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Predicting Somatoform Disorder Symptoms Based on Alexithymia, Self-Critical Rumination, and Body Monitoring: Examining the Mediating Role of Interpersonal Sensitivity

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A B S T R A C T

The present study aimed to investigate the roles of alexithymia, self-critical rumination, and body monitoring in predicting somatoform disorder symptoms, with interpersonal sensitivity as a mediator. The statistical population consisted of adults with somatoform disorder who attended specialized mental health centers, psychiatric clinics, and counseling centers in Tehran. A total of 200 eligible individuals were selected using purposive sampling. Data were collected using the Toronto Alexithymia Scale (TAS-20), Self-Critical Rumination Scale (SCRS), Multidimensional Assessment of Interoceptive Awareness (MAIA), Interpersonal Sensitivity Measure (IPSM), and the Powell and Enright Somatic Symptoms Questionnaire. Data were analyzed using SPSS version 23 and AMOS version 24 through descriptive statistics, correlation analyses, and structural equation modeling. The findings indicated that self-critical rumination had a positive and significant indirect effect on somatoform disorder symptoms through interpersonal sensitivity ($\beta = .108$, $p = .002$). Alexithymia also had a negative and significant indirect effect on somatoform disorder symptoms through interpersonal sensitivity ($\beta = -.052$, $p = .003$). In contrast, the indirect effect of body monitoring on somatoform disorder symptoms through interpersonal sensitivity was not significant ($\beta = .008$, $p = .682$). Overall, the findings demonstrated that interpersonal sensitivity mediates the relationships between certain cognitive and emotional factors and somatoform disorder symptoms. Based on these findings, attention to self-critical rumination, emotional processes, and interpersonal sensitivities is recommended in the assessment and psychological treatment of somatic symptoms.

Keywords: *somatoform disorder, alexithymia, self-critical rumination, body monitoring, interpersonal sensitivity*

1. Introduction

Somatic symptoms constitute a major area of concern in clinical psychology because bodily complaints can be experienced as persistent, distressing, and functionally impairing even when they cannot be fully accounted for by identifiable organic pathology. Contemporary diagnostic perspectives have increasingly moved away from defining

such problems solely on the basis of the absence of a medical explanation and have instead emphasized the psychological, cognitive, emotional, and behavioral processes associated with the experience and interpretation of bodily symptoms. The transition from older conceptualizations of somatoform disorders to the framework of somatic symptom disorder in the DSM-5 and related developments in ICD-11 reflects this broader emphasis on excessive symptom-related thoughts, affective responses, and behavioral involvement rather than on medically unexplained symptoms alone (Creed, 2023). Reviews of somatic symptom disorder have similarly highlighted the heterogeneity of its manifestations and the need to examine psychological processes that contribute to the persistence and amplification of somatic complaints (Wu et al., 2023). Recent systematic evidence further indicates that the general burden of somatic symptoms is multidimensional and may reflect partially overlapping domains of bodily distress rather than a single uniform symptom construct (Hybelius et al., 2026). Measurement research has therefore emphasized the importance of reliable assessment of somatic symptom severity, with commonly used instruments demonstrating varying psychometric characteristics across populations and clinical settings (Hybelius et al., 2024). A systematic review of instruments for medically unexplained physical symptoms has likewise shown that accurate assessment requires attention not only to symptom frequency but also to severity, functional interference, and the psychological meaning attributed to bodily experiences (Kuanar Baboo et al., 2024). Clinical observations also suggest that patients with somatic symptom disorder may exhibit distinctive patterns of symptom-related behavior, avoidance, functional limitation, and interaction with rehabilitation environments, indicating that the disorder is embedded in broader behavioral and interpersonal processes rather than being restricted to bodily sensations alone (Barak, 2023).

Psychological models of somatic symptomatology increasingly conceptualize bodily distress as the product of interactions among emotional processing, cognitive appraisal, attentional focus, stress reactivity, and interpersonal vulnerability. A recent systematic review and meta-analysis identified several psychological risk factors associated with somatic symptom disorder, reinforcing the view that maladaptive cognitive-emotional processes are central to symptom onset and maintenance (Smakowski et al., 2024). Stress-related mechanisms are particularly important because chronic or repeated psychological distress may increase physiological arousal, alter attention to bodily sensations, and contribute to the interpretation of ordinary bodily changes as threatening or pathological. Evidence from ambulatory assessment indicates that individuals with somatic symptom disorder may show heightened daily psychological stress, particularly when adverse developmental experiences are present (Fischer et al., 2022). Childhood maltreatment has also been associated with adult somatic symptoms, and alexithymia has been proposed as one mechanism through which early adverse experiences become translated into persistent bodily distress (Adamovic, 2024). Similarly, research on psychosomatic symptoms has suggested that childhood trauma may influence somatic symptom severity through maladaptive cognitive processes such as self-critical rumination (Yazdani, 2024). These findings support models in which somatic symptoms are not viewed as isolated physical events but as outcomes emerging from complex interactions among developmental vulnerabilities, emotional processing difficulties, repetitive negative thinking, and maladaptive responses to internal and interpersonal experiences.

Among the emotional variables potentially involved in somatic symptomatology, alexithymia has received substantial attention. Alexithymia is generally characterized by difficulties in identifying and describing emotional states, together with a tendency toward externally oriented thinking. Such deficits may restrict an individual's ability to differentiate emotional arousal from bodily sensations and may consequently increase the likelihood that psychological distress is experienced or interpreted in somatic terms. Clinical evidence demonstrates a relatively high prevalence of alexithymic features among individuals with medically unexplained physical symptoms, supporting the relevance of impaired emotional awareness to somatic symptom presentations (Rady et al., 2021). Alexithymia has also been associated with somatic symptoms in both autistic and non-autistic adults, with intolerance of uncertainty contributing additional explanatory value (Larkin et al., 2023). In individuals with elevated autistic traits, interoceptive sensibility has been linked to somatoform symptoms through alexithymia and emotional dysregulation, suggesting that difficulties in interpreting internal bodily states may become clinically significant when emotional differentiation is impaired (Zdankiewicz-Scigala et al., 2021). More broadly, alexithymia has been found to mediate relationships between emotional or perceptual processes and psychological outcomes, demonstrating its potential role as an intermediate mechanism rather than merely a static personality characteristic (Zhang et al., 2024). Research has further

KMAN-CPN KMAN-Counseling & Psychology Nexus
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indicated that early maladaptive schemas may predict alexithymia through reduced emotional self-disclosure, underscoring the interpersonal and developmental foundations of impaired emotional expression (Faramarzi Rad et al., 2023). Alexithymia has also been associated with rumination and anxiety-related processes among clinical populations (Mirshafiei & Jafari, 2024), while emotion-regulation strategies and self-compassion have been identified as important correlates of alexithymic functioning (Shahi & Zadeh Mohammadi, 2024). In addition, internalized shame and self-criticism may contribute to alexithymia through anxiety sensitivity, further demonstrating that emotional identification deficits are embedded in broader self-evaluative processes (Mokaramifar & Nouri, 2024).

