

Original Article

From Social Struggles to Internal Battles: Understanding Depression Through Interpersonal Problems and Rumination

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Abstract

Objective: Depression represents a significant global health burden, with interpersonal problems and rumination emerging as crucial correlates. However, the precise nature of the associations linking these elements remains unclear. This study investigated the statistical mediation pattern of rumination in the relationship between interpersonal problems and depressive symptoms in the Iranian population.

Method: A cross-sectional study was conducted with 564 participants (38.5% male, 61.5% female; mean age = 21.50, SD = 3.47) recruited through social media networks in Zanjan, Iran. Participants completed the Inventory of Interpersonal Problems (IIP-32), Rumination Response Scale (RRS), and Beck Depression Inventory-II (BDI-II). Structural equation modeling was employed to test the hypothesized mediation model.

Results: The structural model demonstrated an excellent fit ($\chi^2/df = 2.904$, RMSEA = 0.055, CFI = 0.979). Interpersonal problems were significantly associated with both rumination ($\beta = 0.637$, $P < 0.001$) and depressive symptoms ($\beta = 0.253$, $P < 0.001$). Rumination showed a significant indirect association ($\beta = 0.373$, $P < 0.001$) in the relationship between interpersonal problems and depression symptoms. The total association of interpersonal problems with depressive symptoms was substantial ($\beta = 0.627$, $P < 0.001$).

Conclusion: The findings confirm that interpersonal problems are both directly and indirectly associated with depressive symptoms, with the indirect statistical pathway operating via rumination. This suggests that the interplay between interpersonal difficulties and ruminative thinking patterns may be a relevant consideration for future clinical research aiming to improve depression outcomes.

Key words: Depression; Interpersonal Problems; Rumination; Structural Equation Modeling

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Depression is one of the leading causes of disability and is among the most debilitating mental disorders worldwide, characterized by persistent sadness, loss of interest or pleasure, and impaired daily functioning (1, 2). It imposes substantial economic burdens and diminishes cognitive, physical, social, and emotional well-being (3). Among the various factors associated with depression, interpersonal problems (IPs) stand out as key correlates of depressive symptomatology (4). Interpersonal difficulties encompass a broad spectrum of potential issues, including challenges in expressing emotions, excessive control over others, or neglecting personal needs in favor of pleasing others (5).

IPs are defined as recurrent difficulties in interacting with others, encompassing a wide range of potential issues, including difficulties in expressing affection or socializing, overly controlling others, or neglecting one's own needs in an effort to please others. The nature of interpersonal functioning inherently correlates with psychological well-being, making IPs a common concern among those seeking psychological assistance (6). Previous studies support the relationship between IPs and depression. For instance, individuals with major depressive disorder (MDD) often report interpersonal issues such as social withdrawal, avoidance, and submissive behaviors, which are significantly associated with difficulties in their personal, professional, and healthcare settings (7). They experience less enjoyable and intimate interactions (8), struggle with social situations (9), and find establishing relationships challenging (10). Both adults and adolescents with MDD face considerable distress in their relationships (11).

Previous studies have underscored the association between IPs and symptoms of MDD. For instance, Basharat *et al.* demonstrated a significant positive correlation between specific IPs and symptoms of anxiety and depression, indicating that IPs can predict 19.4% and 21.4% of the variance in anxiety and depressive symptoms, respectively (12). Peters *et al.* demonstrated that six different anxiety and depressive disorders share comparable interpersonal profiles characterized by submissiveness, supporting the notion that interpersonal style may function as a transdiagnostic factor across these conditions (13). Research on a non-clinical Portuguese female population has shown that interpersonal problems, especially social inhibition, self-sacrifice, and dominance, significantly predict depressive symptoms (14). Similarly, Tricoli *et al.* found that individuals with high levels of depression reported more severe IPs, with depression levels predicting the degree of IPs (15). Recent structural equation modeling research further reinforces this connection, demonstrating that thwarted interpersonal needs significantly predict depression and are correlated with other maladaptive behaviors (16).

Notably, a comprehensive meta-analysis reported a significant positive correlation between interpersonal

problems and depressive symptoms ($r = 0.473$), with this association holding consistently across both clinical and non-clinical samples, underscoring the robust link between interpersonal difficulties and depression (17). In a study examining the relationship between IPs and treatment outcomes in MDD, researchers found that specific IPs, such as difficulty providing support to others and being closed to feedback, were associated with higher dropout rates and poorer treatment outcomes. These findings suggest that interpersonal difficulties represent important correlates to consider when evaluating depressive symptomatology (18).

