

# Predicting Borderline Personality Disorder Symptoms Based on Childhood Trauma and Alexithymia With the Mediating Role of Mentalization in University Students

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## ABSTRACT

The present study aimed to predict borderline personality disorder (BPD) based on childhood trauma and alexithymia, with the mediating role of mentalization in university students. This study employed a descriptive correlational design. The statistical population included male and female students from three branches of the Islamic Azad University: Tehran Central (Sardar Soleimani Complex, Faculty of Psychology and Educational Sciences), Tehran West (Payambar Azam Complex, Faculty of Architecture and Art), and Shahre Qods (Faculty of Engineering). These branches were selected from among all branches of the Islamic Azad University in Tehran during the 2024–2025 academic year. The sample size was determined to be 300 participants based on the method proposed by Kline (1990), and they were selected through a non-random convenience sampling method. Data were collected using the Jackson and Claridge Borderline Personality Scale (1991), the Childhood Trauma Questionnaire by Bernstein and Fink (2003), the Toronto Alexithymia Scale (1985), and the Mentalization Scale by Fonagy et al. (2016). Statistical analyses were performed using SPSS version 28 and AMOS version 24. The results of data analysis showed that childhood trauma had a standardized coefficient of 0.175 on borderline personality disorder and the direction of the effect was positive. Additionally, alexithymia had a standardized coefficient of 0.334 on borderline personality disorder and the direction of the effect was positive. Furthermore, childhood trauma had no significant effect on borderline personality disorder through the mediating role of mentalization ( $p = 0.358$ ). However, alexithymia had a significant effect on borderline personality disorder through the mediating role of mentalization ( $p = 0.016$ ). Finally, the empirical model demonstrated acceptable and appropriate fit, and the overall model was confirmed. Childhood trauma and alexithymia play important roles in the emergence of borderline personality disorder symptoms, and mentalization served as a mediator only in the relationship between alexithymia and borderline personality disorder. These findings highlight the necessity of incorporating emotion regulation training and strengthening mentalization skills in preventive and therapeutic interventions.

**Keywords:** Borderline personality disorder, Childhood trauma, Alexithymia, Mentalization, University students

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## Introduction

Borderline Personality Disorder (BPD) is a complex and multifaceted psychiatric condition characterized by pervasive instability in affect regulation, interpersonal relationships, self-image, and impulse control. Individuals with BPD often experience intense emotional dysregulation, chronic feelings of emptiness, and recurrent self-harming behaviors, which together contribute to marked functional impairment and heightened risk of suicide (1, 2). Contemporary theoretical models increasingly conceptualize BPD not as a discrete categorical disorder, but as the cumulative outcome of early developmental vulnerabilities interacting with maladaptive emotion regulation processes, especially in the context of traumatic childhood experiences and impaired socio-cognitive capacities such as Mentalization (3, 4).

One of the most robust etiological correlates of BPD is Childhood Trauma, which encompasses a broad spectrum of adverse experiences including emotional, physical, and sexual abuse as well as emotional and physical neglect (5). A growing body of meta-analytic evidence has confirmed a strong association between early maltreatment and subsequent development of BPD symptomatology, suggesting that trauma-related disruptions in attachment and neurobiological development confer enduring vulnerability to affective instability, identity disturbance, and interpersonal dysfunction (6-9). These early adversities are thought to dysregulate stress-response systems and undermine the development of secure attachment representations, thereby impairing later capacities for affect regulation and social cognition (10, 11). Empirical studies further reveal that childhood trauma predicts more severe clinical profiles, including heightened suicidality, dissociation, and self-injury in individuals with BPD (12-14).

Another salient psychological construct implicated in the pathogenesis of BPD is Alexithymia, a trait-like deficit in emotional awareness, processing, and expression (15, 16). Alexithymia comprises three core dimensions: difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking, and it has been extensively operationalized through standardized self-report measures such as the Toronto Alexithymia Scale (TAS-20) (17, 18). Converging evidence suggests that alexithymia is markedly elevated among individuals with BPD and contributes to emotional dysregulation, interpersonal instability, and self-harm tendencies by impeding the recognition and communication of internal affective states (2, 3, 19). This emotional unawareness may amplify the impact of traumatic memories, as individuals who cannot identify or label their emotional experiences are more prone to maladaptive coping strategies such as impulsivity, aggression, and dissociation (20, 21).