Another potentially important mechanism in somatic symptomatology is self-critical rumination. Rumination refers to repetitive, perseverative thinking that maintains attention on distressing experiences, whereas self-critical rumination specifically involves recurring thoughts centered on personal shortcomings, failures, perceived inadequacies, and negative self-evaluation. Unlike adaptive self-reflection, this repetitive cognitive process tends to be rigid, emotionally aversive, and difficult to disengage from. Experimental evidence has demonstrated that self-critical rumination can increase shame and stress, suggesting a direct pathway through which repetitive negative self-evaluation may intensify psychological distress (Milia et al., 2021). Research has also shown that self-critical rumination and its associated metacognitive beliefs may mediate the relationship between perfectionistic tendencies and reduced self-esteem (Fearn et al., 2022). Validation studies of the Self-Critical Rumination Scale have supported the construct's role as an intermediary between emotion-regulation difficulties and broader psychopathology (Martinez-Sanchis et al., 2021). The Persian version of the instrument has also demonstrated psychometric applicability, supporting its use in Persian-speaking populations and facilitating empirical examination of self-critical repetitive thinking in Iranian samples (Shahian et al., 2024). At a broader level, self-criticism has consistently been associated with poorer psychotherapy outcomes, suggesting that persistent negative self-evaluation may operate as a transdiagnostic vulnerability that interferes with emotional recovery and adaptive coping (Löw et al., 2020). Studies among adolescents have further shown that rumination and self-criticism can contribute to maladaptive psychological outcomes in the context of reduced self-compassion (Sheikh Fendereski et al., 2024). These findings suggest that self-critical rumination may be especially relevant to somatic symptoms because sustained negative self-focus may increase stress, enhance monitoring of internal experiences, and amplify the perceived significance of bodily discomfort.

Body monitoring represents another theoretically relevant factor in understanding somatic symptoms. Attention to bodily sensations is not inherently maladaptive; indeed, adaptive interoceptive awareness can facilitate emotional regulation and effective self-care. However, when bodily monitoring becomes excessive, threat-oriented, or associated with dysfunctional interpretation, it may increase the salience of benign physiological sensations and contribute to symptom amplification. Contemporary research distinguishes between adaptive awareness of bodily states and maladaptive self-objectification or hypervigilant monitoring. The psychological literature on self-objectification indicates that sociocultural pressures can interact with self-system processes to intensify body-focused attention and alter the way individuals evaluate their physical experiences (Liu et al., 2025). This distinction is particularly important in psychosomatic research because the same act of attending to bodily sensations may have different psychological consequences depending on whether attention is accompanied by acceptance, trust, anxiety, or threat appraisal. Research on interoceptive sensibility has shown that awareness of internal bodily states may become related to somatic symptoms when mediated by alexithymia and emotion dysregulation (Zdankiewicz-Scigala et al., 2021). Emotional processing research further suggests that improvement in the ability to recognize, experience, and express emotions can be associated with reductions in somatic symptoms, indicating that the clinical significance of bodily awareness depends partly on how bodily sensations are integrated with emotional information (Maroti et al., 2021). Therefore, body monitoring may influence somatic symptomatology either directly or indirectly through emotional and interpersonal processes, although the specific mechanisms remain insufficiently clarified.

Interpersonal sensitivity may be one of the mechanisms linking cognitive-emotional vulnerabilities to somatic symptoms. Interpersonal sensitivity refers to heightened awareness of, and reactivity to, the perceived evaluations, attitudes, and behaviors of others, often accompanied by concerns about rejection, criticism, disapproval, separation, or social inadequacy. Individuals with elevated interpersonal sensitivity may devote substantial cognitive resources to

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monitoring social cues and interpreting ambiguous interpersonal events as threatening. Such patterns may contribute to chronic psychological stress and emotional arousal, which may subsequently intensify attention to bodily sensations. Research has shown that interpersonal sensitivity is closely related to cognitive distortions and may contribute to the development and maintenance of several forms of psychopathology (Topalalioglu, 2025). It has also been identified as a mediator between schema-related vulnerabilities and maladaptive conflict-resolution patterns (Razeghi et al., 2025), suggesting that interpersonal sensitivity can function as a pathway through which deeper cognitive schemas influence overt psychological functioning. Among adolescents, interpersonal sensitivity has been found to mediate the association between mentalization and self-injurious functioning (Shahdadian et al., 2025). Longitudinal findings have likewise demonstrated that interpersonal sensitivity can participate in the pathway from childhood emotional abuse to later social anxiety, particularly in interaction with insecurity (Zhu et al., 2025). Together, these findings support the conceptualization of interpersonal sensitivity as a transdiagnostic vulnerability capable of transmitting the effects of cognitive and emotional risk factors into diverse forms of psychological distress.

