

Effectiveness of Mindfulness Training in Reducing Maladaptive Daydreaming and Rumination Among Students With Childhood Trauma

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ABSTRACT

Objective: The present study aimed to determine the effectiveness of mindfulness training in reducing maladaptive daydreaming and rumination among university students with a history of childhood trauma.

Method and Materials: This study employed a quasi-experimental pretest–posttest design with a control group. The statistical population consisted of all students with a history of childhood trauma enrolled at Islamic Azad University branches in Tehran during the 2023–2024 academic year. Using convenience sampling, 30 eligible participants were selected and randomly assigned to an experimental group (n = 15) and a control group (n = 15). The experimental group received mindfulness training based on the protocol developed by Segal et al. in eight 150-minute sessions, whereas the control group received no intervention. Data were collected at the pretest and posttest stages using the Maladaptive Daydreaming Scale developed by Somer et al. (2016) and the Ruminative Responses Scale developed by Nolen-Hoeksema and Morrow (1991). Data were analyzed using univariate analysis of covariance (ANCOVA) in SPSS, with the significance level set at .05.

Findings: The results of the analysis of covariance indicated that mindfulness training significantly reduced maladaptive daydreaming ($p < .001$) and rumination ($p < .001$) in the experimental group compared with the control group.

Conclusion: Mindfulness training, by enhancing moment-to-moment awareness and reducing cognitive engagement with trauma-related thoughts and memories, may constitute an effective intervention for reducing maladaptive daydreaming and rumination among university students with a history of childhood trauma. The application of this approach in university counseling centers and in preventive and therapeutic programs addressing problems associated with childhood trauma is recommended.

Keywords: mindfulness, childhood trauma, maladaptive daydreaming, rumination

1. Introduction

Childhood trauma is widely recognized as a significant developmental risk factor that can exert enduring effects on emotional regulation, cognitive functioning, interpersonal relationships, and psychological adjustment across adolescence and adulthood. Experiences such as emotional abuse, physical abuse, neglect, chronic family conflict, and other adverse early-life events can alter the ways in which individuals interpret internal and external experiences and may increase vulnerability to persistent negative affect, avoidance-based coping, and maladaptive cognitive processing. The psychological consequences of childhood trauma are not limited to the immediate period following the traumatic experience; rather, they may remain latent or become reactivated when individuals encounter later developmental challenges, interpersonal stressors, or academic demands. Evidence indicates that childhood maltreatment is associated with emotional distress partly through dysfunctional beliefs about emotions and psychological inflexibility, both of which can make it more difficult for individuals to tolerate distressing internal experiences and respond adaptively to negative thoughts and emotions (Taşören, 2023). Similarly, cumulative exposure to stressors during development has been associated with a range of maladaptive behavioral and psychological outcomes, suggesting that early adverse experiences may influence multiple pathways of vulnerability over time (Hoffmann & Jones, 2022).

University students with a history of childhood trauma may constitute a particularly vulnerable population because the transition to higher education is accompanied by substantial developmental, social, and academic demands. Students are often required to cope with increased autonomy, changing interpersonal relationships, academic performance pressures, uncertainty about the future, and the need to develop more independent emotion-regulation strategies. When unresolved traumatic experiences are present, these demands may intensify intrusive thought patterns, emotional dysregulation, cognitive avoidance, and repetitive negative thinking. Trauma-related distress can also influence the capacity to regulate attention and disengage from internally generated negative material. Research suggests that childhood trauma is associated with difficulties in controlling negative thoughts and that dissociative processes and metacognitive mechanisms may contribute to such difficulties (Barlow & Goldsmith, 2020).

Likewise, evidence has shown that trauma-related symptoms can be linked to maladaptive forms of repetitive cognition, particularly rumination, which may maintain both post-traumatic stress symptoms and depressive symptoms over time (Roley et al., 2020). These findings emphasize the importance of identifying cognitive and attentional processes through which childhood trauma may continue to affect psychological functioning in young adults.

One process that has recently received increasing attention in relation to trauma and psychological distress is maladaptive daydreaming. Maladaptive daydreaming refers to extensive, immersive, and difficult-to-control fantasy activity that becomes sufficiently intense to interfere with daily functioning, social participation, academic responsibilities, and emotional well-being. Although ordinary daydreaming is a common and often adaptive human experience, maladaptive daydreaming is distinguished by its compulsive quality, high degree of absorption, emotional intensity, and functional impairment. Individuals experiencing maladaptive daydreaming may spend prolonged periods engaged in elaborate internal fantasy scenarios and may find it difficult to disengage from these fantasies even when doing so interferes with important life activities. Somer proposed that maladaptive daydreaming can function as a psychologically reinforcing form of absorption that may be maintained by emotional relief, avoidance, and reward processes (Somer, 2018). Psychometric research has also supported the measurable and multidimensional nature of maladaptive daydreaming, including evidence regarding the reliability and construct validity of standardized measures in different cultural contexts (Sándor et al., 2020). In Iran, the psychometric properties of the Maladaptive Daydreaming Scale have likewise been examined, with findings supporting its validity and reliability for assessing this construct in Iranian samples (Ahmadi et al., 2022).