Rumination emerges as one of the key features of depression. Repetitive negative thoughts are common phenomena that everyone may experience, but when these thoughts become excessively intense, they may play a significant role in the persistence of various mental disorders (19). These thoughts are characterized by their repetitive, intrusive, and uncontrollable nature. Rumination is considered one of the most significant forms of repetitive negative thinking. It is a transdiagnostic regulation strategy that is associated with various forms of psychopathology, including depression, anxiety, substance abuse, binge eating, and self-harming behavior (20).

There is substantial evidence that rumination links IPs and depression. Multiple studies highlight that rumination, particularly depressive rumination, plays a crucial role in intensifying and sustaining depressive symptoms when interpersonal difficulties are present (21, 22). Tao *et al.* conducted a meta-analysis of 29 studies and reported a strong correlation of 0.61 between rumination and depression in adolescents, highlighting rumination as a pivotal factor in adolescent mental health (23). Another study demonstrated that rumination represents a key statistical link through which feelings of loneliness and interpersonal difficulties are associated with depression (24). This indirect association indicates that the relationship between interpersonal difficulties and depression severity may be theoretically linked through ruminative tendencies. Prior work has also found that interventions reducing ruminative tendencies, such as mindfulness-based therapy, are associated with lower depressive symptoms (25).

According to Nolan-Hoeksema's response styles theory (26), individuals characterized by a ruminative response style tend to dwell passively and repetitively on their negative mood states, a phenomenon often referred to as depressive rumination. It is well-established that depressive rumination exacerbates depressive symptoms (27, 28) and predicts the onset, severity (29), and recurrence (30) of major depressive episodes. Typical examples of ruminative thoughts in depression include "Why am I the only one facing these challenges and suffering from sadness?"

While the relationship between IPs, rumination, and depression has been examined in Western contexts, there remains a significant gap in understanding how these

relationships manifest within the Iranian cultural context. Iranian society holds distinct collectivistic values that emphasize family unity, interdependence, and adherence to traditional social norms. These cultural characteristics may uniquely influence how IPs are experienced and expressed, as well as how they relate to rumination and depression (31). For instance, Sharifi *et al.* noted that Iranians tend to express psychological distress through interpersonal and somatic complaints rather than through the direct acknowledgment of depressive symptoms, suggesting a culturally specific pathway between interpersonal difficulties and psychological disorders (32). Additionally, Dejman *et al.* found that Iranian women's experiences of depression were deeply intertwined with their interpersonal relationships and social expectations, highlighting the importance of examining these variables within this specific cultural context (33).

The existing literature reveals significant findings regarding the association of IPs and rumination with depressive symptoms. Despite the well-documented connection between these factors, there remains a need to clarify how interpersonal difficulties and rumination specifically relate to the variance in depression. By addressing these gaps, this study will provide valuable insights into the associations among these variables, contributing to the theoretical foundation for future research on depressive symptoms. Given these foundations and the background provided by previous studies, this research aims to examine the statistical associations among interpersonal problems, rumination, and depressive symptoms, testing rumination as a statistical intermediary variable in a cross-sectional SEM framework within an Iranian cultural context. The hypothetical mediation model is presented in Figure 1.

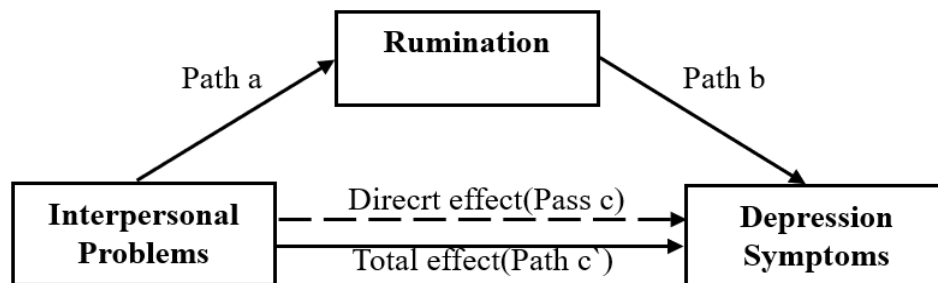


Figure 1. Hypothesized Mediation Model. Path A = Interpersonal Problems (IIP) → Rumination (RRS); Path B = Rumination (RRS) → Depressive Symptoms (BDI); Path C' = Direct Effect of Interpersonal Problems (IIP) → Depressive Symptoms (BDI), controlling for Rumination. (N = 564)

Materials and Methods

Participants

This multivariate, cross-sectional investigation sought to analyze multivariate associations within the structural equation modeling (SEM) framework. Participants were recruited through online postings in Zanjan, Iran, social media networks, which included brief explanations of the study's purpose and methodology, along with a participation link. Before completing the scales, participants provided informed virtual consent by selecting the "I agree" option. A sample of 564 individuals was selected based on a sample size estimation method for structural equation modeling with an effect size of 0.18 and a statistical power of 0.8 (34). The inclusion criteria for this study included informed consent and an age range of 18 to 50 years. The exclusion criterion was a desire to withdraw from the study or random responses to the items. The participants in this study were drawn from the general population and comprised 217 males (38.5%) and 347 females (61.5%). They had a mean age of 21.50 (SD = 3.47). The participants' marital status distribution was as follows: 8.3% married and 91.7% single. Educational attainment levels were categorized as 74.5% undergraduates and

25.5% postgraduates. All participants were Iranian and Persian-speaking and were selected using convenience sampling.

