



## **Predicting the Level of Academic Stress Using Ineffective Attitudes and Spontaneous Thoughts with the Mediation of Mindfulness in Students**

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### **ABSTRACT**

**Background and Aim:** One type of stress related to learning environments is academic stress, which affects millions of students worldwide annually. This study was conducted to predict the level of academic stress using maladaptive attitudes and self-defeating thoughts with the mediating role of mindfulness in high school students in Torkaman city. **Methods:** The research method was correlation. The statistical population of the study was all high school students in Torkaman city in the academic year 2020-2021. A sample of 361 students was selected using multi-stage sampling. The research instruments included the Gadzela academic stress questionnaire (1991), the Hollon and Kendall self-defeating thoughts questionnaire (1980), the long version of the Weisman and Beck irrational beliefs scale (1978), and the five-factor mindfulness questionnaire by Baer and colleagues (2006). **Results:** The results of the structural equation modeling indicated a direct relationship between maladaptive attitudes and academic stress ( $\beta = 0.42, p < 0.001$ ), an indirect relationship between maladaptive attitudes and academic stress through mindfulness ( $\beta = -0.17, P < 0.05$ ), a direct relationship between negative self-defeating thoughts and academic stress ( $\beta = 0.4, p < 0.001$ ), and an indirect relationship between negative self-defeating thoughts and academic stress through mindfulness ( $\beta = -0.14, P < 0.05$ ). Therefore, the research model was confirmed based on significant indices and fit. **Conclusion:** This study, by investigating the dimensions of academic stress, negative self-defeating thoughts, and maladaptive attitudes in students, has taken a preliminary step towards creating a psychological therapy model in the future.



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## Introduction

During development, adolescents experience a wide range of stresses and anxieties, some of which are intense enough to jeopardize their daily and academic lives. One such stress related to educational environments is academic stress. Academic stress refers to the increasing need for knowledge and, simultaneously, the individual's perception of not having enough time to acquire that knowledge (Morris, 1990; Gadzella & Baloglu, 2001) and is a significant educational problem affecting millions of students worldwide each year (Shirani, 2021). The minds of individuals with academic stress are incapable of rapidly analyzing the plethora of information inundating them, potentially leading to irreversible physical and psychological damage. Typically, these stresses result from the tendency to acquire the maximum information in the shortest time in highly competitive environments (Ghanbari et al., 2021). Academic stress affects the psychophysical health of students and their ability to perform academic tasks effectively (Akan & Kiarooshi, 2020). Students facing stressors exhibit a range of physical and psychological reactions, including physical injuries, chronic energy deficiency, motivational poverty, headaches, digestive problems, and sleep issues, reducing their capabilities and sometimes leading to academic failure (Matud et al., 2020). If students perceive stress as a challenge, their motivation for learning increases (Proz et al., 2021), but excessive and threatening levels can lead to academic decline and inhibit the emergence of talents and creative thinking, resulting in performance deficiencies (Seyed, 2021). Toskos et al. (2018) stated that stress in students is a fundamental issue due to its physical and social impact and its connection to students' futures. Green et al. (2022) found negative relationships between academic stress and mental well-being. Thus, it is clear that academic stress affects psychophysical health and the ability to effectively perform academic tasks, with high levels of stress leading to negative psychological, emotional, and physical outcomes such as poor sleep, weakened immune systems, and illness (Gao et al., 2020). Hoffman et al. (2010) and Beckerman & Corbit (2010) showed that individuals with academic stress are unaware of their negative automatic thoughts and mental ruminations, which influence their behavioral and mood processes, making them unable to

control their stress and disrupting their social functioning.

