

Predicting rumination based on spiritual intelligence, cognitive flexibility, and self-esteem

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Abstract

Introduction: Rumination, defined as a repetitive and persistent focus on distressing thoughts, has been associated with various manifestations of psychological distress. Therefore, understanding the determinants of rumination is essential for designing effective intervention strategies. This study explored the complex interrelations between spiritual intelligence, cognitive flexibility, self-esteem, and rumination among married women.

Materials and Methods: In this descriptive-correlational study, 400 married women in Tehran, Iran, in 2023-2024 were selected using the convenience sampling method. They responded to the Rumination-Reflection Questionnaire, the Spiritual Intelligence Questionnaire, the Cognitive Flexibility Inventory (CFI), and the Rosenberg Self-Esteem Scale. We analyzed the data using Pearson correlation analysis and multiple regression analysis.

Results: The findings revealed significant negative correlations between spiritual intelligence, cognitive flexibility, self-esteem, and rumination. These results suggest that higher levels of spiritual intelligence, cognitive flexibility, and self-esteem correlate with lower levels of ruminative thinking in married women. Moreover, the multiple regression analysis demonstrated that these three variables collectively explained approximately 28% of the variance in rumination, emphasizing their combined impact on this cognitive process.

Conclusion: This study highlights the critical role of spiritual intelligence, cognitive flexibility, and self-esteem in mitigating rumination among married women. Strengthening these psychological capacities through specialized and evidence-based interventions may reduce rumination and enhance psychological well-being.

Keywords: Cognitive flexibility, Rumination, Self-esteem, Spiritual intelligence

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Introduction

Gender differences in depression, with women being nearly twice as affected as men, are associated with psychological, social, and biological factors. Rumination, particularly maladaptive rumination, is more prevalent

among women. This form of rumination focuses on negative thoughts and past experiences, significantly impairing mental health. Maladaptive rumination has been linked to decreased cognitive flexibility and emotional challenges such as depression and anxiety (1).

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Additionally, it can diminish self-esteem and foster feelings of hopelessness (2). Research suggests that men are more likely to use adaptive thinking to solve problems. At the same time, women tend to ruminate maladaptively (3), contributing to the higher risk of mental disorders in women (4). As a personality trait, spiritual intelligence is critical in reducing rumination and enhancing mental health (5). It assists individuals in processing their thoughts and emotions by creating meaning in life and establishing a connection with the source of existence, enabling them to confront life's challenges adaptively (6). Pant states that this type of intelligence is also related to cognitive flexibility and self-esteem. Individuals with high levels of spiritual intelligence and cognitive flexibility are better equipped to employ diverse strategies for managing problems and respond positively to life's challenges through heightened self-esteem (7). Spiritual intelligence is a supportive factor in stressful situations, helping individuals lead more meaningful lives and experience improved quality of life. Cognitive flexibility—the ability to modify coping strategies based on varying circumstances—combined with spiritual intelligence and self-esteem, serves a protective role against rumination and psychological issues such as depression. Conversely, individuals with lower cognitive flexibility and self-esteem tend to show higher tendencies toward rumination and associated psychological problems (8). Moreover, high self-esteem enables individuals to adapt more effectively to stress and utilize challenges for personal growth. In contrast, reduced cognitive flexibility can lead to increased rumination and elevate the risks of depression and anxiety (9). Self-esteem can serve as a significant predictor of rumination, particularly among individuals with low self-esteem who are more prone to negative and self-critical thoughts. These individuals exhibit a greater tendency toward negative comparisons and ruminating over their failures and shortcomings. Conversely, high self-esteem, as evidenced by positive responses on instruments like the Rosenberg Self-Esteem Scale, is associated with reduced rumination (10). Research also indicates that self-esteem positively correlates with spiritual intelligence (11) and cognitive flexibility (12). Together, these three factors contribute to enhancing mental health and reducing rumination. A

notable research gap in Iran is the lack of studies simultaneously examining the effects of spiritual intelligence, cognitive flexibility, and self-esteem on rumination, particularly in married women. In contrast, international studies, such as those by Wang (13), Morris et al. (14), and Stenhaug (4), have demonstrated that cognitive flexibility plays a crucial role in mitigating rumination and that self-esteem functions as a protective factor against anxiety.

