modeling of Emotional Exhaustion Based on Cognitive Avoidance and Psychological Flexibility with the Mediating Role of Mindfulness. *KMAN Conseling and Psychology Nexus, 5*, 1-16.
http://doi.org/10.61838/kman.psynexus.6726

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A B S T R A C T

The present study aimed to develop and test a causal model of emotional exhaustion based on cognitive avoidance and psychological flexibility, with mindfulness as a mediating variable among twelfth-grade students. This descriptive-correlational study was conducted using structural equation modeling. The statistical population consisted of twelfth-grade students enrolled in mathematics and physics, experimental sciences, and humanities programs in District 2 of Tabriz during the 2024–2025 academic year. A total of 360 students were selected through proportionate stratified random sampling combined with cluster sampling. Data were collected using the Multidimensional Fatigue Inventory developed by Smets et al. (1996), the Cognitive Avoidance Questionnaire developed by Sexton and Dugas (2008), the Psychological Flexibility Questionnaire developed by Ben-Itzhak et al. (2014), and the Five Facet Mindfulness Questionnaire developed by Baer et al. (2006). Data were analyzed using correlation analysis, structural equation modeling, the Sobel test, coefficients of determination, Stone–Geisser's Q^2 index, and the goodness-of-fit index. Cognitive avoidance had a significant direct effect on emotional exhaustion ($\beta = -0.172$, $t = 2.632$, $p < .01$). Psychological flexibility also significantly predicted emotional exhaustion ($\beta = 0.243$, $t = 4.046$, $p < .01$), and mindfulness had a significant direct effect on emotional exhaustion ($\beta = 0.158$, $t = 2.477$, $p < .05$). Mindfulness significantly mediated the relationship between cognitive avoidance and emotional exhaustion ($Z = -2.222$, VAF = 0.239, $p < .05$) and the relationship between psychological flexibility and emotional exhaustion ($Z = 2.049$, VAF = 0.124, $p < .05$). The model explained 43.3% of the variance in mindfulness and 64.6% of the variance in emotional exhaustion. Positive Q^2 values and a GOF value of 0.422 indicated satisfactory predictive relevance and overall model fit. The findings indicate that cognitive avoidance and psychological flexibility are significantly associated with emotional exhaustion both directly and indirectly through mindfulness, supporting the importance of mindfulness-related processes in explaining students' emotional exhaustion.

Keywords: *Emotional Exhaustion, Cognitive Avoidance, Psychological Flexibility, Mindfulness, Structural Equation Modeling, Students*

1. Introduction

Emotional exhaustion has increasingly been recognized as one of the most consequential psychological outcomes associated with prolonged academic demands, sustained performance pressure, and insufficient psychological resources among students. Within educational settings, emotional exhaustion reflects a condition of depleted emotional and mental energy in which students experience persistent fatigue, diminished enthusiasm, reduced capacity for effort, and a sense of being psychologically overextended by academic responsibilities. Although burnout has traditionally been examined in occupational contexts, the construct has been progressively extended to school and university populations because students are continuously exposed to workloads, examinations, achievement expectations, interpersonal demands, and uncertainty regarding their educational future. Research has demonstrated that school burnout is closely related to reduced academic engagement, depressive symptoms, lower achievement, and impaired adjustment, indicating that exhaustion is not merely a temporary emotional reaction but a potentially significant threat to educational functioning and psychological well-being (Fiorilli et al., 2019; Salmela-Aro & Upadyaya, 2020). Similar findings have shown that academic burnout is associated with students' self-efficacy, academic performance, procrastination, loneliness, and perceived learning environments, further emphasizing that emotional exhaustion emerges from the interaction of personal and contextual risk factors (Bahrami et al., 2017; Masoudi et al., 2022; Shahbazian Khoniq et al., 2018).

Adolescence, particularly the final years of secondary education, represents a developmental period in which vulnerability to emotional exhaustion may become especially pronounced. Twelfth-grade students are simultaneously confronted with intensive coursework, competitive examinations, future career decisions, family expectations, and heightened sensitivity to social evaluation. These demands can increase cognitive and emotional strain, particularly when students perceive that available personal resources are insufficient for managing academic pressures. Studies of educational functioning have demonstrated that psychological and motivational resources such as academic self-efficacy, aspirations, resilience, self-directed learning, and adaptive coping are strongly associated with academic outcomes and persistence (Ansonga et al., 2019; Raouf et al., 2024). Conversely, difficulties in emotional regulation, family flexibility, and psychological adjustment have been linked to academic burnout among high school students (Ebrahimi et al., 2022). Research on adolescent mental health also indicates that high school students may experience trajectories of anxiety and depression that interact with problematic behavioral patterns and academic stressors, underscoring the importance of examining the cognitive and psychological mechanisms involved in exhaustion during this developmental stage (Gao et al., 2021).

One of the cognitive processes that may contribute to emotional exhaustion is cognitive avoidance. Cognitive avoidance refers to deliberate or habitual attempts to suppress, replace, distract from, or otherwise disengage from distressing thoughts, images, memories, and anticipated threats. Although avoidance may temporarily reduce psychological discomfort, persistent reliance on this strategy can interfere with effective emotional processing, reinforce perceived threat, and increase the recurrence of unwanted cognitions. In academic situations, students may avoid thoughts related to examinations, failure, uncertainty, or perceived inadequacy rather than processing these concerns adaptively. Evidence suggests that avoidance is associated with maladaptive repetitive thinking, heightened stress, and impaired emotional regulation. Recent research has shown that cognitive avoidance can contribute to rumination through perfectionism and stress, indicating that avoidance may paradoxically strengthen the cognitive processes it is intended to suppress (An et al., 2025). Similarly, avoidance of examination-related experiences has been associated with lower mastery experiences, diminished perceived control, and increased test anxiety, suggesting that avoidance may undermine rather than protect academic adjustment over time (Patwain & Symes, 2025).

