The Role of Rumination in University Students' Mental Health: A Mediation Analysis of Depression and Anxiety

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A R T I C L E I N F O

A B S T R A C T

This study examined the relationship between rumination and mental health among university students by testing the mediating roles of depression and anxiety. Rumination refers to a repetitive and passive focus on negative experiences and emotions that may influence psychological functioning. A quantitative correlational design was employed. A total of 113 students completed the Ruminative Response Scale (RRS), Beck Depression Inventory-II (BDI-II), Beck Anxiety Inventory (BAI), and General Health Questionnaire (GHQ-12). Parallel mediation analysis indicated that rumination significantly predicted depression (β = .6197, p < .001) and anxiety (β = .5830, p < .001). Depression significantly predicted mental health (β = .2893, p = .025), whereas anxiety was not a significant predictor (β = .1186, p = .343). The direct effect of rumination on mental health was not significant (β = −.0940, p = .427), nor was the total effect (β = .1544, p = .098). However, the indirect effect through depression was significant (β = .1793, p = .031; 95% CI [.00464, .0957]), whereas the indirect path through anxiety was not significant (β = .0692, p = .347). These findings indicate that depression fully mediates the relationship between rumination and mental health. Thus, the influence of rumination on students' mental health primarily operates through increased depressive symptoms.

1. INTRODUCTION

University students are in a developmental phase marked by substantial academic demands and significant role transitions, which increase their vulnerability to psychological distress (Beiter et al., 2015; Auerbach et al., 2016). In this context, rumination, characterized by a tendency toward repetitive and passive thinking about negative experiences, is viewed as a maladaptive cognitive response that contributes to diminished mental health (Nolen-Hoeksema et al., 2008). Conceptually, rumination influences mental health through emotional and cognitive processes that intensify distress, including heightened negative affect, emotion regulation dysfunction, and negative cognitive bias (Watkins & Roberts, 2020). This abstract and evaluative mode of processing reinforces the activation of negative schemas and reduces adaptive problem-solving capacity, thereby increasing vulnerability to depression and anxiety (Nolen-Hoeksema et al., 2008). Accordingly, rumination is understood as a transdiagnostic cognitive mechanism that maintains emotional distress and links maladaptive thinking patterns to declines in university students' mental health (Watkins & Roberts, 2020).

Within the theoretical framework, rumination is conceptualized in Response Styles Theory as a pattern of responding to negative mood that maintains and exacerbates emotional distress (Nolen-Hoeksema et al., 2008). Through abstract and evaluative processing, individuals prone to rumination reinforce negative cognitive biases about themselves and their experiences, thereby repeatedly activating negative schemas (Watkins & Roberts, 2020). This pattern disrupts adaptive emotion regulation and strengthens pessimistic interpretations (Joormann, 2010),

ultimately increasing the risk of persistent depressive symptoms and contributing to declines in mental health.

Beyond its association with depression, rumination is also linked to anxiety through the mechanism of anticipatory worry. Repetitive thinking heightens vigilance toward potential future threats and reinforces negative expectations, thereby triggering anxiety symptoms (Clark & Beck, 2010; McLaughlin & Nolen-Hoeksema, 2011). Although rumination is typically associated with the evaluation of past experiences, its shared characteristics with worry suggest overlapping cognitive mechanisms underlying depression and anxiety (Nolen-Hoeksema et al., 2008). This repetitive cognitive process maintains focus on potential threats and inhibits an individual's ability to respond flexibly and adaptively to situations. Accordingly, rumination may contribute to both forms of emotional distress through interrelated cognitive pathways.

Mental health is not merely defined as the absence of emotional disorders but also as a state of psychological well-being that encompasses optimal functioning, meaning in life, and the quality of social relationships (Keyes, 2005). The two-continuum model explains that mental illness and well-being are related yet distinct dimensions; thus, increases in depressive and anxiety symptoms may co-occur with declines in well being (Kessler et al., 2005; Keyes, 2005). Within this framework, depression and anxiety reflect not only emotional disturbances but also impede positive psychological functioning, including adaptive emotion regulation, social engagement, and perceived meaning in life. Therefore, university students' mental health should be understood as a multidimensional construct shaped by the interaction between maladaptive cognitive processes and the accompanying emotional responses.

Based on the preceding discussion, rumination can be understood as a cognitive process that triggers and maintains emotional distress through increased depression and anxiety, which subsequently contributes to declines in university students' mental health (McLaughlin & Nolen-Hoeksema, 2011; Watkins & Roberts, 2020). Repetitive thinking focused on negative content not only reinforces negative affect but also impairs adaptive psychological functioning that underlies well-being (Keyes, 2005; Nolen-Hoeksema et al., 2008). Within this framework, depression and anxiety function as emotional responses that mediate the influence of rumination on overall psychological functioning. Accordingly, the relationship between rumination and mental health is neither simple nor direct but involves interrelated emotional mechanisms.

