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The Mediating Role of Emotion Regulation Difficulty in the Relationship between Self-Compassion with Obsessive-Compulsive Symptoms and Rumination

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ABSTRACT

Background: Obsessive-compulsive symptoms and rumination are distinct psychological constructs that seems to have common underlying mechanisms and their comorbidity can have significant negative consequences. The aim of this research was to investigate the mediating role of emotion regulation difficulty in the relationship between self-compassion with obsessive-compulsive symptoms and rumination.

Method: The research design was a descriptive correlational design based on path analysis. The statistical population included undergraduate and graduate students of Valiasr Complex of Islamic Azad University, South Tehran branch in the academic year 2022-2023. According to Klein (2011) the minimum sample size in studies that use structural equation modeling is 200. Therefore, considering the possibility of subject attrition and to increase the generalizability of the research results, 335 students were selected to participate in this study using a multi-stage cluster random sampling method. The data were collected using the Revised Obsessive-Compulsive Inventory (Foa et al., 2002), Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991), shortened version of Emotion Regulation Difficulties Scale (Bjureberg et al., 2016), and self-compassion scale-short form (Raes, Pommier, Neff & Van Gucht, 2011). The data were analyzed by path analysis.

Results: The results showed that all the direct effects in the model were significant except for the effect of self-compassion on obsessive-compulsive symptoms. Also, the indirect effects of self-compassion (through emotion regulation difficulty) on rumination and obsessive-compulsive symptoms were obtained significant.

Conclusion: Based on the findings of this research, it can be concluded that low self-compassion can play a role in the development or exacerbation of rumination and obsessive-compulsive symptoms through creating problems in emotion regulation.

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Extended Abstract

Introduction

Obsessive-compulsive disorder and rumination are common psychological problems that significantly impact individuals' quality of life and can lead to chronic mental disorders. These two cognitive phenomena often co-occur, making it important to understand the factors influencing their relationship. Difficulty in emotion regulation is a key factor that can affect the severity of obsessive-compulsive symptoms and rumination. Individuals with difficulties in emotion regulation unable to manage negative emotions, which contributes to the onset or exacerbation of these psychological disorders. Moreover, self-compassion can help reduce the severity of obsessive-compulsive symptoms and rumination by reducing difficulties in emotion regulation. People with higher self-compassion tend to have better skills in regulating negative emotions and experience fewer problems in emotion regulation. Based on previous findings it seems that difficulties in emotion regulation can play an important mediating role in these relationships. Therefore, the main aim of this study is to examine the mediating role of difficulties in emotion regulation in the relationship between self-compassion and obsessive-compulsive symptoms and rumination, to better understanding of the psychological processes underlying these relationships and to guide the design of effective and targeted interventions.

Method

This study was descriptive-correlational and conducted using path analysis. The statistical population consisted of undergraduate and graduate students of Valiasr Complex of Islamic Azad University, South Tehran Branch, during the academic year 2022-2023. The sample size was determined as 335 individuals based on Klein's criterion, in order to increase generalizability and considering potential participant attrition. Multi-stage cluster random sampling was employed; initially, First, three colleges were randomly selected. Then, several classes from each faculty were randomly chosen, and all students in those classes were included in the study. After excluding incomplete or invalid questionnaires, data from 300 students (186 females and 114 males) were analyzed. The mean age of participants was 20.95 years with a standard deviation of 4.91 and an age range of 18 to 45 years.

Inclusion criteria were being an undergraduate or graduate student and willingness to participate, while exclusion criteria included incomplete questionnaire responses or withdrawal from the study. Data collection instruments included the Revised Obsessive-Compulsive Inventory (Foa et al., 2002), the Short Form of the Difficulties in Emotion Regulation Scale (Bjureberg et al., 2016), the Short Form of the Self-Compassion Scale (Raes, Pommier, Neff & Van Gucht, 2011), and the Ruminative Responses Scale (Nolen-Hoeksema & Morrow, 1991), all of which have demonstrated validity and reliability in Iranian samples. The study was conducted in accordance with ethical standards, and informed consent was obtained from all participants. Data were analyzed using SPSS 22 and LISREL 8.7.

Results

To examine the mediating role of difficulty in emotion regulation in the relationship between self-compassion and obsessive-compulsive symptoms and rumination, a path analysis was conducted. Prior to data analysis, the underlying assumptions of path analysis, including sample size adequacy, normality of data distribution, the sphericity test, and non-multicollinearity were checked. After confirming these assumptions, the fit of the conceptual model was assessed. Since the direct effect of self-compassion on obsessive-compulsive symptoms was not significant, this path was removed from the model and the model fit

was reassessed. The standardized path coefficients in the final model are presented in diagram 1. The obtained fit indices (χ^2/df= 3, CFI= 0.99, GFI= 0.99, AGFI= 0.95, RMSEA= 0.064, NNFI= 0.97, NFI= 0.99) indicated a good model fit. Therefore, the total standardized coefficients, the direct and indirect effects in the model were calculated using the bootstrap method (with 5000 resamples from the original data and a 95% confidence interval).

