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Examining the Relationship Between Mindfulness and Emotion Regulation With Rumination in Anxious Students at Islamic Azad University, Lahijan Branch

Reyhaneh. Arian[1], Marzieh. Masjoudi[2*]

[1] Department of Psychology, Ra.C., Islamic Azad University, Rasht, Iran
[2] Department of Midwifery, Ra.C., Islamic Azad University, Rasht, Iran

*** Corresponding author email address**: masjoudi@iaurasht.ac.ir

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A B S T R A C T

Objective: The objective of this study was to investigate the relationship between mindfulness and emotion regulation with rumination in university students experiencing anxiety.

Methods and Materials: This descriptive-correlational study was conducted among students at Islamic Azad University, Lahijan Branch, during the 2023–2024 academic year. From a total population of approximately 9,000 students, a sample of 368 was selected using convenience sampling based on scores from the Beck Anxiety Inventory. The instruments utilized in the study included the Beck Anxiety Inventory (Beck et al., 1988), the Five Facet Mindfulness Questionnaire (Baer et al., 2006), the Emotion Regulation Questionnaire (Gross & John, 2003), and the Ruminative Responses Scale (Nolen-Hoeksema & Morrow, 1991). Descriptive statistics (mean, standard deviation, frequency, and percentage) were used for demographic data, while Pearson correlation coefficient and stepwise multiple regression were employed to analyze relationships and predictability among variables. All analyses were performed using SPSS software.

Findings: The results indicated significant negative correlations between mindfulness and rumination ($r = -0.256$, $p < .01$), emotion suppression and rumination ($r = -0.384$, $p < .01$), and emotion reappraisal and rumination ($r = -0.374$, $p < .01$). Stepwise regression analysis revealed that emotion suppression and mindfulness together explained 17.6% of the variance in rumination (adjusted $R^2 = 0.176$). Emotion suppression emerged as the strongest predictor of rumination, indicating that higher levels of suppression were associated with increased rumination among anxious students.

Conclusion: Emotion suppression, in particular, plays a crucial role in predicting rumination, suggesting that interventions aimed at improving adaptive emotion regulation and enhancing mindfulness may be effective in reducing maladaptive cognitive patterns such as rumination in anxious university populations.

Keywords: *mindfulness, emotion regulation, rumination, anxiety, university students*

1. Introduction

Students constitute one of the key populations that play a critical role in the future development and advancement of any country. While student life offers new opportunities, it is also accompanied by numerous challenges and stressors associated with this transitional life stage (Dargahi et al., 2022). The university period can be particularly stressful due to entering a new academic environment and, at times, separation from family. Research indicates that a significant portion of students experience stress and anxiety (Kord & Mohammadi, 2019).

Anxiety disorders are among the most prevalent psychological disorders across the lifespan (Reardon et al., 2020). A central feature of anxiety disorders is excessive fear and worry, which is often disproportionate to the actual threat, appears without clear cause, persists chronically, and disrupts an individual's daily functioning (Zikopoulou et al., 2021). Anxiety can have various negative consequences on academic performance, interpersonal relationships, and emotional well-being (Schwartz et al., 2019). One such consequence is the intrusion of distressing thoughts that may enter a repetitive cycle, leading to rumination (Seah et al., 2020).

Rumination consists of persistent, repetitive thoughts that revolve around a common theme, intrude involuntarily into consciousness, and distract attention from current goals and tasks (Ji, 2024; Wang & Sun, 2024). Rumination is often a maladaptive response to distress and is closely linked to the onset, intensity, and maintenance of depressive episodes (Nolen-Hoeksema et al., 2008). Theoretical models suggest that individuals engage in rumination because they believe it helps them better understand their circumstances and enhances problem-solving (Li et al., 2022). Kraft et al. (2021) also demonstrated that rumination is prevalent among university students and is particularly intensified in those experiencing anxiety (Kraft et al., 2021).