Research findings have shown that certain psychological components, such as negative automatic thoughts and inefficient attitudes, can significantly affect stressful situations. Inefficient attitudes are attitudes and beliefs that predispose individuals to depression or, generally, mental turmoil. These beliefs prepare individuals to interpret specific situations as excessively negative and inefficient (Ozawa et al., 2020). The interaction of inefficient attitudes with negative events has been reported in academic stress or increased depression symptoms in a sample of high school students (when inefficient attitudes exceed a certain threshold) (Zhou, 2021). Research indicates that the likelihood of mental disorders occurring within a year significantly increases with higher scores of inefficient attitudes (Leo et al., 2020). Since dysfunctional thinking performance is one of the primary causes of disturbances (Akbaba Turkoglu et al., 2015), the more inefficient attitudes and illogical beliefs individuals have, the greater the perceived stress (Tang et al., 2020). Also, a correlation has been observed between inefficient attitudes and other mental disorders, including anxiety (Otani et al., 2017). Inefficient attitudes are considered a predisposing factor in the onset of depressive episodes, either directly or as a vulnerability factor under environmental stress conditions (Ozawa et al., 2020). Bushman et al. (2018) showed that reducing negative automatic thoughts significantly decreased academic stress. Another cognitive process affecting adolescents' academic stress is negative automatic thoughts. Automatic thoughts are transient and automatic thoughts that occur in consciousness and play a significant role in determining human behaviors in stressful situations (Momenpour et al., 2021). In fact, these thoughts arise from failure to respond to life's stresses. These inefficient cognitive processes, shaped by cultural and environmental factors throughout life, lead to cognitions becoming sources of worry and conflict in individuals' lives (Inkster et al., 2018). Since negative automatic thoughts automatically and involuntarily come to mind when an individual is in a negative mental framework, they can be triggered by external or internal events and result in emotional and stressful reactions (Aydin & Yeringuner, 2020). Research

shows that negative automatic thoughts perpetuate worries and lead to disorders affecting individuals' thinking styles and adaptability, involuntarily reinforcing and intensifying emotional responses (Takeda et al., 2019). Some studies have shown that negative automatic thoughts are related to depression. For example, Budak et al. (2021) found that repetitive negative thoughts were significantly associated with depression and stress, and improvements in these thoughts were strongly linked to reduced depression and stress.

Mindfulness, derived from the third wave of cognitive-behavioral therapy, is a variable receiving considerable attention in recent stress research. Mindfulness means being in the moment with whatever is happening now, without judgment and without commenting on what is occurring; it is experiencing pure reality without explanation (Silsen et al., 2019). Mindfulness increases self-awareness and attention to the present moment, which can reduce stress and anxiety and generally improve psychological well-being (Galant et al., 2018). Rogers (2019) and Hedman-Lagerlof et al. (2018) showed that increased mindfulness is associated with improved psychological functioning, reduced pain, and stress in individuals with psychological injuries.

Researchers have studied the correlates of academic stress in various educational groups. Additionally, the moderating role of mindfulness in the relationship between stress and adolescents' psychological symptoms (McLean et al., 2017), stress and depressed mood (Bertol et al., 2017), stress and rumination and worry (Takeda et al., 2019), stress and repetitive negative thoughts (Budak et al., 2021), and stress and vulnerability under environmental pressure (Ozawa et al., 2020) has shown significant relationships. However, these studies have only examined pairwise relationships between variables. Considering the relationship between academic stress, inefficient attitudes, and negative automatic thoughts, as well as the relationship of these variables with mindfulness, and the fact that no research has yet comprehensively studied how these variables interact, this study answers the question of whether inefficient attitudes and negative automatic thoughts can predict academic stress in secondary school students in the city of Tonekabon, mediated by mindfulness.

## Method

The method of this research is correlational and involves structural equation modeling. The statistical population consisted of all secondary school students in the city of Tonekabon in the 2020-2021 academic year, totaling 6147 students in 42 schools. The required sample size for this research, considering the number of variables, was estimated at 361 individuals. For participant selection, the researcher used multistage random sampling, where students were chosen in three stages using different sampling units (including school, classroom, and student).