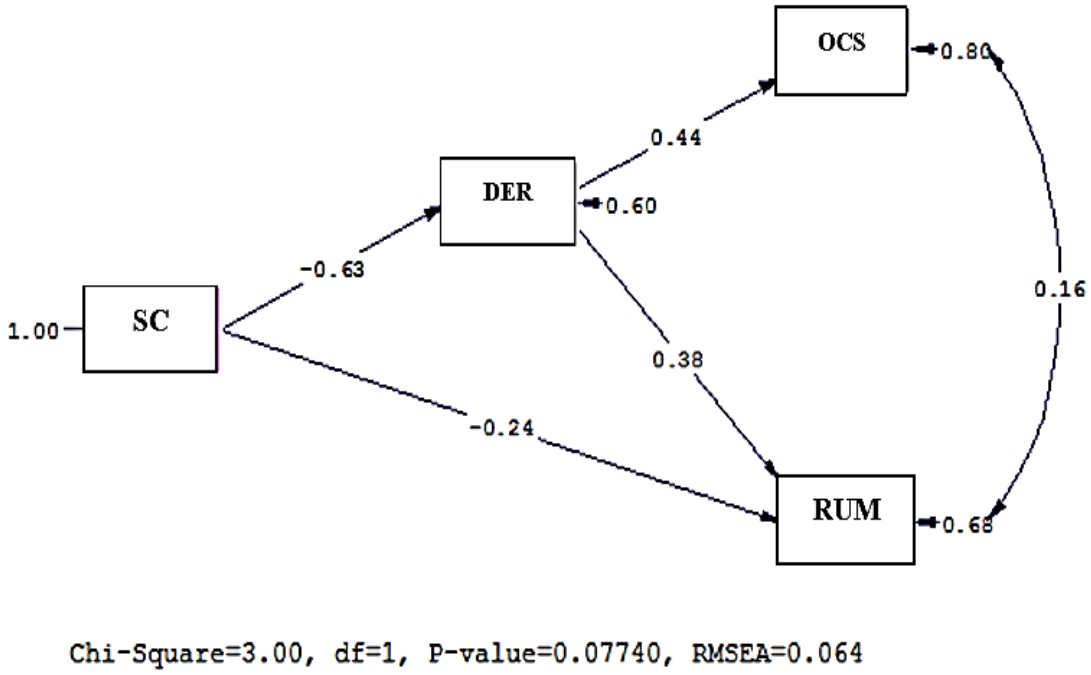

Diagram 1. Path diagram with standard path coefficients
SC= self-compassion; DER= difficulty in emotion regulation; OCS= obsessive-compulsive symptoms; RUM= rumination

The results showed that the direct effect of self-compassion on difficulty in emotion regulation (β= -0.63, p< 0.001) was significantly negative, and the direct effects of difficulty in emotion regulation on obsessive-compulsive symptoms (β= 0.44, p< 0.001) and on rumination (β= 0.38, p< 0.001) were significantly positive. The indirect effect of self-compassion on rumination (β= -0.24, p< 0.001) and obsessive-compulsive symptoms (β= -0.28, p< 0.001) was significantly negative. The total effect of self-compassion on rumination (direct and indirect via difficulty in emotion regulation) (β= -0.48, p< 0.001) was significantly negative, and the total effect of self-compassion on obsessive-compulsive symptoms (only indirect via difficulty in emotion regulation) (β= -0.28, p< 0.001) was significantly negative. Finally, findings showed that self-compassion explained 40% of the variance in difficulty in emotion regulation, 32% in rumination, and 22% in obsessive-compulsive symptoms. Difficulty in emotion regulation explained 28% of the variance in rumination and 30% in obsessive-compulsive symptoms.

Conclusion

The results of this study indicated a significant negative relationship between self-compassion and obsessive-compulsive symptoms, rumination, and difficulty in emotion regulation, while difficulty in emotion regulation exhibited a significant positive relationship with rumination and obsessive-compulsive symptoms. Also, path analysis results revealed that difficulty in emotion regulation plays a mediating role in the relationship between self-compassion and obsessive-compulsive symptoms, as well as between self-compassion and rumination. The mediating role of difficulty

in emotion regulation in the relationship between self-compassion and rumination indicates that individuals with high levels of self-compassion, through accepting negative emotions, mindfulness, and self-kindness, improve their emotion regulation and escape cycles of negative thinking and self-criticism. Furthermore, in explaining the mediating role of difficulty in emotion regulation in the relationship between self-compassion and obsessive-compulsive symptoms it can be said that emotion regulation leads to a reduction in anxiety and distress by enhancing emotional acceptance, reducing internal judgment, and effectively managing distressing emotions through mindfulness, which in turn leads to a reduction in dependence on compulsive behaviors. These findings suggest that emotion regulation, as a key mechanism, can partially explain the association of self-compassion with reduction of symptoms of psychological disorders.

Ethical Considerations

Ethics Code: The Ethics Committee of Tehran Central Branch, Islamic Azad University, Tehran, Iran, approved this study (IR.IAU.CTB.REC.1401.132).

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Authors' Contributions: R. A: Conceptualization, data curation, statistical analysis, writing– original draft, writing – review & editing; A. GH: Supervision, conceptualization, methodology, project administration, writing– original draft, writing – review & editing. This article is extracted from the first author Master's thesis.

Conflict of Interest: The authors of this study had no conflicts of interest.