Mounting research also implicates deficits in mentalization—the ability to interpret one's own and others' behaviors in terms of underlying mental states—as a central mechanism linking childhood trauma and alexithymia to BPD (21-23). Mentalization develops through early attachment relationships and supports adaptive emotion regulation, perspective-taking, and interpersonal functioning. Disruptions in caregiving environments, such as neglect or abuse, can severely impair the maturation of this socio-cognitive capacity, fostering hypermentalizing or hypomentalizing patterns observed in BPD populations (3, 4, 24). Individuals with BPD often display fluctuating or inconsistent mentalizing abilities, which contribute to the characteristic instability of their relationships and self-concept (23, 25). Moreover, empirical studies suggest that mentalization serves as a protective factor that mitigates the progression from emotional dysregulation and alexithymia to full-blown BPD pathology (21, 26, 27).

Evidence from developmental and clinical research has underscored that traumatic experiences in childhood disrupt the secure attachment processes required for normal mentalization development, thereby creating a dual vulnerability: heightened emotional reactivity combined with impaired reflective capacities (10, 28). This developmental cascade has been corroborated by meta-analytic findings showing that maltreated children often present with both alexithymic traits and mentalizing deficits, which synergistically predict later BPD features (6-8). Furthermore, studies focusing specifically on adolescents have revealed that difficulties in mentalization partially mediate the relationship between childhood trauma and BPD symptom severity, highlighting the critical role of this socio-cognitive skill as a developmental buffer (20, 29). Similarly, longitudinal evidence shows that alexithymia exacerbates the effects of trauma on BPD by impairing the individual's ability to regulate affective arousal and engage in adaptive interpersonal behaviors, thereby indirectly influencing symptom persistence and chronicity (13, 19).

Neuroscientific studies have further clarified the mechanisms underlying these interrelations. Neuroimaging research indicates that individuals with BPD and histories of childhood trauma show structural and functional abnormalities in brain regions central to emotion regulation and mentalization, including the amygdala, anterior cingulate cortex, and medial prefrontal cortex (3). These neural irregularities overlap with patterns observed in alexithymia, suggesting a shared neurobiological substrate linking trauma exposure, emotional processing deficits, and impaired mentalization (4, 21). Such findings underscore the notion that BPD emerges from the convergence of affective and cognitive vulnerabilities shaped by early relational experiences.

Within this framework, mentalization has been increasingly conceptualized as a potential therapeutic target to interrupt the trajectory from trauma and alexithymia to BPD. Mentalization-based interventions, rooted in attachment theory and the work of Peter Fonagy, aim to enhance reflective functioning and foster secure relational patterns, thereby improving emotional regulation and reducing BPD symptoms (22, 24). Clinical trials and conceptual models support the view that strengthening mentalization skills can ameliorate the effects of childhood trauma and emotional dysregulation, facilitating more stable self-representations and interpersonal functioning (14, 25, 26). This perspective aligns with the broader biopsychosocial understanding of BPD, which emphasizes the interplay between early environmental stressors, individual emotion regulation capacities, and socio-cognitive development (1, 10).

Collectively, this growing body of evidence suggests a conceptual model in which childhood trauma predisposes individuals to BPD through two converging pathways: by fostering alexithymic tendencies that impair emotional awareness and regulation, and by disrupting mentalization capacities essential for adaptive interpersonal functioning. Alexithymia amplifies the emotional burden of traumatic memories, while poor mentalization undermines the ability to contextualize emotional experiences within social and relational frameworks, creating a synergistic risk profile for BPD (2, 12, 21). By integrating these findings, the present study aims to empirically examine this triadic model, exploring the mediating role of mentalization in the relationship between childhood trauma, alexithymia, and borderline personality disorder symptoms.

## Methods and Materials

### *Study Design and Participants*

The overall design of the present study was descriptive and correlational, and its aim was to predict symptoms of Borderline Personality Disorder (BPD) based on Childhood Trauma and Alexithymia with the mediating role of Mentalization among university students. The statistical population consisted of all students enrolled at branches of the Islamic Azad University in Tehran during the 2024–2025 academic year. The study sample included 300 undergraduate, master's, and doctoral students who were selected through a non-random convenience sampling method from three branches of the Islamic Azad University (Tehran West, Tehran Central, and Shahre Qods). Since structural equation modeling (SEM) requires a large sample size, several researchers have suggested that the minimum sample size for SEM should not be less than 100, with 100–200 considered medium and more than 200 considered large (Kalantari, 2008). Accordingly, the sample size of 300 participants in the present study is considered large and sufficient for conducting SEM analyses.