## Materials

**1. Academic Stress Questionnaire:** To measure the level of academic stress among students, Gadzella's (1991) Academic Stress Questionnaire was used. This tool is based on the theoretical model described by Morris (1990) and designed to study the stress factors in academic life and reactions to these factors. It consists of 51 questions across 9 subscales. The model assesses five categories of stressors (failures, conflicts, pressures, changes, and self-imposed stress) and four types of reactions to stressors (physical, emotional, behavioral, and cognitive evaluation). In each subscale, questions are summed to obtain a total score. Higher scores indicate greater academic stress and more reactions to stress. The questionnaire uses a five-point Likert scale from never (1 point) to always (5 points). The reliability and validity of this tool have been confirmed by Gadzella (1991). It was translated into Persian by Shokri et al. (2006), and its content validity and cultural adaptation were confirmed. Shokri et al. (2006) reported Cronbach's alpha reliability coefficients for the subscales of failures, conflicts, pressures, changes, and self-imposed stress as 0.74, 0.79, 0.70, 0.75, and 0.77, respectively, and for the subscales of physiological, emotional, behavioral, and cognitive reactions as 0.84, 0.80, 0.88, and 0.74, respectively, and for the overall stress score as 0.80 (as cited in Majidi Kakroodi et al., 2016). In the present study, the reliability of this tool was re-evaluated, obtaining a Cronbach's alpha of 0.78.

**2. Automatic Thoughts Questionnaire:** The Holton and Kendall (1980) Automatic Thoughts Questionnaire, consisting of 30 questions, was developed to assess negative automatic statements about oneself. It is scored on a Likert scale, with options ranging from never (1 point) to always (5 points). The total score for an individual ranges from 30 to 150, with higher scores indicating higher negative automatic thoughts. This questionnaire measures four subscales: personal inconsistency and desire for change, negative self-concept and negative expectations, low self-esteem and helplessness. The internal reliability of this questionnaire is very good with a Cronbach's alpha of 0.97 (Holton & Kendall,

1980). In the study by Kaviani et al. (2005), the correlation between the scores of this scale and the level of depression in the initial sample of participants was calculated, showing coefficients of 0.67 and 0.74 for belief in automatic thoughts and their frequency, respectively. These figures can be considered as convergent validity. Also, the interclass correlation between the control group's scores in the first and second stages showed coefficients of 0.76 and 0.88, respectively, for belief in automatic thoughts and their frequency, which can be considered a criterion for reliability. In the research by Kord and Mohammadi (2019), a Cronbach's alpha of 0.91 was reported. In the study by Moqtader (2016), the convergent validity of this questionnaire was reported to be satisfactory. Also, this researcher reported the reliability of the questionnaire using Cronbach's alpha as 0.94. In the current study, the reliability of the tool was obtained using Cronbach's alpha as 0.83.

**3. Dysfunctional Attitudes Questionnaire:** The long-form of the Dysfunctional Attitudes Scale, designed by Weisman and Beck (1978), is based on Beck's original questionnaire and measures the level of dysfunctional attitudes in individuals. It consists of four subscales: perfectionism-success, need for approval, need to please others, and vulnerability-performance evaluation. The questionnaire contains 26 questions. Respondents indicate their agreement or disagreement with each statement on a seven-point Likert scale from strongly disagree (1 point) to strongly agree (7 points). Unanswered statements are scored as 0. If all questions are answered, scores range from 26 to 182, with lower scores indicating more adaptive beliefs and fewer cognitive distortions. Beck et al. (1991) estimated the reliability and validity of the tool using a sample of 2023 outpatient patients seeking cognitive therapy, obtaining satisfactory coefficients. The scale had a high reliability coefficient over more than six weeks ( $r = 0.90$ ) and a Cronbach's alpha of 0.75. In the research by Ebrahimi and Mousavi (2013), the internal consistency of the questions of this tool using Cronbach's alpha was 0.92, and the correlation coefficient with the original form and the predictive validity through correlation with mental health questionnaire scores in patient and

non-patient groups was 0.56. In the current study, the reliability of the tool was obtained using Cronbach's alpha as 0.86.

**4. Mindfulness Questionnaire:** The Five Facet Mindfulness Questionnaire, developed by Baer et al. (2006), consists of 39 statements. It includes subscales for observation, acting with awareness, non-judgment of inner experience, description, and non-reactivity. The respondent must indicate their agreement or disagreement with each statement on a five-point Likert scale from never (1 point) to always (5 points). The score range for this scale is 39 to 159, with higher scores indicating greater mindfulness. Based on the results, the internal consistency of the subscales was appropriate, with alpha coefficients ranging from 0.75 to 0.91. The correlation between subscales was moderate and significant in all cases, ranging from 0.15 to 0.34. In a study on the validation and reliability of this questionnaire in Iran, test-retest correlation coefficients were observed between 0.57 and 0.84. Also, acceptable alpha coefficients (ranging from 0.55 to 0.83) were obtained (Ahmadvand et al., 2012). In the current study, the reliability of the tool was obtained using Cronbach's alpha as 0.81.