Studies by Brozovich et al. (2015) and Constantin et al. (2018) confirmed that individuals with anxiety disorders tend to experience higher levels of rumination (Brozovich et al., 2015; Constantin & English, 2018). Similarly, research by Ogińska-Bulik and Michalska (2020) found that rumination plays a significant role in emotional processing difficulties following traumatic events. Several factors may contribute to the development of rumination, one of which is emotion regulation (Ogińska-Bulik & Michalska, 2020).

Emotion regulation refers to the set of thoughts and behaviors that enable individuals to become aware of the type of emotions they are experiencing, when these emotions arise, and how to appropriately express them (Omidi et al., 2024; Prosen & Jendričko, 2019). Individuals with strong emotion regulation skills can express their emotions appropriately and reduce the intensity of unpleasant emotions such as sadness (Zafari & Khademi Ashkzari, 2020).

In a study by Rezaei and Rezakhani (2019), which examined the role of cognitive emotion regulation strategies and coping styles in predicting rumination in women, the results indicated that cognitive emotion regulation components accounted for 37% and coping strategies for 13.9% of the variance in rumination. Furthermore, the findings revealed that among cognitive emotion regulation strategies, self-blame and rumination positively predicted rumination, while acceptance negatively predicted it. Emotion-focused coping also positively predicted women's rumination (Rezaei & Rezakhani, 2019).

Another variable potentially influencing rumination is mindfulness. Mindfulness is a nonjudgmental, present-moment awareness of experiences as they occur within the scope of an individual's attention. It also involves acknowledging and accepting these experiences (Jankowski & Bak, 2019). Mindfulness is often described as a technique that combines meditation with specific mental orientations, enabling individuals to become aware of the present moment in a nonjudgmental manner by minimizing involvement in thoughts and emotions (Nasiri Karbasdehi et al., 2024; Potek, 2012). Tabatabaei and Mohammadzadeh (2023) showed that mindfulness is associated with both rumination and schema formation in students (Tabatabaei & Mohammadzadeh, 2019).

Given that university students represent a pivotal segment of the population for national development, and considering that their problems and challenges can affect their efficiency and abilities, it is crucial to pay attention to their mental health and address the issues they face. With increasing research evidence pointing to a rise in anxiety levels among students and the various psychological and social consequences associated with it, the present study aims to explore whether there is a relationship between mindfulness and emotion regulation with rumination in students experiencing anxiety.

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2. Methods and Materials

2.1. Study Design and Participants

The present study is descriptive-correlational in nature. The statistical population consisted of all students at Islamic Azad University, Lahijan Branch, during the 2023–2024 academic year. Given the population size (N = 9,000) and based on the Krejcie and Morgan sampling table (Krejcie & Morgan, 1970), the sample size was estimated to be 368 participants (n = 368), selected through convenience sampling. Initially, for screening purposes, the Beck Anxiety Inventory was administered to 500 students, and the 368 individuals who scored higher in anxiety were selected as the final sample.

2.2. Measures

2.2.1. Anxiety

This inventory, developed by Beck and colleagues (1988), is a 21-item self-report scale designed to measure clinical anxiety. Each item offers four options representing increasing levels of anxiety severity and is rated on a 4-point Likert scale ranging from 0 to 3. Each item reflects a common symptom of anxiety (cognitive, physical, or panic-related). Total scores range from 0 to 63. Based on the total score, individuals can be categorized into four levels: no anxiety (0–7), mild anxiety (8–15), moderate anxiety (16–25), and severe anxiety (26–63). Beck et al. (1988) reported a Cronbach's alpha of 0.92 and a test-retest reliability of 0.75 after one week. The inventory's convergent validity with the Hamilton Anxiety Rating Scale was 0.51, indicating moderate validity. In an Iranian sample, the Cronbach's alpha was 0.92, split-half reliability 0.95, and test-retest reliability 0.77. The internal consistency coefficient (Cronbach's alpha) was 0.82, with test-retest reliability of 0.75, and item correlations ranging from 0.30 to 0.76. The instrument's validity was confirmed across five dimensions: content, concurrent, construct, diagnostic, and factorial, all supporting its strong psychometric properties (Jandaghi & Gholami Andrati, 2019). In the present study, the Cronbach's alpha was 0.84.