### *Data Collection*

The Borderline Personality Scale was developed by Jackson and Claridge (1991) and later revised in 2001. This questionnaire was designed to assess borderline traits in non-clinical populations based on a dimensional model of psychological characteristics. The instrument includes 18 items with dichotomous responses (Yes = 1, No = 0) and measures two main factors: "Hopelessness" (feelings of aimlessness, despair, and suicidal thoughts) and "Impulsivity" (tendency toward destructive and antisocial behaviors). Jackson and Claridge reported a test-retest reliability of .61 and concurrent validity with Eysenck's Neuroticism and Psychoticism scales of .64 and .44, respectively. In Iran, Mohammadzadeh, Goodarzi, Taghavi, and Molazadeh (2005) reported acceptable validity and reliability for this scale among university students (Cronbach's  $\alpha = .84$ ). The main advantage of this tool is its applicability in general populations and non-clinical research.

The Childhood Trauma Questionnaire was developed by Bernstein and Fink (2003) to screen for adverse childhood experiences. This instrument includes 28 items that assess five types of maltreatment: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Responses are rated on a five-point Likert scale (1 = Never to 5 = Always), and some items are reverse-scored. Three validity items are also included. The total score ranges from 25 to 125, with higher scores indicating greater exposure to trauma. Bernstein and Fink (2003) reported Cronbach's  $\alpha$  coefficients ranging from .78 to .95 and concurrent validity with clinicians' evaluations ranging from .59 to .78. In Iran, Mirzaei-Nasab et al. (2022) reported Cronbach's  $\alpha$  coefficients ranging from .89 to .98, indicating excellent internal consistency.

The Toronto Alexithymia Scale was initially developed by Taylor, Ryan, and Bagby (1985) with 26 items and was later revised by Bagby, Taylor, and Parker (1994) into a 20-item version. This questionnaire measures three dimensions: Difficulty Identifying Feelings, Difficulty Describing Feelings, and Externally-Oriented Thinking. Responses are scored on a five-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree), and four items are reverse-scored. Total scores range from 20 to 100, with higher scores indicating greater levels of alexithymia. In a study by Bagby (2020), Cronbach's  $\alpha$  was reported as .97 for the total

scale and .96, .89, and .92 for the subscales. In Iran, Besharat and Shahidi (2013) reported Cronbach's alpha coefficients of .85 for the total scale and between .72 and .82 for the subscales.

The Mentalization Scale is a self-report instrument developed by Fonagy et al. (2016) to assess mentalization ability. The original version includes 26 items, but in Iran, a shortened 14-item version has been used, which measures two subscales: Certainty (9 items) and Uncertainty (5 items). Responses are scored on a seven-point Likert scale from 1 (Strongly agree) to 7 (Strongly disagree), and items in the Uncertainty subscale are reverse-scored. This instrument has been used in both clinical populations (e.g., borderline personality disorder, eating disorders) and non-clinical populations. Fonagy et al. (2016) reported Cronbach's alpha coefficients of .86 and .87 for the two factors and .91 for the total scale. In Iran, Doruger and Fathi-Ashtiani (2020) reported Cronbach's alpha coefficients of .88 for the Certainty subscale and .66 for the Uncertainty subscale.

### Data analysis

Data were analyzed at both descriptive and inferential levels. In the descriptive section, demographic variables were described using frequency and percentage indices, and the main variables were described using means and standard deviations. In the inferential section, statistical assumptions including normality, absence of outliers, multicollinearity, and linearity were examined. Pearson correlation was used to assess relationships between variables, and structural equation modeling (SEM) with a bootstrap approach was used to evaluate the conceptual model and test the mediating role. Analyses were conducted using SPSS version 28 and AMOS version 24, with a significance level set at .05.

### Findings and Results

Table 1 presents descriptive statistics (mean, standard deviation, minimum, and maximum scores) for the main study variables.

**Table 1. Descriptive statistics (mean, standard deviation, minimum, and maximum scores) of the main variables**

Variable	Mean	SD	Minimum	Maximum
Emotional abuse	8.16	3.70	4.00	23.00
Physical abuse	6.47	2.82	3.00	21.00
Sexual abuse	6.57	3.19	4.00	25.00
Emotional neglect	10.30	4.40	4.00	25.00
Physical neglect	7.20	2.65	5.00	17.00
Childhood Trauma (total)	38.70	12.81	24.00	95.00
Difficulty identifying feelings	16.78	6.60	7.00	34.00
Difficulty describing feelings	12.07	4.31	5.00	25.00
Externally-oriented thinking	18.37	4.08	8.00	31.00
Alexithymia (total)	47.22	12.35	22.00	75.00
Certainty	39.50	12.26	9.00	63.00
Uncertainty	13.64	5.47	5.00	35.00
Mentalization (total)	53.13	13.47	17.00	87.00
Hopelessness	2.12	1.88	0.00	8.00
Impulsivity	3.22	2.09	0.00	9.00
Borderline Personality Disorder (total)	5.34	3.42	0.00	14.00

Descriptive findings showed that the mean score of the Childhood Trauma Questionnaire was 38.70, with emotional neglect having the highest mean among its components. The mean score of the Toronto

Alexithymia Scale was 47.22; among its components, externally-oriented thinking and difficulty identifying feelings had the highest means, while difficulty describing feelings had the lowest mean. The mean score of the Mentalization Scale was 53.13, with the Certainty subscale showing the highest and the Uncertainty subscale the lowest mean scores. The mean score of borderline personality disorder was 5.34, with impulsivity showing the highest and hopelessness the lowest mean scores.

