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Research Paper

Structural Model Test of the Effect of Insecure Attachment Style on Somatic Symptoms: The Mediating Roles of Mentalization and Emotion Regulation

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Abstract

Introduction and Objective: Understanding the psychological mechanisms underlying somatic symptoms can clarify the processes involved in psychosomatic problems and facilitate the design of targeted therapeutic interventions. The present study aimed to examine the structural model of the effect of insecure attachment on somatic symptoms, with mentalization and difficulty in emotion regulation serving as mediating variables in adults.

Research Methodology: The research design was correlational and employed structural equation modeling (SEM). The statistical population included all individuals aged 18 or older living in Hamedan who had consulted a physician in 2024 with somatic symptoms. A sample of 295 individuals was selected using convenience sampling. Data were collected using several standardized assessment tools, including Fraley et al.'s Attachment Scale (2011), the Difficulties in Emotion Regulation Scale by Gratz & Roemer (2004), the Reflective Functioning Questionnaire by Fonagy and Luyten (2016), and the Somatic Symptom Disorder-B Criteria Scale by Toussaint et al. (2016).

Results: The results indicated that insecure attachment to close friends, mothers, fathers, and partners had a significant negative impact on mentalization ($\beta = -0.12$ to -0.39, $p < 0.0\Delta$) and a significant positive impact on somatic symptoms ($\beta = 0.15$ to 0.27, $p < 0.01$). The analysis revealed a significant indirect relationship between insecure attachment and somatic symptoms, mediated by mentalization and emotion regulation, across all models ($p < 0.05$). The fit indices for the four models, including RMSEA ≤ 0.066 and CFI > 0.96, indicated good fit.

Conclusion: Therefore, insecure attachment can lead to somatic symptoms by reducing mentalization capacity and increasing difficulties in emotion regulation. These results underscore the importance of addressing mentalization processes and emotion regulation skills in psychotherapeutic interventions for psychosomatic disorders.

Keywords:

Insecure Attachment, Mentalization, Emotion Regulation, Somatic Symptoms

Citation:

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Introduction

According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed.), somatic symptoms are defined as pathological conditions characterized by recurrent, severe, and chronic physical complaints and illnesses lasting typically more than six months, characterized by distressing somatic symptoms accompanied by excessive thoughts, feelings, or behaviors related to those symptoms.

These conditions can lead to significant stress, psychological distress, and impairment in the individual's daily functioning (Airey, 2022). The prevalence of this syndrome is estimated to be between 5% and 7% in the general population and approximately 17% in primary care settings. It is characterized by a chronic course, with up to 90% of patients reporting symptoms lasting longer than five years (Maroti et al., 2021).

Clinically, distressing somatic symptoms are regarded as a critical diagnostic criterion for somatic symptom disorder, and these symptoms are significantly correlated with the patient's quality of life. The ongoing manifestation of these symptoms cannot be exclusively linked to a particular medical condition; evidence indicates that psychosocial factors significantly contribute to both their severity and persistence (Kop et al., 2019). Investigating the antecedents and psychological factors that influence somatic symptom disorder is significant and can contribute to a better understanding of the disorder.

In recent years, theorists have proposed attachment theory as a framework for understanding vulnerability to chronic physical and psychological illnesses. Physiological arousal and somatic symptoms have been distinctly observed in individuals with insecure attachment styles (LaBelle et al., 2020). Attachment is an affectionate bond that initially develops between a child and their primary caregiver and is influenced by the parents' responsiveness to the child's needs. Insecure attachment is characterized by high levels of anxiety and avoidance (Ainsworth & Bowlby, 1991). In adulthood, secure attachment leads to positive self- and other-representations and encourages individuals to seek emotional support actively (Mikulincer & Shaver, 2018). In contrast, insecure attachment may be characterized by negative self-perceptions and varying perceptions of others, which can manifest as different types of disorganized and avoidant-dismissive attachment (Bartholomew, 1994).

In adulthood, attachment styles significantly influence the quality of individuals' intimate relationships, including those with partners, friends, and parents (Fraley, 2007). Ideally, attachment figures should serve as a haven and a secure base, providing a sense of trust and comfort. Failure to address these figures to alleviate distress and express discomfort is indicative of insecure attachment. A secure attachment style is generally recognized as a predictor of positive mental and physical health outcomes, whereas an insecure attachment style is regarded as a health risk (Mikulincer & Shaver, 2018).

