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Structural Equation Modeling of Bulimia Nervosa Disorder Based on Emotional Flexibility and Self Esteem: The Mediating Role of Fear of Negative Evaluation

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A B S T R A C T

Purpose: The present study aimed to examine a structural model of Bulimia Nervosa based on emotional flexibility and self esteem, with fear of negative evaluation hypothesized as a mediating variable.

Methods and Materials: This descriptive–correlational, cross sectional study employed structural equation modeling. Participants were individuals exhibiting symptoms of Bulimia Nervosa, recruited through purposive sampling in Iran in 2025. Data were collected using the Gormally Binge Eating Scale, the Emotional Flexibility Questionnaire, the Fear of Negative Evaluation Scale, and the Rosenberg Self Esteem Scale. Data analysis was conducted using SPSS version 27 and SmartPLS version 4, with a significance level set at 0.05.

Findings: Emotional communication was not significantly associated with Bulimia Nervosa symptoms ($\beta = 0.126$, $t = 1.884$, $p = 0.060$). In contrast, negative emotion regulation ($\beta = -0.173$, $t = 1.970$, $p = 0.049$) and positive emotion regulation ($\beta = -0.238$, $t = 2.596$, $p = 0.009$) demonstrated significant negative associations with Bulimia Nervosa symptoms. Positive emotion regulation was also negatively related to fear of negative evaluation ($\beta = -0.169$, $t = 2.061$, $p = 0.039$), as was self esteem ($\beta = -0.807$, $t = 4.893$, $p < 0.001$). However, none of the indirect pathways through fear of negative evaluation reached statistical significance.

Conclusion: The findings indicate that emotional flexibility—particularly positive and negative emotion regulation—and self esteem exert direct effects on Bulimia Nervosa symptoms, whereas fear of negative evaluation does not function as a mediating mechanism within the tested model. These results suggest that psychological interventions for Bulimia Nervosa may be more effective when primarily focused on enhancing emotion regulation capacities and strengthening self esteem rather than targeting evaluative social fears.

Keywords: *Bulimia Nervosa; Emotional Flexibility; Emotion Regulation; Self esteem; Fear of Negative Evaluation; Structural Equation Modeling*

1. Introduction

Eating disorders constitute a group of complex and severe psychiatric conditions that significantly impair physical health, psychological well-being, and social functioning across the lifespan. Among these disorders, bulimia nervosa (BN) is distinguished by recurrent episodes of binge eating accompanied by inappropriate compensatory

behaviors, such as self-induced vomiting, misuse of laxatives, fasting, or excessive exercise. These behavioral patterns are typically embedded in a persistent cycle of loss of control, shame, guilt, and emotional distress, which reinforces symptom chronicity and complicates recovery processes. Contemporary scholarship emphasizes that, beyond biological and genetic vulnerabilities, psychological, emotional, and interpersonal mechanisms play a decisive role in both the emergence and maintenance of bulimic symptomatology (Khalid et al., 2025; Ren, 2024). Understanding these mechanisms is therefore central to advancing explanatory models and designing effective, targeted interventions for individuals affected by BN.

Recent theoretical and empirical developments increasingly frame eating disorders within transdiagnostic and process-based perspectives, highlighting shared psychological processes such as emotion regulation difficulties, maladaptive self-evaluation, and heightened sensitivity to social feedback (Mallorquí-Bagué et al., 2018; Ren, 2024). Within this framework, bulimia nervosa is conceptualized not merely as a disorder of eating behavior, but as a manifestation of broader dysregulation in emotional and self-related systems. Neurobiological evidence further supports this view, demonstrating that individuals with BN exhibit altered neural processing of body image, reward, and affective stimuli, which may underlie difficulties in regulating emotional responses to internal and external cues (Norrlin & Baumann, 2025). These findings underscore the need for integrative models that bridge emotional, cognitive, and interpersonal domains in explaining bulimic pathology.

One construct that has gained growing attention in this regard is emotional flexibility. Emotional flexibility refers to the capacity to experience, regulate, and shift emotional responses in accordance with situational demands, rather than relying on rigid or maladaptive regulatory strategies. Deficits in emotional flexibility have been linked to a wide range of psychopathological outcomes, including anxiety, depression, and eating disorders (Mallorquí-Bagué et al., 2018; Mikhail et al., 2024). In the context of bulimia nervosa, binge eating and compensatory behaviors are frequently conceptualized as maladaptive attempts to manage overwhelming negative affect or internal tension. Longitudinal evidence indicates that changes in affect mediate the relationship between emotion regulation strategies and disordered eating behaviors, suggesting that difficulties in flexibly modulating emotional states may precede and perpetuate bulimic symptoms (Mikhail et al., 2024). Similarly, experimental and observational studies demonstrate that negative emotional states such as shame, anxiety, and sadness often trigger binge episodes, while ineffective regulation of these states increases reliance on purging behaviors as short-term relief strategies (Hill et al., 2024).

Importantly, emotional flexibility encompasses not only the regulation of negative affect but also the capacity to experience and sustain positive emotions. Emerging research suggests that individuals with eating disorders may struggle with positive emotion regulation, including reduced savoring, fear of positive affect, or rapid dampening of pleasurable experiences, which may paradoxically increase vulnerability to maladaptive coping behaviors (Mikhail et al., 2024; Ren, 2024). From this perspective, bulimic behaviors may function both to escape aversive emotions and to compensate for deficits in positive emotional engagement. Clinical studies conducted in Iranian contexts further support the relevance of emotional processes, demonstrating associations between rumination, grief-related emotion management, and emotional eating in overweight and obese populations (Arghavani Hadi et al., 2023). Moreover, interventions targeting emotional and cognitive flexibility have shown promising effects on psychological adjustment, suggesting that enhancing flexibility may be a key mechanism of change in eating-related psychopathology (Aghaei Doost, 2021).