In the Indonesian context, several studies have reported high levels of depression, anxiety, and emotion regulation difficulties among university students, indicating substantial vulnerability to psychological distress (Handayani et al., 2022; Wahyuni et al., 2024). Consistent with these findings, international research demonstrates that rumination is significantly associated with increased depression and anxiety in both university students and the general population and predicts symptom escalation over time (McLaughlin & Nolen-Hoeksema, 2011). Meta-analytic evidence further indicates that rumination, as a maladaptive emotion regulation strategy, is associated with various forms of psychopathology (Aldao et al., 2010) and is conceptualized as a transdiagnostic mechanism underlying emotional disorders (Watkins & Roberts, 2020). These findings underscore the role of rumination in the emergence and persistence of psychological distress, which impacts mental health.

Rumination is understood as a transdiagnostic cognitive process that maintains psychological distress and is associated with depression and anxiety as emotional responses arising from repetitive negative thinking (Harvey et al., 2004). Within this framework, depression and anxiety may function as psychological mechanisms that mediate the relationship between rumination and mental health. Simultaneously examining these two mediators is essential for developing a more comprehensive understanding of the cognitive–emotional mechanisms underlying university students' mental health. To date, no study has simultaneously examined the mediating roles of depression and anxiety in the relationship between rumination and mental health among Indonesian university students.

Based on the theoretical framework and prior empirical findings, this study aims to examine the relationship between rumination and mental health among university students and to analyze the simultaneous mediating roles of depression and anxiety. The proposed model positions rumination as the predictor, depression and anxiety as mediators, and mental health as

the outcome. It is hypothesized that depression and anxiety jointly mediate the relationship between rumination and mental health among university students. Practically, understanding this mechanism is expected to provide an empirical basis for the development of cognition-based interventions, such as Cognitive Behavioral Therapy targeting ruminative thinking patterns, the design of mental health prevention programs in higher education settings, and the strengthening of psychological screening systems to identify the risk of distress at an earlier stage.

2. METHOD

This study employed a quantitative correlational design to examine the relationships among rumination, depression, anxiety, and mental health in university students in emerging adulthood. A correlational design was selected to align with the study objective of exploring patterns of association and mediational pathways among psychological variables without asserting direct causal relationships. All data were collected through online self-report instruments administered via a digital survey platform, enabling high accessibility, anonymity, and data collection across diverse locations.

The instruments used in this study were as follows: Ruminative Response Scale (RRS) was used to assess the tendency to engage in repetitive thinking about negative experiences. The scale consists of 22 items with an internal consistency reliability of $\alpha = .91$. Beck Depression Inventory–II (BDI-II) was used to assess affective, cognitive, and physiological symptoms of depression. The scale consists of 21 items with an internal consistency reliability of $\alpha = .89$. Beck Anxiety Inventory (BAI) was used to assess cognitive and somatic symptoms of anxiety. The instrument demonstrated an internal consistency reliability of $\alpha = .90$. General Health Questionnaire–12 (GHQ-12) was used to measure general mental health, including psychological distress and daily functioning. The instrument demonstrated an internal consistency reliability of $\alpha = .85$.

A total of 113 emerging adult university students were recruited using purposive sampling. Participants were undergraduate medical students from a public university in Indonesia, representing an academic context characterized by high academic demands within an Indonesian socio-cultural environment. The inclusion criteria were: (a) aged 18–24 years (emerging adulthood), (b) adequate proficiency in the Indonesian language, and (c) not currently undergoing active psychological or psychiatric treatment. The exclusion criteria included incomplete responses or inconsistent response patterns. Participants were recruited through online announcements distributed via social media and university networks and provided electronic informed consent prior to completing the survey.

Data collection was conducted online over a two-month period. After providing informed consent, participants completed demographic questions via a survey link and subsequently responded to the four psychological instruments administered in this study. Upon completion of data collection, participants received an individualized report card based on their responses. The report card provided a brief description of each participant's levels of rumination, depression, anxiety, and mental health, along with recommendations for follow-up actions when elevated scores were identified on specific variables. All data were screened for completeness and response consistency prior to analysis. Responses deemed invalid were excluded from the analytic sample. This study received approval from the institutional ethics committee (085/KEPK/PE/VII/2025) and was conducted in accordance with the ethical guidelines of the American Psychological Association.