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Introduction

Obsessive-compulsive disorder is characterized by the obsessions, compulsions, or both. Obsessive thoughts involve intrusive and unwanted thoughts, impulses, or mental images, while compulsive behaviors involve repetitive actions or mental activities that are performed in response to an obsessive thought or according to rigid rules (1). The lifetime prevalence of this disorder is approximately 2-3%, ranking it as the fourth most common mental disorder after Phobias, substance-related disorders, and major depressive disorder (2). Furthermore, 80-90% of the non-clinical population experiences intrusive thoughts similar to those in obsessive-compulsive disorder, but with less distress and lower frequency (3). There is considerable evidence for cognitive deficits in individuals with obsessive-compulsive disorder (4).

One of the cognitive features of these patients is rumination (5, 6), which involves a tendency to repeatedly and passively analyze problems, worries, and feelings of distress without deciding to make positive changes (7). These thoughts intrude into awareness involuntarily and divert focus from current tasks and goals (8). It is important to note that ruminative thoughts occur in both clinical and non-clinical populations and are not limited to any specific psychological disorder (9). In fact, rumination is experienced by both normal individuals and those with obsessive-compulsive disorder (10). Freeston and Ladouceur (11) reported that patients with obsessive-compulsive disorder use excessive analysis of obsessive thoughts as a way to cope with distress. Moreover, research has indicated that rumination has a significant role in exacerbating obsessive-compulsive disorder (5, 6). Evidence also indicates a relationship between rumination and obsessive-compulsive symptoms in non-clinical samples. For example, the results of a study by Wahl et al. (12) on a non-clinical sample indicate that the tendency to ruminate is correlated with the severity of obsessive-compulsive symptoms. Although rumination and obsession are two distinct constructs, they share similar cognitive processes characterized by being repetitive,

intrusive, and uncontrollable (5). Obsessions manifest involuntarily and intrusively (1), whereas rumination involves a repetitive focus on the causes and consequences of one's symptoms (7). Based on a review of the research literature, Rinz et al. (5) concluded that there may be common procedural characteristics between the two phenomenon.

Therefore, based on the points above, it seems essential to identify the underlying factors of these two constructs for better understanding of their relationships and developing targeted interventions that address both rumination and obsessive-compulsive disorder. Among these, emotion regulation is a key variable that plays a role in both rumination (13, 14) and obsessive-compulsive symptoms (15-19). Emotion regulation refers to the methods individuals use to modify, control, and express their emotional experience (16, 20-22) and it is associated with the human capacity for emotional adaptation to different situations and psychopathological symptoms (23). Maladaptive emotion regulation strategies can lead to the development of psychopathological problems, including obsessive-compulsive disorder (16). Oltmanns and Gibbs (24) stated that attempts to manage emotional reactions, for instance, when emotion regulation strategies are ineffective, may play an important role in the formation of obsessive thoughts. Also, it has been found that suppressing emotions in response to stressful events increases rumination (25). Emotional suppression leads to increased thought frequency and difficulties in controlling thoughts (26), whereas the ability to manage emotions results in a reduction of rumination (13).

Another variable that that plays a role in mental health and emotion regulation is self-compassion (27-29). Self-compassion means accepting and being empathetic towards oneself, and refraining from criticism and judgment regarding the experience of certain feelings and thoughts (29, 30). The relationship between self-compassion and emotion regulation has been demonstrated in various studies (17, 31, 32). Self-compassion can be associated with a reduction in negative emotions and an increase in positive emotions (33, 34). Self-compassion training helps individuals to use effective emotion regulation strategies to accept themselves despite their shortcomings (35). Moreover, self-compassion aids in emotion management by facilitating the understanding and acceptance of emotions (36). Various studies (17, 37-40) have shown that a lack of self-compassion is associated with obsessive-compulsive symptoms; such that patients with obsessive-compulsive disorder are highly self-critical and punish themselves for having intrusive negative thoughts (38). In addition, research has shown that self-compassion is associated with more positive thoughts and fewer irrational and negative thoughts (41, 42). Evidence indicates that individuals with high levels of self-compassion tend to engage less in rumination and worry (43-46), These individuals experience improved positive emotions and affect, greater acceptance, less self-judgment, and consequently, less rumination (30). Therefore, it can be concluded that self-compassion influences emotion regulation, and both of these factors affect the obsessive-compulsive symptoms and rumination. Moreover, given that the comorbidity of obsessive-compulsive symptoms and rumination can lead to significant negative consequences for individuals (5), identifying the shared underlying factors in the formation of both constructs is of great importance. Therefore, this research seeks to investigate whether emotion regulation can play a mediating role in the relationship between self-compassion and obsessive-compulsive symptoms and rumination.

Method

Research Design: The present research was descriptive-correlational research conducted using path analysis.

Participants: The participants were undergraduate and graduate students of the Valiasr Academic Complex at Islamic Azad University, South Tehran Branch, during the 2022-2023 academic years. Based on Klein's (47) recommendation that a minimum sample size of 200 is appropriate for research using Structural Equation Modeling (SEM) methodology, and considering that path analysis is a specific type of SEM (48), and furthermore, to account for potential participant attrition and to enhance the generalizability of the study's results, 335 students were selected using a multi-stage cluster random sampling method.