Interpersonal sensitivity is also closely associated with rumination, anxiety, and inflexible cognitive responding. Evidence suggests that self-efficacy, interpersonal sensitivity, and rumination jointly contribute to the prediction of social anxiety symptoms, highlighting the interdependence of repetitive negative thinking and interpersonal vulnerability (Alipour, 2026). Other research has shown that the believability of anxious thoughts and feelings is associated with interpersonal sensitivity and that cognitive flexibility may mediate this relationship (Sohrabi et al., 2022). Mindfulness-related processes have likewise been associated with interpersonal sensitivity, with acceptance and action functioning as potential mediators (Arshadi, 2022). Studies of parental bonding and sexual functioning have further demonstrated the mediating role of interpersonal sensitivity in relational outcomes, suggesting that this construct affects how individuals interpret and respond to emotionally significant interpersonal experiences (Amini & Arzami, 2023). These findings are relevant to somatic symptomatology because social-evaluative stress and heightened sensitivity to interpersonal cues may intensify physiological arousal and redirect attention toward the body. An individual who repeatedly evaluates the self negatively may become more vigilant to criticism or rejection, whereas an individual who has difficulty identifying emotions may rely more heavily on interpersonal and bodily cues to understand internal distress. Interpersonal sensitivity may therefore represent an important intermediary mechanism through which self-critical rumination and alexithymia influence the experience of somatic symptoms.

The relationships among self-criticism, emotional processing, and interpersonal sensitivity may also be understood within a broader self-regulatory framework. Self-critical individuals often evaluate their internal experiences through a harsh and punitive perspective, which may intensify stress and impair the capacity to regulate negative affect. Research on gifted adolescents, for example, has shown that self-coldness and reduced self-compassion are associated with greater stress and anxiety, whereas self-compassion may serve a protective role against negative self-evaluation (Kara et al., 2024). Such findings complement evidence linking self-criticism to rumination and emotional dysfunction. If repetitive self-critical cognition heightens interpersonal sensitivity, social situations may become persistent sources of perceived threat. Conversely, alexithymic individuals may have difficulty labeling internal affective states and may consequently depend more strongly on external interpersonal feedback or bodily sensations when interpreting distress. In this context, interpersonal sensitivity may either amplify or alter the effect of alexithymia on somatic symptoms. This possibility is particularly important because alexithymia does not necessarily produce identical outcomes across individuals; its consequences may depend on accompanying emotional, cognitive, and interpersonal characteristics. Research examining emotion regulation, shame, self-criticism, and alexithymia supports the view that these variables form interconnected systems rather than independent risk factors (Mokaramifar & Nouri, 2024). Similarly, evidence connecting alexithymia with rumination and anxiety sensitivity suggests that repetitive cognition and emotional identification deficits may mutually reinforce one another (Mirshafiei & Jafari, 2024).

Despite growing empirical attention to somatic symptom disorder, important gaps remain in the simultaneous investigation of alexithymia, self-critical rumination, body monitoring, and interpersonal sensitivity within an integrated structural framework. Much of the available literature has examined these variables separately or in relation to other forms of psychopathology. For example,

KMAN-CPN KMAN-Counseling & Psychology Nexus
E-ISSN: 3041-9026

self-critical rumination has been investigated in relation to shame, perfectionism, self-esteem, and general psychopathology (Fearn et al., 2022; Martinez-Sanchis et al., 2021; Milia et al., 2021), whereas interpersonal sensitivity has frequently been studied in relation to social anxiety, attachment-related experiences, cognitive distortions, and maladaptive relational functioning (Amini & Arzami, 2023; Topalalioglu, 2025; Zhu et al., 2025). Likewise, alexithymia has been examined in association with somatic symptoms, childhood maltreatment, emotion regulation, and interoception (Adamovic, 2024; Larkin et al., 2023; Rady et al., 2021). However, comparatively little research has tested whether interpersonal sensitivity explains how these cognitive-emotional characteristics become associated with somatoform symptom severity. Such investigation may be especially valuable because psychological interventions for somatic symptoms increasingly emphasize not merely symptom reduction but modification of the cognitive, emotional, and interpersonal processes that maintain symptom-related distress.

A structural approach is therefore warranted because it allows direct and indirect relationships among these variables to be examined simultaneously. Such an approach can help distinguish whether self-critical rumination, alexithymia, and body monitoring exert independent direct effects on somatic symptoms or whether some of their effects are transmitted through heightened interpersonal sensitivity. This distinction has practical significance because mediated pathways can indicate psychologically meaningful targets for assessment and intervention. If interpersonal sensitivity carries part of the effect of repetitive self-critical cognition, interventions aimed at reducing social-evaluative hypervigilance, rejection concerns, and maladaptive interpersonal interpretations may complement approaches targeting rumination itself. If alexithymia affects somatic symptoms through interpersonal sensitivity, interventions focused on emotional identification and communication may benefit from explicitly addressing interpersonal interpretations and relational insecurity. Conversely, if body monitoring is related to somatic symptoms primarily through a direct pathway rather than through interpersonal sensitivity, treatment may require more specific strategies targeting interoceptive interpretation, bodily hypervigilance, and symptom-focused attention. These distinctions are consistent with contemporary views emphasizing multidimensional assessment and individualized psychological formulation in somatic symptom presentations (Hybelius et al., 2026; Kuanar Baboo et al., 2024). They also align with evidence suggesting that emotional processing can be meaningfully associated with changes in somatic symptom severity during psychological treatment (Maroti et al., 2021).

Accordingly, the present study aimed to investigate the predictive roles of alexithymia, self-critical rumination, and body monitoring in somatoform disorder symptoms and to examine the mediating role of interpersonal sensitivity in these relationships.

2. Methods and Materials

2.1. Study Design and Participants

The present study was applied in terms of its objective because its findings could be used to identify factors associated with somatic symptoms and to develop related psychological interventions. In terms of its nature and implementation method, the study employed a descriptive-correlational, survey-based design. Given that the primary objective was to examine the structural relationships among the variables and to test the mediating role of interpersonal sensitivity in the relationships between the predictor variables and somatic symptoms, structural equation modeling (SEM) was employed. The statistical population consisted of adults with somatic symptoms who attended selected specialized mental health centers, psychiatric clinics, and counseling centers in Tehran, including Zehn-e Ziba, Salma, Pendar, Pendar Nimrokh, and Behzist clinics. The study sample consisted of 200 eligible individuals who were selected through purposive sampling. The diagnosis of the disorder was established based on the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), a clinical interview, and a review of the participants' diagnostic records. Participation in the study was contingent upon confirmation of the diagnosis and fulfillment of the study inclusion criteria.