Procedure

After obtaining approval from the Ethics Committee of Zanjan University of Medical Sciences, sampling was initiated (ID: IR.ZUMS.REC.1401.257). This study was questionnaire-based and conducted online. At the outset, participants were provided with information regarding the voluntary nature of the study, anonymity, confidentiality, and their ability to withdraw at any time during questionnaire completion. Additionally, respondents were allowed to contact the researchers if they had any questions about the questionnaire content or an interest in the results after completing the survey.

Instruments

Inventory of Interpersonal Problems (IIP-32)

The IIP-32 is a 32-item self-report questionnaire designed to assess a broad range of interpersonal difficulties that individuals may experience, and it was developed by Barkham *et al.* (35). The IIP-32 measures interpersonal difficulties across six distinct domains of interpersonal functioning: Assertiveness, Sociability, Submissiveness, Intimacy, Responsibility, and

Controlling. Participants rate each item on a 5-point Likert scale ranging from "Not at all" (0) to "Extremely" (4). The instrument has demonstrated good internal consistency across its scales and strong construct validity, effectively distinguishing between different interpersonal difficulties (36). The Persian version of the IIP-32 demonstrated good reliability with a Cronbach's alpha of 0.82 and a split-half reliability of 0.82 (37). In the present sample, the IIP-32 demonstrated a Cronbach's alpha of 0.898.

Beck Depression Inventory Second Edition (BDI-II)

The BDI-II is a 21-item self-report tool designed to assess the presence and severity of depressive symptoms developed by Beck in 1996 (38). When the BDI-II is administered, participants are asked to respond to each statement based on their feelings over the past two weeks. The scores for each of the 21 items related to depressive symptoms are summed to provide a total score for the questionnaire. Each item uses a four-point scale ranging from 0 to 3. The total score ranges from 0-13 (normal), 14-19 (mild), 20-28 (moderate), and 29-63 (severe). This questionnaire has a high Cronbach's alpha coefficient (0.80), its construct validity has been established, and it effectively distinguishes between depressed and non-depressed participants (38). In the present sample, the BDI-II demonstrated a Cronbach's alpha of 0.877.

Rumination Response Scale (RRS)

The RRS is a self-report measure developed by Nolen Hoeksema that assesses individuals' tendencies to ruminate in response to a depressed mood. It also indicates individuals' vulnerability to depression and predicts the course of clinical depression (39). The items are rated on a Likert scale from 1 (almost never) to 4 (almost always). The RRS demonstrates high internal consistency, with a Cronbach's alpha coefficient ranging from 0.88 to 0.92, and a test-retest correlation of 0.67 (40). In the present sample, the RRS demonstrated a Cronbach's alpha of 0.941.

Data Analysis Method

Reliability and validity analyses were initially employed to assess the measurement model's quality, ensuring that the measurement scale accurately captured the variables. Reliability was evaluated using Cronbach's alpha for variables in SPSS 27 software. Validity analysis was conducted using confirmatory factor analysis (CFA) generated by AMOS version 24. Secondly, for the descriptive statistical analysis of the questionnaires, SPSS version 27 was utilized to report means, standard deviations, skewness, and kurtosis, assuming normality with values less than ± 2 . To measure the strength of the relationship between IPs, rumination, and depressive symptoms within the sample, the Pearson correlation coefficient (r) was employed. The study utilized SEM to test the hypothesized statistical mediation pattern of rumination in the association between IPs and depression. Within this framework, the subscale scores of the IPs, rumination, and depression were treated as

observed variables, while their total scores were considered latent variables. Each path underwent standardized estimation, resulting in a standardized path coefficient that illustrated the strength of the association between variables for each path. Model fit was assessed using various fit indices such as the root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker Lewis index (TLI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), and the Chi-square statistic (χ^2)/degrees of freedom (df) (CMIN/DF). Models with an RMSEA below 0.08, CFI above 0.90, TLI above 0.90, GFI above 0.95, AGFI above 0.80, and CMIN/DF below 5 were deemed to fit well (41). Given the potential conceptual and item-level overlap between the RRS Depression subscale and the BDI-II, a sensitivity analysis was additionally conducted using a two-factor structure of the RRS (Reflection and Brooding subscales only, excluding the Depression-related items) to verify that the observed structural pathways were not attributable to this overlap. All statistical analyses were conducted using SPSS version 27.0 and Amos 24.0 software for Windows, with statistical significance set at $P < 0.05$ (two-tailed). The results were reported as means $\pm$ standard deviations in the study.