### Implementation

The criteria for inclusion in the study were an interest in participating in the research, being enrolled in one of the secondary schools in Tonekabon during the 2020-2021 academic year, and consent to participate based on a letter of introduction from the parents. Recent psychological and medical treatments, psychiatric disorders, and incomplete or incorrect questionnaire responses were exclusion criteria. This research used structural equation modeling for data analysis, employing version 23 of the Amos statistical software.

### Results

Among the participants in the research, 178 (49.30%) were female, and 183 (50.70%) were male; 119 (32.96%) were in the tenth grade, 120 (33.24%) in the eleventh grade, and 122 (33.80%) in the twelfth grade. Also, 119 (32.96%) were 15 years old, 120 (33.24%) were 16, and 122 (33.80%) of the students were 17 years old.

Table 1. Descriptive findings

Variable	Mean	Standard deviation	Min.	Max.
Academic stress	15.122	36.16	58	245
Negative automatic thoughts	42.68	25.10	43	140
Dysfunctional.maladaptive attitudes	14.65	05.9	35	173
Mindfulness	86.80	16.13	46	183

The contents of the above table indicate that the mean and (standard deviation) for the variable of academic stress were 122.15 and (16.36), for the

variable of negative automatic thoughts 68.42 and (10.25), for the variable of dysfunctional attitudes

65.14 and (9.05), and for the variable of mindfulness 80.86 and (13.16).

Variable	1	2	3	4
1. Academic stress	-			
2. Negative automatic thoughts	0.36**	-		
3. Dysfunctional attitudes	0.48**	0.29*	-	
4. Mindfulness	-0.30**	-0.42**	-0.44**	-

\* $p < 0.05$ ; \*\* $p < 0.01$

As the contents of Table 2 show, all the obtained correlation coefficients are significant, some at the 0.05 level and some at the 0.01 level.

Before analyzing the data related to the hypotheses, to ensure that the data of this research met the underlying assumptions of the structural equation model, they were examined. For this purpose, four important assumptions of the structural equation model, including missing data, outlier data, normality, and multicollinearity, were examined.

In the current research, the method of replacing data with the mean of the variable was used for missing values. To check for univariate outliers, Z-scores of the variables were calculated. The results showed that no variable scores were more than 2 standard deviations above or below the mean. Additionally, to check for multivariate outliers, Mahalanobis distance for the predictor variables was calculated. The minimum and maximum Mahalanobis distance in the current research were 0.79 and 24.35, respectively. Considering that the chi-square ( $\chi^2$ ) table with 29 degrees of freedom (the number of

predictor variables) at the 0.05 level is 42.56, and since the maximum Mahalanobis distance (24.35) is less than the table  $\chi^2$  (42.56), the presence of multivariate outliers in the collected data is not evident. Another important assumption of the structural equation model is the normal distribution of variables. When data are not normally distributed, the chi-square value increases, and standard errors become underestimated, leading to the significance of estimated indices, which are not truly significant. The Kolmogorov-Smirnov test was used to check for normality. The criterion for normality of variables in this test was the non-significance of the Z-score of the variables. The results showed that all research variables have a normal distribution and the use of parametric tests in the analysis of research hypotheses is permitted.

In order to test the research hypothesis, a hypothetical model was designed based on the research background and the model was tested, the results of which are reported below.