**Table 2. Skewness and kurtosis values for assessing univariate normality**

Variables	Skewness	Kurtosis
Emotional abuse	1.26	1.30
Physical abuse	1.46	1.29
Sexual abuse	1.68	1.37
Emotional neglect	0.807	0.136
Physical neglect	1.32	1.21
Childhood trauma (total)	1.37	1.72
Difficulty identifying feelings	0.430	-0.550
Difficulty describing feelings	0.264	-0.625
Externally-oriented thinking	-0.027	-0.008
Alexithymia (total)	0.143	-0.856
Certainty	-0.381	-0.483
Uncertainty	0.778	1.16
Mentalization (total)	-0.235	-0.266
Impulsivity	0.903	0.476
Hopelessness	0.228	-0.810
Borderline personality disorder (total)	0.437	-0.501

Based on skewness and kurtosis values, the distribution of all main variables was within the acceptable range ( $\pm 2$ ). Therefore, the assumption of univariate normality was confirmed, and parametric Pearson correlation coefficient analysis was used to examine the relationships.

**Table 3. Pearson correlation coefficient matrix between the main variables**

Variables	Childhood trauma	Alexithymia	Mentalization	Borderline personality disorder
Childhood trauma	1			
Alexithymia	0.337	1		
Mentalization	0.150	0.226	1	
Borderline personality disorder	0.334	0.484	0.343	1

\*Note:  $p \leq .05 = *$ ,  $p \leq .01 = ***$

The findings indicated that there were positive and significant correlations between childhood trauma, alexithymia, and mentalization with borderline personality disorder ( $p < .05$ ). Among the predictor variables, alexithymia showed the highest correlation with borderline personality disorder ( $r = .484$ ), followed by mentalization ( $r = .343$ ) and childhood trauma ( $r = .334$ ). Additionally, childhood trauma and alexithymia also had positive and significant correlations with the mediating variable mentalization, with the correlation between alexithymia and mentalization ( $r = .226$ ) being stronger than that between childhood trauma and mentalization ( $r = .150$ ).

Table 4 presents the results of the Pearson correlation coefficient analysis between the components of the predictor variables and Borderline Personality Disorder (BPD).

**Table 4. Pearson correlation analysis between the components of the predictor variables and borderline personality disorder**

Variables	BPD (total) r / p	Hopelessness r / p	Impulsivity r / p
Emotional abuse	0.324 / p < .001	0.323 / p < .001	0.240 / p < .001
Physical abuse	0.205 / p < .001	0.182 / p = .002	0.171 / p = .003
Sexual abuse	0.160 / p = .005	0.175 / p = .002	0.105 / p = .070
Emotional neglect	0.304 / p < .001	0.320 / p < .001	0.209 / p < .001
Physical neglect	0.244 / p < .001	0.260 / p < .001	0.166 / p = .004
Childhood Trauma (total)	0.334 / p < .001	0.341 / p < .001	0.239 / p < .001
Difficulty identifying feelings	0.511 / p < .001	0.520 / p < .001	0.368 / p < .001
Difficulty describing feelings	0.366 / p < .001	0.378 / p < .001	0.260 / p < .001
Externally-oriented thinking	0.253 / p < .001	0.189 / p < .001	0.244 / p < .001
Alexithymia (total)	0.484 / p < .001	0.472 / p < .001	0.368 / p < .001
Certainty	0.222 / p < .001	0.140 / p = .015	0.236 / p < .001
Uncertainty	0.347 / p < .001	0.312 / p < .001	0.288 / p < .001
Mentalization (total)	0.343 / p < .001	0.254 / p < .001	0.332 / p < .001

The results of the Pearson correlation analysis showed that all components of childhood trauma, alexithymia, and mentalization had positive and significant relationships with borderline personality disorder ( $p < .05$ ). Among the components of childhood trauma, emotional abuse had the strongest correlation with borderline personality disorder ( $r = .324$ ). Among the components of alexithymia, difficulty identifying feelings had the strongest correlation with borderline personality disorder ( $r = .511$ ). Furthermore, among the components of mentalization, uncertainty had the strongest correlation with borderline personality disorder ( $r = .347$ ).