Data were analyzed using jamovi version 2.3.18 developed by the The jamovi project. First, descriptive statistics were computed to evaluate the distribution, central tendency, and variability of each variable. Second, simple linear regression analyses were conducted to assess the predictive effects of rumination on depression, anxiety, and mental health. Third, mediation analysis was performed using a bootstrapping procedure with 5,000 resamples to test the roles of depression and anxiety as parallel mediators in the relationship between rumination and mental health among university students. The level of statistical significance was set at $p < .05$ (two-tailed).

3. RESULT AND DISCUSSION

Result

The study involved 113 university students as participants. Preliminary analyses indicated that all variables demonstrated adequate internal consistency reliability, and the data met the assumptions required for parametric analyses, including normality of distribution and linearity.

Table 1. Descriptive Statistics

	Rumination	Depression	Anxiety	Mental Health
N	113	113	113	113
Mean	54.3	11.8	5.94	15.0
Standard deviation	12.3	7.77	3.92	3.44
Minimum	29	0	0	4
Maximum	81	38	17	27
Shapiro-Wilk W	0.985	0.940	0.922	0.975
Shapiro-Wilk p	.251	<.001	<.001	.033

Table 1 presents the descriptive statistics for all study variables, including rumination, depression, anxiety, and global mental health. The mean score for rumination (M = 54.3, SD = 12.3) fell within the moderate range, indicating that participants generally engaged in recurrent negative thinking to a considerable degree. Depression (M = 11.8, SD = 7.77) and anxiety (M = 5.94, SD = 3.92) scores showed substantial variability, with most participants reporting mild symptoms, while a smaller proportion exhibited moderate to severe levels. The global mental health score (M = 15.0, SD = 3.44) was in the moderate range, reflecting variability in psychological well-being across the sample. The Shapiro–Wilk test indicated that rumination approximated a normal distribution, whereas depression and anxiety deviated from normality, which should be considered in selecting appropriate statistical procedures. Overall, these descriptive findings provide an initial overview of the sample characteristics and underscore the importance of examining the relationships among rumination, depressive and anxiety symptoms, and global mental health.

Table 2. Correlation Matrix

		Rumination	Depression	Anxiety	Mental Health
Rumination	Pearson's r	—			
	df	—			
	p-value	—			
Depression	Pearson's r	0.620***	—		
	df	111	—		
	p-value	<.001	—		
Anxiety	Pearson's r	0.583***	0.669***	—	
	df	111	111	—	
	p-value	<.001	<.001	—	

Table 2. Correlation Matrix

		Rumination	Depression	Anxiety	Mental Health
Mental Health	Pearson's r	0.154	0.310***	0.258**	—
	df	111	111	111	—
	p-value	.102	<.001	.006	—

Note. * p < .05, ** p < .01, *** p < .001

Pearson correlation analysis indicated that rumination was positively and significantly associated with depression (r = .620, p < .001) and anxiety (r = .583, p < .001). These findings suggest that higher levels of rumination are accompanied by higher levels of depressive and anxiety symptoms among university students. Depression and anxiety were also strongly and positively correlated (r = .669, p < .001), indicating that these forms of emotional distress tend to co-occur. In contrast, rumination was not significantly associated with global mental health (r = .154, p = .102). However, depression (r = .310, p < .001) and anxiety (r = .258, p = .006) were significantly correlated with mental health, suggesting that increases in emotional symptoms are related to changes in overall mental health status. This pattern of associations indicates that the influence of rumination on mental health may not be direct but may operate through specific emotional mechanisms. Accordingly, these correlational findings provide an empirical basis for testing the mediating roles of depression and anxiety in the relationship between rumination and mental health among university students.

Table 3. Mediation Analysis Results

Type	Effect	Estimate	SE	95% C.I. (a) Lower	95% C.I. (a) Upper	β	z	p
Indirect	Rumination ⇒ Depression ⇒ Mental Health	0.0502	0.0232	0.00464	0.0957	0.1793	2.160	.031
	Rumination ⇒ Anxiety ⇒ Mental Health	0.0194	0.0206	-0.02096	0.0597	0.0692	0.941	.347
Component	Rumination ⇒ Depression	0.3920	0.0467	0.30045	0.4835	0.6197	8.392	<.001
	Depression ⇒ Mental Health	0.1280	0.0573	0.01575	0.2403	0.2893	2.235	.025
	Rumination ⇒ Anxiety	0.1860	0.0244	0.13821	0.2338	0.5830	7.628	<.001