While domestic studies have largely focused on the relationship between spiritual intelligence and self-esteem, no research has yet explored the prediction of rumination based on the combination of these three factors. This underscores the need for comprehensive studies that concurrently consider these variables as predictors of rumination. Moreover, previous research on emotion regulation and spiritual intelligence suggests that rumination often acts as a mediating variable (15). This highlights the necessity of exploring more complex relationships among various factors contributing to rumination (16). The present study seeks to address this gap by conducting a detailed investigation. To date, no research in Iran has specifically examined the prediction of rumination in married women based on spiritual intelligence, cognitive flexibility, and self-esteem. Therefore, the need for this research is evident. The primary objective of this study is to determine whether rumination can be predicted based on spiritual intelligence, cognitive flexibility, and self-esteem.

Materials and Methods

The statistical population of this study comprised all married women in Tehran, Iran, from the second semester of 2023 to the first semester of 2024. Sampling was conducted using the convenience sampling method. Based on Loehlin's recommendations (17) and considering four latent variables, the sample was 400 participants. Data analysis was performed using SPSS and LISREL software.

Inclusion criteria included being female, married, and providing informed consent to participate in the study. Psychological health requirements included the absence of severe physical or psychological issues, no history of substance abuse, and no experience of major stressful events within the past three months. Exclusion criteria included unwillingness to participate, lack of cooperation, or failure to complete the questionnaires.

Research instruments

A) *The Rumination-Reflection Questionnaire*: Trapnell and Campbell developed this 24-item questionnaire to differentiate between maladaptive rumination and adaptive reflection. It divided into two 12-item subscales: self-focused rumination and adaptive reflective thinking. The items are evaluated on a 5-point Likert scale, with the distinction that some items are reverse-scored. Trapnell and Campbell reported that the rumination subscale has a strong positive correlation with neuroticism symptoms, while the reflection subscale strongly correlates with openness to experience (18). Ghorbani et al. evaluated the construct validity of this scale and reported a positive relationship between the rumination subscale and neuroticism symptoms. Additionally, using Cronbach's alpha, satisfactory internal consistency was reported for reflection ($\alpha=0.91$) and rumination ($\alpha=0.90$). Furthermore, the two factors showed a minimum correlation of 0.22 with each other, demonstrating that this instrument possesses suitable psychometric properties. This study was conducted on 723 Iranian students, including 226 male students and 497 female students, with the overall internal consistency of the tool reported as 0.82 (19).

B) *The Spiritual Intelligence Questionnaire*: Abdollahzadeh et al. standardized this tool in 2008 on Payame Noor University students. Initially, the questionnaire contained 30 items, and in the pilot phase, its reliability, measured using Cronbach's alpha, was 0.87. After analyzing the items, 12 items were removed, resulting in a final version with 29 items. The questionnaire consists of two factors: the first factor, "understanding and connection with the source of existence," and the second factor, "living a meaningful life through reflection on inner existence." In the final phase, the questionnaire was administered to a sample of 280 individuals, and the reliability was found to be 0.89. For validity assessment, in addition to content and face validity, which experts confirmed, factor analysis was also employed, and the correlation of all items was above 0.3 (20).

C) *The Cognitive Flexibility Inventory (CFI)*: Dennis and Vander Wal designed this tool to assess an individual's progress in developing flexible thinking. This questionnaire consists of 20 items and measures three main components: perception of alternative options, perception of

controllability, and perception of behavior justification. Scoring is done using a 7-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (7), with a total score range of 20 to 140. In their study, Dennis and Vander Wal examined the factor structure, convergent validity, and concurrent validity of the questionnaire, reporting a concurrent validity of 0.39 and a convergent validity of 0.75. The reliability of the questionnaire was calculated using Cronbach's alpha for the total scale as well as for the subscales of controllability perception, behavior justification, and alternative options perception, with values of 0.91, 0.84, and 0.91, respectively. Test-retest reliability was 0.77, 0.81, and 0.75 for these subscales (21). Soltani et al. reported a test-retest reliability coefficient of 0.71 for the overall scale in Iran (22). In contrast, Kohandani and Abolmaali Alhosseini reported a Cronbach's alpha of 0.81 for the reliability. They also evaluated the psychometric properties of this tool in an Iranian sample, where the test-retest reliability coefficient for the entire scale was 0.71, with subscale values of 0.55, 0.72, and 0.57 for controllability, alternative options, and behavior justification, respectively. Furthermore, these researchers reported Cronbach's alpha coefficients of 0.90 for the total scale and 0.87, 0.89, and 0.55 for the subscales (23). In the study by Hafezi and Garavand, Cronbach's alpha for the entire scale was reported as 0.87, with values of 0.89 and 0.86 for problem-solving processing and controllability perception, respectively, indicating the tool's acceptable reliability (24).