Examining the measurement model with standardized coefficients showed that all factor loadings of the subscales on the main constructs were greater than 0.50. This finding indicates that the observed variables had appropriate associations with the latent constructs and that the measurement model demonstrated a good fit.

**Table 5. Goodness-of-fit indices for the measurement model**

Fit Index	Acceptable Threshold	Obtained Value
GFI (Goodness of Fit Index)	> 0.90	0.93
RMSEA (Root Mean Square Error of Approximation)	< 0.08	0.055
CFI (Comparative Fit Index)	> 0.90	0.94
NFI (Normed Fit Index)	> 0.90	0.90
IFI (Incremental Fit Index)	> 0.90	0.95
AGFI (Adjusted Goodness of Fit Index)	> 0.90	0.92
PGFI (Parsimony Goodness of Fit Index)	> 0.70	0.67
$\chi^2/df$ (Chi-Square to degrees of freedom ratio)	Between 1 and 5	1.91

Evaluation of the measurement model fit indices indicated that all indices were within the acceptable range, and none were observed to be weak or unacceptable. Therefore, it can be concluded that the measurement model had an appropriate and acceptable fit, and its overall structure was confirmed.

The proposed model was tested using Structural Equation Modeling (SEM) in AMOS. Figure 1 presents the empirical model with standardized path coefficients, and Figure 2 presents the model with unstandardized coefficients.