Table 3. Mediation Analysis Results

Type	Effect	Estimate	SE	95% C.I. (a)		β	z	p
				Lower	Upper			
	Anxiety⇒ Mental Health	0.1041	0.1097	-0.11101	0.3192	0.1186	0.948	.343
Direct	Rumination ⇒ Mental Health	-0.0263	0.0331	-0.09127	0.0386	-0.0940	-0.794	.427
Total	Rumination ⇒ Mental Health	0.0432	0.0261	-0.00799	0.0945	0.1544	1.654	.098

Note. Confidence intervals computed with method: Standard (Delta method)

Note. Betas are completely standardized effect sizes

A mediation analysis was conducted to examine the roles of depression and anxiety in the relationship between rumination and mental health. The results indicated that rumination significantly predicted depression (β = .6197, p < .001) and anxiety (β = .5830, p < .001). When both mediators were entered simultaneously into the model, only depression significantly predicted mental health (β = .2893, p = .025), whereas anxiety did not show a significant effect (β = .1186, p = .343). The indirect effect analysis revealed that rumination had a significant effect on mental health through depression (β = .1793, p = .031, 95% CI [.00464, .0957]), but not through anxiety (β = .0692, p = .347, 95% CI [−.02096, .0597]). Furthermore, the direct effect of rumination on mental health was not significant after the mediators were included in the model (β = −.0940, p = .427), and the total effect was also not significant (β = .1544, p = .098). These findings indicate that depression functions as a significant mediator in the relationship between rumination and mental health, whereas anxiety does not serve as a meaningful mediator. Overall, the mediation model suggests that the relationship between rumination and mental health among university students is primarily explained through increased depressive symptoms rather than anxiety.

Discussion

This study aimed to examine the roles of depression and anxiety as mediators in the relationship between rumination and mental health among university students. The findings indicate that rumination is associated with mental health primarily through increased depressive symptoms, whereas the mediating role of anxiety was not significant when tested simultaneously. These results support the hypothesis that rumination contributes to mental health outcomes through emotional mechanisms, with depression functioning as a full mediator and the primary psychological pathway. From a theoretical perspective, the findings underscore the role of rumination in maintaining emotional distress, which ultimately undermines psychological well-being among university students.

The findings indicate that rumination is positively associated with depression and anxiety; however, its impact on mental health primarily operates through increased depressive symptoms. This finding aligns with theoretical perspectives that conceptualize rumination as a maladaptive cognitive process that maintains negative affect through repetitive processing of distressing emotional experiences (Nolen-Hoeksema, 2000). Individuals with a tendency to ruminate are more likely to focus on the causes and consequences of distress without engaging in adaptive

problem-solving strategies, thereby prolonging and intensifying depressive experiences (Watkins, 2008).

The significant mediating role of depression observed in this study is consistent with cognitive vulnerability models, which propose that repetitive thinking patterns reinforce negative schemas about the self, the world, and the future (Watkins & Roberts, 2020). The activation of these schemas contributes to more persistent depressive symptoms and compromises overall psychological functioning. In addition, emotion regulation research suggests that rumination is associated with difficulty disengaging attention from negative emotional information, thereby prolonging and intensifying negative affective experiences (Joormann, 2010). These findings align with prior research demonstrating that rumination predicts increases in depressive symptoms, which are subsequently linked to reduced psychological well-being among university students.

Mediation analysis indicated that depression fully mediated the relationship between rumination and mental health. The indirect effect of rumination on mental health through depression was significant, whereas the direct effect was no longer significant after the mediator was included in the model. These findings suggest that the impact of rumination on mental health operates primarily through increased depressive symptoms as the central psychological mechanism. Compared to anxiety, depression emerged as the more dominant mediator, as only the indirect pathway through depression was significant and demonstrated a larger effect size.

The absence of a significant mediating role of anxiety suggests that although rumination is associated with increased anxiety, its contribution to mental health becomes non-significant when depression is simultaneously taken into account. Conceptually, anxiety is more closely related to the anticipation of future threats, whereas rumination is more focused on the evaluation of past negative experiences (Watkins, 2008). This difference in temporal orientation may explain why depression constitutes a more dominant pathway in accounting for the impact of rumination on mental health among university students. Several previous studies have reported that anxiety also serves as a significant mediator in the relationship between rumination and mental health. These discrepant findings may be attributable to variations in sample characteristics, differences in measurement instruments, or sociocultural research contexts. Theoretically, these results indicate that the mediating role in the association between rumination and mental health is context-dependent, with depression emerging as a more central mechanism than anxiety within the university student population.