In the first stage, three faculties were randomly selected from Valiasr Academic Complex: the Faculty of Economics and Accounting, the Faculty of Law and Political Science, and the Faculty of Psychology and Educational Sciences. Subsequently, from each of these faculties, several classes were randomly chosen, and all students in those classes were chosen as the final study sample. Of the 335 questionnaires distributed to students, 35 were excluded from the sample due to either the students' unwillingness to complete them or because the questionnaires were incomplete. Ultimately, data from 300 students (186 women and 114 men) were analyzed. The mean age of the participants was 20.95 years (SD= 4.91), with an age range of 18 to 45 years. Among them, 277 were single and 23 were married.

Instruments

1. The Revised Obsessive-Compulsive Inventory: This inventory was generated by Foa et al. (49) to measure the symptoms of obsessive-compulsive disorder. This inventory contains 18 items and is categorized into six subscales: washing, intrusive thought, hoarding, ordering, checking, and neutralizing. Each subscale containing three items equally. In this inventory, respondents rate their level of distress that each item has caused them over the past month on a 5-point scale from 0 (Never) to 4 (Extremely). The total score ranges from 0 to 72. This inventory has demonstrated good internal consistency (ranging from 0.81 to 0.93) and test-retest reliability (ranging from 0.57 to 0.91) across various populations (49). To evaluate the diagnostic accuracy of this inventory, the Receiver Operating Characteristic (ROC) curve method was used. The results demonstrated that the inventory effectively distinguishes between patients with obsessive-compulsive disorder from those with other anxiety disorders, and a non-anxiety control group (49). Its correlation coefficient with the Yale-Brown Obsessive Compulsive Scale was 0.53 ($p< .01$), and with the Maudsley Obsessive-Compulsive Inventory was 0.85 ($p< .01$), providing evidence for its convergent validity (49). The validation results of this inventory in Iran, conducted by Mohammadi, Zamani, and Fata (50), demonstrated that this tool has satisfactory validity and reliability in the Iranian population. The Cronbach's alpha coefficient was reported as 0.85 for the total score and ranged from 0.50 to 0.72 for the subscales. Furthermore, in the same study, its six-factor structure was confirmed using confirmatory factor analysis. Also, the correlations between each of the subscales and the total score were significant, ranging from ($0.61 \preceq r \leq 0.75$, $p< .01$). In this research, the Cronbach's alpha coefficient for the total score of this inventory was calculated to be 0.85.

2. The Difficulties in Emotion Regulation Scale-Short Form (DERS-SF): This scale is the short-form of the difficulties in emotion regulation Scale, which was designed by Bjureberg et al. (51). This scale consists of 16 items that evaluate an individual's difficulties in emotion regulation across five domains: 1. Non-acceptance of negative emotions 2. Difficulty engaging in goal-directed behavior when distressed, 3. Difficulties controlling impulsive behaviors when distressed, 4. Limited access to effective emotion regulation strategies, and 5. Lack of

emotional clarity. The items of this scale are scored based on a 5-point Likert scale from 1 (almost never) to 5 (almost always). The total score ranges from 16 to 80, with higher scores indicating greater difficulty in emotion regulation. Bjureberg et al. (51) have examined the reliability and validity of this scale. They reported the internal reliability of the short form of the difficulties in Emotion Regulation Scale using Cronbach's alpha coefficient of 0.92. The test-retest reliability of this scale has also been reported as satisfactory (r= 0.85, p< .0001). Furthermore, significant positive correlations were obtained between the total score of this scale and other related constructs, including the anxiety subscale (r= 0.43, p< .001), depression subscale (r= 0.55, p< .001), and stress subscale (r= 0.56, p< .001) of the Depression, Anxiety, and Stress Scale (DASS). These results provide evidence supporting the construct validity of the instrument. Shahabi, Hassani, and Bjureberg (52) investigated the psychometric properties of this scale in an Iranian student population. In this study, a Cronbach's alpha of 0.91 and a test-retest reliability of 0.92 (p < .001) were reported for the total score, indicating the satisfactory reliability of the scale. Furthermore, the factor analysis results supported the five-factor structure of the scale. Additionally, the correlation between the total score of the short form of the difficulties in Emotion Regulation Scale and the anxiety (r= 0.57, p < .001), depression (r= 0.62, p< .001), and stress (r= 0.66, p< .001) subscales of the Depression, Anxiety, and Stress Scale provided evidence for the convergent validity of this scale. In the present study the Cronbach's alpha coefficient for this scale was found to be 0.91.