D) *The Rosenberg Self-Esteem Scale*: It consists of 10 questions, five positive and five negative, with responses scored dichotomously as "agree" or "disagree." Scores range from 0 to 10, with higher scores indicating higher self-esteem. This scale assesses general self-esteem, and its validity has been confirmed in multiple studies (25,26). In the study by Mohammadi, the reliability of the questionnaire was assessed using Cronbach's alpha and the split-half method, with values of 0.69 and 0.68, respectively, and test-retest reliability at one, two, and three weeks of 0.77, 0.73, and 0.78, respectively (27). In the study by Mayordomo et al., content validity analysis yielded a value of 0.79 (CVR), indicating the acceptable validity. Additionally, the reliability of the questionnaire in their research, determined through Cronbach's alpha, was reported as 0.73 (28). Rajabi evaluated the convergent validity between the

Rosenberg self-esteem scale and the death obsession scale in the entire sample and separately by gender, finding a moderate correlation of 0.44 and concluding that the Rosenberg scale has good validity. The reliability of this questionnaire, based on Cronbach's alpha, was calculated as 0.93 (29). In the study by Sang Pahn, Dolatshahi, and Yazdani, the reliability of the tool based on Cronbach's alpha was calculated to be 0.81 (30). This research collected data from participants after reviewing various sources and obtaining the necessary permissions.

Descriptive and inferential statistical methods were used for data analysis, including Pearson's

correlation, regression, and structural equation modeling.

Results

In terms of the education distribution of the respondents, 4% had below high school education, 27.5% had a high school diploma, 17.5% had an associate degree, 44% had a bachelor's degree, 4.5% had a master's degree, and 2.5% had a doctoral degree. In the age distribution analysis, 36.8% were in the 20-30 age group, 44.8% were in the 30-40 age group, 14.5% were in the 40-50 age group, and 4% were in the 50-60 age group. Table 1 presents the descriptive statistics of variables.

Table 1. Descriptive statistics of research variables

Variable	Minimum	Maximum	Mean	Standard Deviation
Rumination	2.17	3.83	3.10	0.35
Adaptive reflective thinking	2.33	3.67	2.98	0.22
Ruminative thinking	2.42	3.58	3.04	0.21
Self-esteem	2	10	6.19	1.31
Perception of connection with the source of existence	1	5	4.08	0.74
Spiritual life	1	5	3.80	0.55
Spiritual intelligence	1	5	3.92	0.59
Perception of different options	2.3	7	5.34	0.74
Perception of control	2.38	6.38	4.16	0.89
Perception of behavioral justification	1	7	4.42	1.36
Cognitive flexibility	3.15	6.45	4.78	0.53

A multiple regression equation was used to examine the prediction of rumination based on the independent variables. The correlation coefficient (R) was found to be 0.53, and the coefficient of determination for the regression equation was 0.28, indicating that approximately 28% of the variance in rumination is explained by the independent variables: spiritual intelligence, cognitive flexibility, and self-esteem. The regression analysis confirmed that spiritual intelligence, cognitive flexibility, and self-esteem predict rumination. Based on Tables 2 and 3, to investigate the impact of spiritual intelligence, cognitive flexibility, and self-esteem on

rumination, the results showed that the F-statistic was 7.401 with a significance level of 0.0001, indicating a significant effect of these variables on rumination. Additionally, the regression model coefficients revealed that the standardized coefficients for self-esteem, spiritual intelligence, and cognitive flexibility were -0.107, -0.108, and -0.165, respectively, with significance levels of 0.035, 0.033, and 0.002. Consequently, there was a significant relationship between the independent and dependent variables (rumination). The negative coefficients of the independent variables also suggest that rumination decreases as each of these variables increases.