The relationship between avoidance processes and psychological distress is also supported by research examining experiential avoidance, metacognition, anxiety, and depression. Experiential avoidance involves unwillingness to remain in contact with uncomfortable internal experiences and efforts to alter their frequency, form, or situational context. Although cognitive avoidance is more specifically focused on thought-related strategies, both constructs reflect an inflexible orientation toward aversive internal events. Empirical evidence indicates significant associations among metacognitive beliefs, mindfulness, experiential avoidance, depression, and anxiety (Ådnøy et al., 2023). Moreover, mindfulness-based interventions have been found to reduce experiential

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E-ISSN: 3041-9026

avoidance and improve adaptive psychological characteristics, illustrating the possibility that avoidance processes can be modified through training in nonjudgmental awareness (Zhang et al., 2025). Cognitive-behavioral studies have also demonstrated that mindfulness-based cognitive therapy can reduce cognitive-behavioral avoidance and rumination, while cognitive-metacognitive interventions may enhance problem-solving strategies among adolescents facing educational difficulties (Ahmadi & Mousavipour, 2024; Ghadampour et al., 2017). Earlier research among anxious students likewise showed that mindfulness-based cognitive therapy could reduce worry and cognitive avoidance (Ahmadi et al., 2016).

Another construct that may play a critical role in explaining emotional exhaustion is psychological flexibility. Psychological flexibility refers to the capacity to remain in contact with present-moment experiences while adjusting thoughts, emotions, and behaviors in accordance with situational demands and personally meaningful goals. Rather than attempting to eliminate unpleasant internal experiences, psychologically flexible individuals are better able to tolerate distress, shift behavioral responses, and continue goal-directed action. Psychological flexibility is therefore considered a central adaptive process within contextual behavioral approaches and may serve as a protective resource under conditions of sustained academic stress. A systematic review of psychological flexibility among higher education students has shown that flexibility is associated with a broad range of psychological and educational outcomes, including lower distress and more adaptive functioning (Mursalzade et al., 2025). Similarly, evidence indicates that psychological flexibility can function as a source of resilience, whereas psychological inflexibility may intensify the cascading effects of stress on individual and family functioning (Daks et al., 2020).

The association between psychological flexibility and burnout has been demonstrated across multiple populations. Longitudinal evidence has indicated that higher psychological flexibility is related to lower emotional exhaustion over time, suggesting that flexibility may protect individuals from progressive depletion under continuing demands (Pakenham & Stafford-Brown, 2022). Among college students, psychological flexibility has also been associated with COVID-19-related burnout through perceived stress, indicating that flexible psychological responding may reduce exhaustion partly by changing the way stress is appraised and experienced (Ye et al., 2022). In academic settings, psychological flexibility has been linked to lower academic burnout and may mediate the relationship between resilience and burnout (Cherry et al., 2024). Iranian findings similarly indicate that psychological flexibility is relevant to academic burnout, mental health, and quality of life among students (Arab Jafari et al., 2021; Movahednejad et al., 2021). Psychometric work conducted among students has also supported the validity and reliability of psychological flexibility measurement, providing a methodological foundation for examining this construct in educational populations (Safarzaei et al., 2020).

Closely related to psychological flexibility is coping flexibility, which refers to the ability to modify coping strategies according to contextual requirements. Research has shown that coping flexibility and proactive coping are significant predictors of academic burnout among college students, reinforcing the broader proposition that rigid psychological responding increases vulnerability to exhaustion whereas flexible responding facilitates adaptation (Hyun et al., 2022). Cognitive flexibility has also been associated with psychological well-being, self-efficacy, cognitive empathy, and maladaptive behavioral patterns among high school students (Negahdari & Seif, 2022). Interventions designed to improve cognitive flexibility have shown beneficial effects on selective attention and academic achievement among students with learning difficulties, further illustrating the educational relevance of flexibility-related capacities (Talepasand et al., 2024). These findings suggest that flexibility may operate not merely as a general personality characteristic but as a functional regulatory resource that influences how students manage pressure, respond to setbacks, and maintain emotional balance.

Mindfulness represents another important mechanism potentially involved in the development or reduction of emotional exhaustion. Mindfulness is generally conceptualized as receptive, nonjudgmental awareness of present-moment experiences, including thoughts, emotions, bodily sensations, and environmental events. By promoting attentive awareness without immediate avoidance or overidentification, mindfulness may reduce automatic reactivity and facilitate more adaptive responses to academic stress. Evidence from acceptance- and mindfulness-based interventions suggests that mindfulness-related processes are important mediators of improvements in anxiety and depression (Walsh et al., 2022). Among students, mindfulness has been associated with lower psychological distress and greater psychological flexibility and valued living (Şık et al., 2025). Brief mindfulness interventions

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have also demonstrated beneficial effects on test anxiety and academic performance in high school students, showing that mindfulness may have direct relevance to the challenges experienced during secondary education (Wang et al., 2025).

Mindfulness may be particularly important in explaining emotional exhaustion because it changes how individuals relate to stressful thoughts rather than merely altering the presence of those thoughts. Students who are able to observe academic concerns without becoming excessively entangled in them may be less likely to rely on avoidance, rumination, or rigid coping responses. Experimental and mediation research supports this proposition. In online mindfulness interventions, reductions in experiential avoidance have been identified as an important mechanism through which mindfulness exerts psychological effects (He et al., 2024). In clinical research, mindfulness skills and experiential avoidance have also emerged as therapeutic mechanisms in mindfulness-based cognitive therapy and lifestyle interventions (Garcia-Toro et al., 2023). Among university students, mindfulness, self-compassion, and psychological flexibility have jointly predicted lower depressive symptoms, suggesting that mindfulness operates within a broader network of adaptive regulatory processes (Aziz et al., 2021). These findings provide a theoretical basis for examining mindfulness not only as an independent predictor but also as a mediator connecting cognitive and flexibility-related processes with emotional outcomes.

The relevance of mindfulness to burnout has also been demonstrated more directly. Among students in science, technology, engineering, and mathematics, mindfulness has been associated with burnout and attention-related failures, suggesting that diminished present-moment attention may accompany exhaustion under cognitively demanding educational conditions (Saxena, 2024). Iranian research has similarly indicated that mindfulness may mediate the protective effects of psychological flexibility and self-leadership on academic burnout among university entrance examination students (Esmaili et al., 2024). A structural model involving mindfulness has also been applied to school dropout, with mindfulness positioned as a mediator between self-directed learning, family functioning, and educational disengagement (Mousivand et al., 2023). Together, these studies suggest that mindfulness may serve as a regulatory bridge through which broader cognitive and psychological characteristics influence students' academic adjustment.