The relationship between childhood trauma and maladaptive daydreaming is especially relevant because immersive fantasy may serve as an avoidance-oriented response to overwhelming or unresolved emotional experiences. Individuals exposed to adverse childhood events may learn to retreat into internal fantasy as a means of reducing distress, compensating for unmet emotional needs, escaping from painful memories, or creating a subjective sense of safety and control. Over time, however, this strategy may become rigid, habitual, and functionally impairing. Research examining developmental pathways to

maladaptive daydreaming has suggested that childhood trauma may be associated with fantasy dependence through mechanisms involving social anxiety and absorptive tendencies (Somer & Herscu, 2017). In this sense, maladaptive daydreaming can be conceptualized not merely as excessive imagination but as a potentially dysregulated cognitive-emotional coping process. Its persistence may become particularly problematic when fantasy increasingly substitutes for direct engagement with interpersonal relationships, academic tasks, and adaptive emotional processing.

Another important cognitive process associated with childhood trauma is rumination. Rumination is characterized by repetitive, passive, and persistent focus on distress, its possible causes, and its perceived consequences without effective movement toward problem solving or behavioral change. Although individuals may engage in rumination in an effort to understand their distress, repeated attention to negative internal content often amplifies rather than resolves emotional suffering. Rumination has been consistently associated with depression, anxiety, post-traumatic stress, and impaired emotion regulation. In trauma-exposed individuals, repetitive thought may become organized around past events, perceived personal failures, unresolved questions, and negative self-appraisals. Research has demonstrated that rumination is significantly associated with both post-traumatic stress and depressive symptomatology, suggesting that it may operate as a transdiagnostic maintenance mechanism across trauma-related and mood disorders (Roley et al., 2020). Moreover, childhood trauma may contribute to later maladaptive outcomes partly through rumination and reduced cognitive flexibility, further highlighting the role of repetitive cognition in the psychological consequences of early adversity (Torkaman et al., 2022).

Rumination is also important because it may interact with emotion-regulation difficulties and reduce the individual's capacity to respond flexibly to distress. Persistent rumination narrows attention around negative content, strengthens negative affect, and limits access to alternative interpretations or coping responses. This process can contribute to a self-perpetuating cycle in which emotional distress triggers repetitive thinking, and repetitive thinking in turn intensifies emotional distress. Studies examining interventions for rumination have therefore emphasized the need for strategies that modify the individual's relationship with thoughts rather than attempting merely to suppress or eliminate them. Psychological interventions that foster

decentering, nonjudgmental awareness, and flexible attention may be especially relevant for individuals whose repetitive thoughts are linked to unresolved traumatic experiences. Research conducted in Iranian populations has shown that psychological interventions can reduce rumination and improve related indices of psychological well-being (Kazemi et al., 2020), while mindfulness-based programs have repeatedly demonstrated particular promise in reducing maladaptive repetitive thought (Barmal et al., 2018; Soltani & Mohammadiforoud, 2019).

Mindfulness has emerged as one of the most influential approaches for modifying repetitive negative thinking and experiential avoidance. Mindfulness is commonly defined as intentional, present-centered awareness characterized by openness, acceptance, and nonjudgment toward ongoing internal and external experiences. Rather than becoming automatically absorbed in thoughts, memories, or emotions, individuals are trained to observe such experiences as transient mental events. Mindfulness-based approaches therefore aim to increase attentional regulation, metacognitive awareness, decentering, acceptance, and psychological flexibility. Mindfulness-based cognitive therapy integrates these principles with elements of cognitive-behavioral treatment and is specifically designed to reduce automatic cognitive reactivity and habitual engagement with maladaptive thought patterns (Crane, 2018). By helping individuals notice thoughts without immediately treating them as facts or commands, mindfulness may weaken the automatic cycles that sustain both rumination and maladaptive fantasy.

The relevance of mindfulness to trauma-related difficulties is supported by a growing empirical literature. Mindfulness-based interventions have been used to improve self-regulation and trauma-related symptoms in populations with post-traumatic stress difficulties (Heshami et al., 2021). Evidence from trauma-exposed adult samples has also suggested that mindfulness-based cognitive therapy may reduce experiential avoidance and improve self-compassion and emotional functioning among individuals with childhood trauma histories (Fani Mohammadabadi et al., 2023). In addition, mindfulness-based trauma recovery interventions have demonstrated efficacy and acceptable safety in highly trauma-exposed populations such as refugees, indicating that mindfulness skills can be adapted for individuals with substantial trauma-related distress (Aizik-Reebs et al., 2021). A systematic review and meta-analysis of mindfulness and yoga interventions for psychological trauma likewise found evidence that

mindfulness-oriented practices may improve a range of trauma-related psychological outcomes (Taylor et al., 2020). These findings support the theoretical assumption that present-moment awareness, acceptance, and reduced cognitive fusion may help trauma-exposed individuals regulate distress without resorting to habitual avoidance or repetitive negative thinking.

Mindfulness may be particularly relevant to rumination because its central mechanisms directly counteract repetitive and automatic engagement with negative thoughts. Through repeated attentional practice, individuals learn to notice the onset of ruminative thinking, disengage from elaborative processing, and redirect attention toward present-moment experience. This process may reduce both the frequency and emotional impact of rumination. Empirical studies have reported significant reductions in rumination following mindfulness-based interventions across diverse populations. Mindfulness training has been associated with lower rumination in individuals with depressive symptoms (Barmal et al., 2018), women with obsessive-compulsive symptoms (Soltani & Mohammadiforoud, 2019), and mothers experiencing substantial psychological stress (Sattarzadeh et al., 2025). More recent randomized evidence among university students has shown that mindfulness-based interventions can significantly reduce rumination and negative emotions, reinforcing their applicability to student populations (Shi et al., 2025). A systematic review and meta-analysis has further supported the effectiveness of mindfulness-based cognitive therapy for reducing rumination and related psychological indicators across multiple clinical and nonclinical contexts (Wei et al., 2025).