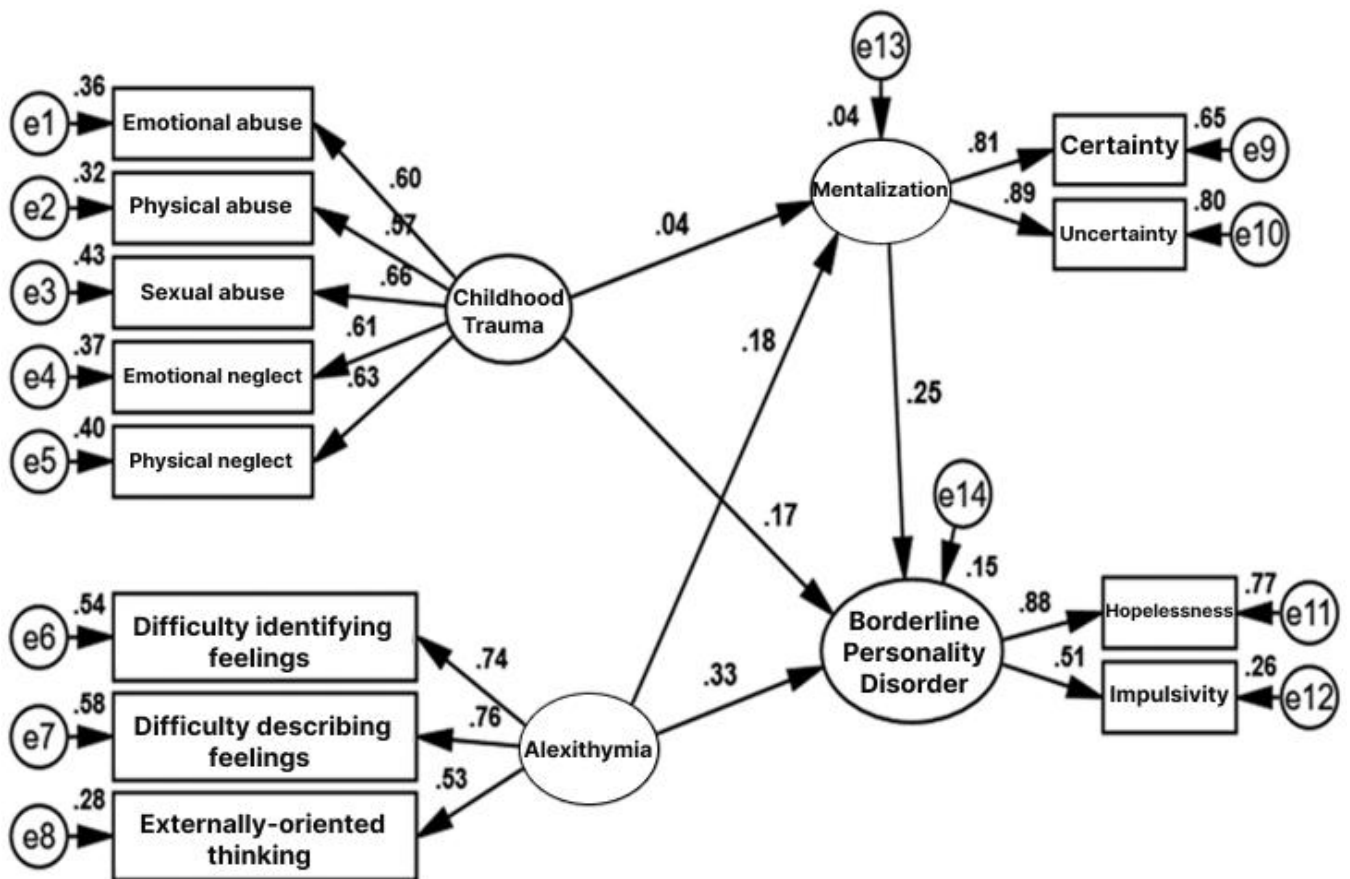
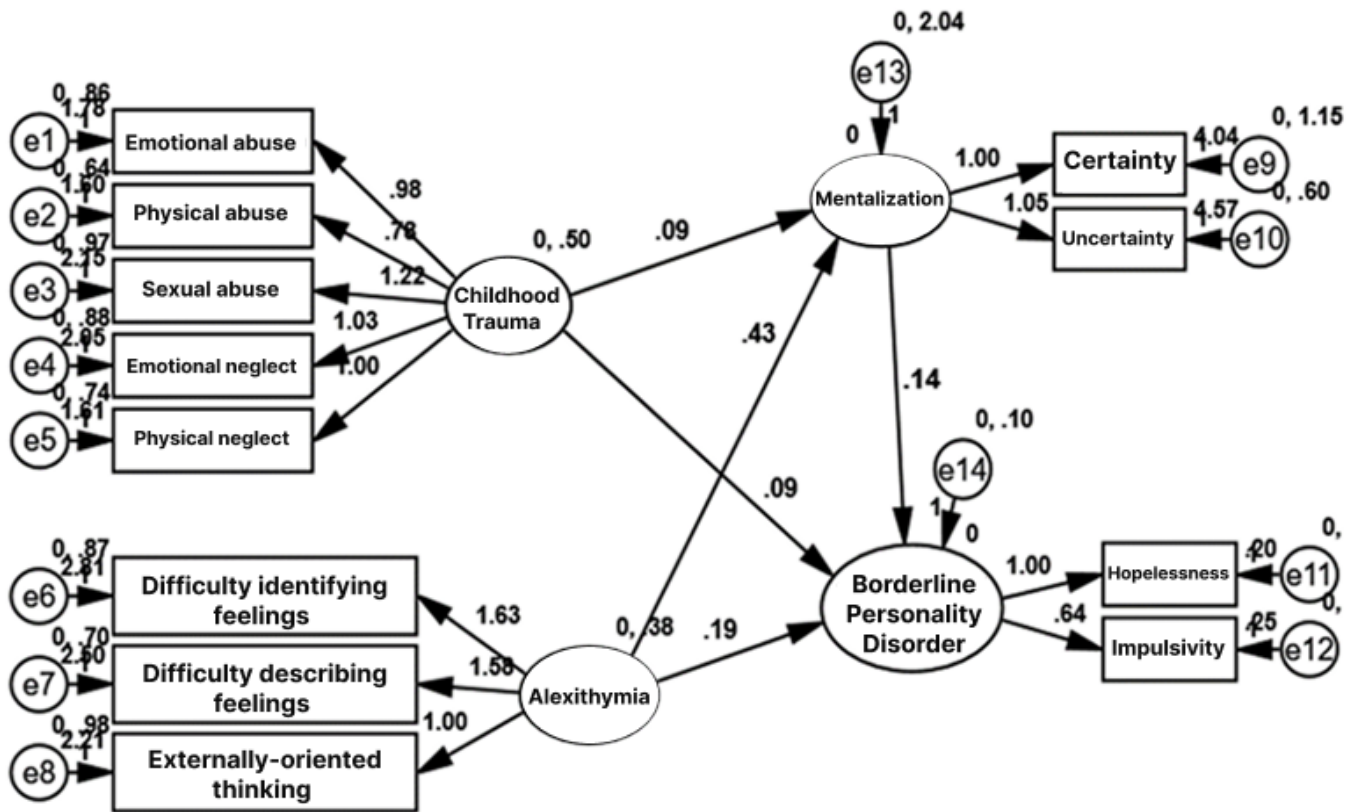


Figure 1. Empirical model with standardized path coefficients





**Figure 2. Empirical model with unstandardized path coefficients**

Examining the structural model with standardized path coefficients showed that the strongest path was from alexithymia to borderline personality disorder ( $\beta = 0.33$ ). Moreover, the coefficient of determination ( $R^2$ ) for borderline personality disorder was 0.15, indicating that the predictor variables—childhood trauma, alexithymia, and mentalization—together explained 15% of the variance in this variable.