The conceptual connection among cognitive avoidance, psychological flexibility, mindfulness, and emotional exhaustion is particularly compelling when considered from a process-oriented perspective. Cognitive avoidance reflects an effort to distance oneself from unpleasant internal experiences, whereas mindfulness involves approaching those same experiences with awareness and reduced judgment. Psychological flexibility, meanwhile, refers to the ability to remain open to internal experience while adapting behavior to situational demands and personally valued goals. Accordingly, cognitive avoidance and psychological flexibility may represent relatively opposing modes of psychological regulation, with mindfulness potentially functioning as a mechanism that explains how these processes influence exhaustion. Recent network research on cognitive emotion-regulation strategies and academic burnout in children and adolescents further suggests that specific regulatory strategies are differentially connected to distinct dimensions of burnout, supporting the need for models that examine multiple psychological processes simultaneously (Iuga et al., 2025). Research on cognitive emotion-regulation strategies among university students likewise shows meaningful associations between regulation patterns and academic burnout (Naz & Qureshi, 2024).

Burnout is not determined solely by intrapersonal factors, and educational context remains important. Teacher-student relationships have been shown to predict emotional exhaustion and personal accomplishment among educators, demonstrating the role of interpersonal environments in exhaustion processes (Corbin et al., 2019). At the organizational level, support and management conditions can influence turnover-related outcomes, indicating that exhaustion-related processes are embedded within wider systems of demands and resources (Li et al., 2021). Within schools, students' perceived learning environments and educational conditions are similarly relevant. Qualitative research has identified multiple educational, technological, familial, and motivational factors contributing to academic decline during online education (Ghasemi & Kadkhoda, 2023), while school burnout research has consistently emphasized the interaction between demands, resources, engagement, and well-being (Salmela-Aro & Upadyaya, 2020). These contextual findings do not diminish the importance of individual psychological processes; rather, they underscore why students exposed to similar academic demands may differ markedly in their emotional responses depending on their internal regulatory resources.

The importance of self-regulatory mechanisms is also evident in research on self-efficacy and burnout. Academic self-efficacy has been repeatedly associated with lower burnout and better academic functioning, and grit has been

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identified as a mediator in the relationship between academic self-efficacy and school burnout (Özhan, 2021). Similarly, academic underachievement among high-ability students has been linked to multiple internal and external factors, including motivational, cognitive, emotional, familial, and educational determinants (Raouf et al., 2024). These findings reinforce the value of multifactorial models in which emotional exhaustion is not attributed to a single antecedent but is understood as the outcome of interacting cognitive and psychological processes. From this perspective, cognitive avoidance may increase vulnerability by encouraging disengagement from distressing thoughts, whereas psychological flexibility and mindfulness may facilitate adaptive contact with difficult experiences and preserve effective functioning.

Evidence also indicates that emotion regulation itself is closely connected to adolescent burnout. Research has demonstrated a relationship between emotion-regulation patterns and academic burnout among adolescents, with individual and contextual factors influencing the strength of this association (Zhao et al., 2021). Difficulties in cognitive and emotional regulation may therefore represent important pathways through which academic demands become translated into exhaustion. Studies of psychological flexibility, mindfulness, and valued living among students further show that these capacities are inversely associated with psychological distress and may promote more adaptive responses to demanding academic contexts (Şık et al., 2025). In this sense, mindfulness may reduce emotional exhaustion by weakening maladaptive avoidance processes and strengthening flexible engagement with stressful academic experiences.

Despite the growing literature on burnout, cognitive avoidance, psychological flexibility, and mindfulness, several gaps remain. First, much of the available evidence has focused on university students, clinical groups, or adults rather than twelfth-grade students facing intensive academic and examination demands. Second, many studies have examined these variables separately or in pairwise relationships instead of testing an integrated explanatory model. Third, although mindfulness has increasingly been recognized as a mechanism of change in psychological interventions, fewer studies have examined whether mindfulness mediates the effects of both maladaptive cognitive avoidance and adaptive psychological flexibility on emotional exhaustion within the same structural model. Finally, cultural and educational differences may influence how these constructs function, making it important to test such relationships in specific student populations rather than assuming that results obtained in other settings generalize directly.

Accordingly, the present study aimed to develop and test a causal model of emotional exhaustion based on cognitive avoidance and psychological flexibility, with mindfulness as a mediating variable among twelfth-grade students.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a descriptive-correlational research design based on structural equation modeling (SEM) to investigate the causal relationships among emotional exhaustion, cognitive avoidance, psychological flexibility, and mindfulness and, specifically, to examine the mediating role of mindfulness in the relationships between the predictor variables and emotional exhaustion. The statistical population consisted of all twelfth-grade students enrolled in mathematics and physics, experimental sciences, and humanities programs in District 2 of Tabriz during the 2024–2025 academic year. According to the available educational records, the population comprised 2,935 students studying in 50 schools, including 976 female and 1,118 male students as reported in the available demographic information. The sample size was determined according to the requirements of structural equation modeling and the recommended rule of approximately 10 to 15 participants for each observed variable or model parameter. Considering the number of variables and indicators included in the proposed model, a sample of 360 students was considered adequate for obtaining stable parameter estimates and testing the hypothesized structural relationships.

A proportionate stratified random sampling procedure combined with cluster sampling was employed to select the participants. Initially, the statistical population was divided into separate strata according to academic major, including mathematics and physics, experimental sciences, and humanities. The proportion of students belonging to each academic major in the total population was then calculated, and the number of participants selected from each stratum was determined proportionally to its population size. In the subsequent stage, cluster sampling was implemented at the school and classroom levels. From among the 50 schools operating in District 2 of Tabriz, a number of schools were selected randomly. Within each selected school, one class and one academic major were randomly selected, and eligible students attending the selected classes were invited

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to participate in the study. Students were eligible for participation if they were enrolled in the twelfth grade during the study period, belonged to one of the three specified academic majors, and were willing to participate and complete the research questionnaires. Questionnaires with substantial missing responses or incomplete response patterns were excluded from the final analysis. Participants were informed of the general objectives of the research and were assured that their responses would remain confidential and would be analyzed exclusively for research purposes. Participation was voluntary, and students were informed that they could discontinue their participation at any stage without adverse consequences.