The relationship between mindfulness and rumination may also have broader implications for mental health and well-being. Among university students, mindfulness has been associated with higher life satisfaction and lower depressive symptoms through pathways involving increased self-compassion and reduced rumination (Wu et al., 2025). These findings suggest that reductions in repetitive negative thinking may represent one of the principal mechanisms through which mindfulness exerts its beneficial effects. Similar results have been reported in clinical contexts, where mindfulness-based cognitive therapy has contributed to reductions in rumination and improvements in trauma-related psychological growth (Zhang et al., 2025). Meta-analytic evidence from Iranian studies has likewise supported the effectiveness of mindfulness-based treatments for depression and anxiety, indicating that mindfulness interventions can produce meaningful improvements across

emotional disorders frequently characterized by repetitive negative thinking (Hosseini et al., 2018). Mindfulness-based cognitive therapy has also demonstrated benefits in other emotionally vulnerable groups, including individuals with psychosomatic symptoms (Namjou & Nouri, 2023) and psycho-oncology patients (Kingston et al., 2015), further supporting the transdiagnostic utility of mindfulness-based approaches.

Mindfulness may also be relevant to maladaptive daydreaming because the defining features of maladaptive daydreaming include attentional absorption, difficulty disengaging from internal fantasy, reduced awareness of ongoing external experience, and repetitive return to emotionally rewarding imagined scenarios. Mindfulness training may interrupt this process by strengthening awareness of attentional shifts and increasing the ability to return voluntarily to present-moment sensory and bodily experience. Importantly, a randomized controlled trial demonstrated that mindfulness meditation combined with self-monitoring significantly reduced maladaptive daydreaming symptoms, providing direct empirical support for the use of mindfulness-based strategies in this problem domain (Herscu et al., 2023). This is particularly noteworthy because it suggests that maladaptive daydreaming is not only measurable but also potentially modifiable through targeted attentional and metacognitive training.

The mechanism through which mindfulness may influence maladaptive daydreaming can also be understood in terms of distress tolerance and resilience. Individuals who use fantasy as a means of escaping difficult emotions may be less likely to rely on immersive daydreaming when they develop greater capacity to remain in contact with distressing internal experiences without immediate avoidance. Mindfulness-based stress reduction has been shown to enhance distress tolerance and resilience through changes in mindfulness-related capacities (Nila et al., 2016). Such mechanisms may be especially relevant for individuals with childhood trauma, for whom painful emotions, memories, and bodily sensations can trigger habitual disengagement or internal escape. Mindfulness may therefore reduce maladaptive daydreaming not by eliminating imagination, but by increasing voluntary control over attention and decreasing the need to use fantasy as an automatic emotion-regulation strategy.

Mindfulness-based interventions may further support trauma recovery by improving emotion regulation and altering defensive or avoidant responses to distress. Evidence suggests that mindfulness-based approaches can

positively affect emotion regulation and psychological defense mechanisms among individuals experiencing trauma-related difficulties (Seyed Ebrahimi, 2022). In addition, mindfulness-based cognitive therapy may help individuals identify automatic mental habits and cultivate a more accepting relationship with internal experiences, thereby reducing experiential avoidance and increasing psychological flexibility (Crane, 2018). Such changes are theoretically relevant to both rumination and maladaptive daydreaming because both processes can involve rigid, repetitive, and difficult-to-control engagement with internal mental content.

Despite this growing literature, important gaps remain. Much of the existing research has examined mindfulness in relation to depression, anxiety, post-traumatic stress symptoms, or rumination, whereas substantially fewer studies have simultaneously investigated maladaptive daydreaming and rumination in trauma-exposed university students. Existing evidence supports the psychometric validity of maladaptive daydreaming as a measurable construct (Ahmadi et al., 2022; Sándor et al., 2020), its association with childhood trauma and fantasy dependence (Somer & Herscu, 2017), and its responsiveness to mindfulness-based strategies (Herscu et al., 2023). At the same time, extensive evidence supports the effectiveness of mindfulness for reducing rumination across both clinical and nonclinical populations (Sattarzadeh et al., 2025; Shi et al., 2025; Wei et al., 2025). However, the joint examination of these two cognitive outcomes may provide a more comprehensive understanding of whether mindfulness training can reduce both avoidance-oriented immersive cognition and repetitive negative cognition in students with a history of childhood trauma. This question is particularly important because these processes may coexist and reinforce psychological disengagement, emotional distress, and impaired academic or interpersonal functioning.

Accordingly, the present study aimed to determine the effectiveness of mindfulness training in reducing maladaptive daydreaming and rumination among university students with a history of childhood trauma.