In this context, various factors may influence the relationship between insecure attachment styles and somatic symptoms, increasing an individual's susceptibility to somatization (Greenman & Johnson, 2022). Two significant constructs among these are emotion regulation and mentalization, which are directly related to attachment theory and have been identified as key mechanisms linking insecure attachment to mental and physical health outcomes. Difficulty in emotion regulation can result in the persistence of negative emotions and heightened sensitivity to somatic symptoms. Concurrently, impaired mentalization diminishes an individual's capacity to accurately interpret physical and emotional experiences, thereby increasing the likelihood of somatization. Despite extensive evidence on mediating processes, particularly emotion regulation and mentalization, they have not yet been comprehensively investigated (Fraley & Roisman, 2019). Individuals with an insecure attachment style are more likely to employ maladaptive emotion regulation strategies to fulfill their attachment needs. Experiencing attachment styles such as anxious, avoidant, or disorganized contributes to the development of negative mental models regarding oneself and others, which can result in maladaptive coping strategies for managing emotional distress (Brenning & Braet, 2013). Due to an increased reliance on maladaptive emotion regulation strategies, these individuals may experience a higher incidence of psychosomatic symptoms as a result of rumination, catastrophizing, and heightened sensitivity to somatic symptoms (LaBelle et al., 2020). Thus, analyzing this variable as a mediating mechanism can enhance our understanding of the relationship between insecure attachment and somatic symptoms.

A recent study has indicated that an insecure attachment style is associated with chronic pain, inadequate pain management, and increased physiological reactivity to stress (Schulz et al., 2023). These results underscore the significance of investigating mediating mechanisms, such as emotion regulation and mentalization, to comprehend the relationship between insecure attachment and somatic symptoms. Advancements in attachment theory have highlighted the importance of mentalization, particularly in the context of learning emotional regulation. Mentalization is a complex and multidimensional construct that reflects the human capacity to understand oneself and others in terms of intentional mental states, including emotions and desires (Luyten et al., 2020).

Research indicates that emotion regulation develops through coordinated interactions between caregivers and infants as they collaboratively manage distress (Fonagy et al., 2019; Luyten et al., 2020). Through the process of mentalization, infants gradually learn that their caregiver's response reflects and represents their internal emotional state. This understanding facilitates the development of their capacity for emotional regulation in their own experiences (Fonagy et al., 2019). However, insecure attachment can impede this process, and persistent

stress may reduce the capacity for mentalization (Ballespí et al., 2019). This impairment in mentalization can lead to difficulties interpreting internal emotions and recognizing physical sensations, thereby contributing to the development of unexplained somatic symptoms. Such disorders may lead to the rejection of psychological explanations for symptoms in favor of physiological causes, thereby perpetuating interpersonal and attachment issues (Ballespí et al., 2019).

Riem et al. (2018) discovered that challenges in identifying emotions partially mediated the relationship between anxious attachment and the severity of somatic symptoms. The mediating role of impairments in mentalization, along with related concepts such as alexithymia, in the relationship between insecure attachment and physical dysfunction symptoms has been highlighted in various cross-sectional studies (Yavuz et al., 2019).

This study aimed to investigate the structural model regarding the impact of insecure attachment on somatic symptoms, with mentalization and difficulties in emotion regulation acting as mediating factors in adults. Although numerous prior studies have investigated the impact of insecure attachment on physical health, the mediating relationships, particularly through mentalization and emotion regulation, have not yet been fully clarified. This study examined various dimensions of insecure attachment, including attachment to the mother, father, partner, and friends, to develop a more comprehensive understanding of the relationships among these variables. The results of this study can elucidate the psychological mechanisms underlying somatic symptom disorder and provide insights for targeted psychotherapeutic interventions for patients experiencing these symptoms.

Methodology

This study employed a correlational research design using structural equation modeling (SEM).

1. Sampling Procedure:

To identify eligible participants, initial coordination was conducted with physicians in District 2, Hamedan. After obtaining the necessary permissions, patient medical records from 2024 were reviewed to identify individuals aged 18 years and older who had consulted a physician for somatic symptoms. This screening process was conducted to locate individuals who potentially met the study eligibility criteria.

Inclusion and Exclusion Criteria:

Inclusion criteria consisted of individuals aged 18 years or older with no history of surgery or chronic physical conditions within the past six months, who provided informed consent to participate in the study.

Exclusion criteria included a history of drug or alcohol use or psychiatric medication use within the past six months, submission of incomplete questionnaires, or unwillingness to continue participation in the study.

Study Selection:

Individuals identified through the medical record review who met the inclusion criteria were subsequently contacted either by telephone or in person. The objectives of the study were explained, and participants were assured of the confidentiality of their information and the voluntary nature of participation. Those who agreed to participate were selected for the study and provided with the study questionnaires in either electronic or paper format.

2. Data Collection Procedure:

Data Collection: Data were collected after eligible participants were identified through medical record review and contacted either by telephone or in person. Participants who agreed to take part in the study received the questionnaires in either electronic or paper format. After completion, the questionnaires were collected for analysis. All data were entered and analyzed using SPSS version 27 and AMOS version 24. Mediation analyses were conducted using the bootstrapping method with 2,000 resamples and a 95% confidence interval.