2.2. Data Collection Tools

Emotional exhaustion was assessed using the 20-item Multidimensional Fatigue Inventory developed by Smets et al. (1996). The instrument consists of five dimensions: general fatigue, physical fatigue, reduced activity, reduced motivation, and mental fatigue. The items are rated on a five-point response scale ranging from 1, indicating that the statement is completely true of the respondent, to 5, indicating that the statement is completely untrue. The questionnaire was originally evaluated across several demographic and clinical populations, including cancer patients receiving radiotherapy, individuals with chronic fatigue syndrome, first-year psychology and medical students, military personnel, and third-year medical students. Confirmatory factor analytic findings supported the multidimensional structure of the questionnaire and indicated that the items assigned to each dimension appropriately represented their corresponding latent construct. The instrument has also demonstrated satisfactory internal consistency, with Cronbach's alpha coefficients exceeding .80 for the general fatigue, physical fatigue, and mental fatigue dimensions and coefficients exceeding .65 for the reduced activity and reduced motivation dimensions. Subsequent investigations have similarly provided evidence supporting the reliability and construct validity of the instrument. The questionnaire was used in the present study to operationalize the fatigue and exhaustion characteristics constituting the principal outcome variable.

Cognitive avoidance was measured using the Cognitive Avoidance Questionnaire developed by Sexton and Dugas (2008). The questionnaire consists of 25 items rated on a five-point Likert scale ranging from 1, “completely untrue,” to 5, “completely true.” It assesses five components of cognitive avoidance, namely thought suppression, thought substitution, distraction, avoidance of threatening stimuli, and transformation of images into verbal thoughts. Higher scores indicate a greater tendency to employ cognitive avoidance strategies when confronting distressing thoughts, emotions, or threatening internal experiences. Sexton and Dugas (2008) reported excellent internal consistency for the total questionnaire, with a Cronbach's alpha coefficient of .95, and a six-week test-retest reliability coefficient of .85. Psychometric evaluation of the Persian version also demonstrated satisfactory reliability, with a Cronbach's alpha coefficient of .86 and a two-month test-retest reliability coefficient of .80. In another Iranian study, the Cronbach's alpha coefficient for the total cognitive avoidance score was reported as .89. The reliability coefficients for the subscales were .92 for thought suppression, .79 for thought substitution, .86 for distraction, .91 for avoidance of threatening stimuli, and .86 for transformation of images into thoughts, indicating adequate to excellent internal consistency across the different dimensions of the scale.

Psychological flexibility was assessed using the Psychological Flexibility Questionnaire developed by Ben-Itzhak, Bluvstein, and Maor (2014). The questionnaire contains 20 items organized into five components and is scored on a six-point Likert scale ranging from 1, “never,” to 6, “very much.” Higher scores indicate a greater capacity to adjust cognitive, emotional, and behavioral responses according to changing situational demands and to engage adaptively with difficult internal and external experiences. In the original psychometric investigation conducted by Ben-Itzhak, Bluvstein, and Maor (2014), the total scale demonstrated excellent internal consistency, with a Cronbach's alpha coefficient of .918. Construct validity and convergent validity were also examined. Exploratory factor analysis using principal component analysis with Varimax rotation supported a five-factor structure, with the five extracted factors explaining 66.8% of the total variance. Evaluation of the Persian version similarly supported its psychometric adequacy. In the study by Safarzadeh and colleagues, Cronbach's alpha for the total scale was .89, and the five extracted factors collectively explained 59.83% of the total variance. In the present study, the Cronbach's alpha coefficient for the total psychological flexibility questionnaire was .82, demonstrating satisfactory internal consistency in the study sample.

Mindfulness was measured using the Five Facet Mindfulness Questionnaire developed by Baer et al. (2006).

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The instrument contains 39 items and evaluates five dimensions of mindfulness: observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience. Responses are provided on a five-point Likert scale ranging from 1, “never or very rarely true,” to 5, “very often or always true.” Higher scores reflect greater dispositional mindfulness and a stronger tendency to maintain present-moment awareness while adopting a nonjudgmental and nonreactive orientation toward internal experiences. Previous psychometric investigations have indicated satisfactory internal consistency for the five dimensions, with Cronbach's alpha coefficients ranging from .75 for nonreactivity to .91 for describing. Correlations among the dimensions have generally been moderate and statistically significant, ranging from approximately .15 to .34, supporting the conceptual distinctiveness of the five facets while demonstrating their association with the broader mindfulness construct. Psychometric assessment of the Persian version has also provided acceptable evidence of reliability. Test-retest correlation coefficients for the Iranian version ranged from .57 for the nonjudging facet to .84 for the observing facet, while Cronbach's alpha coefficients ranged from .55 for nonreactivity to .83 for describing. In the present study, Cronbach's alpha for the total mindfulness scale was .89, indicating good internal consistency.

2.3. Data Analysis

Data analysis was conducted at both descriptive and inferential levels. Before testing the hypothesized structural model, the dataset was screened for incomplete responses, coding errors, extreme observations, and potential violations of the assumptions underlying multivariate statistical analysis. Descriptive statistics, including frequency, percentage, mean, standard deviation, minimum, and maximum scores, were calculated to describe the demographic characteristics of the participants and the distribution of the main study variables. The internal consistency of the measurement instruments was evaluated using Cronbach's alpha coefficients. The distributions of emotional exhaustion, cognitive avoidance, psychological flexibility, and mindfulness were examined to determine whether the data sufficiently approximated normality. Skewness and kurtosis indices were evaluated, and the suitability of the data for structural equation modeling was assessed prior to estimating the structural relationships. Potential multicollinearity among the predictor variables was also examined because excessive correlations among exogenous constructs could adversely affect the stability and interpretability of structural coefficients.

Pearson product-moment correlation coefficients were calculated to determine the direction and magnitude of the bivariate relationships among emotional exhaustion, cognitive avoidance, psychological flexibility, and mindfulness. Subsequently, structural equation modeling was employed to test the proposed causal model in which cognitive avoidance and psychological flexibility were specified as exogenous predictor variables, mindfulness was specified as the mediating variable, and emotional exhaustion was specified as the endogenous outcome variable. Both direct and indirect pathways were estimated. Accordingly, the model examined the direct effects of cognitive avoidance and psychological flexibility on emotional exhaustion, the effects of cognitive avoidance and psychological flexibility on mindfulness, the effect of mindfulness on emotional exhaustion, and the indirect effects of cognitive avoidance and psychological flexibility on emotional exhaustion through mindfulness. Standardized path coefficients, standard errors, critical ratios or corresponding test statistics, and significance levels were used to evaluate the hypothesized relationships.