3. The Self-Compassion Scale-Short Form (SCS-SF): The short form of the Self-Compassion Scale was developed by Raes et al (53). This scale consists of 12 items and measures three main components: 1) Self-Kindness vs. Self-Judgment, 2) Common Humanity vs. Isolation, and 3) Mindfulness vs. Over-Identification. Scoring is based on a 5-point Likert scale ranging from 1 (Almost Never) to 5 (Almost Always), with a higher total score indicating a higher level of self-compassion. It should be noted that items 1, 4, 8, 9, 11, and 12 are reverse-scored. In one study, Raes et al. (53) investigated the psychometric characteristics of this short form across three different samples. The internal consistency, calculated using Cronbach's alpha for the total score, was reported as satisfactory in all three samples (α≥ .86). Furthermore, the correlation between the scores of the short and long forms of this inventory was 0.97 or higher and statistically significant across all three samples. The psychometric properties of the Iranian version of the Self-Compassion Scale-Short Form were examined by Khanjani, Foroughi, Sadeghi, and Bahrainian (54). The Cronbach's alpha coefficient for the total score was recorded as 0.86, and its test-retest reliability over a one-week interval with a sample of 50 participants was 0.90 (p< .001), indicating the instrument's high reliability. To examine divergent validity, the correlation between the scores of this scale and the External Shame scale (r= -0.21, p< .01), Perfectionism scale (r= -0.33, p< .01), and Negative Affect scale (r= -0.38, p< .01) was calculated. The results indicated that this scale has satisfactory divergent validity. Therefore, the results indicate that the short form of the difficulties in emotion regulation Scale has acceptable psychometric properties for use in the Iranian population. In the present study, the Cronbach's alpha reliability coefficient for the total scale was computed to be 0.73.

4. The Ruminative Responses Scale: this scale was generated by Nolen-Hoeksema and Morrow (55) to measure three components: Reflection, Brooding, and depression. This scale contains 22 items and three subscales. It is scored using a 4-point Likert scale ranging from 1 (Never) to 4 (Always). The total score ranges from 22 to 88, with higher scores indicating greater

rumination. In the study by Nolen-Hoeksema, Parker, and Larson (56), the internal consistency, as measured by Cronbach's alpha for this scale, was estimated at 0.90. Furthermore, studies have reported acceptable convergent and predictive validity for the Ruminative Responses Scale (55). For example, participants' responses on this scale were significantly correlated (r= 0.62) with the use of ruminative responses to depressed mood in a 30-day daily study (56). Furthermore, in a controlled laboratory research, participants who scored above the median on this scale were considerably more likely to engage in an emotion-focused task (as opposed to a non-emotion-related task) when feeling depressed compared to those who scored below the median (56). Farrokhi, Seyedzadeh, and Mostafapoor (57) examined the psychometric features of this questionnaire in an Iranian population. The internal consistency of the Ruminative Responses Scale, calculated using Cronbach's alpha, was 0.78. Furthermore, the test-retest reliability of the scale over a 50-day interval was 0.78 (p< .001). To examine the construct validity, the correlation between the scores of the Ruminative Responses Scale and the Metacognitions Questionnaire as well as the Beck Depression Inventory-II was calculated, which were 0.72 (p< .001) and 0.87 (p< .001), respectively. In the present study, the overall Cronbach's alpha coefficient for this scale was found to be 0.89.

Research implementation process: After selecting the classes and coordinating with the professors, the researcher visited the classes. She briefly described research's purpose, assured the students that their information would remain confidential and anonymous, and then asked them to complete the questionnaires if they were willing. Students were notified that they could remove from the research at any time during the questionnaire completion process. Furthermore, this research was accepted by the Ethics Committee of Islamic Azad University, Central Tehran Branch (Ethics Code: IR.IAU.CTB.REC.1401.132).

Results

Table 1 indicates the mean, standard deviation, minimum and maximum values, results of the Kolmogorov-Smirnov test and its significance level, and the skewness and kurtosis of the variables.

Table 1. The mean, median, standard deviation, minimum, maximum, results of the Kolmogorov-Smirnov test, skewness, and kurtosis of the studied variables

Variable	Description								
	Mean	Median	SD	Minimum	Maximum	K-S	K-S P value	Skewness	Kurtosis
Self-Compassion	38.01	38	7.56	16	55	0.845	0.474	-0.269	-0.285
Obsessive-Compulsive	20.72	19.5	11.51	1	59	1.251	0.087	0.518	-0.292
Rumination	50.47	49	11.82	26	86	0.922	0.363	0.614	1.098
Difficultyin Emotion Regulation	38.70	36	12.87	16	80	1.210	0.061	0.756	0.220

Abbreviations: K-S, Kolmogorov-Smirnov; SD, Standard Deviation.

As shown in Table 1, the significance level of the Kolmogorov-Smirnov test for the above variables is greater than 0.05. Furthermore, the skewness of the score distributions falls within the range of -2 to +2, and the kurtosis falls within the range of -3 to +3. Therefore, the distribution of the variables in the student population does not significantly differ from a normal distribution. It should also be noted that linear relationships between the variables were confirmed using scatter plots. Table 2 shows the Pearson correlation coefficients between the variables.