Instruments:

Attachment Scale

The Attachment Scale is a self-report instrument developed by Fraley et al. (2011) to evaluate attachment styles in intimate relationships. The instrument includes 9 items associated with 4 domains: mother, father, partner or fiancé, and best friend. The instrument comprises two primary subscales: avoidant attachment (items 1–6) and anxious attachment (items 7–9). Scores on this scale are derived from a 7-point continuum, ranging from 1 (strongly disagree) to 7 (strongly agree). Higher scores indicate a higher level of insecure attachment in each domain.

In the primary version, Cronbach's alpha was reported as 0.82 for anxious attachment and 0.81 for avoidant attachment. Fraley et al. used the Adult Attachment Questionnaire to assess convergent validity, reporting correlations ranging from 0.50 to 0.70 (Fraley et al., 2011). In Iran, Pouravari et al. reported that the Cronbach's alpha of this questionnaire was higher than 0.70, and the test-retest coefficient over 2 weeks was 0.71 for avoidant attachment and 0.73 for anxious attachment. The validity of the questionnaire using the depression scale was measured at 0.19 for anxious attachment and 0.14 for avoidant attachment. For the anxiety scale, the validity was reported at 0.23 for avoidant attachment and 0.22 for anxious attachment (Pooravari et al., 2014).

Difficulties in Emotion Regulation Scale

The Difficulties in Emotion Regulation Scale (DERS), developed by Gratz and Roemer in 2004, consists of 36 items and evaluates individuals' deficits in emotional regulation across six domains. These areas include: an inability to accept negative emotions; difficulties controlling impulsive behaviors; difficulties engaging in goal-directed behaviors; limited access to effective emotion regulation strategies; and a lack of emotional awareness and clarity. Respondents are requested to rate each item using a five-point Likert scale, ranging from rarely (1) to almost always (5). Higher scores on each subscale and the total score indicate greater difficulty with emotional regulation (Gratz & Roemer, 2004).

The construct and predictive validity of this scale have been validated in multiple studies. Gratz and Roemer (2004) reported that the overall Cronbach's alpha coefficient for the scale was 0.93 and that all subscales had alphas above 0.80. The test-retest reliability for the overall scale was 0.88, while the subscale reliabilities exceeded 0.57 (Gratz & Roemer, 2004). In Iran, the construct validity and desirable convergent validity were confirmed, and Cronbach's alpha coefficients for all subscales were above 0.63 (Kermani Mamazandi & Talepasand, 2018).

Reflective Functioning Questionnaire

The Mentalization or Reflective Functioning Questionnaire (RFQ) was developed by Fonagy and Luyten in 2016. The initial version included 26 items, whereas the version attributed to the Iranian community contains only 14. This instrument includes two primary subscales: Certainty about Mental States (items 1 to 9) and Uncertainty about Mental States (Items 10 to 14). The questions are rated on a 7-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (7).

A factor analysis conducted by Fonagy et al. (2016) identified two factors: certainty and uncertainty regarding one's own and others' mental states. Fonagy and Luyten (2016) reported internal consistency coefficients of 0.63 and 0.67 for the two subscales, respectively. They assessed reliability using the test-retest method, achieving coefficients of 0.75 and 0.84 for uncertainty. In Iran, Fathi Ashtiani and Ashrafi (2019) validated this questionnaire and, through confirmatory factor analysis, indicated that the two-factor model provided a good fit and strong construct and convergent validity. The reliability of the confidence subscale was reported to be 0.88, while the reliability of the uncertainty subscale was 0.66 (Drogar et al., 2020).

Somatic Symptom Disorder-B Criteria Scale

The Somatic Symptoms Questionnaire, developed by Toussaint and colleagues (2016), consists of 12 items. The scale uses a 5-point Likert scale, ranging from "never" (0) to "always" (4). This instrument is the first self-report questionnaire developed in accordance with the criteria of the Fifth Diagnostic and Statistical Manual of Mental Disorders and the psychological characteristics of somatic symptoms in model B. The developers of this scale have affirmed its validity and reliability for both clinical and non-clinical symptoms, with a reported Cronbach's alpha coefficient of 0.95 (Toussaint et al., 2016).

Confirmatory factor analysis further confirmed the three-factor structure, encompassing three psychological constructs: thoughts, feelings, and behaviors. In the study by Izadi et al. (2019), this scale demonstrated significant correlations with somatic symptoms (0.73), health anxiety (0.63), and depressive symptoms (0.64). The reliability of the Persian version of this questionnaire, as measured by a 2-week test-retest, has been reported as 0.89 (Izadi et al., 2019).

Quality Assessment: To ensure data quality, only participants who met the inclusion criteria and provided complete questionnaires were included in the analysis. Questionnaires that were distorted, incomplete, or submitted by participants who were unwilling to continue their participation were excluded. Participants were assured that their personal information would remain confidential, and all procedures were conducted in accordance with ethical standards to minimize potential bias in data collection.