Results

Preliminary analyses

Preliminary analyses were conducted to examine the distributional properties of the study variables. Descriptive statistics revealed that interpersonal problems had a mean score of 41.10 ($SD = 16.22$), ruminative responses showed a mean of 45.18 ($SD = 13.94$), and depression demonstrated a mean of 13.40 ($SD = 9.66$). Examination of skewness and kurtosis values for all variables revealed that they fell within the acceptable range of ± 2 , indicating a normal distribution of the data.

Correlation Analyses

Bivariate correlations revealed significant associations among the primary study variables (Table 1). Interpersonal problems demonstrated a strong positive correlation with ruminative responses ($r = 0.571$, $P < 0.001$), indicating that greater interpersonal difficulties were associated with increased ruminative tendencies. Additionally, interpersonal problems showed a moderate positive correlation with depression ($r = 0.475$, $P < 0.001$). Furthermore, ruminative responses exhibited a strong positive association with depression ($r = 0.619$, $P < 0.001$), suggesting that higher levels of rumination were linked to more severe depressive symptoms. These findings provide preliminary support for the hypothesized relationships among interpersonal problems, rumination, and depressive symptomatology.

Table 1. Descriptive Statistics and Bivariate Correlations Among Interpersonal Problems, Rumination, and Depression Subscales in the Iranian Sample (N = 564)

scale	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. IIP	41.10	16.22	1	0.784 ^a	0.519 ^a	0.557 ^a	0.662 ^a	0.732 ^a	0.732 ^a	0.571 ^a	0.570 ^a	0.547 ^a	0.425 ^a	0.475 ^a	0.420 ^a	0.468 ^a	0.268 ^a
2. IIP-A	9.16	5.94		1	0.445 ^a	0.243 ^a	0.357 ^a	0.620 ^a	0.439 ^a	0.438 ^a	0.451 ^a	0.434 ^a	0.238 ^a	0.437 ^a	0.397 ^a	0.449 ^a	0.203 ^a
3. IIP-S	3.44	2.14			1	0.218 ^a	0.165 ^a	0.527 ^a	0.167 ^a	0.252 ^a	0.256 ^a	0.208 ^a	0.215 ^a	0.228 ^a	0.186 ^a	0.249 ^a	0.126 ^a
4. IIP-Su	8.56	3.32				1	0.247 ^a	0.106 ^a	0.432 ^a	0.319 ^a	0.312 ^a	0.290 ^a	0.277 ^a	0.179 ^a	0.170 ^a	0.185 ^a	.067
5. IIP-I	5.86	3.87					1	0.375 ^a	0.525 ^a	0.483 ^a	0.473 ^a	0.477 ^a	0.355 ^a	0.443 ^a	0.376 ^a	0.412 ^a	0.348 ^a
6. IIP-R	8.88	5.11						1	0.349 ^a	0.343 ^a	0.348 ^a	0.316 ^a	0.249 ^a	0.365 ^a	0.316 ^a	0.345 ^a	0.260 ^a
7. IIP-C	5.19	2.82							1	0.453 ^a	0.455 ^a	0.442 ^a	0.336 ^a	0.287 ^a	0.273 ^a	0.264 ^a	0.162 ^a
8. RRS	45.18	13.94								1	0.974 ^a	0.900 ^a	0.843 ^a	0.619 ^a	0.582 ^a	0.574 ^a	0.359 ^a
9. RRS-D	24.89	8.18									1	0.834 ^a	0.753 ^a	0.625 ^a	0.583 ^a	0.582 ^a	0.367 ^a
10. RRS-R	10.35	3.64										1	0.663 ^a	0.591 ^a	0.569 ^a	0.546 ^a	0.314 ^a
11. RRS-B	9.94	2.93											1	0.428 ^a	0.398 ^a	0.397 ^a	0.259 ^a
12. BDI	13.40	9.66												1	0.911 ^a	0.891 ^a	0.715 ^a
13. BDI-NA	5.87	4.99													1	0.679 ^a	0.502 ^a
14. BDI-PD	4.94	4.00														1	0.559 ^a
15. BDI-SE	2.58	2.15															1