2.2.2. Mindfulness

This 39-item self-report measure assesses five facets of mindfulness: observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience. Some items in the "nonjudging" and "acting with awareness" subscales are reverse-scored. Responses are given on a 5-point Likert scale ranging from 1 (never or very rarely true) to 5 (very often or always true). Total scores range from 39 to 195. Higher scores indicate greater mindfulness. The overall Cronbach's alpha for the total scale has been reported as 0.90. Inter-factor correlations were moderate and statistically significant, ranging from 0.15 to 0.34. Ahmadvand, Heydarinasab, and Shairi (2013) reported Cronbach's alpha values ranging from 0.55 to 0.83 and test-retest reliability of 0.80, supporting the scale's validity in Iranian nonclinical samples (Ahmadvand et al., 2013). In the current study, the Cronbach's alpha was 0.79.

2.2.3. Emotion Regulation

Developed by Gross and John (2003), this 10-item scale includes two subscales: cognitive reappraisal and expressive suppression. Respondents rate each item on a 7-point Likert scale ranging from "strongly disagree" to "strongly agree." The total score ranges from 10 to 70. The internal consistency (Cronbach's alpha) for the expressive suppression subscale across four administrations was reported as 0.73, 0.68, 0.75, and 0.76, respectively. The three-month test-retest reliability was reported as 0.69 (Miri et al., 2021).

2.2.4. Rumination

Nolen-Hoeksema and Morrow (1991) developed this self-report questionnaire to assess four types of responses to negative mood. The scale comprises two main components: ruminative responses and distraction responses. The ruminative responses subscale includes 22 items rated on a 4-point scale ranging from 1 (almost never) to 4 (almost always). The total score is obtained by summing the responses, resulting in a possible score range of 22 to 88. Empirical evidence has demonstrated high internal consistency for the ruminative responses subscale, with Cronbach's alpha ranging from 0.88 to 0.92. Test-retest reliability has been reported as 0.67 across various studies (Bagheri Khorasgan, 2024).

2.3. Data Analysis

Data analysis in this study was conducted using both descriptive and inferential statistical methods. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the demographic characteristics of the participants and the main

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variables under investigation. For inferential analysis, Pearson correlation coefficient was employed to assess the relationships between mindfulness, emotion regulation (including the subcomponents of emotional suppression and emotional reappraisal), and rumination. Furthermore, stepwise multiple regression analysis was conducted to determine the predictive power of mindfulness and emotion regulation variables on rumination among anxious students. All statistical analyses were performed using SPSS software, with significance levels set at $p < .01$.

3. Findings and Results

The descriptive analysis of the sample characteristics revealed that among the 368 students of Islamic Azad University, Lahijan Branch, based on age, the largest group was aged 18–25 years with 128 individuals (34.78%), while the smallest group consisted of individuals aged 45 and above with 60 individuals (16.30%). Regarding gender, out of the 368 students, 208 were female (56.52%), and 160 were male (43.48%). The descriptive indicators of the study variables are presented in Table 1.

Table 1

Descriptive Statistics of Study Variables: Mindfulness, Emotion Regulation, and Rumination

Variables	Minimum	Maximum	Mean	Standard Deviation	N
Mindfulness	39	76	58.47	4.07	368
Emotion Suppression	7	20	16.94	4.20	368
Emotion Reappraisal	7	20	16.97	4.16	368
Rumination	31	80	56.47	3.61	368

As shown in Table 1, among the components of emotion regulation, the highest mean was observed in emotion reappraisal (M = 16.97, SD = 4.16), and the lowest mean was in emotion suppression (M = 16.94, SD = 4.20). The mean of mindfulness was 58.47 (SD = 4.07), and the mean of rumination was 56.47 (SD = 3.61).

To examine the relationship between mindfulness and emotion regulation with rumination, the Pearson correlation coefficient was calculated.