3. Data Analysis:

Narrative Synthesis:

The collected data were synthesized descriptively and analyzed using structural equation modeling to examine the relationships among variables, including insecure attachment components, mentalization dimensions, emotion regulation subscales, and somatic symptoms. Results were summarized narratively, highlighting patterns, associations, and mediation effects observed in the study. Due to the quantitative nature of the study and the use of SEM, the synthesis focused on interpreting statistical relationships and the strength of associations between variables.

4. Reporting:

The study procedures, participant recruitment, data collection, and data analysis were reported in a clear and systematic manner. The process of identifying eligible participants through medical record review, contacting participants, administering questionnaires, and analyzing data using SPSS 27 and AMOS 24 was documented to ensure transparency and reproducibility. The results of the structural equation modeling and mediation analysis, including bootstrapping with 2,000 samples and a 95% confidence interval, were reported based on the collected data.

Limitations:

This study had several limitations. The use of convenience and non-probability sampling may limit the generalizability of the results. Data were collected using self-report questionnaires, which may be subject to response bias. Additionally, the cross-sectional and correlational nature of the study restricts the ability to draw causal inferences from the observed relationships among variables.

Results

In this study, a sample of 295 individuals aged 18 to 65 years, with an average age of 34.50 years (standard deviation 10.83), was examined. In terms of gender, 191 individuals (64.7%) were women, while 104 people (35.3%) were men. The highest educational level among participants was a bachelor's degree, reported by 112 individuals (38%). In addition, 68 participants (23.1%) had a high school diploma or lower level of education, 35 (11.9%) held an associate degree, 59 (20%) had a master's degree, and 21 (7.1%) had a doctoral degree or higher. In the field of employment, 154 individuals (52.2%) were employed, while 141 people (47.8%) were reported as unemployed. Also, 126 individuals (42.7%) had children, while 169 (57.3%) did not.

Table 1. Descriptive Indicators of Research Variables

	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis
Insecure Attachment to a Close Friend	1	7	3.61	1.32	0.16	-0.47
Insecure Attachment to Mother	1	7	3.04	1.50	0.56	-0.35
Insecure Attachment to Father	1	7	3.39	1.50	0.32	-0.60
Insecure Attachment to Partner	1	7	3.47	1.52	0.21	-0.52
Mentalization	1	7	3.75	1.04	-0.13	0.58
Certainty about Mental States	1	7	4.15	1.46	-0.26	-0.61
Uncertainty about Mental States	1	7	3.02	1.40	0.72	0.18
Difficulty in Emotion Regulation	1	5	2.28	0.94	0.81	-0.07
Denial of Negative Emotions	1	5	2.24	1.07	0.77	-0.33
Difficulty in Controlling Impulsive Behaviors	1	5	2.21	1.10	0.83	-0.15
Difficulty of Purposeful Behaviors	1	5	2.65	1.13	0.29	-0.83
Lack of Emotional Awareness	1	5	2.30	1.01	0.82	-0.11
Lack of Emotional Clarity	1	5	2.03	1.05	0.97	0.18
Somatic Symptoms	0	4	1.24	1.07	0.94	0.06

Average scores for individuals with an insecure attachment style, including close friends, mother, father, and partner, ranged from 3.04 to 3.61. Mentalization had a mean score of 3.75 with a standard deviation of 1.04. The difficulty in regulating emotions had a mean of 2.28 and a standard deviation of 0.94. Somatic symptoms had a mean score of 1.24 and a standard deviation of 1.07.

Table 2. Correlation Matrix of Research Variables

component	1	2	3	4	5	6	7
1- Insecure Attachment to a Close Friend	1						
2- Insecure Attachment to Mother	0.43**	1					
3- Insecure Attachment to Father	0.48**	0.67**	1				
4- Insecure Attachment to Partner	0.29**	0.39**	0.38**	1			
5- Mentalization	-0.35**	-0.39**	-0.39**	-0.12*	1		
6- Difficulty in Emotion Regulation	0.35**	0.28**	0.41**	0.36**	-0.43**	1	
7- Somatic Symptoms	0.29**	0.38**	0.37**	0.36**	-0.30**	0.52**	1

All dimensions of insecure attachment indicate negative correlations with mentalizing capacity, ranging from r=-0.12 to r=-0.39. These dimensions show a moderate, positive correlation with difficulty in emotion regulation, ranging from r = 0.28 to r = 0.41. Moreover, insecure attachment has a significant positive correlation with the severity of somatic symptoms, ranging from r= 0.29 to r= 0.38.

Necessary assumptions, including normality of the data, non-collinearity, independence of errors, and linear relationships, were assessed. Skewness and kurtosis indices of the variables, within the range of ±1/96, confirmed the normality of the distributions. Reviewing the VIF values (below 2 and tolerance above 0.45) indicates that the multicollinearity problem does not exist. The Durbin-Watson test result of 1.80 confirmed the independence of errors. Analysis of scatter plots and correlation coefficients revealed a linear relationship between the variables.