2.2. Data Collection Tools

Toronto Alexithymia Scale (TAS-20): This questionnaire was developed by Taylor, Bagby, and Parker (1985) and was subsequently revised in 1990. It consists of 20 items assessing three principal dimensions: difficulty identifying feelings (5 items), difficulty describing feelings (5 items), and externally oriented thinking (8 items). Items are scored on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Besharat (2007) reported satisfactory validity and reliability for the Persian version of this scale.

KMAN-CPN KMAN-Counseling & Psychology Nexus
E-ISSN: 3041-9026

In the present study, Cronbach's alpha coefficient for the scale was .810.

Self-Critical Rumination Scale (SCRS): This scale was developed by Smart et al. (2016). It consists of 10 items assessing the extent to which participants agree with each statement using a 4-point Likert scale ranging from not at all (1) to very much (4). The minimum possible score is 10, and the maximum possible score is 40. Smart et al. (2016) confirmed the construct validity of the instrument and reported a Cronbach's alpha coefficient of .92. In the present study, Cronbach's alpha coefficient for the scale was .899.

Multidimensional Assessment of Interoceptive Awareness (MAIA): This questionnaire was developed by Mehling et al. (2012) to assess individuals' attention to and awareness of internal bodily sensations and states. The version used in the present study consists of 32 items organized into eight dimensions: Noticing, Not-Distracting, Not-Worrying, Attention Regulation, Emotional Awareness, Self-Regulation, Body Listening, and Trusting. In the present study, Cronbach's alpha coefficient for this scale was .870.

Interpersonal Sensitivity Measure (IPSM): This questionnaire was developed by Boyce and Parker (1989) and consists of 36 items across five dimensions: interpersonal awareness (7 items), need for approval (8 items), separation anxiety (8 items), timidity (8 items), and fragile inner self (5 items). In the present study, Cronbach's alpha coefficient for this questionnaire was .922.

Somatic Symptoms Questionnaire: This questionnaire was developed by Powell and Enright (1991). It consists of 18 items assessing the occurrence of symptoms such as headache, fatigue, gastrointestinal problems, heart palpitations, sleep disturbances, and other bodily complaints. In the present study, Cronbach's alpha coefficient for this questionnaire was .944.

2.3. Data Analysis

The research data were analyzed using SPSS version 23 and AMOS version 24 through descriptive statistics, Pearson correlation analysis, and structural equation modeling (SEM). The statistical significance of the indirect effects was examined using a bootstrap procedure with 1,000 resamples and 95% confidence intervals.

3. Findings and Results

A total of 200 participants were examined in the present study, including 109 women and 91 men. The highest age-frequency category was 33–40 years (28%), whereas the lowest frequency was observed among participants older than 56 years (8%). In terms of educational attainment, participants with a bachelor's degree constituted the largest group (35%), whereas those with a doctoral degree represented the smallest group (5%). Regarding marital status, 101 participants were married, 90 were single, 6 were divorced, and 3 were widowed. The most frequent type of illness was musculoskeletal and chronic pain (10.5%), and the longest duration of illness was observed among participants with a disease history of more than 7 years (32%).

Table 1

Descriptive Statistics for the Study Variables

Variable	N	Mean	SD	Skewness	Kurtosis
Alexithymia	200	106.62	11.182	-0.309	-0.499
Difficulty Identifying Feelings	200	15.90	5.074	0.282	-0.454
Difficulty Describing Feelings	200	9.560	3.025	-0.442	-0.614
Externally Oriented Thinking	200	14.16	3.951	-0.832	-0.031
Interpersonal Sensitivity	200	124.10	23.137	0.327	0.269
Interpersonal Awareness	200	13.71	3.957	-0.421	-0.168
Need for Approval	200	17.72	4.597	-0.507	-0.007
Separation Anxiety	200	10.88	2.753	0.638	0.123
Timidity	200	10.90	2.831	-0.571	-0.105
Fragile Inner Self	200	6.86	2.289	-0.137	-1.045
Body Monitoring	200	96.68	21.140	0.213	-0.293
Noticing	200	5.90	2.240	0.038	-0.725
Not-Distracting	200	6.04	2.218	-0.154	-0.778
Not-Worrying	200	5.39	1.185	0.216	-0.262
Attention Regulation	200	5.40	2.151	0.130	-0.781
Sustained Attention to the Body	200	7.04	1.908	-0.622	-0.013

KMAN-CPN KMAN-Counseling & Psychology Nexus
E-ISSN: 3041-9026

Emotional Awareness	200	7.39	1.199	-0.662	-0.001
Self-Regulation	200	5.41	2.152	0.331	-0.515
Body Listening and Trusting	200	12.03	4.768	0.011	-1.111
Self-Critical Rumination	200	37.27	7.932	-0.778	0.635
Somatoform Disorder Symptoms	200	57.94	16.234	-0.352	-0.273

For alexithymia, the mean score was 106.62 with a standard deviation of 11.182. For interpersonal sensitivity, the mean was 124.10 with a standard deviation of 23.137. For body monitoring, the mean was 96.68 with a standard deviation of 21.140. The mean score for self-critical rumination was 37.27 with a standard deviation of 7.932, while somatoform disorder symptoms had a mean of 57.94 and a standard deviation of 16.234. Cronbach's alpha coefficients were .810 for alexithymia, .922 for interpersonal sensitivity, .944 for somatic symptoms, .899 for self-critical rumination, and .870 for body monitoring.

The distributional characteristics of the study variables were examined using the Shapiro–Wilk and Kolmogorov–Smirnov tests. For alexithymia, the Shapiro–Wilk test value was .980 and the Kolmogorov–Smirnov significance value was .200. For interpersonal sensitivity, the corresponding values were .591 and .200, respectively. For somatoform disorder symptoms, the Shapiro–Wilk value was .960 and the Kolmogorov–Smirnov significance value was .200. For self-critical rumination, the Shapiro–Wilk value was .196 and the Kolmogorov–Smirnov significance value was .073. For body monitoring, the Shapiro–Wilk value was 1.000 and the Kolmogorov–Smirnov significance value was .200. Because the Kolmogorov–Smirnov significance level for all variables was greater than .05, the null hypothesis of normality was not rejected. Therefore, the distributions of the study variables were considered acceptably normal, and the data were deemed suitable for subsequent statistical analyses and testing of the proposed research model.