## Discussion and Conclusion

The present study sought to investigate the predictive role of Childhood Trauma and Alexithymia in Borderline Personality Disorder (BPD) symptoms, with Mentalization serving as a mediating variable among university students. The findings revealed that childhood trauma exerted a positive and significant direct effect on BPD symptoms, consistent with the extensive literature demonstrating that early adverse experiences are strongly linked to the development of borderline pathology. Moreover, alexithymia showed an even stronger positive association with BPD, suggesting that difficulties in identifying and describing emotions constitute a salient vulnerability factor in the manifestation of borderline symptoms. Notably, mentalization was found to mediate the relationship between alexithymia and BPD but not the relationship between childhood trauma and BPD. This pattern underscores the complex interplay between emotional processing deficits and socio-cognitive capacities in shaping borderline psychopathology.

The positive predictive effect of childhood trauma on BPD symptoms aligns closely with a robust body of meta-analytic and empirical evidence indicating that exposure to early maltreatment—including emotional, physical, and sexual abuse as well as neglect—elevates the risk of developing borderline symptomatology (6-8). These studies collectively highlight that the cumulative impact of trauma disrupts normative emotional

development, contributes to insecure attachment styles, and fosters affective instability, identity disturbance, and interpersonal dysfunction—all hallmarks of BPD. Consistent with these findings, our results revealed that emotional abuse and emotional neglect were particularly salient among the trauma subtypes in predicting borderline features. This observation supports prior evidence showing that emotional forms of maltreatment exert especially potent and enduring effects on personality development compared to other trauma types (9, 12). Theoretically, this may be because emotional trauma undermines the formation of secure internal working models of self and others, thereby heightening vulnerability to rejection sensitivity, abandonment fears, and emotional dysregulation commonly seen in BPD (10, 11).

In contrast to childhood trauma, alexithymia emerged as an even stronger predictor of BPD symptoms in this study. This finding is consistent with mounting evidence that alexithymia—a multifaceted deficit encompassing difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking—plays a central role in the emotional dysregulation and interpersonal instability characteristic of BPD (2, 19). The present results corroborate prior studies demonstrating that individuals with elevated alexithymia are more likely to engage in impulsive and self-harming behaviors, experience intense emotional lability, and struggle to form coherent self-concepts, all of which are core aspects of BPD (3, 15, 16). Importantly, our correlation analyses revealed that among the alexithymia subcomponents, difficulty identifying feelings exhibited the strongest association with borderline symptoms. This echoes earlier findings that deficits in recognizing one's emotional states are especially detrimental because they impede effective emotion regulation, increase susceptibility to affect-driven behavioral dyscontrol, and exacerbate interpersonal misunderstandings (17, 18).

A particularly noteworthy contribution of this study is its demonstration of mentalization as a mediator in the relationship between alexithymia and BPD. This finding suggests that deficits in mentalizing capacity—defined as the ability to understand and interpret behavior in terms of intentional mental states—partially explain why alexithymic individuals are vulnerable to borderline psychopathology. This is consistent with theoretical frameworks emphasizing that alexithymia compromises the reflective functions necessary for mentalizing, leading to misinterpretations of social cues and destabilized relationships (21-23). Individuals who struggle to identify and articulate their own emotional states are less able to recognize and reason about others' emotions, resulting in the fluctuating or polarized interpersonal perceptions characteristic of BPD (4, 20). The present results thus align with prior work suggesting that strengthening mentalization capacities may buffer the progression from alexithymic emotional dysregulation to full-blown borderline symptomatology (25, 26).

Interestingly, mentalization did not mediate the link between childhood trauma and BPD in this study. While this contrasts with some findings showing that early adversity impairs the development of mentalizing capacities (12, 28), it may reflect developmental timing and resilience factors within the university sample. Many students may have experienced compensatory social relationships and supportive educational environments that helped restore mentalization abilities despite earlier trauma. Alternatively, trauma may contribute to BPD symptoms through other mechanisms not captured in this model, such as heightened threat sensitivity, attachment disorganization, or chronic stress-related neurobiological alterations (3, 10). These alternative pathways could overshadow the indirect effect of trauma through mentalization in this particular cohort.