Table 2. Correlation matrix of the research variables

Variables	1	2	3	4
1. Self-Compassion	-			
2. Obsessive-Compulsive	-0.350**	-		
3. Rumination	-0.491**	0.413**	-	
4. Difficulty in Emotion Regulation	-0.630**	0.443**	0.531**	-

p< 0.001**

As the results in Table 2 demonstrate, all the examined variables have significant correlations with each other (p<.001). Subsequently, to investigate the mediating role of difficulty in emotion regulation in the relationship between self-compassion and both obsessive-compulsive symptoms and rumination, path analysis was used. Before performing the path analysis, verification was made that the fundamental assumptions - sample size adequacy, normality of data distribution, sphericity, and absence of multicollinearity were satisfied. The normality of data distribution was examined in previous stages. With reference to Kline's recommendation (47), the sample size is enough. Moreover, the Kaiser-Meyer-Olkin (KMO) measure was obtained as 0.884, and since it is greater than 0.6, it indicates the adequacy of the sample size. The results of Bartlett's test of sphericity (χ^2= 9079.359, p< .001) confirmed the assumption that the correlation matrix between the variables is not an identity matrix. Multicollinearity among the research variables was investigated through the Tolerance index and Variance Inflation Factor (VIF). Coincidentally, the tolerance index for both self-compassion and difficulty in emotion regulation was found to be equal, with a value of 0.60. The variance inflation factor (VIF) for both mentioned variables was also calculated to be 1.65. Given that the tolerance values were greater than 0.1 and the VIF values were less than 10, the assumption of no multicollinearity was confirmed. Therefore, path analysis can be performed.

Subsequently, the conceptual model of the study was fitted to the data using path analysis with the maximum likelihood method to determine the mediating role of difficulty in emotion regulation in the relationship between self-compassion and obsessive-compulsive symptoms and rumination. Given that the direct effect of self-compassion on obsessive-compulsive symptoms was non-significant, this path was removed from the model, and the model fit was assessed again. The standardized coefficients for each path in the revised model are presented in diagram 1.

The model has a satisfactory fit if the following criteria are met: the chi-square to degrees of freedom ratio (χ^2/df) is less than or equal to 3, the Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), and Adjusted Goodness-of-Fit Index (AGFI) are greater than or equal to 0.90, the Root Mean Square Error of Approximation (RMSEA) is less than 0.08, and the Normed Fit Index (NFI) and Non-Normed Fit Index (NNFI) are greater than 0.90. As the results presented in Table 3 indicate, the model demonstrated an acceptable fit. After confirming the adequate fit of the model, the total standardized path coefficients, as well as the direct and indirect effects within the model, were calculated using the bootstrapping method (with 5000 resamples from the original data and a 95% confidence interval). The results are reported in Table 4.

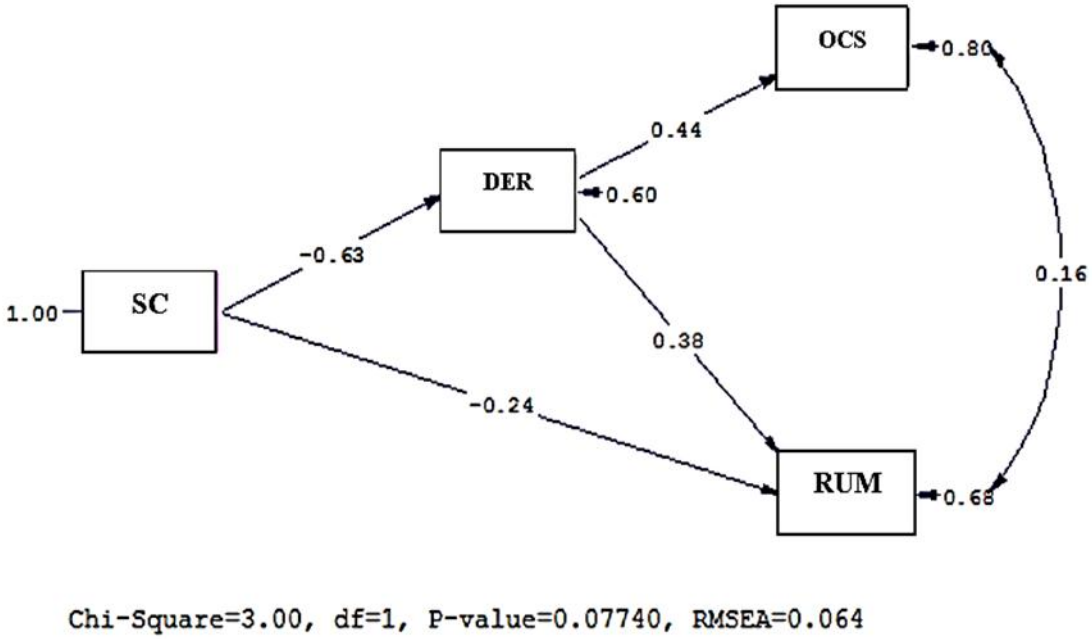

Diagram 1. Path diagram with standard path coefficients

Abbreviations: S-C, Self- Compassion; DER, Difficulty in Emotion Regulation; RUM, Rumination; OCS, Obsessive-Compulsive Symptoms.

Table 3. Fit indices for the model predicting obsessive-compulsive symptoms and rumination based on self-compassion with the mediating role of difficulty in emotion regulation

$\varkappa^2/df$	RMSEA	GFI	CFI	AGFI	NNFI	NFI
3	0.064	0.99	0.99	0.95	0.97	0.99

Table 4. Standardized path coefficients of the total, direct and indirect effects and the explained variance values in the model for predicting obsessive-compulsive symptoms and rumination based on self-compassion with the mediating role of difficulty in emotion regulation

Paths	Total Effect	Standard Deviation	Direct Effect	Standard Deviation	Indirect Effect	Standard Deviation	R^2
S-C→ DER	-0.63*	0.035	-0.63*	0.035	-	-	0.40
S-C→ RUM	-0.48*	0.048	-0.24*	0.062	-0.24*	0.040	0.32
S-C→ OCS	-0.28*	0.037	-	-	-0.28*	0.037	0.22
DER→ OCS	0.44*	0.052	0.44*	0.052	-	-	0.30
DER→ RUM	0.38*	0.058	0.38*	0.058	-	-	0.28

Abbreviations: S-C, Self- Compassion; DER, Difficulty in Emotion Regulation; RUM, Rumination; OCS, Obsessive-Compulsive Symptoms; R2, Explained variance.