Table 2

Goodness-of-Fit Indices for the Final Model

CMIN	df	p	CMIN/df	RMSEA	CFI	GFI	IFI	NFI	PCLOSE	Hoelter	TLI
6.382	3	.094	2.127	.075	.977	.987	.978	.960	.235	244	.924

The results of the structural model fit analysis indicated a chi-square value of 6.382 with 3 degrees of freedom and a significance level of .094. Because the chi-square test was nonsignificant at the .05 level, no statistically significant discrepancy was observed between the empirical covariance matrix and the model-implied covariance matrix. In addition, the chi-square-to-degrees-of-freedom ratio was 2.127, which was below 3 and therefore indicated an acceptable fit of the structural model to the study data. The RMSEA value of .075 was also below .08, indicating an acceptable approximation error. The remaining fit indices further supported the adequacy of the model. The values of CFI = .977, IFI = .978, and TLI = .924 were all above .90, indicating satisfactory model fit. Similarly, NFI = .960 and GFI = .987 were within acceptable ranges. The PCLOSE value of .235 was also greater than .05, suggesting an acceptable close fit of the model. Furthermore, the Hoelter value of 244 indicated that the sample size was adequate for model estimation. Taken together, the various fit indices confirmed the adequacy of the proposed structural model. The satisfactory model fit indicates that the proposed structure, comprising self-critical rumination, alexithymia, and body monitoring as predictor variables, interpersonal sensitivity as the mediating variable, and somatoform disorder symptoms as the dependent variable, adequately represented the pattern of relationships observed in the data obtained from individuals with somatoform disorder.

Table 3

Standardized Direct Effects and Total Effects With Bootstrap Confidence Intervals in the Structural Model

Path	Standardized Direct Effect	Lower	Upper	p	Standardized Total Effect
Self-Critical Rumination → Interpersonal Sensitivity	.341	.228	.447	.002	.341
Alexithymia → Interpersonal Sensitivity	-.164	-.272	-.041	.036	-.164
Body Monitoring → Interpersonal Sensitivity	.024	-.080	.128	.693	.024

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E-ISSN: 3041-9026

Self-Critical Rumination → Somatoform Disorder Symptoms	.485	.399	.576	.001	.593
Alexithymia → Somatoform Disorder Symptoms	.104	-.006	.204	.114	.052
Body Monitoring → Somatoform Disorder Symptoms	.114	.033	.200	.015	.121
Interpersonal Sensitivity → Somatoform Disorder Symptoms	.316	.217	.405	.003	.316

The findings indicated that self-critical rumination had a significant indirect effect on somatoform disorder symptoms through interpersonal sensitivity (β = .108, p = .002). The bootstrap confidence interval for this effect ranged from .063 to .162 and did not include zero; therefore, the mediating pathway was statistically significant. This finding suggests that self-critical rumination may contribute to increased somatoform symptoms by increasing individuals' sensitivity to interpersonal relationships and social evaluations. Individuals who are persistently preoccupied with negative and self-critical thoughts may monitor others' reactions and interpersonal situations with greater concern, and the psychological distress associated with such experiences may heighten their attention to bodily sensations. Among individuals with somatoform disorder, this process may increase the salience of bodily sensations and intensify the experience or reporting of somatic symptoms. Therefore, based on the obtained findings, the first research hypothesis was supported.

Table 4

Standardized Indirect Effects With Bootstrap Confidence Intervals in the Structural Model

Indirect Path	Standardized Indirect Effect	Lower	Upper	p	Result
Self-Critical Rumination → Interpersonal Sensitivity → Somatoform Disorder Symptoms	.108	.063	.162	.002	Supported
Alexithymia → Interpersonal Sensitivity → Somatoform Disorder Symptoms	-.052	-.098	-.012	.030	Supported
Body Monitoring → Interpersonal Sensitivity → Somatoform Disorder Symptoms	.008	-.025	.044	.682	Not Supported

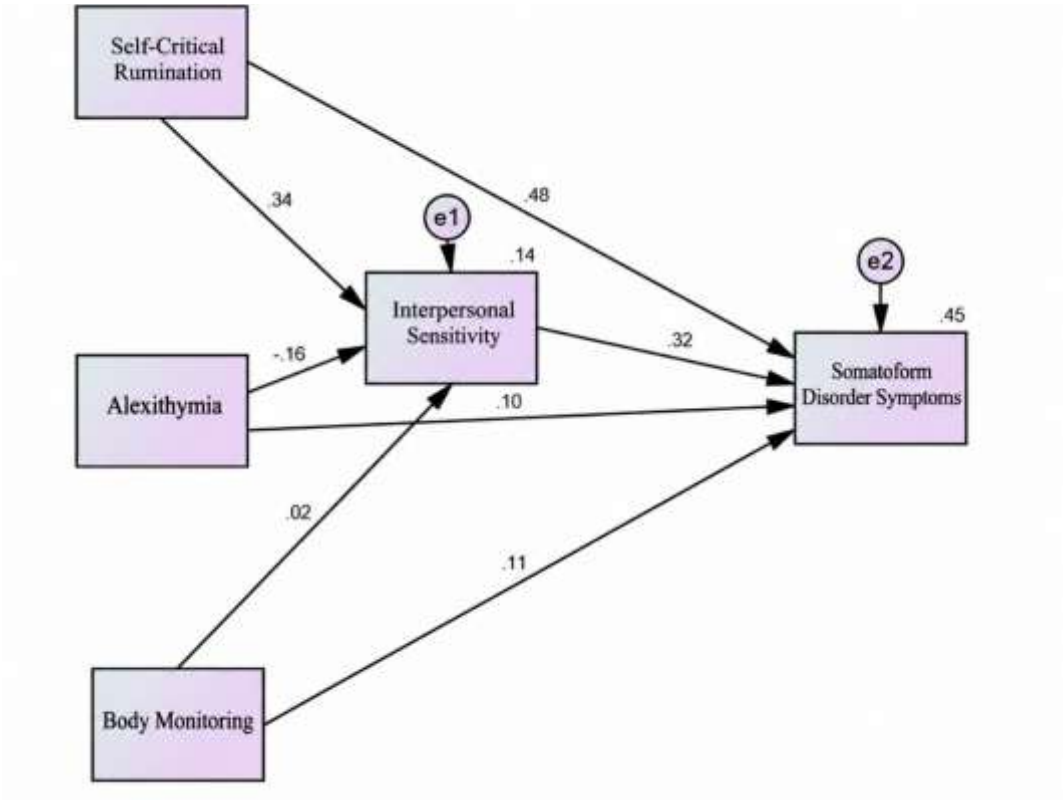
The findings also showed that alexithymia had a significant indirect effect on somatoform disorder symptoms through interpersonal sensitivity (β = −.052, p = .030). The bootstrap confidence interval for this effect ranged from −.098 to −.012 and did not include zero; therefore, the mediating effect of interpersonal sensitivity was statistically significant. The negative direction of the effect indicates that, within the scoring structure used in the present study, higher alexithymia was indirectly associated with lower somatoform disorder symptom scores through interpersonal sensitivity. Difficulties in identifying and describing emotions may influence the manner in which individuals process emotional experiences and respond to social situations, thereby altering the relationship between emotional experiences and somatic symptoms. Among individuals with somatoform disorder, interpersonal sensitivity may represent one of the pathways through which psychological experiences become associated with somatic symptoms. Therefore, based on the obtained findings, the second research hypothesis was supported.