Table 2

Pearson Correlation Between Mindfulness, Emotion Regulation, and Rumination

Variables	1	2	3	4
1. Mindfulness	1			
2. Suppression	.270**	1		
3. Reappraisal	.203**		1	
4. Rumination	-.256**	-.384**	-.374**	1

**p<0.01

The results in Table 2 indicate a significant negative relationship between mindfulness and rumination ($r = -0.256$, $p < .01$), between emotion suppression and rumination ($r = -0.384$, $p < .01$), and between emotion reappraisal and rumination ($r = -0.374$, $p < .01$).

To predict rumination (Y) based on mindfulness and emotion regulation (X), stepwise regression was used. The results are presented in Table 3.

Table 3

Stepwise Regression Model – Entered and Removed Variables

Model	Variable Entered	Variable Removed	Step
1	Emotion Suppression	–	First
2	Mindfulness	–	Second

As shown in Table 3, regression analysis progressed to two steps. In the first step, emotion suppression entered the model with a correlation coefficient of $r = 0.384$ with rumination. The coefficient of determination (R^2) was 0.147,

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and the adjusted R^2 was 0.145. In the second step, with the addition of mindfulness, the multiple correlation increased to r = 0.424, R^2 rose to 0.180, and the adjusted R^2 reached 0.176. Thus, based on the adjusted R^2, 17.6% of the variance in the dependent variable (rumination) is explained by the two predictors (emotion suppression and mindfulness).

Table 4

Model Summary and Durbin-Watson Statistic

Step	R	R^2	Adjusted R^2	Std. Error	Durbin-Watson
Step 1	0.384	0.147	0.145	3.58	1.808
Step 2	0.424	0.180	0.176	4.26	–

Below is the ANOVA table for both models.

Table 5

ANOVA for Regression Significance

Source	SS	df	MS	F	Sig.
Regression (Model 1)	10023.371	1	10023.371	47.438	.0005
Residual	57988.358	366	158.048		
Total	68011.728	367			
Regression (Model 2)	12247.578	2	6123.789	40.083	.0005
Residual	155764.150	365	152.778		
Total	68011.728	367			

The regression models with the predictors (emotion suppression and mindfulness) significantly predict rumination, as evidenced by p-values less than .01 in both steps.

Table 6

Regression Coefficients

Model	B (Unstd.)	Std. Error	Beta (Std.)	t	Sig.	Tolerance	VIF
Constant (Model 1)	77.537	–	–	–	–	–	–
Suppression	-1.243	0.156	-0.384	-7.889	.0005	1.000	1.000
Constant (Model 2)	93.649	–	–	–	–	–	–
Suppression	-1.119	0.157	-0.346	-7.135	.0005	0.957	1.045
Mindfulness	-0.311	0.082	-0.185	-3.816	.0005	0.957	1.045

Based on Model 2, the regression equation can be written as follows:

Rumination = (-1.119 × Emotion Suppression) + (-0.311 × Mindfulness)

All predictor variables in the model were statistically significant. The standardized beta coefficients indicate that both variables (emotion suppression and mindfulness) are significant predictors of rumination. Among them, emotion suppression had the stronger effect, as a one-unit increase in suppression leads to a 0.348-unit increase in rumination. Therefore, the research hypothesis—that there is a significant relationship between mindfulness and emotion regulation with rumination in anxious students—is supported.

4. Discussion and Conclusion

In examining the research hypothesis that there is a relationship between mindfulness and emotion regulation with rumination in students experiencing anxiety, the results indicated that the two components—emotion suppression and mindfulness—serve as significant predictors of rumination. Moreover, emotion suppression had the strongest predictive power; specifically, a one-unit change in emotion suppression predicted a 0.348-unit change in rumination. This supports the hypothesis that there is a significant relationship between mindfulness and emotion regulation with rumination among anxious students. These findings are consistent with previous research (Bagheri

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Khorasgan, 2024; Cao et al., 2023; Dargahi et al., 2022; Davodi et al., 2020; Jafarpour et al., 2021; Kraft et al., 2021; Li et al., 2022; Miri et al., 2021; Ogińska-Bulik & Michalska, 2020; Reardon et al., 2020; Rezaei & Rezakhani, 2019; Seah et al., 2020; Tabatabaei & Mohammadzadeh, 2019; Zafari & Khademi Ashkzari, 2020; Zikopoulou et al., 2021).