Table 2. Regression analysis of variance

Source	Sum of squares	Degrees of freedom	Mean square	F	P
Regression	1.007	3	0.366	7.401	0.0001
Residual	17.96	396	0.045		
Total	18.96	399			

Table 3. Regression model coefficients

Predictor	Unstandardized coefficients		Standardized coefficients		t	P
	B	Standard Error	Beta			
Constant	2.77	0.115	—		24.11	0.0001
Self-esteem	-0.018	0.008	-0.107		-2.11	0.035
Spiritual intelligence	-0.04	0.019	-0.108		-2.13	0.033
Cognitive flexibility	-0.067	0.021	-0.165		-3.18	0.002

According to Table 4, the conceptual model illustrated the relationships between the factors defined in the study. Based on the data, the Chi-Square statistic was 296.02 with 113 degrees of freedom, and the Chi-Square to degrees of freedom ratio was 2.61, indicating a good model fit. Additionally, the RMSEA value was 0.048, and the GFI and AGFI indices were 0.92

and 0.90, all of which indicate a good model fit. Overall, the data align well with the model, and the provided indices suggested that the proposed model is appropriate, with the empirical data fitting it well. The estimated model and T-Values will be analyzed for a more detailed examination.

Table 4. Model fit statistics

Statistic	Chi-Square	DF	Chi-Square/DF	RMSEA	GFI	AGFI
Conceptual Model	296.02	113	2.61	0.048	0.92	0.90

According to results, the standardized estimation model showed the estimated factor loadings, representing the raw scores of predicted factors. Additionally, for the analysis of the T-values model, raw data values were calculated to determine the significance of each parameter. In cases where the sample size exceeds 30, and the observed T-value exceeds 1.96, the relationship obtained is considered significant with over 95% confidence. The T-values obtained for the model, and the analysis of these values confirmed the significance of the relationships.

Discussion

In examining the relationship between spiritual intelligence, cognitive flexibility, self-esteem, and rumination in married women, various studies have found intriguing evidence, which we now analyze and compare. Multiple studies have shown a significant correlation between these variables, helping to clarify the areas of vulnerability and potential strategies for improving the quality of life for women.

The results of this study align with the findings of Torkaman et al. in Iran (9) and Boğay-Soğukmez et al. in Turkey (10). Torkaman et al. assessed 280 individuals from medical centers in Hamada, Iran, during the summer and fall of 2021, using the Cognitive Flexibility Scale by Dennis and Vanderwal, the Rumination Scale by Nolen-Hoeksema and Morrow, and self-esteem-related scale. The findings showed that individuals with low self-esteem and poor

cognitive flexibility were more prone to rumination (9). These findings are similar to those of Boğay-Soğukmez et al. (10) in which self-esteem was identified as an influencing variable on rumination. Additionally, the role of cognitive flexibility in reducing rumination and its positive impact on mental health was confirmed in both studies. The focus of both studies on different populations with large samples suggests that the effects of these variables are generalizable, independent of cultural differences, and in line with the present findings. As a result, individuals with low cognitive flexibility tend to show greater rumination.

This study also aligns with the findings of Wang et al. in China (13) and Morris and Mansell in the United Kingdom (14). Wang et al. studied 1,619 Chinese adults, demonstrated a negative relationship between cognitive flexibility and rumination. Similarly, Morris and Mansell, in their systematic review, emphasized that cognitive inflexibility plays a key role in psychopathological processes, such as rumination (14).

A noteworthy aspect of the present study is its focus on a specific population—married women. Due to their distinct social and economic circumstances, this sample group may exhibit different rumination patterns. For instance, Sanaei Araei and Seyed-Ebrahimi assessed 70 women in Aran and Bidgol, Iran. They found that spiritual intelligence significantly predicts self-esteem (16). This finding, confirmed in the

present study, highlights the positive and significant relationship between spiritual intelligence and reduced rumination. Methodologically, this study utilized tools specifically designed to measure the variables under investigation accurately. In contrast, many prior studies, such as the research by SadatMiri et al. on 221 university students in Tehran, employed more generalized models that could not fully capture the details of the variables (31). In the present study, structural equation modeling was used to examine the relationships, and the results indicated that spiritual intelligence and emotion regulation contribute to reducing rumination. However, the target population of this research—married women with diverse social and familial roles—may exhibit unique rumination patterns due to their specific life circumstances. Moreover, the current findings reinforce correlations reported in other research, suggesting that individuals who do not draw on spiritual resources are more prone to negative and ruminative thinking. These findings point to the critical role of spiritual intelligence in combating rumination and enhancing mental health. Thus, increasing spiritual intelligence and cognitive flexibility may effectively reduce rumination and improve self-esteem among married women (14).