Another plausible interpretation is that while trauma undermines the early foundations of mentalization, the current mentalizing capacity of these participants may be more influenced by proximal emotional competencies like alexithymia. This notion is supported by evidence that mentalization deficits are more closely associated with current emotional awareness and regulation skills than with historical trauma exposure *per se* (21, 27). Thus, alexithymia may operate as a more proximal determinant of mentalization, while childhood trauma exerts more distal and diffuse effects on BPD risk. This temporal distinction could explain why mentalization mediated the alexithymia-BPD relationship but not the trauma-BPD relationship.

The current findings also resonate with neurobiological research demonstrating overlapping neural abnormalities associated with alexithymia, mentalization deficits, and BPD, particularly in brain regions involved in social-emotional processing such as the amygdala, anterior cingulate cortex, and medial prefrontal cortex (3). Disruptions in these circuits may impede both emotional awareness and the capacity to attribute mental states to self and others, thereby reinforcing the behavioral dysregulation seen in BPD (4). This integrative perspective highlights the convergence of emotional and cognitive vulnerabilities—alexithymia and impaired mentalization—as critical mechanisms translating early psychosocial adversity into borderline psychopathology.

Overall, this study advances the understanding of BPD etiology by elucidating the interplay between trauma-related and emotion-processing vulnerabilities and socio-cognitive capacities. It suggests a developmental cascade wherein childhood trauma sets the stage for emotional dysregulation, alexithymia intensifies this dysregulation by limiting emotional insight, and impaired mentalization permits these dysregulated states to disrupt interpersonal relationships, culminating in the characteristic symptoms of BPD. The findings support multidimensional models that conceptualize BPD as arising from the cumulative interaction of adverse early environments, emotion regulation deficits, and social-cognitive dysfunctions (2, 12, 14). This has critical clinical implications, underscoring the potential utility of interventions targeting both emotional awareness (e.g., emotion identification training) and mentalization skills to mitigate the risk or severity of BPD in at-risk populations (24, 26).

Despite its contributions, this study is not without limitations. First, the cross-sectional design precludes causal inferences regarding the directional relationships among childhood trauma, alexithymia, mentalization, and BPD. Although the proposed model is theoretically grounded, longitudinal data are needed to confirm whether these variables unfold sequentially over development. Second, the reliance on self-report measures may have introduced common method bias and social desirability effects, especially given the sensitive nature of trauma and emotional functioning constructs. The use of retrospective self-reports for childhood trauma may also be prone to recall biases or underreporting. Third, the study sample consisted exclusively of university students, which may limit the generalizability of findings to clinical or more socioeconomically diverse populations. University students may possess protective resources, such as social support or cognitive skills, that buffer the effects of trauma or emotional deficits on mentalization and BPD risk. Finally, cultural factors specific to the educational and social context may shape emotional expression, mentalization development, and responses to trauma, yet these factors were not explicitly measured or controlled for in the current design.

Future studies should employ longitudinal designs to trace the developmental trajectories linking childhood trauma, alexithymia, and mentalization to BPD, which would enable stronger causal inferences

and identification of sensitive periods for intervention. It would also be valuable to replicate this model in clinical populations diagnosed with BPD, as well as in community samples with diverse sociodemographic backgrounds, to enhance external validity. Incorporating multi-method assessments—including clinician-rated interviews, behavioral tasks, and neuroimaging—would provide a more comprehensive and objective evaluation of mentalization capacities and emotional functioning. Furthermore, future work could examine potential moderators such as attachment style, resilience factors, or genetic predispositions that might buffer or exacerbate the effects of trauma and alexithymia on BPD development. Finally, experimental intervention studies could evaluate whether targeted training in emotion identification and mentalization reduces borderline symptoms among individuals with high trauma exposure and alexithymia, thereby testing the clinical applicability of the current model.

The findings of this study suggest several practical implications for psychological assessment and intervention. Mental health practitioners should systematically assess histories of childhood trauma, alexithymia, and mentalization deficits in young adults presenting with emotional dysregulation or emerging borderline traits to facilitate early identification of those at elevated risk for BPD. Psychoeducational and skills-based programs focusing on enhancing emotional awareness and labeling may help reduce alexithymic tendencies, while mentalization-based interventions can improve reflective functioning and interpersonal stability. Integrating these approaches into university counseling services and community mental health settings could serve as a preventive strategy to interrupt maladaptive developmental trajectories. Moreover, fostering supportive relational environments that model and reinforce mentalizing interactions may enhance resilience among trauma-exposed individuals, reducing their vulnerability to borderline symptomatology.

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### **Authors' Contributions**

All authors equally contributed to this study.

### **Declaration of Interest**

The authors of this article declared no conflict of interest.

### **Ethical Considerations**

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

### **Transparency of Data**

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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