The findings indicated that body monitoring did not have a significant indirect effect on somatoform disorder symptoms through interpersonal sensitivity (β = .008, p = .682). The bootstrap confidence interval for this effect ranged from −.025 to .044 and included zero; therefore, there was insufficient statistical evidence to support a mediating role for interpersonal sensitivity in this relationship. This finding suggests that although body monitoring is associated with the degree of attention to and awareness of one's internal bodily states, it did not produce a significant change in somatoform disorder symptoms through interpersonal sensitivity. In other words, greater attention to bodily states was not necessarily accompanied by increased sensitivity to interpersonal relationships and evaluations. Furthermore, the absence of a mediating effect suggests that the possible association between body monitoring and somatoform symptoms should be examined primarily through a direct pathway or through other psychological mechanisms. Therefore, based on the obtained findings, the third research hypothesis was not supported.

Figure 1

Final Standardized Model

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4. Discussion

The present study investigated whether alexithymia, self-critical rumination, and body monitoring predicted somatoform disorder symptoms and whether interpersonal sensitivity mediated these relationships. The structural model demonstrated an acceptable overall fit, indicating that the proposed configuration of cognitive, emotional, bodily, and interpersonal variables provided an adequate representation of the observed data. The most prominent finding was that self-critical rumination had both a significant direct effect on somatoform disorder symptoms (β = .485) and a significant indirect effect through interpersonal sensitivity (β = .108, p = .002). Self-critical rumination also significantly predicted interpersonal sensitivity (β = .341), while interpersonal sensitivity itself was positively associated with somatoform disorder symptoms (β = .316). These findings suggest that repetitive negative self-evaluation may contribute to somatic symptom severity through more than one pathway. Part of its influence appears to be direct, whereas another part may operate by increasing sensitivity to interpersonal evaluation, rejection, criticism, or perceived relational threat. This pattern is broadly consistent with evidence showing that self-critical rumination is associated with emotional distress, shame, and heightened stress reactivity (Milia et al., 2021). Experimental findings indicate that engaging in self-critical rumination can intensify negative affect and stress, processes that may heighten physiological arousal and increase attention to bodily discomfort. The present results are also compatible with studies showing that self-critical rumination functions as a maladaptive cognitive mechanism connecting broader vulnerabilities with psychological symptoms (Martinez-Sanchis et al., 2021). Furthermore, self-critical rumination and related metacognitive processes have been shown to mediate associations between perfectionistic tendencies and low self-esteem (Fearn et al., 2022), suggesting that repetitive self-criticism may sustain a negative self-referential processing style that generalizes across emotional, interpersonal, and somatic domains.

The positive relationship between self-critical rumination and interpersonal sensitivity is theoretically meaningful. Individuals who repeatedly focus on their shortcomings, failures, or perceived inadequacies may become especially attentive to how they are evaluated by others. Such individuals may interpret ambiguous interpersonal cues as evidence of rejection or criticism and may remain cognitively preoccupied with the possibility of negative evaluation. Previous research has shown that rumination and interpersonal sensitivity are interconnected in anxiety-related psychopathology, with both contributing to greater vulnerability to social distress (Alipour, 2026). Interpersonal sensitivity has also been conceptualized as an important

KMAN-CPN KMAN-Counseling & Psychology Nexus
E-ISSN: 3041-9026

mechanism linking cognitive vulnerabilities with psychological maladjustment (Topalalioglu, 2025). Research indicating that cognitive flexibility may mediate the relationship between anxious thoughts and interpersonal sensitivity further supports the proposition that rigid and repetitive thinking can intensify maladaptive responses to interpersonal cues (Sohrabi et al., 2022). In this context, self-critical rumination may create a cognitive environment in which social interactions are continually filtered through negative self-evaluation. This may increase anticipatory anxiety, emotional arousal, and vigilance toward perceived interpersonal threat. Among people already experiencing somatoform symptoms, such chronic interpersonal stress may enhance awareness of bodily sensations and increase the perceived severity of somatic discomfort. The present findings therefore extend previous research by suggesting that interpersonal sensitivity may be one specific pathway through which self-critical repetitive cognition is translated into somatic distress.

The finding that interpersonal sensitivity significantly predicted somatoform disorder symptoms is also consistent with a broader transdiagnostic interpretation of interpersonal vulnerability. Interpersonal sensitivity reflects exaggerated responsiveness to the perceived attitudes, judgments, and behaviors of others and may involve fears of rejection, need for approval, separation anxiety, timidity, and fragile self-esteem. Such tendencies can generate persistent social-evaluative stress and may contribute to heightened autonomic arousal, emotional instability, and excessive monitoring of internal states. Previous evidence has shown that interpersonal sensitivity can mediate relationships between maladaptive schemas and dysfunctional interpersonal outcomes (Razeghi et al., 2025). It has likewise been identified as an intervening mechanism between mentalization-related difficulties and maladaptive behavioral outcomes (Shahdadian et al., 2025). Longitudinal research has also demonstrated that interpersonal sensitivity may partly explain how adverse relational experiences become translated into later psychopathology (Zhu et al., 2025). These studies converge on the idea that interpersonal sensitivity is not merely a correlate of psychological distress but may function as a process through which more fundamental vulnerabilities influence symptoms. Applied to somatoform disorder, heightened concern about social evaluation may maintain a state of psychological tension that increases physiological reactivity and strengthens attention to bodily sensations. It may also make symptoms more salient when physical complaints become intertwined with reassurance seeking, perceived invalidation, or fears that others do not understand the individual's suffering.