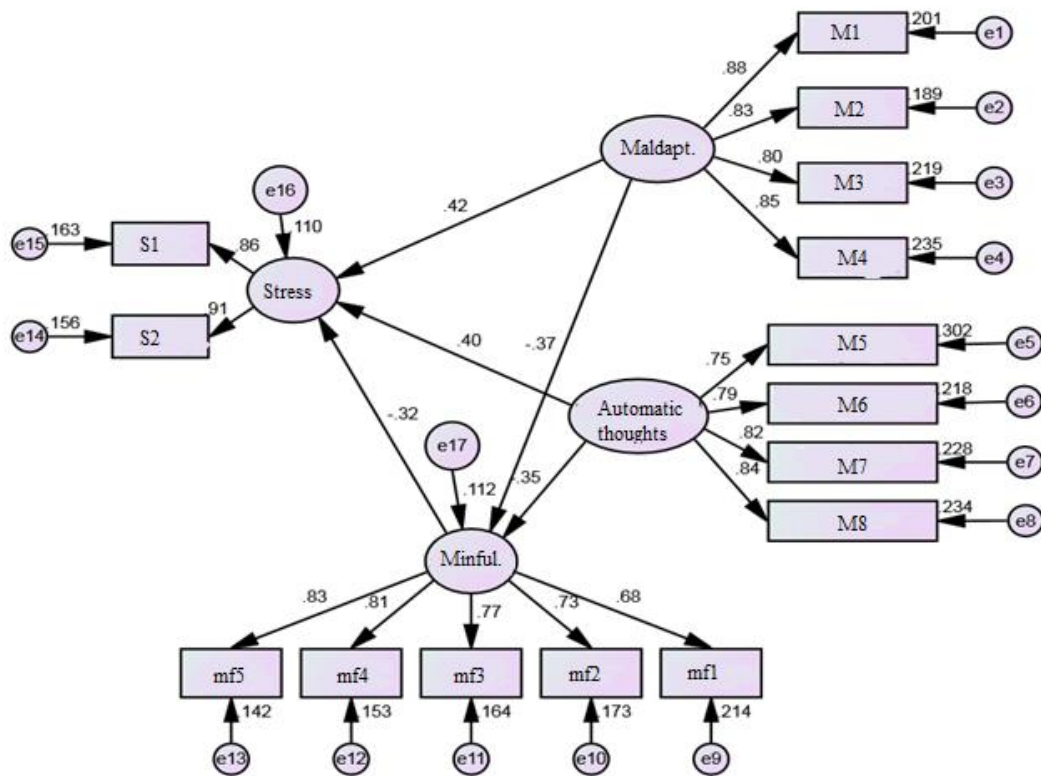


Figure 1. Proposed model of the study

To assess the fit of the factor models, indices such as chi-square, degrees of freedom, chi-square to degrees of freedom ratio ( $\chi^2/df$ ), root mean square error of approximation (RMSEA), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), comparative fit index (CFI), incremental fit index (IFI), and non-normed fit index (NNFI) were used.

The values for the Chi-square index, degrees of freedom, the ratio of Chi-square to degrees of freedom, the Root Mean Square Error of Approximation (RMSEA), the Goodness of Fit Index (GFI), the Adjusted Goodness of Fit Index (AGFI), the Normed Fit Index (NFI), the Comparative Fit Index (CFI), the Non-Normed Fit Index (NNFI), and the Parsimonious Normed Fit

Index were respectively 6.650, 3, 2.216, 0.058, 0.985, 0.982, 0.986, 0.989, 0.989, and 0.990. The model's fit was assessed using these indices, focusing on the validity and reliability of the instrument under examination. A  $\chi^2/df$  ratio less than 3 is desirable. Similarly, an RMSEA less than 0.1 indicates an acceptable fit (Kline, 2015). Furthermore, GFI, AGFI, NFI, CFI, and NNFI values closer to 1 signify a more favorable model fit. Given the indices obtained in the above table, a  $\chi^2/df$  ratio of 2.21 and GFI, AGFI, NFI, CFI, and NNFI values ranging from 0.90 to 1 were achieved, meeting the required standards, thus confirming the model's good fit. Table 4 shows the measurement parameters of the direct relationships between variables in the proposed model of the current study.