M: mean, SD: standard deviation, IIP: Inventory of Interpersonal Problems, IIP-A: Assertiveness, IIP-S: Sociability, IIP-Su: Submissiveness, IIP-I: Intimacy, IIP-R: Responsibility, IIP-C: Controlling, RRS: Rumination Response Scale, RRS-D: Depression, RRS-R: Reflection, RRS-B: Brooding, BDI: Beck Depression Inventory, BDI-NA: Negative Attitude, BDI-PD: Performance Difficulty, BDI-SE: Somatic Elements. ^aP < 0.001, ^bP < 0.05,

Measurement Model of Study Instruments

Prior to testing the structural model, a CFA was conducted to verify the internal factor structure of each instrument in the present sample. The three-factor structure of the BDI-II showed an acceptable fit ($\chi^2/df = 2.098$, GFI = 0.938, AGFI = 0.923, CFI = 0.928, TLI = 0.919, RMSEA = 0.044), with standardized item loadings ranging from 0.396 to 0.739. The three-factor structure of the RRS exhibited an acceptable fit ($\chi^2/df = 2.989$, GFI = 0.915, AGFI = 0.890, CFI = 0.941, TLI = 0.931, RMSEA = 0.059), with loadings ranging from 0.528 to 0.768. The six-factor structure of the IIP-32 showed an acceptable fit ($\chi^2/df = 2.892$, GFI = 0.901, AGFI = 0.889, CFI = 0.903, TLI = 0.901, RMSEA = 0.058), with loadings ranging from 0.402 to 0.830.

Structural Model

To examine the hypothesized relationships among the constructs and evaluate the hypothesized statistical mediation pattern, structural equation modeling was conducted using AMOS-24. The analysis employed a bootstrapping procedure with 5000 resamples and bias-corrected confidence intervals to simultaneously assess direct and indirect effects. The measurement model demonstrated an excellent fit to the data: $\chi^2/df = 2.904$, RMSEA = 0.055 (90% CI: [0.046, 0.069]), CFI = 0.979, TLI = 0.962, GFI = 0.970, AGFI = 0.936, surpassing conventional thresholds for model adequacy.

All subscale loadings in this combined measurement model were significant and ranged from 0.33 to 0.93. The lowest loading, for the IIP Submissiveness subscale ($\lambda = 0.33$), remained above the conventional minimum acceptable threshold of 0.30 and was retained given its established validity within the IIP-32 taxonomy. One correlated measurement error, between the Performance Difficulty and Somatic Elements indicators of the BDI

factor, was freed based on modification indices; conceptually, these two components frequently co-occur as joint markers of the functional-physiological impairment dimension of depressive symptomatology, supporting the shared residual variance.

Figure 2 displays the final structural equation model with standardized path coefficients and factor loadings for all subscales. Analysis of standardized path coefficients revealed significant relationships across all hypothesized pathways. Table 2 presents the standardized direct, indirect, and total effects along with their 95% confidence intervals. The direct path from path A (IIP to RRS, $\beta = 0.637$, $P < 0.001$) indicated that interpersonal problems were strongly linked to ruminative responses. Path B (RRS to depressive symptoms) showed a substantial positive association ($\beta = 0.586$, $P < 0.001$), suggesting that increased rumination was correlated with higher depression levels. Path C (IIP to Depression symptoms) remained significant ($\beta = 0.253$, $P < 0.001$). Notably, the indirect pathway linking IIP to depressive symptoms through RRS was significant ($\beta = 0.373$, $P < 0.001$), consistent with the statistical mediation pattern in which ruminative responses partially accounted for the association between interpersonal problems and depression symptoms. The total association of IIP with depressive symptoms ($\beta = 0.627$, $P < 0.001$) demonstrated the relationship between interpersonal problems and depressive symptoms, both directly and indirectly through rumination. These findings provide robust evidence for the proposed theoretical model, highlighting the pattern in which interpersonal difficulties showed both direct and indirect statistical associations with depressive symptoms via ruminative responses (Table 2).

Table 2. Standardized Direct, Indirect, and Total Effects of Interpersonal Problems on Depressive Symptoms via Rumination in the Structural Equation Model

Effect	Path	Estimate	C.R	P-value	95% Confidence Intervals	
					Lower Bounds	Upper Bounds
Direct	A) IIP → RRS	0.637	9.395	< 0.001	0.566	0.704
	B) RRS → Dep	0.586	10.472	< 0.001	0.496	0.684
	C) IIP → Dep	0.253	4.365	< 0.001	0.147	0.351
Indirect	IIP → Dep	0.373		< 0.001	0.305	0.454
Total	C') IIP → Dep	0.627		< 0.001	0.558	0.688

IIP: Inventory of Interpersonal Problems, RRS: Rumination Response Scale, Dep: Depression