The adequacy of the proposed structural model was evaluated using several complementary goodness-of-fit indices rather than relying on a single statistic. The chi-square statistic and the ratio of chi-square to degrees of freedom were considered alongside absolute and comparative fit indices, including the Root Mean Square Error of Approximation, Comparative Fit Index, Goodness-of-Fit Index, Adjusted Goodness-of-Fit Index, and other relevant model-fit indicators. A chi-square-to-degrees-of-freedom ratio below approximately 3, RMSEA values below .08, and comparative fit indices approaching or exceeding .90 were considered indicative of an acceptable model fit. The statistical significance of the mediated effects of mindfulness was examined using a bootstrap procedure based on repeated resampling of the observed data. An indirect effect was considered statistically significant when its bootstrap confidence interval did not include zero. The coefficient of determination for the endogenous variables was also examined to determine the proportion of variance in mindfulness and emotional exhaustion explained by the predictor variables included in the model. All statistical tests were interpreted at a significance level of .05, and structural equation modeling was used as the principal analytical

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framework for evaluating the overall consistency of the proposed theoretical model with the observed data.

3. Findings and Results

The descriptive characteristics of the study variables were initially examined for the 360 participants. Table 1 presents the mean, standard deviation, minimum and maximum observed scores, together with the results of the Kolmogorov–Smirnov test for cognitive avoidance, psychological flexibility, emotional exhaustion, and mindfulness. The mean scores for cognitive avoidance, psychological flexibility, emotional exhaustion, and mindfulness were 84.74, 85.19, 64.16, and 119.88, respectively. The corresponding standard deviations were 15.34, 14.22, 12.76, and 12.09. Cognitive avoidance scores ranged from 27 to 120, psychological flexibility scores ranged from 25 to 116, emotional exhaustion scores ranged from 28 to 99, and mindfulness scores ranged from 85 to 160. The Kolmogorov–Smirnov statistics were statistically significant for all four variables, indicating departure from univariate normality. Accordingly, the subsequent structural analyses were interpreted within a variance-based structural equation modeling framework, which is relatively robust to deviations from multivariate normality.

Table 1

Descriptive Statistics and Kolmogorov–Smirnov Test Results for the Study Variables

Variable	N	Mean	SD	Minimum	Maximum	Kolmogorov–Smirnov Statistic	p
Cognitive avoidance	360	84.74	15.34	27	120	0.055	0.010
Psychological flexibility	360	85.19	14.22	25	116	0.055	0.010
Emotional exhaustion	360	64.16	12.76	28	99	0.053	0.017
Mindfulness	360	119.88	12.09	85	160	0.091	<0.010

The measurement properties of the latent constructs were subsequently examined through Cronbach's alpha, composite reliability, and average variance extracted. As shown in Table 2, Cronbach's alpha coefficients ranged from .812 to .870 and composite reliability coefficients ranged from .782 to .879. Thus, all coefficients exceeded the commonly accepted threshold of .70. Furthermore, AVE values ranged from .529 to .687, exceeding the recommended minimum criterion of .50 for all constructs. These results indicated satisfactory internal consistency reliability and convergent validity for cognitive avoidance, psychological flexibility, emotional exhaustion, and mindfulness.

Table 2

Reliability and Convergent Validity of the Study Constructs

Construct	Composite Reliability	Cronbach's Alpha	AVE
Cognitive avoidance	0.869	0.870	0.621
Psychological flexibility	0.782	0.850	0.658
Emotional exhaustion	0.879	0.854	0.687
Mindfulness	0.816	0.812	0.529

Discriminant validity was evaluated by comparing the square root of the AVE for each construct with its correlations with the other constructs. Table 3 presents the inter-construct correlation matrix, with the square roots of AVE displayed on the principal diagonal. The diagonal values were .788 for cognitive avoidance, .811 for psychological flexibility, .829 for emotional exhaustion, and .727 for mindfulness. In each case, the diagonal value was greater than the absolute correlations of the corresponding construct with the remaining variables, supporting adequate discriminant validity. The observed correlations also demonstrated that cognitive avoidance was negatively associated with emotional exhaustion and mindfulness, whereas psychological flexibility was positively related to both emotional exhaustion and mindfulness. Mindfulness was positively correlated with emotional exhaustion in the observed data.

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Table 3

Correlations and Discriminant Validity of the Study Constructs

Variable	1	2	3	4
1. Cognitive avoidance	0.788			
2. Psychological flexibility	0.094	0.811		
3. Emotional exhaustion	-0.256	0.398	0.829	
4. Mindfulness	-0.372	0.315	0.427	0.727

Following confirmation of the reliability and validity of the measurement model, the structural relationships among the latent variables were examined. The coefficient of determination for mindfulness was (R^2=.433), indicating that cognitive avoidance and psychological flexibility jointly accounted for 43.3% of the variance in mindfulness. The coefficient of determination for emotional exhaustion was (R^2=.646), demonstrating that cognitive avoidance, psychological flexibility, and mindfulness jointly explained 64.6% of the variance in emotional exhaustion. These coefficients indicated substantial explanatory capacity for the endogenous variables, particularly emotional exhaustion.

The direct structural effects are reported in Table 4. Cognitive avoidance exerted a statistically significant direct effect on emotional exhaustion, with a standardized path coefficient of (\beta=-.172), a standard error of .065, and a t value of 2.632. Because the absolute t value exceeded 2.58, this path was statistically significant at the .01 level. Thus, higher cognitive avoidance was associated with lower emotional exhaustion within the estimated structural model. Psychological flexibility also had a statistically significant direct effect on emotional exhaustion ((\beta=.243), SE = .060, t = 4.046, p < .01). The magnitude of the t statistic indicated a robust direct relationship between psychological flexibility and emotional exhaustion. Mindfulness likewise exerted a statistically significant direct effect on emotional exhaustion ((\beta=.158), SE = .069, t = 2.477, p < .05). Therefore, each of the three direct structural paths leading to emotional exhaustion was statistically significant.