The second major finding was that alexithymia exerted a significant indirect effect on somatoform disorder symptoms through interpersonal sensitivity ($\beta = -.052$, $p = .030$), whereas its direct effect on somatoform symptoms was not statistically significant ($\beta = .104$, $p = .114$). Alexithymia also showed a significant negative association with interpersonal sensitivity ($\beta = -.164$). The direction of this indirect effect deserves careful interpretation. Much of the previous literature has reported positive relationships between alexithymia and somatic symptom severity. For example, alexithymia has been frequently observed among patients with medically unexplained physical symptoms (Rady et al., 2021), and it has been shown to predict somatic symptoms in both autistic and non-autistic adults (Larkin et al., 2023). Alexithymia has also been implicated as a mechanism connecting childhood maltreatment with later somatic complaints (Adamovic, 2024). Moreover, difficulty integrating emotional and interoceptive information has been associated with somatoform symptoms through alexithymia and emotional dysregulation (Zdankiewicz-Scigala et al., 2021). Accordingly, the negative mediated pathway observed in the present study should not be interpreted as evidence that alexithymia is generally protective against somatic symptoms. Rather, it suggests that within this particular multivariate model, the component of alexithymia statistically transmitted through interpersonal sensitivity operated in an inverse direction.

Several mechanisms may account for this pattern. Alexithymia is characterized by difficulty identifying and describing feelings and by externally oriented thinking. Individuals with higher alexithymia may have reduced conscious access to emotional states and may therefore report lower awareness of certain interpersonal-emotional reactions even when physiological or somatic arousal remains elevated. In such cases, emotional under-identification may attenuate self-reported interpersonal sensitivity while still contributing to somatic experience through other pathways. This interpretation is compatible with research suggesting that alexithymia alters the relationship between internal experience and emotional interpretation rather than simply increasing all forms of subjective distress (Zhang et al., 2024). Studies have further shown that alexithymia is embedded in broader processes involving emotional self-disclosure, maladaptive schemas, shame, self-criticism, and anxiety sensitivity (Faramarzi Rad et al., 2023; Mokaramifar & Nouri, 2024). Thus, individuals

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E-ISSN: 3041-9026

with strong alexithymic characteristics may experience emotional arousal primarily as diffuse physical discomfort rather than as explicitly recognized interpersonal distress. In statistical terms, the negative path to interpersonal sensitivity together with the nonsignificant positive direct path to somatic symptoms may reflect an inconsistent mediation or suppression-like pattern in which different components of alexithymia operate through distinct psychological mechanisms. This possibility underscores the importance of avoiding a simplistic interpretation of the negative indirect coefficient.

The current findings can also be interpreted in light of research emphasizing emotional processing as an important mechanism in somatic symptom disorders. Difficulties in recognizing, differentiating, and expressing emotions may encourage the transformation of emotional arousal into bodily experience, especially when emotional states remain poorly represented cognitively. Evidence from emotional awareness and expression therapy suggests that improvements in emotional processing are associated with reductions in somatic symptom severity (Maroti et al., 2021). Other studies have shown that more adaptive emotion-regulation strategies and self-compassion are associated with lower alexithymic tendencies (Shahi & Zadeh Mohammadi, 2024). Therefore, the present results suggest that alexithymia may not influence somatic symptoms in a single linear manner. One pathway may involve somatization of poorly differentiated affect, whereas another may involve reduced conscious reporting of interpersonal reactivity. The coexistence of these processes could explain why the direct path from alexithymia to somatoform symptoms was nonsignificant while the indirect pathway through interpersonal sensitivity was statistically significant and negative. The result may also reflect characteristics of the clinical sample, the scoring properties of the measures, or the simultaneous inclusion of self-critical rumination and body monitoring in the model, which may have absorbed variance that alexithymia shares with somatic symptom severity.

The third major finding was that body monitoring did not exert a significant indirect effect on somatoform disorder symptoms through interpersonal sensitivity ($\beta = .008$, $p = .682$). Body monitoring did not significantly predict interpersonal sensitivity ($\beta = .024$), although it showed a significant direct effect on somatoform disorder symptoms ($\beta = .114$, $p = .015$). This pattern indicates that heightened attention to bodily states may contribute to symptom severity independently of interpersonal sensitivity. From an interoceptive perspective, monitoring bodily sensations can influence symptom experience when individuals repeatedly attend to fluctuations in pain, heart rate, gastrointestinal sensations, fatigue, dizziness, or other internal cues. Increased attention can enhance the perceptual salience of these sensations, particularly when they are interpreted as threatening. Previous research has shown that interoceptive sensibility is relevant to somatoform symptoms, although its effects may depend on the presence of alexithymia and emotional dysregulation (Zdankiewicz-Scigala et al., 2021). The present findings similarly suggest that body-related awareness may be connected to somatic symptoms but does not necessarily operate through social-evaluative or relational sensitivity.

The absence of mediation through interpersonal sensitivity may also reflect the conceptual distinction between interoceptive attention and interpersonal monitoring. Body monitoring concerns the allocation of attention toward internal somatic signals, whereas interpersonal sensitivity concerns the appraisal of external relational signals such as criticism, rejection, approval, or separation. Although both involve heightened monitoring, they may represent relatively distinct attentional systems. Therefore, greater body monitoring does not necessarily imply greater interpersonal vigilance. The direct association observed in the present study may instead reflect a pathway in which attention itself magnifies the subjective prominence of physical sensations. This interpretation is compatible with contemporary models of somatic symptom disorder that emphasize attentional amplification and symptom-focused cognition (Smakowski et al., 2024). Research on the measurement of somatic symptoms has also emphasized that the subjective burden of bodily complaints involves not only symptom occurrence but also the degree to which symptoms are noticed, appraised, and experienced as distressing (Hybelius et al., 2024, 2026). The present findings therefore suggest that body monitoring may be clinically relevant even when it is not associated with interpersonal sensitivity.