Table 3. Measures of Goodness of Fit for Evaluating the Proposed Research Models
Estimation of the Model Fit Index for Each Dimension of Insecure Attachment

index	Acceptable values	Friend	Mother	Father	Partner
Chi-square (χ^2)	p>0.05	294.323 p<0.001	286.244 p<0.001	307.770 p<0.001	301.473 p<0.001
df	-	133	135	135	135
χ^2/ df	< 3	2.213	2.120	2.280	2.233
RMSEA	< 0.08	0.064	0.062	0.066	0.065
GFI	>0.9	0.92	0.91	0.91	0.91
AGFI	>0.9	0.90	0.90	0.90	0.90
CFI	>0.9	0.97	0.97	0.96	0.96
NFI	>0.9	0.94	0.94	0.94	0.94
SRMR	<0.05	0.058	0.055	0.066	0.070

The results of the model fit indices for various dimensions of insecure attachment, including close friends, mother, father, and partner, indicate a strong alignment with the data. The ratio of chi-square to degrees of freedom in all models ranges from 2.12 to 2.28, which is less than the permissible limit of 3 and indicates a good fit. The root-mean-square error of approximation ranges from 0.062 to 0.066, below the threshold of 0.08, indicating low approximation error and a good model fit. Goodness-of-fit indices (GFI) ranging from 0.91 to 0.92 and adjusted goodness-of-fit indices (AGFI) of 0.90 indicate a good fit for the models. The comparative fit indexes and the normed fit index range from 0.96 to 0.97 and 0.94, respectively. These values indicate a significant improvement in the proposed models compared to the baseline model. The standardized root mean square residual index ranges from 0.055 to 0.070. Although this value exceeds the strict criterion of 0.05, it is below the 0.08 threshold recommended by some. The fit indices for the four models of insecure attachment are all within acceptable ranges.

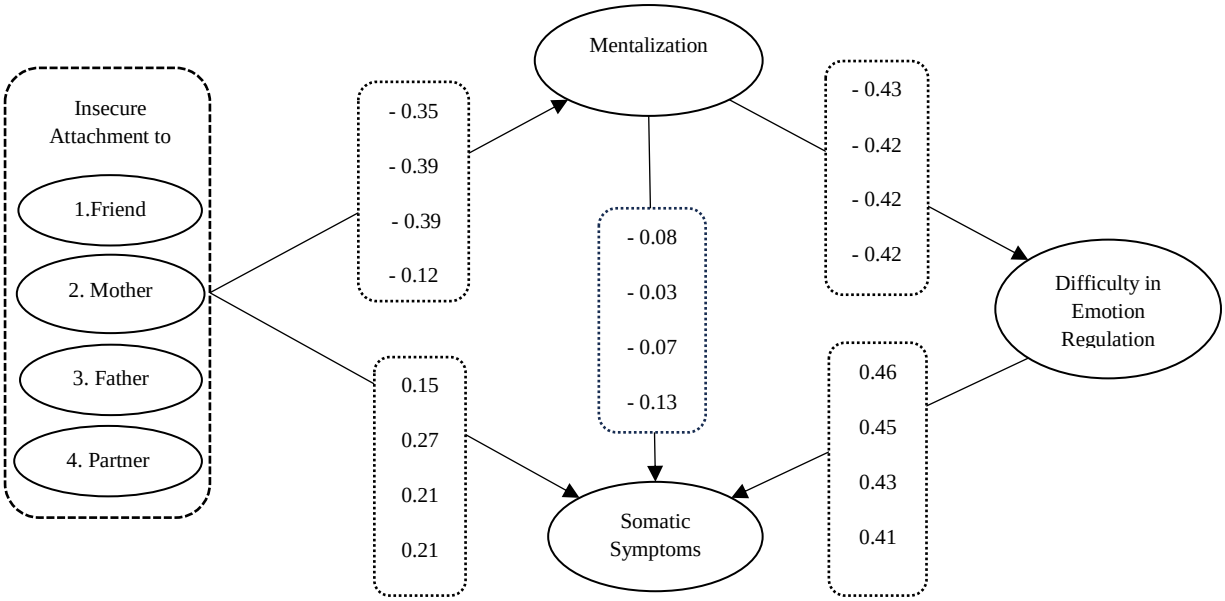

Figure 1. General structural model of the effects of insecure attachment on somatic symptoms. The four insecure attachment sources (1: Friend, 2: Mother, 3: Father, 4: Partner) are grouped within the dashed box. Path coefficients for each model are presented along the respective paths.