The dominance of the depressive pathway can also be understood in light of the developmental characteristics of university students as the study population. University students are in the phase of emerging adulthood, characterized by identity exploration, academic demands, and uncertainty about the future, all of which require mature emotion regulation capacities. Several studies have shown that difficulties in emotion regulation and a ruminative tendency are significant predictors of psychological distress in university student populations (Aldao et al., 2010; Regehr et al., 2013). Individuals prone to rumination are more likely to become trapped in the processing of negative experiences, thereby depleting cognitive resources that would otherwise support adaptive functioning and perpetuating negative affect.

In the Indonesian cultural context, the expression of negative emotions is often managed through self-control and internal reflection, which may reinforce tendencies toward repetitive thinking. The emphasis on social harmony and the regulation of emotional expression encourages individuals to internalize emotional experiences rather than express them openly (Sarwono, 2012). Cross-cultural perspectives on emotion regulation suggest that emotion regulation strategies are shaped by prevailing social norms and cultural values (Gross, 2015). Academic pressures and social demands on university students may further heighten tendencies toward repetitive self-evaluation of negative experiences, and coping patterns centered on internal reflection have been linked to emotional distress in Indonesian populations (Nashori, 2002). These conditions may render rumination a more dominant psychological mechanism influencing mental health among university students. Therefore, the present findings provide a contextualized understanding of emotion regulation dynamics among Indonesian university students, which may differ from those observed in other cultural settings.

Theoretically, this study reinforces cognitive-emotional models that conceptualize rumination as a transdiagnostic risk factor for affective disturbances, consistent with the Response Styles Theory, which posits that rumination maintains and exacerbates emotional distress (Nolen-Hoeksema et al., 2008). The findings are also aligned with cognitive models of depression that emphasize the role of maladaptive thinking processes in the development of emotional symptoms (Beck, 2008). Furthermore, this study advances understanding of the psychological mechanisms underlying university students' mental health by demonstrating that depression constitutes the primary pathway linking maladaptive cognitive processes to psychological well-being. Collectively, these results provide empirical support for transdiagnostic frameworks that position emotion regulation mechanisms and cognitive vulnerabilities as foundational processes underlying various emotional disorders (Barlow et al., 2017), particularly within the Indonesian university student context.

Practically, the findings of this study have implications for student mental health services. Psychological interventions targeting cognitive processes, such as emotion regulation training, mindfulness, and cognitive restructuring, have the potential to reduce ruminative tendencies and indirectly improve mental health (Segal et al., 2013). These findings also inform campus counseling services, particularly in developing initial assessment procedures and cognitive-process-based interventions for students exhibiting ruminative tendencies. In a preventive context, screening for rumination can serve as an early indicator of psychological distress, allowing interventions before symptoms escalate. Promotive, campus-based approaches are also important for strengthening students' emotion regulation skills as a strategy to prevent mental health problems.

Although this study provides empirical contributions, several limitations should be acknowledged. The cross-sectional design does not allow for causal inferences between variables. The use of self-report instruments may also be influenced by respondents' subjective perception biases. Additionally, the characteristics of the student sample limit the generalizability of the findings to the broader adult population. The sampling technique employed may introduce bias, so the representativeness of the sample for the wider student population should be interpreted with caution. The relatively small sample size may also affect the stability of parameter estimates and the statistical power of the analyses. Future research is recommended to employ longitudinal designs with larger and more representative samples to examine the directionality of relationships between variables and to consider protective factors such as adaptive emotion regulation and social support.

Overall, the present findings support the role of rumination as a significant cognitive factor contributing to university students' mental health through increased depressive symptoms. This study advances understanding of the psychological mechanisms linking maladaptive cognitive processes to psychological well-being within the Indonesian university context. Collectively, these results provide an empirical foundation for the development of cognitive-based interventions and underscore the importance of prevention and early intervention strategies to promote university students' mental health.

4. CONCLUSION

The findings indicate that rumination functions as a central cognitive factor influencing university students' mental health, primarily through increased depressive symptoms, whereas anxiety did not emerge as a significant mediator in the simultaneous model. These results provide empirical support for the role of maladaptive thinking patterns as a key psychological mechanism underlying student mental health and extend understanding of these processes within developmental and sociocultural contexts. Practically, the findings underscore the importance of interventions targeting cognitive processes and emotion regulation within university mental health services, spanning both preventive and therapeutic efforts, and highlight the potential for campus-based promotive programs aimed at reducing ruminative tendencies. Future research should employ longitudinal or experimental designs to more rigorously examine the directionality of relationships among variables, utilize larger and more diverse samples, and consider protective

factors such as adaptive emotion regulation, social support, and psychological resilience to further clarify the mechanisms underlying university students' mental health.

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