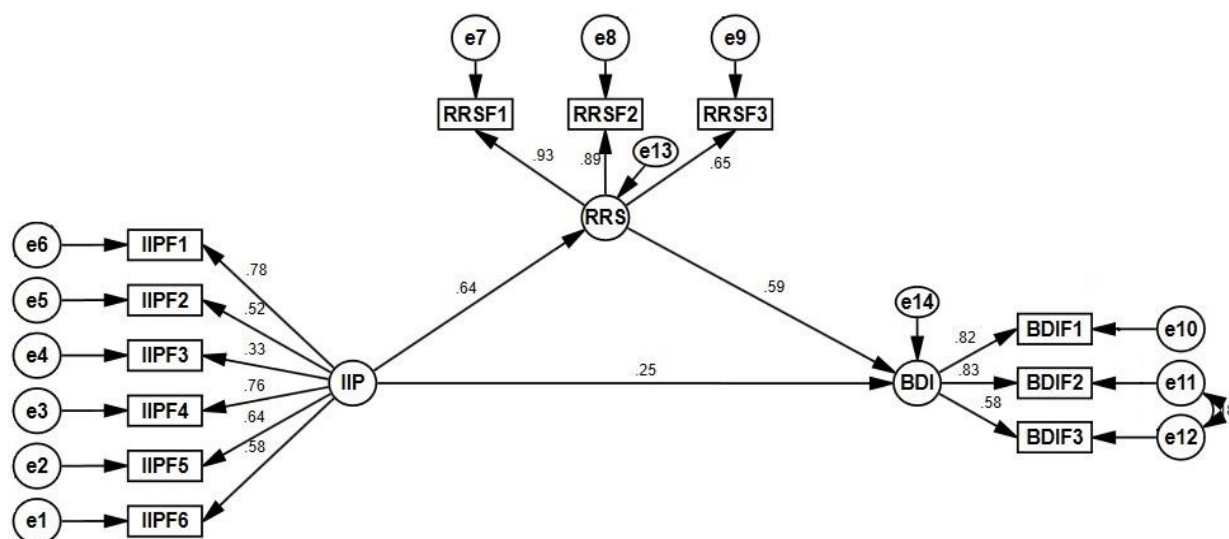


Figure 2. Final Structural Equation Model with Standardized Path Coefficients (β) and Factor Loadings for the Mediation of Rumination (RRS) between Interpersonal Problems (IIP-32) and Depressive Symptoms (BDI-II), Including Their Respective Subscales (N = 564)

IIP: Inventory of Interpersonal Problems, IIP-F1: Assertiveness, IIP-F2: Sociability, IIP-F3: Submissiveness, IIP-F4: Intimacy, IIP-F5: Responsibility, IIP-F6: Controlling, RRS: Rumination Response Scale, RRS-F1: Depression, RRS-F2: Reflection, RRS-F3: Brooding, BDI: Beck Depression Inventory, BDI-F1: Negative Attitude, BDI-F2: Performance Difficulty, BDI-F3: Somatic Elements

Sensitivity Analysis Excluding RRS–Depression Overlap

Because several RRS Depression subscale items overlap in content with the BDI-II, a sensitivity analysis was conducted using a two-factor structure of the RRS, retaining only the Reflection and Brooding subscales as indicators of rumination. This sensitivity model demonstrated adequate fit to the data: $\chi^2/df = 2.991$, RMSEA = 0.069, CFI = 0.967, TLI = 0.939, GFI = 0.966, AGFI = 0.933, with values within the recommended thresholds.

The pattern of path coefficients closely mirrored the primary model. The path from interpersonal problems to rumination remained strong and significant ($\beta = 0.591$, $P < 0.001$), as did the path from rumination to depression ($\beta = 0.517$, $P < 0.001$) and the direct path from interpersonal problems to depression ($\beta = 0.305$, $P < 0.001$). The standardized indirect effect of interpersonal problems on depression through rumination remained significant ($\beta = 0.306$, $P < 0.001$). These results were consistent with the primary tri-factor model, indicating that the reported mediation pathway was not substantially driven by item-level overlap between the RRS Depression subscale and the BDI-II.

Discussion

The present study aimed to examine the statistical mediation pattern of rumination in the association between IPs and depressive symptoms. Our findings revealed that while IPs are directly linked to depressive symptoms, they are also indirectly associated through increased ruminative thinking, suggesting a more

complex structural relationship than previously considered. Prior literature has discussed this relationship as potentially bidirectional (42), however, the present cross-sectional design tested only the statistical pathway from IPs to depression via rumination, and our findings should not be interpreted as evidence for or against reverse, causal, or bidirectional pathways.

Our findings should be interpreted with attention to the cultural context of Iran, although the present study did not include a comparative (e.g., cross-national) sample and therefore cannot directly test culture-specific mechanisms. The observed relationship between IPs and depression is consistent with prior work suggesting that in collectivistic societies such as Iran, social harmony plays an important role in psychological well-being; the pronounced indirect statistical association via rumination might tentatively reflect culturally-shaped patterns of emotional processing, such as extensive self-reflection about interpersonal conflicts (31).