Table 4. Standardized Straight Path Coefficients

Insecure Attachment to

path	Friend		Mother		Father		Partner	
	β	p	β	p	β	p	β	p
Insecure Attachment > Mentalization	- 0.35	0.001	- 0.39	0.001	- 0.39	0.001	- 0.12	0.034
Insecure Attachment > Somatic Symptoms	0.15	0.005	0.27	0.001	0.21	0.019	0.21	0.001
Mentalization > Difficulty in Emotion Regulation	- 0.43	0.001	- 0.42	0.001	- 0.42	0.001	- 0.42	0.001
Mentalization > Somatic Symptoms	-0.08	0.175	-0.03	0.572	-0.07	0.225	-0.13	0.016
Difficulty in Emotion Regulation > Somatic Symptoms	0.46	0.001	0.45	0.001	0.43	0.001	0.41	0.001

The results indicated that insecure attachment to close friends, mothers, fathers, and partners has a direct and significant adverse effect on mentalization (-0.39, -0.39, -0.35, and β=-0.12, p< 0.05, respectively). Insecure attachment across all four groups has a significant positive effect on somatic symptoms (0.15, 0.27, 0.21, and β=0.21, p <0.01, respectively). Mentalization had a direct and significant negative effect on difficulty in emotion regulation (p<0.001, β= -0.43 to -0.42). Conversely, difficulty in emotion regulation had a direct, significant positive effect on somatic symptoms across all models (p<0.001, β= 0.46 to 0.41).

The structural models revealed that the predictors accounted for varying proportions of the variance in somatic symptoms. Specifically, the model for insecure attachment to the mother explained 46% of the variance, followed by the father (42%), friend (33%), and romantic partner (31%) models.

Table 5. Standardized Indirect Path Coefficients

Insecure Attachment to

path	Friend		Mother		Father		Partner	
	β	p	β	p	β	p	β	p
Insecure Attachment>Mentalization< Somatic Symptoms	0.028	0.60	0.011	0.66	0.027	0.57	0.016	0.75

Insecure Attachment > Mentalization > Difficulty in Emotion Regulation	0.151	0.005	0.166	0.004	0.165	0.004	0.052	0.059
Mentalization > Difficulty in Emotion Regulation > Somatic Symptoms	- 0.197	0.015	- 0.193	0.014	-0.181	0.010	-0.175	0.011
Insecure Attachment > Mentalization > Difficulty in Emotion Regulation > Somatic Symptoms	0.097	0.006	0.088	0.012	0.099	0.003	0.038	0.049

The results of the indirect path analysis in the model showed that insecure attachment to somatic symptoms, mediated by mentalization, was not significant across all dimensions (close friend, mother, father, and partner) ($p > 0.05$; β= between 0.011 and 0.028). However, the indirect path of insecure attachment through mentalization to emotion regulation was significant in the dimensions of intimate friends ($p = 0.005$, β=0.151), mother (p= 0.004, β=0.166), and father (p= 0.004, β= 0.165). In contrast, it was not significant in the dimension of partner (p= 0.059, β= 0.052). The analysis revealed a significant and negative indirect relationship from mentalization to emotion regulation, which subsequently affects somatic symptoms across all dimensions ($p<0.05$, β= -0.175 to -0.197). Finally, the indirect path of insecure attachment through mentalization, emotion regulation, and then somatic symptoms in the dimensions of intimate friends (p= 0.006, β= 0.097), Mother(p= 0.012, β= 0.088), father(p= 0.003, β= 0.099), and partner(p= 0.049, β= 0.038) was significant.

Discussion and Conclusion

The current study investigated the structural model of the impact of insecure attachment on somatic symptoms, with mentalization and difficulty in emotion regulation as mediating factors. The model fit indices indicated a favorable fit to the data, and the evaluated models effectively explained the relationships among variables. The indirect pathway of insecure attachment through mentalization and emotion regulation to somatic symptoms was found to be significant across various dimensions. These results indicate that insecure attachment is positively correlated with the severity of somatic symptoms, highlighting the relationship among insecure attachment styles in relationships with father, mother, close friends, and romantic partner, and an increase in somatic symptoms. These results are consistent with previous studies on the relationship between attachment style and psychosomatic symptoms (Barone et al., 2016; Bizzi et al., 2021; Renzi et al., 2024).

From this perspective, the increased occurrence of somatic symptoms may reflect an unconscious need for care and closeness to attachment figures. From a developmental psychopathological perspective, a child's somatic symptoms or disorders serve to establish closer proximity to an attachment figure, and the expression of physical discomfort may function to obtain care (Renzi et al., 2024). In this regard, attachment theory and physiological studies examining somatic symptoms underscore the significance of the parent-child relationship and the caregiving environment in the development of physical disorders. Indeed, chronic illness experiences may reinforce care-seeking behavior. More specifically, chronic pain or somatic symptoms require that the individual and significant others in the patient's life serve as both facilitators and contributors to illness-related behaviors. It may lead to the use of maladaptive methods (i.e., expressing emotional distress through somatic symptoms) to fulfill attachment needs (Renzi et al., 2024).