2. Methods and Materials

2.1. Study Design and Participants

The present study was an applied, quasi-experimental investigation employing a pretest–posttest design with an experimental group and a control group. The study population consisted of university students with a history of

childhood trauma who were enrolled at Islamic Azad University branches in Tehran, Iran, during the 2023–2024 academic year. A total of 30 eligible students were recruited using nonprobability convenience sampling. Following authorization from the relevant university authorities, potentially eligible students were approached and screened for participation. The Maladaptive Daydreaming Scale developed by Somer et al. (2016) and the Ruminative Responses Scale developed by Nolen-Hoeksema and Morrow (1991) were administered during the initial assessment. Among students with a history of childhood trauma, those whose scores on the study variables were at least one standard deviation above the corresponding sample means were considered for enrollment, provided that they also met the predefined eligibility criteria. Thirty eligible participants were subsequently selected and randomly assigned to either the experimental group ($n = 15$) or the control group ($n = 15$). The inclusion criteria were being between 18 and 30 years of age, being unmarried, being enrolled in an associate, bachelor's, or master's degree program, having a history of childhood trauma, not currently using psychiatric medication, and not concurrently receiving individual or group counseling or psychotherapy. The exclusion criteria included the presence of a physical or medical condition that could interfere with regular attendance at the intervention sessions, the presence of a chronic or specific medical condition such as diabetes mellitus or multiple sclerosis, unwillingness to continue participation at any stage of the study, and absence from more than one intervention session. Before participation, eligible students were informed about the study procedures and provided informed consent. Participants were informed that participation was voluntary and that they could withdraw from the study at any time. Before the intervention, both groups completed the study measures as the pretest. The experimental group then participated in the mindfulness training program, whereas the control group received no psychological intervention during the study period. After completion of the intervention, both groups completed the same measures as the posttest. To address ethical considerations and provide access to the intervention, the mindfulness training program was also offered to participants in the control group after completion of the posttest assessment.

2.2. Measures

Maladaptive Daydreaming Scale. Maladaptive daydreaming was assessed using the Maladaptive Daydreaming Scale developed by Somer et al. (2016). The version used in the present study consisted of 14 items assessing three dimensions of maladaptive daydreaming: interference with social activities, distress, and interference with physical activities. Items were rated on a 6-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree), with higher scores indicating a greater degree of maladaptive daydreaming. Previous psychometric evaluations have demonstrated satisfactory to excellent internal consistency for the scale. Sándor and Molnár (2018, as cited in Sabzian & Safaei, 2021) reported a Cronbach's alpha coefficient of .92. In an Iranian psychometric evaluation, Cronbach's alpha coefficients for the total scale and its subscales of interference with social activities, distress, and interference with physical activities were reported to be within an acceptable-to-high range, supporting the internal consistency of the instrument (Sabzian & Safaei, 2021). In the present study, Cronbach's alpha for the total Maladaptive Daydreaming Scale was .89, indicating good internal consistency reliability.

Ruminative Responses Scale. Rumination was assessed using the Ruminative Responses Scale, which is a subscale of the Response Styles Questionnaire developed by Nolen-Hoeksema and Morrow (1991). The scale consists of 22 items designed to assess the tendency to engage in repetitive and persistent thinking in response to negative emotional states. Items are rated on a 4-point Likert-type scale ranging from 1 (almost never) to 4 (almost always), yielding a possible total score ranging from 22 to 88, with higher scores reflecting a greater tendency toward rumination. The instrument has been described as comprising dimensions related to distraction, reflection, and brooding (Wallace, 2004, as cited in Kazemi et al., 2020). Empirical evidence has supported the reliability of the scale, with Cronbach's alpha coefficients generally ranging from .88 to .92. Test-retest correlations of approximately .67 and intraclass correlation coefficients of approximately .75 across repeated measurements have also been reported. Wells and Fisher (2015) reported a Cronbach's alpha coefficient of .90 and a test-retest reliability coefficient of .67. In an Iranian study, Bagherinejad et al. (2010) reported Cronbach's alpha coefficients ranging from .88 to .90. Evidence for construct-related validity has also been reported, including a correlation of .65 with measures of metacognitive beliefs at

$p < .001$ (Kazemi et al., 2020). In the present study, Cronbach's alpha for the scale was .83, indicating acceptable internal consistency.

2.3. Intervention

The mindfulness training intervention was based on the therapeutic program developed by Segal et al. (2013) and was administered in a group format over eight weekly sessions, each lasting approximately 150 minutes, across a two-month period. The intervention was designed to enhance present-moment awareness, promote nonjudgmental acceptance of internal experiences, and reduce habitual cognitive engagement with distressing thoughts and emotions. The first session introduced the concept of mindfulness and emphasized awareness of moment-to-moment experiences, including thoughts, emotions, bodily sensations, and routine daily activities, with particular attention to cultivating the capacity to remain psychologically present in the "here and now." The second session focused on recognizing mind wandering, directing attention toward bodily sensations and breathing, and developing greater awareness and acceptance of unpleasant thoughts and emotions. The third session emphasized adaptive responses to distressing thoughts and feelings through breathing exercises, body-scan practice, sitting meditation, and exercises designed to redirect attention to present-moment experience. The fourth session focused on reducing persistent engagement with negative thoughts by teaching participants to observe fluctuations in thoughts without avoidance, suppression, or withdrawal from challenging experiences. The fifth session addressed habitual and automatic patterns of cognition, including automatic engagement in daily activities, diminished motivation, perceptions of activities as futile, avoidance of difficult life situations, unrealistic aspirations, and persistent comparison between one's current circumstances and desired circumstances; participants were trained to observe and accept thoughts and emotions without judgment or attempts at immediate modification. The sixth session emphasized awareness of psychological well-being warning signs and encouraged cognitive decentering, particularly the recognition that thoughts are mental events rather than objective representations of reality. The seventh and eighth sessions consolidated the acquired skills by increasing sensitivity to subtle changes in mood and psychological functioning, identifying early signs of declining psychological well-being, developing individualized plans

for responding to future distress, and strengthening participants' ability to incorporate mindfulness and present-moment awareness into everyday life. Participants in the control group did not receive any psychological intervention during the experimental period. Following completion of the eight intervention sessions, both the experimental and control groups completed the posttest assessments to determine the effect of mindfulness training on maladaptive daydreaming and rumination. After completion of posttest data collection, the mindfulness protocol was made available to the control group for ethical reasons.