Table 3. Estimates of direct and indirect effects							
Path			Standardized coefficient	Non-standard coefficient	SE	Critical ratio	p
Dysfunctional attitudes to academic stress		to	0.42	0.55	0.023	23.91	0.001
Dysfunctional attitudes to mindfulness		to	-0.37	-0.46	0.030	-15.33	0.001
Negative automatic thoughts to academic stress		to	0.40	0.52	0.025	20.80	0.001

Negative automatic thoughts to mindfulness	-0.35	-0.44	0.032	-13.75	0.001
Mindfulness to academic stress	-0.32	-0.40	0.036	-11.11	0.001

According to Table 3, all paths related to the proposed model were significant at  $p \leq 0.05$ . Specifically, dysfunctional attitudes had a direct effect ( $\beta = 0.42$ ) and an inverse effect on mindfulness ( $\beta = -0.37$ ) on academic stress, and

negative automatic thoughts had a direct effect ( $\beta = 0.40$ ) and an inverse effect on mindfulness ( $\beta = -0.35$ ) on academic stress. Mindfulness had an inverse effect ( $\beta = -0.32$ ) on academic stress.

**Table 4. Standardized coefficients of direct, indirect and total effects**

Path	Direct effect	Indirect effect	Total effect
Dysfunctional attitudes to academic stress	0.42**	-	0.42**
Dysfunctional attitudes to mindfulness	-0.37**	-	-0.37**
Dysfunctional attitude to mindfulness to academic stress	-0.37**	-0.17*	-0.52**
Negative automatic thoughts to academic stress	0.40**	-	0.40**
Mindfulness to academic stress	-0.32**	-	-0.32**
Negative automatic thoughts to mindfulness to academic stress	0.40**	-0.14*	0.36**

As observed in Table 4, there is a direct effect ( $\beta = 0.42$ ,  $t = 23.91$ ), an indirect effect through mindfulness ( $\beta = -0.17$ ,  $t = -6.14$ ), and a total effect ( $\beta = -0.52$ ,  $t = -26.32$ ) between dysfunctional attitudes and academic stress. Also, there is a direct effect ( $\beta = 0.40$ ,  $t = 20.80$ ), an indirect effect through mindfulness ( $\beta = -0.14$ ,  $t = -5.18$ ), and a total effect ( $\beta = 0.36$ ,  $t = 16.06$ ) between negative automatic thoughts and academic stress.

### Conclusion

This research aimed to predict the level of academic stress using dysfunctional attitudes and negative automatic thoughts, with mindfulness as a mediator, among high school students in the city of Tonekabon. The results indicated that dysfunctional attitudes indirectly affect academic stress through mindfulness. These findings align with the research of Leo et al. (2020), Otani et al. (2017), Galant et al. (2018), Ozawa et al. (2020), and Zhu (2021). Leo et al. (2020), in support of Beck's cognitive model, state that dysfunctional attitudes are associated with symptoms of academic stress. Attitudes are activated immediately following negative life events (such as academic failure) and once activated, they stimulate a pattern of information processing characterized by a negative bias, or in other words, marked by negative thinking errors. These negative attitudes can be detrimental to mental health and directly influence academic stress. Mindfulness allows individuals to observe thoughts, worries, and negative emotions without judgment, merely as thoughts and emotions. This process gradually reduces the intertwining of

emotions with stress and future emotions. Consequently, with emotions becoming independent, the grounds for unbiased and nonjudgmental thought processing are laid, thereby playing a mediating role between negative automatic thoughts and academic stress. The presence of several common illogical beliefs leads to low frustration tolerance and subsequently negative emotions like academic stress. As Ozawa et al. (2020) and Zhu (2021) also demonstrated, high negative mood correlates directly with feelings of helplessness, non-adaptive motivational structures, and illogical, dysfunctional beliefs. Otani et al. (2017), in examining Beck's cognitive vulnerability-stress theory, identified dysfunctional attitudes as a risk factor in the emergence of academic stress symptoms. When students encounter negative life events with dysfunctional attitudes, they are prone to creating negatively biased interpretations about themselves, the world, and the future, leading to symptoms of academic stress. These attitudes are characterized by absolutist, perfectionistic musts and needs for approval and effectiveness, which are, according to rational-emotive theory, the root of emotional problems. Moreover, unlike traditional cognitive methods that focused solely on changing dysfunctional attitudes, mindfulness offers a different relationship with thoughts. Its emphasis is not on collecting or responding to thoughts consistent or inconsistent with beliefs, but rather on resisting negative thoughts through