*P< 0.001

The results in Table 4 show that the direct effect of self-compassion on difficulty in emotion regulation (β= -0.63) is significantly negative, and the direct effect of difficulty in emotion regulation on obsessive-compulsive symptoms (β= 0.44) and on rumination (β= 0.38) are significantly positive. The indirect effect of self-compassion on rumination (β= -0.24) and on obsessive-compulsive symptoms (β= -0.28) is significantly negative. The total effect of self-compassion on rumination (both direct and indirect via difficulty in emotion regulation) (β= -0.48) is significantly negative. Similarly, the total effect of self-compassion on obsessive-compulsive symptoms (only the indirect effect via difficulty in emotion regulation) (β= -0.28) is also significantly negative.

Finally, the results presented in Table 4 indicate that self-compassion accounts for 40% of the variance in difficulty in emotion regulation, 32% of the variance in rumination, and 22% of the variance in obsessive-compulsive symptoms. Difficulty in emotion regulation explains 28% of the

variance in rumination and 30% of the variance in obsessive-compulsive symptoms. These findings demonstrate that difficulty in emotion regulation has a mediating role in the relationship between self-compassion and obsessive-compulsive symptoms and rumination.

Discussion

The results revealed a significant negative relationship between self-compassion and obsessive-compulsive symptoms. This finding is consistent with the research of Eichholz et al. (17), Moron, Biolik -Moron, & Matuszewski (38), Carvalho & Guiomar (39), and Leeuwerik, Cavanagh, and Strauss (37). One possible explanation for the negative correlation between self-compassion and obsessive-compulsive symptoms is that individuals with high levels of self-compassion may be more self-accepting and less self-judgmental, which can lead to lower levels of anxiety and distress. This in turn, may lead to fewer obsessive-compulsive symptoms (58). Furthermore, self-compassion may help individuals cope more effectively with the distressing thoughts and emotions that often accompany obsessive-compulsive symptoms. By practicing self-kindness, sharing, and mindfulness, individuals may be able to reduce their levels of anxiety and stress, which in turn reduces their reliance on compulsive behaviors (17). However, despite this, the results from the path analysis showed that the direct effect of self-compassion on obsessive-compulsive symptoms is not significant. This finding is somewhat consistent with the results of Eichholz et al. (17), who presented that after controlling for obsessive beliefs and depression, self-compassion could not significantly predict the severity of obsessive-compulsive symptoms. Similarly, Leeuwerik et al. (37) found that after controlling for distress tolerance and obsessive beliefs, self-compassion had only a minor predictive effect on checking and washing symptoms. These findings could indicate that self-compassion might not have an independent effect on obsessive-compulsive symptoms and that other variables are involved in this relationship. Moreover, it is possible that not all types of obsessive-compulsive symptoms are similarly influenced by self-compassion, and it may be necessary to examine the different types of these symptoms separately, which was not considered in this study. Therefore, it appears that more research is needed to fully understand the mechanisms involved in the relationship between self-compassion and obsessive-compulsive symptoms.

The findings showed a significant negative correlation between self-compassion and rumination**.** Additionally, the direct effect of self-compassion on rumination was found to be significant. The present finding aligned with prior research (43, 46); however, it contradicted the study by Krieger et al. (45), which demonstrated no significant correlation between self-compassion and self-focused rumination. Self-compassion is linked to positive emotions, enabling individuals to maintain a non-judgmental awareness of their negative emotions without suppressing or denying those (33). Therefore, self-compassion would allow individuals to approach their negative experiences and emotions with greater acceptance and less judgment, thereby reducing the likelihood of rumination (30). Consequently, self-compassionate individuals may be less susceptible to cycles of negative thought and self-blame. Instead, they are more inclined to demonstrate self-kindness and self-understanding, which may serve as a protective factor against the harmful effects of rumination (29, 46). In addition, self-compassion may enhance emotion regulation, reduce reactive responses to negative experiences, and lead to less rumination (44).

Additionally, the results showed a significant negative correlation between self-compassion and difficulty in emotion regulation, additionally the direct effect of self-compassion on difficulty in emotion

regulation was found to be significant. The present finding aligns with the studies by Eichholz et al. (17), Inwood and Ferrari (34), and Scoglio et al. (32). Given that self-compassion pertains to how individuals treat themselves in moments of distress, emotion regulation seems to be one of the potential mechanisms through which self-compassion operates (28).