At the same time, it is important to distinguish maladaptive body monitoring from adaptive interoceptive awareness. Awareness of bodily states can support emotion recognition, behavioral regulation, and self-care when it is characterized by acceptance and trust rather than threat, worry, or compulsive checking. Research on bodily awareness and self-related processes indicates that body-focused attention can differ substantially depending on whether it is grounded in adaptive self-regulation or in self-objectification and sociocultural pressure (Liu et al., 2025).

KMAN-CPN KMAN-Counseling & Psychology Nexus
E-ISSN: 3041-9026

This distinction is important for interpreting the present study because the body-monitoring construct may encompass both potentially adaptive and maladaptive forms of bodily attention. Accordingly, the relatively modest direct effect on somatoform symptoms may represent the net result of competing processes: some forms of bodily awareness may increase symptom salience, whereas others may facilitate adaptive regulation. Future analyses of the subdimensions of body monitoring may therefore provide a more differentiated understanding of its relationship with somatic symptoms.

5. Conclusion

Taken together, the findings support a multidimensional model of somatoform disorder symptoms in which repetitive self-critical cognition, emotional-processing difficulties, bodily attention, and interpersonal vulnerability contribute through partially distinct pathways. This interpretation is consistent with contemporary views that somatic symptom disorders arise from interactions among cognitive, emotional, developmental, and behavioral factors rather than from a single psychological deficit (Creed, 2023; Wu et al., 2023). Psychological risk-factor research similarly indicates that multiple processes, including stress, maladaptive emotional regulation, adverse developmental experiences, and symptom-related cognition, contribute to somatic symptom severity (Smakowski et al., 2024). The present findings add to this literature by identifying interpersonal sensitivity as a significant mediator of the relationship between self-critical rumination and somatoform symptoms, while also demonstrating that not all psychological predictors operate through the same mediator. This differentiation is clinically important because it suggests that effective psychological formulations of somatic symptom disorder may need to identify whether an individual's symptoms are maintained primarily by repetitive self-criticism and social-evaluative sensitivity, deficits in emotional identification, heightened bodily monitoring, or some combination of these processes.

The findings should be interpreted in light of several limitations. First, the cross-sectional and correlational design does not permit causal conclusions regarding the temporal sequence among self-critical rumination, alexithymia, body monitoring, interpersonal sensitivity, and somatoform disorder symptoms. Although structural equation modeling can test theoretically specified directional associations, it cannot establish causality in the absence of longitudinal or experimental data. Second, participants were recruited through purposive sampling from selected mental health and counseling centers in Tehran, which may limit the generalizability of the findings to individuals who do not seek treatment, populations from other geographic or cultural contexts, or patients with different clinical profiles. Third, the study relied primarily on self-report measures, creating the possibility of common-method variance, recall bias, social desirability, and response-style effects. Fourth, somatic symptom presentations are clinically heterogeneous, and differences in symptom type, duration, medical comorbidity, medication use, psychiatric comorbidity, and previous treatment may have influenced the observed associations. Fifth, the negative indirect effect of alexithymia through interpersonal sensitivity should be interpreted cautiously because it may reflect suppression, scoring characteristics, overlap among predictor variables, or sample-specific patterns. Finally, the study examined interpersonal sensitivity as the principal mediator, whereas other potentially relevant mechanisms, such as anxiety sensitivity, emotion dysregulation, health anxiety, catastrophic interpretation of bodily sensations, attachment insecurity, and experiential avoidance, were not included in the model.

Future studies should employ longitudinal designs to determine the temporal ordering of self-critical rumination, alexithymia, interpersonal sensitivity, body monitoring, and somatic symptom development. Prospective studies could clarify whether interpersonal sensitivity precedes increases in somatic symptoms or whether persistent somatic symptoms themselves increase interpersonal vulnerability. Experimental research could also test whether manipulating self-critical rumination or interpersonal threat alters bodily attention and symptom perception. Replication in larger and more diverse clinical and community samples is recommended, including participants from different cities, cultural contexts, age groups, and diagnostic categories. Future research should examine specific dimensions of alexithymia and body awareness separately rather than relying solely on total scores, because different components may have opposite or nonlinear relationships with somatic symptoms. It would also be valuable to test alternative and competing mediators, including emotion dysregulation, anxiety sensitivity, health anxiety, cognitive flexibility, shame, self-compassion, attachment insecurity, and catastrophic appraisal of bodily sensations. Multi-method assessment combining self-report questionnaires with clinical interviews, behavioral tasks, physiological indices,

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E-ISSN: 3041-9026

and ecological momentary assessment could reduce method bias and provide a more precise account of how emotional and interpersonal processes unfold in daily life. Finally, future models should examine potential moderators, such as sex, symptom chronicity, trauma history, psychiatric comorbidity, and treatment status, to determine whether the identified pathways are equally applicable across clinically meaningful subgroups.

The findings suggest that psychological assessment of individuals with somatoform disorder symptoms should extend beyond the severity and frequency of physical complaints and include evaluation of repetitive self-critical thinking, emotional awareness, interpersonal sensitivity, and patterns of body-focused attention. Clinicians may benefit from identifying whether patients habitually engage in harsh self-evaluation, interpret interpersonal situations as threatening, struggle to identify and verbalize emotional states, or excessively monitor bodily sensations. Interventions may incorporate techniques for reducing self-critical rumination, restructuring negative self-appraisals, improving self-compassion, and increasing cognitive flexibility. Because interpersonal sensitivity emerged as an important mediator, therapeutic work may also address rejection concerns, need for approval, fear of criticism, and maladaptive interpretations of others' responses. For patients with alexithymic characteristics, interventions can emphasize emotion identification, differentiation, labeling, and communication rather than assuming that somatic complaints directly reflect consciously recognized emotional distress. For patients characterized by elevated body monitoring, treatment may focus on reducing threat-based scanning of bodily sensations while fostering nonjudgmental and regulated interoceptive awareness. An individualized formulation integrating these cognitive, emotional, bodily, and interpersonal mechanisms may ultimately improve the precision of psychological treatment for somatoform disorder symptoms.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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