a distinct mind, with greater attention and focus. Dysfunctional attitudes, due to their rigid and obligatory nature and causing extremely unreasonable and excessive attributions, hinder individuals from logically and adaptively confronting their emotions in emotional situations, thereby reducing mindfulness. Since mindfulness focuses on developing three qualities: non-judgment, intentional awareness, and present-moment focus, it thus addresses all aspects of immediate experience including cognitive, physiological, or behavioral activities, enhancing individuals' awareness of their daily activities. Mindfulness leads to moment-to-moment awareness of thoughts, feelings, and bodily states, thus freeing individuals from the automatic, everyday mind focused on the past and future (Galant et al., 2018). According to this narrative, mindfulness re-establishes the connection of all internal and external resources for learning and improvement, resources that an individual might not believe they possess. Consequently, high school students with high academic stress can establish more constructive relationships with their surroundings and thus exhibit less academic stress. Mindfulness can create behavioral patterns that positively direct the content of dysfunctional attitudes, thereby playing a mediating role between dysfunctional attitudes and academic stress.

The research findings also showed that negative automatic thoughts indirectly affect academic stress through mindfulness. These findings are consistent with Hoffman et al. (2010), Beckerman and Corbit (2010), and Bushman et al. (2018). Negative automatic thoughts are primary factors in psychological distress, correlating with high levels of academic stress. Hoffman et al. (2010) and Beckerman and Corbit (2010) believe that individuals with academic stress are often unaware of their negative automatic thoughts and mental ruminations that affect their mood and behavioral processes, resulting in impaired control over their stress and disrupting their social functioning. Therefore, individuals with high academic stress, due to their low mindfulness towards their thoughts and emotions, fail to comprehend their psychological and physical state, focusing only on their often incorrect cognitive processes. This inability to control negative thoughts results in a thoughtful insight into bodily sensations, a contemplative view of mental content, and a distinction between

thoughts, feelings, and emotions. This ability, in turn, enhances the control over mental ruminations and negative automatic thoughts, reducing long-term psychopathological symptoms and improving individual and social functions. Negative automatic thoughts cause disorders that affect an individual's thinking style and adaptability, leading involuntarily to the reinforcement of emotional responses, mostly stemming from rumination and worry. Bushman et al. (2018) examined the relationship between automatic thoughts and academic stress. Their results indicated that positive beliefs about worry, uncontrollability, and danger, cognitive assurance, the need to control thoughts, and cognitive mindfulness significantly reduced academic stress. Individuals with more automatic negative thoughts are more likely to experience stress and anxiety, as negative assumptions and attitudes containing helplessness and self-destructive elements lead to the establishment of negative assumptions and biases. Negative automatic thoughts, when an individual is in a negative mental frame, quickly come to mind automatically and involuntarily and can be triggered by external or internal events. Adolescents, facing physiological changes, a need for independence, academic pressures, and fluctuations in social relationships, often experience increased emotional reactions and academic stress. These internal and external challenges, invoking negative automatic thoughts based on personal incompatibility, create a mental framework of negativity regarding the inability to establish adaptive relationships in adolescents' minds. The activation of this negative belief generates beliefs and attitudes in adolescents that prevent them from being effectively aware and responsive to their emotions in their relationships with others, and thus personal incompatibility can predict a decrease in mindfulness in many dimensions. An adolescent with negative automatic thoughts experiences a lack of understanding and mindfulness.

In summary, the study's results demonstrated that dysfunctional attitudes and negative automatic thoughts can indirectly influence academic stress through the mediation of mindfulness among high school students in the city of Tonekabon. Like many human sciences research, this study's cross-sectional nature is one of its fundamental



limitations. Such studies do not allow for precise statements about the causal relationship between research variables. Therefore, replication and expansion of these findings require longitudinal designs. Additionally, operationalizing intervention and educational workshops related to mindfulness as an effective construct in educational psychology to promote mental health and reduce academic stress can be significantly impactful.

### Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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