2.4. Data Analysis

Data were analyzed using both descriptive and inferential statistical procedures. Descriptive statistics, including appropriate measures of central tendency and dispersion, were calculated to summarize participants' scores on maladaptive daydreaming and rumination at the pretest and posttest assessments. To evaluate the effectiveness of mindfulness training while statistically controlling for baseline differences between the experimental and control groups, univariate analysis of covariance (ANCOVA) was

conducted separately for each dependent variable, with the corresponding pretest score entered as the covariate and the posttest score as the outcome variable. Prior to conducting ANCOVA, the relevant statistical assumptions were evaluated to ensure the appropriateness of the analysis. All statistical analyses were performed using IBM SPSS Statistics, Version 24, and the level of statistical significance was set at $p < .05$.

3. Findings and Results

The descriptive and inferential findings were examined to determine the effectiveness of mindfulness training in reducing maladaptive daydreaming and rumination among university students with a history of childhood trauma. Descriptive statistics were first calculated for the pretest and posttest scores of both dependent variables in the experimental and control groups. Subsequently, the assumptions required for analysis of covariance were evaluated, and univariate analyses of covariance were conducted to determine whether the posttest scores differed significantly between the two groups after controlling for the corresponding pretest scores.

Table 1

Descriptive Statistics for Maladaptive Daydreaming and Rumination by Group and Assessment Stage

Variable	Group	Pretest M	Pretest SD	Posttest M	Posttest SD
Maladaptive daydreaming	Experimental	50.47	13.490	44.67	12.877
	Control	51.67	13.896	51.27	14.033
	Total	51.07	13.470	47.97	13.652
Rumination	Experimental	60.27	10.131	48.93	7.066
	Control	59.33	13.668	61.67	15.060
	Total	59.80	11.830	55.30	13.249

As shown in Table 1, the experimental and control groups had relatively similar mean scores at pretest for both maladaptive daydreaming and rumination. For maladaptive daydreaming, the experimental group mean decreased from 50.47 ($SD = 13.49$) at pretest to 44.67 ($SD = 12.88$) at posttest, whereas the control group showed little change, with the mean decreasing only from 51.67 ($SD = 13.90$) to 51.27 ($SD = 14.03$). A more pronounced pattern was observed for rumination. The experimental group mean decreased from 60.27 ($SD = 10.13$) at pretest to 48.93 ($SD = 7.07$) at posttest, whereas the control group mean increased from 59.33 ($SD = 13.67$) at pretest to 61.67 ($SD = 15.06$) at posttest. These descriptive findings indicate a reduction in both maladaptive daydreaming and rumination following mindfulness training in the experimental group, while

comparable reductions were not observed in the control group.

Prior to conducting the analyses of covariance, the relevant statistical assumptions were examined. The Kolmogorov-Smirnov test indicated no statistically significant deviation from normality for maladaptive daydreaming at either pretest or posttest in the experimental and control groups, with all corresponding significance values equal to .200. For rumination, the significance values were .064 and .200 for the experimental group at pretest and posttest, respectively, and .200 and .086 for the control group at pretest and posttest, respectively. Because all significance values exceeded .05, the assumption of normality was considered satisfied. Homogeneity of error variances was assessed using Levene's test. The results were

nonsignificant for both maladaptive daydreaming, $F(1, 28) = 0.082, p = .777$, and rumination, $F(1, 28) = 3.340, p = .078$, indicating that the assumption of homogeneity of variances was met. The assumption of independence of observations

was also satisfied because each participant belonged to only one study group and observations were independent across participants. Therefore, the data were considered suitable for the planned univariate ANCOVA analyses.

Table 2

Univariate Analysis of Covariance for the Effects of Mindfulness Training on Maladaptive Daydreaming and Rumination

Dependent Variable	F	df	p	Partial η^2	Observed Power
Maladaptive daydreaming	32.567	1	< .001	.570	1.000
Rumination	32.575	1	< .001	.547	1.000

As presented in Table 2, after controlling for pretest scores, there was a statistically significant difference between the experimental and control groups in posttest maladaptive daydreaming scores, $F(1, 27) = 32.567, p < .001$, partial $\eta^2 = .570$. The effect size indicates that approximately 57.0% of the variance in posttest maladaptive daydreaming scores, after adjustment for baseline scores, was associated with group membership and therefore with participation in the mindfulness intervention. The observed statistical power was 1.000, indicating very high sensitivity for detecting the observed effect. Accordingly, the hypothesis that mindfulness training would reduce maladaptive daydreaming among students with a history of childhood trauma was supported. Similarly, a statistically significant between-group difference was found for posttest rumination scores after adjustment for pretest scores, $F(1, 27) = 32.575, p < .001$, partial $\eta^2 = .547$. This effect size indicates that approximately 54.7% of the adjusted variance in posttest rumination scores was associated with the intervention condition. The observed statistical power was also 1.000. Thus, the second hypothesis was supported, indicating that mindfulness training was effective in reducing rumination among university students with a history of childhood trauma. Taken together with the descriptive results, these findings demonstrate that participants who received mindfulness training exhibited substantially lower levels of both maladaptive daydreaming and rumination at posttest compared with participants in the control group.