In interpreting these results, it is important to recognize that the foundation of anxiety disorders lies in destructive and negative thoughts that are often repeated in the patient's mind. Consequently, in recent years, rumination has been conceptualized as a tendency toward repetitive negative thoughts that play a key role in the onset, maintenance, and recurrence of disorders such as depression and anxiety (Nolen-Hoeksema et al., 2008). Rumination is characterized as a thinking style defined by repetitive, intrusive, and uncontrollable thoughts (Kobylińska & Kusev, 2019), which persist even in the absence of immediate or relevant environmental stimuli. Individuals who engage in rumination often focus excessively on distressing thoughts and emotions, believing their problems are unsolvable and intolerable, which deters them from seeking effective solutions. Consequently, their problem-solving strategies become impaired, contributing to repeated failure in resolving life difficulties (Gross, 2015). Thus, rumination and the mental repetition of negative thoughts are hallmark features of anxiety disorders and further intensify anxiety symptoms.

Individuals with anxiety tend to exhibit heightened emotional reactivity in response to stressful life events. Emotion regulation encompasses a range of cognitive and behavioral strategies—both conscious and unconscious—that are used to reduce, maintain, or enhance emotional experiences. In his process model of emotion regulation, Gross (2015) posits that throughout the generation of a full emotional response, different regulatory strategies may be employed. Prior to the full emergence of an emotion, emotional cues are evaluated, and this evaluation can occur from multiple perspectives. Following this assessment, experiential, behavioral, and physiological responses may be activated. Each stage of the emotion generation process represents a potential target for regulation, and emotion regulation skills can be employed at various points along this continuum. Gross's model includes five stages of regulation, with each stage comprising both adaptive and maladaptive strategies. Individuals with emotional regulation difficulties tend to rely more on maladaptive strategies such as rumination and avoidance. However, when an individual possesses effective emotion regulation skills, they are more likely to use adaptive strategies, thereby reducing repetitive thinking and rumination.

5. Limitations & Suggestions

One of the primary limitations of this study lies in its use of a non-random, convenience sampling method, which may restrict the generalizability of the findings to the broader population of university students. The reliance on self-report instruments could also introduce response biases, such as social desirability or inaccurate self-perception. Additionally, the cross-sectional design limits the ability to draw causal inferences between mindfulness, emotion regulation, and rumination. Cultural and contextual factors specific to the sample—students from a single university in Iran—may further limit the applicability of the results to other demographic or geographical populations. Lastly, the study did not control for comorbid psychological conditions such as depression, which may also influence rumination and emotion regulation patterns.

Future research should aim to replicate these findings using larger and more diverse samples across different universities and cultural settings to enhance generalizability. Employing longitudinal designs could also help clarify the directionality and causal relationships among mindfulness, emotion regulation, and rumination over time. Incorporating qualitative methods, such as interviews or focus groups, may provide deeper insights into the cognitive and emotional experiences underlying these constructs. It is also recommended that future studies include control variables for comorbid psychological disorders such as depression or PTSD, as these may confound the relationships observed. From a practical standpoint, the results underscore the importance of integrating mindfulness-based interventions and emotion regulation training into mental health programs for university students. Programs such as Mindfulness-Based Stress Reduction (MBSR) or Emotion Regulation Therapy (ERT) may be particularly beneficial in reducing rumination and anxiety symptoms. University counseling centers should consider routine screening for high levels of rumination and emotion regulation difficulties to identify at-risk students early. Lastly, psychoeducational workshops and curricula aimed at promoting emotional literacy, awareness, and coping flexibility could enhance students' psychological resilience and overall well-being.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. This article is extracted from the master's thesis of the first author at the Rasht Branch of Islamic Azad University, Rasht, Iran. The study was approved by the Research Ethics Committee of Islamic Azad University, Rasht Branch, under ethics code IR.IAU.RASHT.REC.1403.035.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

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