Table 4

Direct Effects in the Structural Model

Structural Path	β	SE	t	Significance	Result
Cognitive avoidance → Emotional exhaustion	-0.172	0.065	2.632	p < .01	Supported
Psychological flexibility → Emotional exhaustion	0.243	0.060	4.046	p < .01	Supported
Mindfulness → Emotional exhaustion	0.158	0.069	2.477	p < .05	Supported

The mediating role of mindfulness was subsequently examined using the Sobel test. For the indirect effect of cognitive avoidance on emotional exhaustion through mindfulness, the path coefficient from cognitive avoidance to mindfulness was (-.341), while the path coefficient from mindfulness to emotional exhaustion was .158. The corresponding standard errors were .062 and .064, respectively. The Sobel statistic was (Z=-2.222), whose absolute value exceeded the critical value of 1.96, indicating that the indirect effect was statistically significant at the .05 level. The variance accounted for index was .239, indicating that 23.9% of the total effect of cognitive avoidance on emotional exhaustion was transmitted through mindfulness. These findings supported the mediating role of mindfulness in the relationship between cognitive avoidance and emotional exhaustion.

A significant mediating effect of mindfulness was also found in the relationship between psychological flexibility and emotional exhaustion. The standardized path coefficient from psychological flexibility to mindfulness was .218, and the coefficient from mindfulness to emotional exhaustion was .158. Their corresponding standard errors were .055 and .064. The Sobel test yielded (Z=2.049), which exceeded the 1.96 criterion and indicated a statistically significant indirect effect at the .05 level. The VAF value was .124, showing that 12.4% of the overall effect of psychological flexibility on emotional exhaustion was explained through mindfulness. Accordingly, mindfulness significantly mediated the relationship between psychological flexibility and emotional exhaustion. The results of the mediation analyses are summarized in Table 5.

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Table 5

Sobel Test Results for the Mediating Role of Mindfulness

Indirect Relationship	a	SEa	b	SEb	Direct Effect (c)	Sobel Z	VAF	Result
Cognitive avoidance → Mindfulness → Emotional exhaustion	-0.341	0.062	0.158	0.064	-0.172	-2.222*	0.239	Supported
Psychological flexibility → Mindfulness → Emotional exhaustion	0.218	0.055	0.158	0.064	0.243	2.049*	0.124	Supported

The predictive relevance of the structural model was further assessed using Stone–Geisser's (Q^2) criterion. This index evaluates the predictive capability of the model for endogenous constructs and was obtained through the blindfolding procedure. The procedure produces cross-validated communality and cross-validated redundancy coefficients, with positive cross-validated redundancy values indicating that the structural model possesses predictive relevance for the respective endogenous construct. As presented in Table 6, the cross-validated communality values were .357 for cognitive avoidance, .384 for psychological flexibility, .412 for emotional exhaustion, and .257 for mindfulness. Cross-validated redundancy, which is relevant to endogenous constructs, was .285 for emotional exhaustion and .225 for mindfulness. Both values were positive, providing evidence of satisfactory predictive relevance for the structural model.

Table 6

Explanatory and Predictive Indices of the Structural Model

Construct	R^2	CV-Com	CV-Red
Cognitive avoidance	—	0.357	—
Psychological flexibility	—	0.384	—
Emotional exhaustion	0.646	0.412	0.285
Mindfulness	0.433	0.257	0.225

Finally, the overall goodness-of-fit index for the model was calculated as (GOF=.422). Given that this value exceeds the conventional benchmark of .36 for a strong overall fit in variance-based structural equation modeling, the estimated model demonstrated a satisfactory overall level of fit. Taken together, the reliability and validity coefficients, coefficients of determination, predictive relevance indices, and overall goodness-of-fit statistic supported the adequacy of the proposed structural model. The results showed that cognitive avoidance and psychological flexibility had significant direct effects on emotional exhaustion and that mindfulness also significantly predicted emotional exhaustion. In addition, mindfulness significantly mediated both the relationship between cognitive avoidance and emotional exhaustion and the relationship between psychological flexibility and emotional exhaustion.

4. Discussion

The present study examined a causal model of emotional exhaustion based on cognitive avoidance and psychological flexibility, with mindfulness as a mediating variable among twelfth-grade students. The structural model demonstrated satisfactory explanatory and predictive power. Cognitive avoidance, psychological flexibility, and mindfulness each showed significant direct relationships with emotional exhaustion, while mindfulness significantly mediated the relationships of both cognitive avoidance and psychological flexibility with emotional exhaustion. In addition, cognitive avoidance and psychological flexibility jointly explained 43.3% of the variance in mindfulness, whereas the predictors included in the structural model explained 64.6% of the variance in emotional exhaustion. The positive Stone–Geisser predictive relevance coefficients and the overall goodness-of-fit value further indicated that the proposed model possessed acceptable predictive and structural adequacy. Taken together, these findings suggest that emotional exhaustion among students is related not only to the presence of academic demands but also to the cognitive and psychological processes through which students respond to difficult internal experiences.

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The first important finding was that cognitive avoidance had a significant direct relationship with emotional exhaustion. In the estimated structural model, the standardized coefficient was negative, indicating that higher cognitive avoidance scores were associated with lower emotional exhaustion after the other variables in the model had been statistically controlled. This finding should be interpreted within the multivariate structure of the model rather than as evidence that avoidance is generally psychologically beneficial. Previous research has typically described cognitive or experiential avoidance as a maladaptive regulatory strategy associated with rumination, stress, anxiety, and impaired psychological adjustment. For example, cognitive avoidance has been shown to predict rumination through perfectionism and perceived stress, suggesting that efforts to suppress or escape unwanted thoughts may ultimately intensify repetitive negative cognition (An et al., 2025). Similarly, avoidance of examinations has been related to lower mastery experiences, reduced perceived control, and increased test anxiety (Patwain & Symes, 2025). Research on metacognitive processes has also demonstrated meaningful associations among experiential avoidance, mindfulness, anxiety, and depression (Ådnøy et al., 2023). Therefore, the negative direct coefficient obtained in the present study may reflect the unique effect of cognitive avoidance after shared variance with mindfulness and psychological flexibility was removed rather than the zero-order psychological function of avoidance.