4. Discussion

The present study investigated the effectiveness of mindfulness training in reducing maladaptive daydreaming and rumination among university students with a history of childhood trauma. The findings showed that mindfulness training produced statistically significant reductions in both

maladaptive daydreaming and rumination compared with the control condition. Specifically, after controlling for baseline scores, participants who received the mindfulness intervention demonstrated significantly lower posttest maladaptive daydreaming scores, with a large effect size, partial $\eta^2 = .570$. Similarly, mindfulness training significantly reduced rumination, with a large effect size, partial $\eta^2 = .547$. These findings indicate that mindfulness training was associated with substantial changes in both forms of maladaptive cognitive activity and suggest that mindfulness-based practices may be particularly useful for students whose current psychological functioning is affected by adverse childhood experiences.

The first major finding was that mindfulness training significantly reduced maladaptive daydreaming. This result is consistent with previous research indicating that mindfulness-based strategies can directly reduce maladaptive daydreaming symptoms. In a randomized controlled trial, mindfulness meditation combined with self-monitoring was found to reduce maladaptive daydreaming, indicating that strengthening present-moment awareness and increasing monitoring of internal mental activity can reduce excessive immersion in fantasy (Herscu et al., 2023). This convergence is theoretically important because maladaptive daydreaming is characterized by prolonged absorption in internally generated fantasy, difficulty disengaging from imagined scenarios, and reduced contact with present-moment experience. Mindfulness training directly targets these processes by helping individuals notice shifts in attention, recognize when the mind has become absorbed in internally generated content, and intentionally redirect attention toward current sensory, emotional, and bodily experience.

The observed reduction in maladaptive daydreaming may also be understood in relation to the role of childhood trauma. Previous research has suggested that childhood trauma can contribute to maladaptive daydreaming through

pathways involving social anxiety, absorption, and dependence on fantasy (Somer & Herscu, 2017). For some trauma-exposed individuals, fantasy may initially function as an emotion-regulation strategy that provides temporary relief from distressing memories, loneliness, shame, fear, or unmet attachment needs. However, when such fantasy becomes repetitive and difficult to control, it may become a maladaptive coping process that interferes with social, academic, and occupational functioning. Somer conceptualized maladaptive daydreaming as a potentially self-reinforcing pattern in which internally generated fantasy becomes increasingly compelling because it provides emotional reward or escape from distress (Somer, 2018). Mindfulness may weaken this cycle by increasing tolerance of difficult internal experiences and reducing automatic avoidance through immersive fantasy.

The present finding can also be interpreted through the attentional mechanisms underlying mindfulness. Maladaptive daydreaming involves sustained attentional capture by imagined content, whereas mindfulness training repeatedly exercises voluntary attention and awareness of attentional drift. Participants are taught to notice when attention has wandered and to return gently to breathing, bodily sensations, or other present-moment anchors. Over time, this practice may improve attentional flexibility and reduce automatic engagement with elaborative fantasy. In this sense, the beneficial effect of mindfulness may not involve suppressing imaginative activity itself, but rather increasing control over when and how attention is allocated. This interpretation is consistent with research showing that mindfulness-based practices can strengthen distress tolerance and resilience through changes in mindfulness capacities (Nila et al., 2016). For students with a history of childhood trauma, an enhanced ability to tolerate distress may reduce the perceived need to retreat into prolonged fantasy as an avoidant coping mechanism.

The psychometric literature on maladaptive daydreaming also supports the clinical significance of this finding. Studies have established that maladaptive daydreaming can be reliably assessed as a distinct pattern of cognitive and behavioral disturbance in different populations (Sándor et al., 2020), and Iranian research has likewise supported the validity and reliability of the Maladaptive Daydreaming Scale (Ahmadi et al., 2022). The present results add an intervention-oriented dimension to this literature by suggesting that maladaptive daydreaming is not only measurable but also responsive to a structured psychological intervention. This finding is particularly relevant in

university populations, where maladaptive daydreaming may impair concentration, academic engagement, social functioning, and daily organization.

The second major finding was that mindfulness training significantly reduced rumination among students with childhood trauma. This finding is strongly consistent with previous research. Mindfulness-based interventions have repeatedly been shown to reduce rumination across clinical and nonclinical populations. For example, mindfulness training has reduced rumination among individuals with depression (Barmal et al., 2018), women with obsessive-compulsive symptoms (Soltani & Mohammadiforoud, 2019), and mothers experiencing high levels of psychological burden (Sattarzadeh et al., 2025). More recent randomized evidence among university students also indicates that mindfulness-based interventions can significantly reduce rumination and negative emotional states (Shi et al., 2025). Furthermore, a systematic review and meta-analysis confirmed the effectiveness of mindfulness-based cognitive therapy in reducing rumination and related psychological indicators across diverse populations (Wei et al., 2025). The present findings therefore align with a substantial body of evidence showing that mindfulness can interrupt repetitive negative thinking.