The direct relationship between IPs and depressive symptoms aligns with an extensive body of previous research highlighting the crucial role of IPs in mental health outcomes. In one study, Besharat *et al.* found that IPs explained 21.4% of the variance in depressive symptoms (12). This link is further solidified by a recent comprehensive meta-analysis which confirmed a robust, consistent positive correlation ($r = 0.473$) between interpersonal difficulties and depressive symptoms across both clinical and non-clinical cohorts (17), a pattern also observed in recent community-based population studies (14). Similarly, McEvoy *et al.*

demonstrated that specific interpersonal difficulties were associated with poorer treatment outcomes in depression (18). This relationship appears bidirectional, as Tricoli *et al.* showed that severely depressed individuals exhibit more negative attitudes toward social contact, creating a vicious cycle of interpersonal difficulties and depressive symptoms (15). In their longitudinal studies, Hammen and Zupan found that chronic interpersonal stressors were the strongest predictors of depressive episodes (43).

The relationship between IPs and depression can be understood through several theoretical frameworks. The interpersonal theory of depression posits that depression-related behaviors are theoretically linked to rejection and further interpersonal difficulties (44). The social learning theory emphasizes how social skill deficits contribute to depression through reduced positive reinforcement (45). The theory regarding depression has been expanded, demonstrating that depressive symptoms are closely linked to decreased social positive reinforcement (46). The Stress-Vulnerability Model explains how IPs relate to individual vulnerabilities in connection with depression (47). Self-regulation theory proposes that IPs are associated with disruptions in self-regulatory processes (48).

The results further revealed that IPs were significantly associated with rumination. Multiple studies support this relationship and propose various theoretical explanations. Takano *et al.* found that individuals with weaker interpersonal skills were more likely to engage in rumination when facing social challenges (49), while Saffrey and Ehrenberg demonstrated that attachment-related IPs were associated with increased rumination during relationship difficulties (50). These findings align with the response styles theory, which conceptualizes rumination as a maladaptive coping strategy for interpersonal stressors (27). Supporting these findings, Nia *et al.* examined 197 students and found that narcissism-related IPs were correlated with increased rumination, which was in turn associated with reduced forgiveness capacity and greater relationship difficulties (51).

IPs may be especially likely to trigger rumination within the Iranian cultural context, where relational conflicts are often internalized rather than directly confronted. This is supported by a qualitative study of Iranian women by Namdarpour *et al.*, who found that unresolved marital conflicts activated insecure attachment styles, which in turn contributed to rumination and further intensified negative emotions and relationship strain. This suggests that within Iranian relational dynamics, unresolved interpersonal strain can become a recurring driver of repetitive negative thinking, making the IP-rumination relationship particularly relevant to examine in this cultural context (52).

The response styles theory suggests that individuals choose different response patterns when facing IPs, with

some opting for rumination instead of active problem-solving (29). The Control-Process perspective suggests that rumination occurs when individuals perceive differences between current and desired interpersonal situations (53), while the metacognitive model emphasizes how beliefs about rumination's problem-solving utility actually perpetuate difficulties (54). These findings support Joiner's cognitive-interpersonal model, where rumination serves as a compensatory response to interpersonal threats (44).

The results demonstrated that rumination was significantly correlated with depressive symptoms. This finding is consistent with previous research which found that rumination independently predicted 30% of the depression variance (55); while Flynn *et al.* demonstrated that rumination is associated with depression in connection with reduced social support and increased interpersonal stress (56, 57). Hessel *et al.* further found that rumination statistically linked psychological need frustration with depressive symptoms (58), supporting the findings reported by Luttenbacher *et al.* regarding rumination mediating between loneliness and depression (21). A longitudinal study of 800 adolescents demonstrated that rumination at age 18 predicted depression at age 22 independent of confounders, while depression did not predict later rumination, supporting rumination as a vulnerability marker rather than merely a symptom of depression (59). Multiple theoretical frameworks explain these relationships. Beck's cognitive theory explains how rumination activates negative schemas and reinforces cognitive biases (60). Additionally, the metacognitive model emphasizes how beliefs about rumination maintain the depression cycle (54). The self-regulatory executive function theory demonstrates how rumination consumes cognitive resources and reduces cognitive flexibility (61). The vulnerability-stress model positions rumination as a cognitive vulnerability factor interacting with environmental stressors (62).