Ideally, primary caregivers demonstrate sensitivity and availability, thereby fostering a sense of secure attachment in children that promotes positive psychological outcomes, even in adverse circumstances such as pain and illness. Securely attached children receive support in managing negative emotions that arise in the context of significant health issues (Bizzi et al., 2021). Conversely, children whose parents demonstrate conflict and ambiguity in addressing their attachment needs may develop insecure attachment styles. Such styles often have negative consequences for physical and mental health (Berry & Drummond, 2014).

The results also indicated that different dimensions of insecure attachment are negatively correlated with mentalizing capacity. It suggests that an increase in the severity of insecure attachment is associated with a decrease in mentalizing ability. This result aligns with previous studies that have demonstrated that insecure attachment can reduce individuals' ability to comprehend and regulate their own and others' mental states (Jańczak, 2023; Saunders et al., 2011). The structure of mentalization is rooted in attachment theory, and mentalization depend on the quality of early attachment interactions with caregivers who recognize the child as an individual with mental states (Fonagy et al., 2019). From this perspective, a close, warm, and emotionally harmonious

relationship between the infant and caregiver fosters secure attachment and creates ideal conditions for effective mentalization. Conversely, a caregiver's inability to be sensitive and responsive to a child's need for protection and support may result in insecure attachment and impede the development of mentalization (Fonagy et al., 2019).

Maladaptive caregiving by parents who do not empathetically reflect on and respond to their child's internal experiences can lead to significant distortions in the child's capacity for mentalization. These distortions include hypermentalization (e.g., excessive interpretive reasoning about mental states), susceptibility to failures in mentalizing capacity, and disruptions in maintaining a coherent and integrated sense of self, adaptive emotional regulation, and stable, mutually satisfying interpersonal relationships (Jańczak et al., 2023; Luyten et al., 2019; Mikulincer & Shaver, 2018).

The current model identified a significant direct relationship between insecure attachment, somatic symptoms, and mentalization. However, the analysis of the mediational pathways indicated that mentalization alone did not emerge as a significant mediator in most models. Other mechanisms may be more effective at generating somatic symptoms in individuals with an insecure attachment style. This result is consistent with the results of recent studies, including Riem et al. (2018), who employed an eye-tracking mind-reading tool to assess mentalization. However, it also presents inconsistencies. In the current study, a self-report instrument was used, which may explain differences in sensitivity when measuring mentalization and, consequently, the observed differences. Somatic symptoms typically arise from interactions between biological, psychological, and social factors. In other words, somatic symptoms are not just physical or psychological; they reflect a dynamic interaction among bodily systems, emotional regulation, and social environments. Contextual influences, including stressors and health behaviors, as well as the time-dependent nature of their interactions, should be given greater consideration. Also, the presence of alternative mechanisms, such as social support or defense mechanisms, may help elucidate this discrepancy. When examining the relationship between insecure attachment and somatic symptoms, it is important to consider cultural differences in emotional expression and somatic symptoms. The indirect relationship between mentalization, emotion regulation, and somatic symptoms was found to be negative and statistically significant across all dimensions. This result confirms the importance of mentalization as a protective mechanism in emotion regulation. This result corroborates prior research regarding the correlation between mentalization and emotion regulation (Jańczak, 2023; Kahya & Munguldar, 2023; Schwarzer et al., 2024). The premise that mentalization is positively and significantly correlated with adaptive emotion regulation is based on the notion that mentalization enables individuals to manage and process their own and others' behaviors and to give them meaning (Fonagy et al., 2016). Therefore, mentalization is thought to reduce feelings of distrust, confusion, and lack of control when confronted with emotionally challenging situations. It also fosters a stable sense of self-coherence and facilitates adaptive social learning throughout life (Fonagy et al., 2019).

Furthermore, the development of an integrated self-image, enhanced by mentalization, promotes adaptive processing of stress-related arousal and the regulation of distressing emotions (Euler et al., 2021; Kahya & Munguldar, 2023; Salazar Kaempf et al., 2023). In the mentalization framework, it is emphasized that possessing a mental representation of potentially stressful events necessitates a series of metacognitive processes that connect the individual to their social context, thereby reducing the effects of various forms of adversity. Consequently, mentalization can act as a foundational element for several critical psychological abilities that characterize mental health, such as emotion regulation strategies, agency, self-efficacy, and psychological well-being (Schultheis et al., 2019; Schwarzer et al., 2021).

On the other hand, the present study indicated that difficulty in emotion regulation had a direct positive effect on the severity of somatic symptoms. In accordance with this result, theories of psychosomatic symptoms consider disturbances in emotion regulation processes as a significant psychological factor (Koechlin et al., 2018; Okur Güney et al., 2019). Emotion regulation in somatic symptom disorder is characterized by the disjointed functioning of emotional response systems, specifically cognition and the body, during the process of emotion regulation (Di Tella & Castelli, 2016; Okur Güney et al., 2019). Although patients reported a greater tendency to suppress their emotions, most observational studies indicated that they actually expressed negative emotions more frequently, primarily through physical behavior.