Self-compassion is likely to foster mindfulness and emotional acceptance, thereby improving an individual's capacity for effective emotion regulation (33). Moreover, by serving as an emotion regulation strategy, it enables individuals to adopt a kind approach toward negative and distressing emotions instead of avoiding them, and to explore new ways of coping (29). Additionally, the results of this study indicated that there is a significant positive relationship between difficulty in emotion regulation and obsessive-compulsive symptoms, and the direct effect of difficulty in emotion regulation on obsessive-compulsive symptoms is significant. This result aligns with prior research (17, 18). To explain this relationship, it can be argued that, based on cognitive-behavioral and emotion-focused models of obsessive-compulsive disorder, individuals with obsessive-compulsive disorder may engage in compulsive behaviors as a way to decrease the distress or anxiety caused by their obsessions. Nevertheless such compulsions often result in merely transient relief and may instead strengthen the person's belief that their obsessions represent a serious threat (16, 17). Difficulties in effective emotion regulation can diminish one's capacity to endure distress without engaging to compulsive behaviors, thus maintaining the obsessive-compulsive symptoms cycle (16, 17). In addition, those with such regulatory difficulties may exhibit a greater tendency to suppress intrusive or unwanted thoughts—a common cognitive strategy employed by individuals with obsessive compulsive disorder. In addition, such individuals may show more rigid or inflexible thought patterns that facilitate the maintenance of obsessions and compulsions (16).

Additionally, the results of this study indicated a significant positive relationship between difficulty in emotion regulation and rumination, and the direct effect of difficulty in emotion regulation on rumination was found to be significant. This result aligns with prior research (13, 14). Various mechanisms can explain the link between difficulties in emotion regulation and rumination. Based on Response Styles Theory (56), individuals with emotion regulation difficulties, such as those who suppress or avoid their negative emotions, may be susceptible to engaging in rumination as a maladaptive strategy for coping with emotional distress. They may engage in persistent analysis and focus on their negative thoughts and emotions, leading to the perpetuation and exacerbation of their distress. Moreover, individuals with difficulty in emotion regulation may have a reduced ability to effectively refocus and disengage from negative stimuli, leading to prolonged engagement in rumination. This consequently disrupts the person's capacity to let go of negative experiences and maintain a positive affective state (23). Additionally, cognitive factors can also account for the relationship between difficulties in emotion regulation and rumination. People experiencing difficulties in emotion regulation might demonstrate a negative interpretive bias toward situations, potentially facilitating both the onset and persistence of rumination. Moreover, the persistence of rumination may be reinforced by their maladaptive beliefs concerning its utility in problem-solving or achieving insight (7).

Additionally, the path analysis revealed that difficulty in emotion regulation mediate the relationship between self-compassion and both obsessive-compulsive symptoms and rumination. The mediating role of difficulty in emotion regulation can be described by the significant contribution of self-

compassion to effective emotion regulation. Individuals with higher levels of self-compassion demonstrate a greater tendency to accept their emotions, thereby facilitating more adaptive emotion regulation (29). Furthermore, they are likely to employ better monitoring skills and coping strategies, enabling effective emotional management and adaptive responses to adverse situations (17).

Self-compassion is expected to foster mindfulness and emotional acceptance, thereby improving an individual's capacity for effective emotion regulation. Conversely, individuals with lower levels of self-compassion may have difficulties in regulating their emotions, which in turn can increase their vulnerability to symptoms of obsessive-compulsive disorder (17) and rumination (13). Specifically, emotion regulation can affect the degree to which intrusive thoughts result in sustained negative affective states. Additionally, deficits in emotional clarity can lead to a poor understanding of one's emotions, which may amplify emotional distress sufficiently to prompt the use of maladaptive, avoidant strategies—such as neutralizing behaviors—in pursuit of immediate relief (16). Consistent with this view, Stern et al. (15) propose that the motivation to avoid emotions may be a fundamental mechanism of obsessive-compulsive disorder, wherein compulsions are utilized to alleviate the distress triggered by intrusive thoughts. According to this rationale, obsessive-compulsive symptoms have a specific link to difficulties in controlling one's behavior when experiencing negative emotions (16).

Moreover, when faced with emotions that are difficult to manage, individuals may resort to rumination as a maladaptive coping strategy. Rumination prolongs the experience of negative emotions by continuously replaying them and their associated thoughts in the mind, which, in turn, impedes effective emotion regulation. This can create a vicious cycle wherein difficulty in emotion regulation exacerbate rumination, which in turn further disrupts emotion regulation (23, 29).

It should be noted that this study was correlational and cross-sectional in design, which limits causal inferences. Future longitudinal research by other investigators would be beneficial for examining the relationships between these variables. Furthermore, the study population was limited to students of the Valiasr Complex at the Islamic Azad University, South Tehran Branch, during the 2022-2023 academic years, which may restrict the generalizability of the findings. Overall, the findings underscore the significance of emotion regulation as a protective factor against psychological difficulties. The use of practical emotion regulation skills may reduce vulnerability to problems like rumination and obsessive-compulsive disorder. Moreover, given the link between high self-compassion and successful emotion regulation, implementing widespread self-compassion training could represent a significant step forward in preventing and alleviating rumination and obsessive-compulsive symptoms. Consequently, these findings carry significant clinical implications. Given that similar mechanisms appear to be involved in the development of both rumination and obsessive-compulsive disorder, mental health professionals can provide more effective interventions to alleviate or reduce such symptoms by focusing on enhancing skills such as self-compassion and emotion regulation.

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