The effect of mindfulness on rumination can be explained through several interrelated cognitive mechanisms. Rumination involves repetitive and passive attention to distress, its causes, and its consequences, often accompanied by difficulty disengaging from negative thoughts. Mindfulness training encourages individuals to observe thoughts as temporary mental events rather than as objective truths that require extended analysis. This shift is often described as decentering or cognitive defusion. By learning to observe thoughts without immediately elaborating on them, individuals may become less vulnerable to prolonged ruminative cycles. Mindfulness-based cognitive therapy is specifically designed to reduce automatic cognitive reactivity and habitual engagement with negative thought patterns (Crane, 2018). Accordingly, the reduction in rumination observed in the present study may reflect improved metacognitive awareness and a greater ability to disengage from repetitive thinking.

This interpretation is especially relevant in the context of childhood trauma. Trauma-exposed individuals frequently experience persistent attempts to understand, reinterpret, or mentally revisit adverse experiences. Such repetitive processing may be intensified by negative beliefs about the self, others, and the world, and by difficulties in emotion

regulation. Research has shown that rumination is closely associated with both post-traumatic stress and depressive symptoms (Roley et al., 2020). In addition, childhood trauma may contribute to later maladaptive outcomes partly through reduced cognitive flexibility and increased rumination (Torkaman et al., 2022). Mindfulness may counter these processes by increasing flexibility in attention and cognition, allowing individuals to notice trauma-related thoughts without becoming trapped in prolonged analysis or self-critical interpretation.

The present findings are also consistent with research showing that mindfulness may improve psychological outcomes in trauma-exposed populations more broadly. Mindfulness-based stress reduction has been shown to improve self-regulation and reduce symptoms among adolescents with post-traumatic stress difficulties (Heshami et al., 2021). Mindfulness-based cognitive therapy has also been associated with improvements in alexithymia, experiential avoidance, and self-compassion among adults with childhood trauma experiences (Fani Mohammadabadi et al., 2023). These findings suggest that mindfulness may be especially useful for individuals whose trauma histories are associated with avoidance of internal experiences or difficulties identifying and regulating emotions. In the present study, reduced rumination may therefore have occurred partly because participants developed greater willingness to experience difficult thoughts and emotions without trying to resolve them through repetitive mental processing.

The effectiveness of mindfulness in trauma-related contexts has also been supported in more severely exposed populations. A randomized waitlist-controlled study of mindfulness-based trauma recovery among refugees demonstrated improvements in psychological functioning and supported the safety and efficacy of mindfulness-oriented intervention for individuals with significant trauma exposure (Aizik-Reebs et al., 2021). A systematic review and meta-analysis similarly concluded that mindfulness and yoga interventions may have beneficial effects on psychological trauma and trauma-related symptoms (Taylor et al., 2020). These studies support the broader interpretation that mindfulness can help trauma-exposed individuals alter their relationship with distressing internal experiences, which may in turn reduce maladaptive cognitive responses such as rumination and excessive fantasy.

Another mechanism that may explain the current findings is improved emotion regulation. Students with childhood trauma may have learned patterns of avoidance, suppression,

or cognitive overengagement in response to difficult emotions. Maladaptive daydreaming and rumination may represent different but related attempts to regulate distress: the former may involve escape into internally rewarding fantasy, whereas the latter may involve repetitive intellectual or emotional processing of distress. Mindfulness offers an alternative regulation strategy based on awareness, acceptance, and nonreactivity. Evidence indicates that mindfulness-based interventions may improve emotion regulation and modify maladaptive defensive processes in individuals with trauma-related difficulties (Seyed Ebrahimi, 2022). By learning to remain in contact with emotional experiences without either escaping into fantasy or becoming cognitively entangled in repetitive thought, participants may develop more adaptive ways of responding to internal distress.

The findings may also be interpreted in terms of psychological flexibility. Childhood maltreatment has been linked to emotional distress through maladaptive beliefs about emotions and psychological inflexibility (Taşören, 2023). Psychological inflexibility can cause individuals to become dominated by distressing thoughts, emotions, and memories and to respond rigidly to them. Mindfulness training directly promotes flexibility by encouraging openness to internal experiences and by weakening automatic behavioral and cognitive responses. This process may be particularly important for students with childhood trauma because academic and interpersonal stressors can reactivate trauma-related emotional responses. Greater psychological flexibility may allow these students to respond to distress with awareness rather than with habitual avoidance or repetitive thought.

The reduction in rumination observed in this study is also consistent with broader evidence linking mindfulness to improved mental health among university students. Recent research has shown that the relationship between mindfulness and psychological well-being may be mediated partly by reduced rumination and increased self-compassion (Wu et al., 2025). This finding suggests that reducing rumination is not merely a narrow cognitive outcome but may represent a central pathway through which mindfulness improves broader emotional functioning. Similarly, mindfulness-based cognitive therapy has been associated with reduced rumination and improved post-traumatic growth in clinical populations (Zhang et al., 2025). These findings suggest that mindfulness may simultaneously reduce maladaptive repetitive thought and create

psychological conditions that support adaptive processing of difficult experiences.