It is also noteworthy that patients with various somatic symptoms, including pain, fatigue, and organ-specific, neurofunctional, or gastrointestinal symptoms, reported similar problems with emotion regulation. Disturbances, including reduced emotional awareness and capacity for reflection, rigid emotional focus, and inappropriate automatic activity, were prevalent across various diagnoses and types of somatic symptoms. Furthermore, recent

neuroimaging studies have provided support for the relationship between somatic symptoms and disorganized emotional processing, particularly through attention and higher cognition. Dissociated emotional processing between higher-order and subcortical structures has been demonstrated to influence dysregulated autonomic and immune functions, contributing to the chronic somatic symptoms (Kanbara & Fukunaga, 2016; Lane et al., 2015).

Thus, integrating comprehensive models of emotion regulation interventions for the treatment of somatic symptoms is considered essential. For instance, in psychosomatic medicine departments in Germany, integrated care including body-based therapies such as dance and movement therapy, creative psychotherapies, including music and art, and physiotherapy, in addition to individual and group psychotherapy, is standard and has proven effective (Zipfel et al., 2016). Mindfulness-based psychotherapy has also been associated with improvements in patients' regulation of emotions and somatic symptoms (Burger et al., 2016). Based on the correlations obtained, approximately half of the variance in somatic symptoms can be attributed to impaired mentalization and subsequent difficulties in emotion regulation. This result is consistent with Ruesch's (1948) theory, which describes somatization patients from a psychoanalytic perspective as "childlike personalities." These individuals not only fail to perceive the physical signs of emotional arousal as emotional states rather than anxiety stemming from somatic symptoms, but they also face challenges in comprehending social interactions. Ruesch emphasized the critical necessity for these patients to have a reliable connection with a living being, given their significant challenges in accurately comprehending their internal experiences and their relationships with others (Ruesch, 1984).

Therefore, in the current model, to confirm the relationship between mentalization and emotion regulation in predicting physical cues, it can be asserted that, for effective emotional processing, a child must associate implicit cues of emotional arousal, including physical sensations and action tendencies, with both nonverbal and verbal emotions. According to the mentalization approach, this process depends on caregivers' specific responses to children's emotional expressions. Suppose caregivers fail to recognize or accurately label these expressions because they cannot mentally represent them as emotions. These children may struggle to form mental representations of physical emotions (Fonagy et al., 2019; Lane & Schwartz, 1987).

Another result of the current study indicates a significant relationship between insecure attachment, as assessed through mentalization, and emotion regulation in the context of close friends, maternal, and paternal relationships. Consistent with this result, it has been suggested that the development of mentalizing ability through secure attachment relationships is enhanced by providing a process for conditioned reflection on a child's emotions and mental-emotional experiences. This mental representation is important for emotion regulation strategies that aid in managing stress and establishing relationships with oneself and others (Camerlynck et al., 2023). If the child acquires high psychological capacity along with an understanding of his mental processes- often referred to as mentalization- he will develop a higher understanding and recognition of intentions. This ability allows him to identify his own thoughts and emotions, as well as those of others, which is essential for adaptive emotional regulation (Alijani & Majidinasab, 2025).

Attachment-based relationships lead to the creation of internal working models about self-worth and the availability of close people during distress (Gillath et al., 2016). Individuals who receive responsive care throughout childhood develop secure attachments and learn to regulate their emotions adaptively, making them comfortable with emotional closeness and seeking support during distress. In contrast, people with anxious-insecure attachment often feel unworthy of love and affection because their attachment needs are met inconsistently. Consequently, they learn to manage their emotions when needed to attract attention and maintain proximity to their attachment figures. Similarly, people with avoidant-insecure attachment represent interpersonal distrust because their attachment needs are linked with rejection. As a result, they tend to suppress their emotions in stressful situations to avoid unwanted intimacy (Alijani & Majidinasab, 2025).

Overall, this study's results indicate that insecure attachment may influence the severity of somatic symptoms through psychological processes, including mentalization and emotion regulation. Higher mentalization was associated with improved emotion regulation and, ultimately, reduced somatic symptoms. Conversely, difficulty in emotion regulation was a factor that exacerbated psychosomatic symptoms. Although the mediating role of mentalization was not confirmed across all dimensions, evidence indicates these two constructs significantly explain the relationship between attachment styles and physical health. These results, while emphasizing the close link among attachment relationships, emotional processes, and somatic symptoms, can be used to develop clinical and preventive interventions aimed at increasing individuals' physical and psychological health. Limitations of

the study included the use of self-report instruments and a cross-sectional design in the attachment research, which may have affected the generalizability of the results. Future research can employ longitudinal methods and clinical samples to assess the validity of the results and examine additional mechanisms related to attachment, mentalization, emotion regulation, and psychosomatic symptoms.

Ethical Considerations

All ethical principles have been considered in this article.

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Conflict of Interest

The authors of this article declare that they have no conflict of interest.

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