The response styles theory provides theoretical frameworks explaining how rumination is linked to depressive symptoms across four primary pathways (26). (1) Activation of negative thoughts and memories: Rumination activates networks of negative memories and thoughts through a persistent focus on negative experiences, which are associated with negative self-beliefs and an intensified depressed mood (29). (2) Interference with effective problem-solving: Rumination consumes cognitive resources and creates circular thinking, impairing efficient problem-solving abilities, particularly evident in challenging interpersonal situations (63). (3) Disruption of instrumental behaviors: Rumination reduces motivation and energy, preventing engagement in purposeful and pleasurable activities that could improve mood (64). (4) Erosion of social support: Ruminators often exhibit behaviors (such as constant complaining or reassurance-seeking) that can alienate

others, which are associated with reduced social support, a significant risk factor for depression (65, 66).

The findings of this study extend those of previous studies by demonstrating these relationships within the Iranian cultural context, where traditional values and collective identity may shape how IPs are experienced and processed. For instance, Sharifi *et al.* observed that in Iranian culture, where maintaining family honor and avoiding shame are paramount concerns, interpersonal difficulties may trigger specific patterns of rumination focused on social evaluation and potential family disapproval. This cultural specificity may explain why our study found particularly strong associations between IPs, rumination, and depression compared to studies conducted in more individualistic societies (32).

Theoretical and Potential Clinical Implications

These findings offer important theoretical implications and directions for future clinical research. The significant pathways identified suggest that future longitudinal or experimental research might evaluate whether simultaneously addressing interpersonal difficulties and ruminative thinking is associated with better outcomes. This is particularly relevant given previous findings that IPs related to rumination can persist even after depressive symptoms improve and may predict a relapse (67). Therefore, therapeutic approaches that combine interpersonal skills training with cognitive interventions targeting rumination warrant future experimental investigation to determine their potential effectiveness; such research would require clinical samples and controlled designs. This potential clinical relevance is especially pronounced within the Iranian mental health context, where traditional psychotherapeutic approaches often emphasize interpersonal harmony and family relationships (33). Our results provide a preliminary theoretical basis for hypothesizing that rumination-focused and interpersonal approaches may be complementary, though this requires testing in clinical samples using longitudinal and interventional designs before any treatment model can be proposed.

Limitation

Several limitations should be considered when interpreting the present findings. First, the reliance on self-report questionnaires may have introduced response biases, including social desirability and memory errors. The cross-sectional nature of the study precludes causal inferences. Furthermore, there are clear sampling limitations; the sample was recruited entirely via social media and consists of a relatively young demographic from the Zanjan city. This specific age profile and online recruitment method, combined with localized cultural, social, and economic factors, limit the generalizability of the findings to older or non-digital populations. Additionally, the study's focus solely on IPs and rumination excluded other potentially influential variables such as social support, attachment styles, and

personality traits. Moreover, because the sample was drawn from the general population without a clinical diagnostic screening, the findings reflect relationships among interpersonal problems, rumination, and depressive symptom severity along a continuum rather than in a clinically diagnosed depressive population, and generalizations to clinical samples should be made with caution. Furthermore, because the study employed a cross-sectional design, the directionality of the tested pathway was theoretically imposed based on prior literature rather than being empirically established. Cross-sectional SEM cannot rule out alternative directions of effects or reciprocal relationships among the study variables, and the reported pathways should be interpreted as associative rather than causal.

To address these limitations, future research should employ multi-method approaches, including structured clinical interviews and observational reports to enhance measurement accuracy. Longitudinal studies and intervention trials would better establish causality and treatment effectiveness. Future studies should utilize random or cluster sampling methods across more diverse age cohorts and geographic populations to improve generalizability. Future studies should also incorporate additional variables such as social support and attachment styles to develop more comprehensive models. Given the increasing role of social media in interpersonal relationships, investigating its impact on IPs and rumination, along with the development of digital interventions, represents an important future direction. Finally, future research employing longitudinal or cross-lagged panel designs would allow for the formal testing of alternative and reciprocal models that the present cross-sectional design cannot address.

Conclusion

The present study demonstrates that interpersonal problems are significantly associated with depressive symptoms, and this relationship is statistically mediated by rumination. Our findings reveal that individuals experiencing interpersonal difficulties are more likely to report ruminative thinking, which in turn is related to a greater severity of depressive symptoms. The significant indirect pathway identified in our model underscores that rumination represents a critical statistical link connecting interpersonal problems with depressive symptomatology. These findings suggest that the associations between interpersonal functioning and ruminative thinking patterns could inform hypotheses for future longitudinal research, which would be needed before any conclusions about treatment-relevant targets can be drawn.

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Conflict of Interest

None.

Author's Contributions

HTS: Conceptualization, Writing – original draft. AR: Writing – original draft, Formal analysis, review & editing. OS: Conceptualization, Methodology, Supervision, review & editing. SB: Data curation, review & editing, Conceptualization. All authors read and approved the final manuscript.

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