The present results are also compatible with Iranian evidence on mindfulness-based interventions. A meta-analysis of Iranian studies found that mindfulness-based treatments were effective in reducing symptoms of depression and anxiety (Hosseini et al., 2018). Other Iranian studies have reported beneficial effects of mindfulness-based approaches on rumination, emotion regulation, psychosomatic symptoms, self-differentiation, and related psychological outcomes (Barmal et al., 2018; Namjou & Nouri, 2023; Soltani & Mohammadiforoud, 2019). The consistency between the current findings and previous Iranian research is important because cultural context may influence the expression of trauma-related symptoms, help-seeking behavior, and attitudes toward psychological treatment. The present study therefore provides further evidence that mindfulness training can be meaningfully applied within the Iranian university context.

The findings may additionally reflect the cumulative nature of the eight-session intervention. Mindfulness is a skill-based approach in which repeated practice is essential. Across the intervention, participants were gradually exposed to breathing exercises, body awareness, sitting meditation, observation of thoughts, nonjudgmental acceptance, recognition of mood changes, and strategies for integrating mindfulness into everyday life. This cumulative training may have allowed participants to develop multiple complementary skills relevant to both dependent variables. Body-focused attention may have increased grounding and present-moment awareness, while cognitive observation exercises may have reduced fusion with thoughts. Acceptance practices may have lowered experiential avoidance, and relapse-prevention elements may have strengthened awareness of early warning signs of distress. Thus, the intervention likely operated through several mutually reinforcing mechanisms rather than through a single isolated technique.

5. Conclusion

The findings suggest that the intervention was not associated merely with small statistical changes but with clinically meaningful shifts in the two cognitive processes assessed. At the same time, these effects should be interpreted cautiously because of the relatively small sample and short-term posttest design. Nevertheless, the consistency of the findings with previous experimental, clinical, and

meta-analytic research strengthens confidence in the conclusion that mindfulness training may be beneficial for reducing both maladaptive daydreaming and rumination in trauma-exposed university students (Herscu et al., 2023; Shi et al., 2025; Wei et al., 2025). Overall, the results support the conceptualization of mindfulness as a transdiagnostic intervention capable of influencing maladaptive attentional, metacognitive, and emotion-regulation processes that may persist after childhood trauma.

6. Limitations & Suggestions

Several limitations should be considered when interpreting the findings of the present study. First, the sample size was relatively small and consisted only of 30 university students, which limits the statistical precision and generalizability of the findings to broader student populations or to trauma-exposed individuals outside university settings. Second, participants were recruited through convenience sampling from Islamic Azad University branches in Tehran, and therefore the sample may not represent students from other universities, regions, socioeconomic backgrounds, or cultural contexts. Third, the outcomes were assessed primarily through self-report questionnaires, which may be influenced by social desirability, response bias, retrospective interpretation, or participants' awareness of their treatment condition. Fourth, the study used a no-treatment control group rather than an active control condition, making it difficult to separate the specific effects of mindfulness from nonspecific factors such as therapist attention, group support, treatment expectations, and structured weekly participation. Fifth, the study assessed outcomes immediately after the intervention and did not include a follow-up assessment; consequently, the durability of reductions in maladaptive daydreaming and rumination cannot be determined. Finally, although participants were identified as having a history of childhood trauma, the design did not examine whether trauma type, severity, chronicity, or developmental timing influenced treatment response.

Future studies should replicate the present investigation with larger and more diverse samples to improve statistical power and external validity. Multicenter studies including students from public and private universities and from different geographical regions would help determine whether the intervention effects generalize across educational and cultural contexts. Future research should also employ active control conditions, such as supportive counseling, stress-management training, or

psychoeducation, to distinguish the specific therapeutic mechanisms of mindfulness from common intervention effects. Longitudinal follow-up assessments at three, six, and twelve months would be valuable for determining whether reductions in maladaptive daydreaming and rumination are maintained over time. Researchers could also examine potential mediators of treatment effects, including psychological flexibility, experiential avoidance, self-compassion, attentional control, distress tolerance, decentering, and emotion regulation. It would also be useful to investigate whether characteristics of childhood trauma, such as emotional abuse, physical abuse, neglect, chronicity, or age at exposure, moderate responsiveness to mindfulness training. In addition, future studies could integrate behavioral, clinician-rated, ecological momentary assessment, or physiological indicators alongside self-report measures to provide a more comprehensive assessment of treatment outcomes.

The findings suggest that structured mindfulness training may be incorporated into university counseling and psychological support services for students with a history of childhood trauma who experience persistent rumination or maladaptive daydreaming. Counseling centers could offer brief group-based mindfulness programs as part of preventive mental health services, particularly for students who report difficulty controlling repetitive thoughts, excessive internal fantasy, emotional avoidance, or concentration problems. Practitioners should consider screening for trauma history, maladaptive daydreaming, and rumination when students present with academic disengagement, attentional difficulties, emotional distress, or repetitive internal preoccupation. Mindfulness exercises should be introduced gradually and adapted to the individual's tolerance for internal experiences, especially when trauma-related memories or bodily sensations are distressing. Training in breathing awareness, body scanning, cognitive decentering, nonjudgmental observation, and recognition of early signs of emotional dysregulation may be particularly useful. Integration of mindfulness into broader trauma-informed counseling programs may help students develop more adaptive ways of responding to distress and reduce reliance on avoidance-based fantasy or repetitive negative thinking.

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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.

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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