In this context, spiritual intelligence is recognized as an influential factor in resilience. Individuals with higher spiritual intelligence typically demonstrate the ability to respond effectively to stressful situations and employ spiritual strategies to resolve problems. These findings align with similar studies, such as the research by Pant and Srivastava conducted on 300 postgraduate students in India. Their study revealed a significant relationship between spiritual intelligence and mental health, with no notable impact from gender or educational background on this relationship (6). However, due to the specific characteristics of the target population (married women), the findings indicated significant differences in the influence of spiritual intelligence and cognitive flexibility on rumination. Furthermore, unlike Pant's study, which used general scales to assess spiritual intelligence and mental health, this research employed more precise and relevant tools, enhancing the accuracy of the results (6).

A study by Zmigrod et al. explored the role of cognitive flexibility and intelligence in spiritual intelligence. The findings indicated that cognitive flexibility could predict spiritual

intelligence, particularly in contexts involving respect for opposing views and a willingness to revise one's attitudes when confronted with new evidence. The study demonstrated that cognitive flexibility and intelligence independently strengthen spiritual intelligence; neither is necessary for high spiritual intelligence. Therefore, individuals inclined toward flexible and rational thinking are more likely to escape the trap of negative thinking and rumination and exhibit greater resilience across various life situations (32).

On the other hand, individuals with higher cognitive flexibility can more easily free themselves from ruminative thoughts and seek new ways to solve problems. Consequently, this ability can help reduce rumination and improve mental health (9). Self-esteem is also a key factor in reducing rumination and enhancing quality of life. Individuals with higher self-esteem are more likely to focus on the positive aspects of negative situations and use those experiences for personal growth instead of being consumed by negative thoughts (10).

Additionally, research by Farahani et al. on 326 Iranian participants using scales of social-emotional competence, childhood trauma, internalized shame, the disability/shame schema, cognitive flexibility, distress tolerance, and alexithymia has shown similarities between cognitive flexibility and self-esteem. Both are connected to an individual's belief in their abilities, indicating that these constructs overlap as components of social-emotional competence (33). Recent studies have explored the complexities of the relationship between emotion regulation, spiritual intelligence, and rumination, emphasizing the mediating role of rumination in these connections (34). These findings align with the current study, although there are significant differences in the measurement tools and target populations. The present results are consistent with studies like that of Mete et al. They assessed 33 adult patients undergoing rhinoplasty at Uludag University Hospital in Turkey and found that personality traits such as perfectionism and ruminative thinking significantly impact rumination. This study aligns with other research emphasizing the role of personality traits in predicting rumination. Thus, psychological characteristics such as spiritual intelligence, cognitive flexibility, and personality traits like perfectionism and self-compassion play crucial roles in emotion regulation and reducing

rumination. These findings hold significant implications for designing psychological interventions to improve mental health and manage rumination. These findings suggest that individuals who do not utilize spiritual resources or employ spiritual strategies to address their problems are more prone to negative and repetitive thinking. Similarly, rumination can impact self-esteem, particularly in individuals with a tendency toward perfectionism (35).

This study faced limitations, including reliance on self-report instruments, the lack of screening for psychological disorders, the restriction of the sample to married women, and the absence of control over demographic variables. For future research, mixed methods should be adopted for data collection, psychological disorders should be screened, the sample population should be diversified, and demographic variables should be controlled. Additionally, interventions focused on executive functioning and enhancing self-esteem and spiritual intelligence are recommended for reducing rumination.

Conclusion

In summary, the current findings demonstrated that spiritual intelligence, cognitive flexibility, and self-esteem are influential factors in reducing rumination. These relationships can be clearly explained within the theoretical framework of resilience and emotional adaptation, contributing to a deeper understanding of the psychological

processes associated with rumination and depression. Therefore, it is recommended that intervention programs be designed and implemented to enhance these traits in individuals, thereby facilitating improvements in their quality of life and mental health.

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Conflict of Interests

The authors declare no conflicts of interest in this study.

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Ethical Considerations

In this study, informed consent was obtained from participants, and ethical principles were upheld in administering the questionnaires and safeguarding participants' human rights throughout the research. This article is derived from a master's thesis and has received ethical approval from the Islamic Azad University, Science and Research Branch, Tehran.

Code of Ethics

IR.IAU.SRB.REC.1403.214

Authors' Contributions

The first author was primarily responsible for the design, execution, and writing. The corresponding author supervised the research process, and revising process of the manuscript.

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