This interpretation is reinforced by the negative correlation observed between cognitive avoidance and mindfulness. Students who relied more heavily on suppressing, replacing, distracting from, or avoiding threatening cognitions tended to report lower mindfulness. This pattern is theoretically coherent because mindfulness requires awareness and acceptance of present internal experiences, whereas cognitive avoidance involves disengagement from or modification of those experiences. Previous intervention studies have demonstrated that mindfulness-based cognitive therapy can reduce worry and cognitive avoidance among anxious students (Ahmadi et al., 2016), and mindfulness-based cognitive therapy has also been effective in reducing cognitive-behavioral avoidance and rumination (Ghadampour et al., 2017). More recent research has shown that experiential avoidance can operate as an important mechanism during mindfulness-based interventions (He et al., 2024), while reductions in experiential avoidance have accompanied improvements following mindfulness-based programs (Zhang et al., 2025). Thus, although the direct path from cognitive avoidance to emotional exhaustion was negative in the adjusted structural model, its broader pattern of associations remains consistent with the view that avoidance represents a less mindful and potentially less adaptive mode of dealing with stressful internal experiences.

The second major finding indicated that psychological flexibility had a significant direct relationship with emotional exhaustion. The standardized direct path was positive. This direction differs from much of the previous literature, in which greater psychological flexibility has generally been associated with lower psychological distress, lower burnout, and better adjustment. Longitudinal research has shown that psychological flexibility is associated with reduced emotional exhaustion across time (Pakenham & Stafford-Brown, 2022), and psychological flexibility has been described as a resilience resource that helps individuals respond adaptively to stressful and changing conditions (Daks et al., 2020). Among students, psychological flexibility has also been associated with lower burnout and has mediated the relationship between resilience and academic burnout (Cherry et al., 2024). Similarly, psychological flexibility has been linked to reduced COVID-19-related burnout through lower perceived stress (Ye et al., 2022). The systematic review by Mursalzade and colleagues further indicates that psychological flexibility is generally associated with more adaptive mental health and educational functioning among higher education students (Mursalzade et al., 2025).

Several considerations may help explain the positive direct coefficient found in the present model. First, structural coefficients represent partial relationships and may differ from simple bivariate associations when conceptually overlapping variables are entered simultaneously. Psychological flexibility and mindfulness were positively correlated, and both were simultaneously modeled as predictors of emotional exhaustion. Under such conditions, the direct coefficient for psychological flexibility reflects only the portion of its variance that is independent of mindfulness. Second, students in the final year of secondary school may use flexibility in the service of sustained engagement with demanding academic requirements. Greater adaptability may enable students to remain involved with intensive studying, repeated examinations, and future-oriented academic goals for longer periods, which may paradoxically coexist with elevated fatigue under highly demanding educational conditions. Thus, flexibility may

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reduce maladaptive disengagement while not necessarily eliminating the energetic costs of persistent academic effort. Research on coping flexibility similarly suggests that flexible responding must be interpreted within the demands of the situation rather than viewed as universally protective in every outcome domain (Hyun et al., 2022).

The positive relationship between psychological flexibility and mindfulness found in the model is more clearly consistent with previous theoretical and empirical evidence. Both constructs emphasize adaptive contact with ongoing experiences rather than rigid avoidance. Psychological flexibility involves remaining open to thoughts and emotions while choosing behavior that is appropriate to contextual demands, whereas mindfulness involves awareness of present experience with reduced judgment and reactivity. Studies among students have repeatedly shown that psychological flexibility and mindfulness are closely related adaptive processes (Aziz et al., 2021; Şık et al., 2025). Iranian research has likewise identified psychological flexibility as relevant to student mental health and quality of life (Movahednejad et al., 2021), and research on academic burnout has suggested that psychological flexibility may operate as an important protective psychological resource (Arab Jafari et al., 2021). Therefore, the present finding that psychological flexibility significantly predicted mindfulness supports the assumption that flexible responding is accompanied by greater openness to and awareness of present-moment experiences.

Another principal finding was that mindfulness had a significant direct relationship with emotional exhaustion. The coefficient was positive in the structural model. As with psychological flexibility, this direction requires careful interpretation because previous research has more commonly reported mindfulness as protective against burnout and distress. Mindfulness has been associated with lower psychological distress, greater valued living, and greater psychological flexibility among students (Şık et al., 2025). Research with STEM students has also linked mindfulness to burnout and attentional functioning, emphasizing the importance of mindful attention in cognitively demanding academic contexts (Saxena, 2024). Brief mindfulness interventions have been shown to reduce test anxiety and support academic performance in high school students (Wang et al., 2025), while systematic review and meta-analytic evidence has identified mindfulness-related mechanisms as relevant to improvements in anxiety and depression (Walsh et al., 2022). These findings generally imply an inverse relationship between mindfulness and maladaptive psychological outcomes.

The positive coefficient in the present structural model may therefore reflect the specific statistical configuration of the predictors or characteristics of the student population. Mindfulness can increase awareness of fatigue, stress, emotional states, and bodily sensations. In a group of students exposed to substantial educational pressure, greater awareness may lead respondents to recognize and report their exhaustion more accurately rather than suppressing or overlooking it. Furthermore, mindfulness was entered into the same model as cognitive avoidance and psychological flexibility, two closely related self-regulatory constructs. Consequently, its direct coefficient represents the association of the mindfulness-specific residual component with emotional exhaustion after the effects of the other predictors have been statistically controlled. Similar complexities are observed in process-based research, where mindfulness and experiential avoidance influence outcomes through interconnected rather than isolated pathways (Garcia-Toro et al., 2023; He et al., 2024). Accordingly, the positive direct path should not be interpreted as showing that mindfulness causes exhaustion; rather, it indicates the direction of the unique association estimated within the specified multivariate model.

One of the most important findings of the study was that mindfulness significantly mediated the relationship between cognitive avoidance and emotional exhaustion. The Sobel test was statistically significant, and the VAF index indicated that 23.9% of the overall relationship was transmitted through mindfulness. Cognitive avoidance negatively predicted mindfulness, while mindfulness was significantly associated with emotional exhaustion. This finding supports a process-based explanation in which students' attempts to distance themselves from unwanted thoughts may influence their emotional functioning partly by changing their capacity for present-moment awareness. Previous studies provide substantial support for the conceptual link between avoidance and mindfulness. Mindfulness-based cognitive therapy has been found to reduce cognitive avoidance among anxious students (Ahmadi et al., 2016), and reductions in avoidance and rumination have been observed after mindfulness-based interventions (Ghadampour et al., 2017). Experimental evidence further suggests that experiential avoidance is one of the mechanisms through which mindfulness interventions produce psychological change (He et al., 2024). Similarly, research has demonstrated interconnected relationships

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among mindfulness, metacognition, experiential avoidance, depression, and anxiety (Ådnøy et al., 2023). These findings are consistent with the mediating role observed in the present study.

The mediation result can be explained by considering cognitive avoidance and mindfulness as competing ways of relating to internal experiences. When students encounter distressing academic thoughts such as fear of failure, perceived inadequacy, concerns about examinations, or uncertainty regarding their future, they may attempt to suppress or replace those thoughts. Such strategies can provide immediate relief but may reduce opportunities to observe, process, and regulate the experiences adaptively. Mindfulness, in contrast, involves maintaining awareness of such thoughts without automatically attempting to eliminate them. Over time, habitual cognitive avoidance may therefore diminish mindful engagement and contribute indirectly to patterns of psychological strain. Research on cognitive emotion-regulation strategies has demonstrated that specific regulatory strategies are differentially connected to dimensions of academic burnout among children and adolescents (Iuga et al., 2025), while cognitive emotion-regulation strategies have also been associated with academic burnout among university students (Naz & Qureshi, 2024). The present mediation finding extends this literature by showing that mindfulness may represent one pathway through which avoidance-related cognitive processes are connected to emotional exhaustion.

Mindfulness also significantly mediated the relationship between psychological flexibility and emotional exhaustion. Although the VAF value of .124 indicated a comparatively modest mediated component, the Sobel statistic confirmed that the indirect pathway was statistically significant. Psychological flexibility positively predicted mindfulness, which in turn predicted emotional exhaustion within the estimated model. This finding is consistent with theoretical approaches that conceptualize mindfulness as a core component of psychologically flexible functioning. Psychological flexibility requires willingness to experience thoughts and emotions while responding according to situational demands, and this process depends partly on awareness of ongoing internal and external experiences. Previous research has shown close associations among mindfulness, psychological flexibility, and psychological well-being (Aziz et al., 2021; Şık et al., 2025). More specifically, mindfulness has been identified as a mediator in the relationship of psychological flexibility and related self-regulatory characteristics with academic burnout among students preparing for university entrance examinations (Esmaili et al., 2024). The present findings therefore provide additional support for the proposition that mindfulness constitutes an important mechanism linking flexible psychological functioning to exhaustion-related outcomes.

The explanatory power of the model also deserves attention. Cognitive avoidance and psychological flexibility explained 43.3% of the variance in mindfulness, suggesting that substantial individual differences in present-moment awareness can be understood through the way students respond to uncomfortable cognition and changing psychological demands. In turn, the model explained 64.6% of the variance in emotional exhaustion, indicating relatively strong explanatory capacity. This finding is compatible with broader models of school burnout that emphasize the balance between demands and psychological resources (Salmela-Aro & Upadyaya, 2020). Academic exhaustion is unlikely to arise exclusively from workload; rather, it reflects how demands are interpreted and regulated. Research has connected burnout with emotion dysregulation, procrastination, family flexibility, academic self-efficacy, resilience, and academic functioning (Ebrahimi et al., 2022; Masoudi et al., 2022; Özhan, 2021). Accordingly, the present model contributes to this literature by showing that cognitive avoidance, psychological flexibility, and mindfulness together account for a substantial proportion of differences in students' emotional exhaustion.

5. Conclusion

The findings should also be considered in the developmental context of twelfth-grade students. Students approaching completion of secondary school face academic examinations, educational transitions, decisions about higher education, and substantial expectations regarding future achievement. Under such conditions, self-regulation becomes especially important. Previous research has demonstrated the importance of academic self-efficacy and educational aspirations for student achievement (Ansonga et al., 2019), while school burnout has been associated with depressive symptoms, reduced engagement, and poorer achievement (Fiorilli et al., 2019). Academic decline is also influenced by interacting motivational, familial, educational, and psychological conditions (Ghasemi & Kadkhoda, 2023; Raouf et al., 2024). The current findings add to this evidence by indicating that students' internal ways of managing distressing cognitions and adapting to psychological demands are closely connected to emotional exhaustion.

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The present study has several limitations. Because the research was cross-sectional and correlational, the use of causal modeling does not establish temporal or experimental causality among cognitive avoidance, psychological flexibility, mindfulness, and emotional exhaustion. All constructs were measured using self-report questionnaires, which may have introduced common-method variance, response tendencies, and social desirability effects. The participants were limited to twelfth-grade students from District 2 of Tabriz, and therefore the findings may not generalize to younger students, university students, adolescents from different cultural or socioeconomic settings, or students in other educational systems. In addition, the statistically significant but directionally unexpected positive paths from psychological flexibility and mindfulness to emotional exhaustion indicate that interpretation of the structural coefficients requires caution, particularly because suppression effects or overlap among predictors may have influenced the estimated direct paths.

Future research should replicate the proposed model in larger and more diverse samples and use longitudinal designs to clarify the temporal order among cognitive avoidance, psychological flexibility, mindfulness, and emotional exhaustion. Repeated assessments across an academic year would make it possible to determine whether changes in avoidance and flexibility precede subsequent changes in mindfulness and exhaustion, particularly during examination periods. Future studies could also combine self-report measures with behavioral, teacher-rated, parent-rated, or physiological indicators of stress and fatigue. Testing alternative structural models, examining possible suppression effects, and evaluating measurement invariance across sex, academic major, achievement level, and socioeconomic groups would further clarify the observed relationships. Experimental or intervention studies could additionally investigate whether directly modifying cognitive avoidance, psychological flexibility, or mindfulness produces corresponding reductions in emotional exhaustion.

In practice, schools and educational counselors can use these findings to design preventive programs that focus on how students respond to academic stress rather than addressing workload alone. Programs may teach students to recognize habitual cognitive avoidance, tolerate distressing academic thoughts without immediately suppressing them, develop flexible coping responses, and strengthen mindful attention to present experiences. School counselors can incorporate brief mindfulness exercises, flexible problem-solving training, acceptance-based strategies, and stress-management skills into support programs for students preparing for major examinations. Screening students for persistent emotional exhaustion and maladaptive cognitive coping may also help identify those who would benefit from early psychological support, while teachers and families can contribute by reducing unnecessary performance pressure and encouraging adaptive engagement with academic difficulties.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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E-ISSN: 3041-9026