Closely intertwined with emotional processes is the construct of self-esteem, defined as an individual's global evaluation of self-worth. Low self-esteem has long been recognized as a central psychological correlate of eating disorders, including bulimia nervosa (Pérez-Fuentes et al., 2019; Zanella & Lee, 2024). Individuals with BN often report pervasive feelings of inadequacy, self-criticism, and conditional self-acceptance, which are frequently contingent on body shape, weight, or perceived social approval. Empirical evidence indicates that self-esteem not only correlates with bulimic symptom severity but also interacts with emotional and cognitive vulnerabilities to exacerbate maladaptive eating behaviors (Ahmadi Golsafidi et al., 2021; Bagherloo, 2022). Structural modeling studies suggest that low self-esteem may exert its effects indirectly by impairing executive function, social cognition, and interpersonal functioning, thereby increasing susceptibility to disordered eating patterns (Zanella & Lee, 2024).

The role of self-esteem extends beyond individual psychopathology to broader health-related outcomes across the lifespan. Research in diverse populations, including adolescents and older adults, has demonstrated significant

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associations between self-esteem, health behaviors, nutritional status, and psychological well-being (Barzegar et al., 2024; Esmaeili et al., 2023). Psychometric investigations further confirm the robustness and cross-cultural applicability of self-esteem measurement, supporting its use as a core construct in explanatory models of mental health (Moksnes et al., 2024). In bulimia nervosa, recurrent binge–purge cycles may progressively erode self-esteem through experiences of perceived failure and loss of control, while low self-esteem, in turn, heightens vulnerability to external validation seeking and maladaptive coping strategies (Ebrahimi Khabir, 2023). This reciprocal relationship highlights self-esteem as both a risk factor and a consequence of bulimic pathology.

Within this intrapersonal context, interpersonal concerns—particularly fear of negative evaluation—have been proposed as potential mechanisms linking emotional and self-related vulnerabilities to eating disorder symptoms. Fear of negative evaluation refers to persistent apprehension about being judged, criticized, or rejected by others and is closely related to social anxiety and psychological inflexibility (Uğur et al., 2021). In individuals with eating disorders, heightened sensitivity to social evaluation may intensify body image concerns, promote secrecy surrounding eating behaviors, and increase reliance on binge eating or purging as maladaptive strategies for managing socially driven distress. Empirical studies indicate that fear of negative evaluation mediates relationships between body dissatisfaction, intrusive imagery, and maladaptive behaviors such as smartphone addiction and disordered eating, underscoring its relevance in contemporary psychosocial contexts (Liu et al., 2023).

Adolescent research further demonstrates that peer dynamics and perceived social judgment play a significant role in loss-of-control eating, with self-esteem and body dissatisfaction moderating these associations (Beckers et al., 2025). Neurocognitive and interpersonal findings thus converge in suggesting that fear of negative evaluation may act as an important interpersonal amplifier of existing emotional and self-related vulnerabilities. However, despite these insights, the precise role of fear of negative evaluation within structural models of bulimia nervosa remains insufficiently clarified. Some evidence suggests that interpersonal fears may be particularly salient in early or subclinical stages of disordered eating, while intrapersonal emotion regulation processes may dominate once symptoms become entrenched (Melisse & Dingemans, 2025; Ren, 2024).

A growing body of intervention research also informs this debate. Cognitive-behavioral, compassion-based, acceptance- and commitment-based, and schema-focused interventions have demonstrated efficacy in improving body image, reducing binge eating, and enhancing psychological functioning among individuals with bulimic and binge-eating symptoms (Ashrafi, 2020; Bagheri Sheikhangafsheh et al., 2024; Bridge et al., 2024). Notably, many of these interventions target emotion regulation skills and maladaptive self-schemas, while interpersonal evaluative concerns are addressed more indirectly. Exercise-based and lifestyle interventions likewise show beneficial effects on body image, overeating behaviors, and self-esteem, further emphasizing the role of self-related and emotional processes in recovery (Agahjani & Faghirpour, 2023; Entezari Meybodi et al., 2020). Motivational frameworks grounded in social-cognitive theory also highlight the importance of self-beliefs and perceived control in recovery from bulimia nervosa (Van Huyssteen, 2025).

Despite substantial progress, several gaps remain in the literature. First, many studies have examined emotional flexibility, self-esteem, or fear of negative evaluation in isolation, limiting understanding of how these constructs interact within comprehensive explanatory models. Second, there is a relative paucity of structural equation modeling studies that simultaneously test direct and indirect pathways among these variables in bulimia nervosa populations, particularly in non-Western contexts. Third, while neurobiological and psychological reviews underscore the multifactorial nature of eating disorders, there is a need for empirically grounded models that integrate emotional regulation capacities with self-evaluative and interpersonal processes (Melisse & Dingemans, 2025; Norrlin & Baumann, 2025). Addressing these gaps is essential for refining theory and informing culturally sensitive, mechanism-focused interventions.

Taken together, existing evidence suggests that emotional flexibility and self-esteem are central intrapersonal determinants of bulimia nervosa, while fear of negative evaluation represents a potentially important interpersonal factor that may mediate or moderate these relationships. Clarifying the relative contribution of these constructs, and the pathways through which they influence bulimic symptoms, can enhance conceptual models and guide more precise clinical targeting. Structural modeling approaches offer a powerful methodological framework for testing such complex relationships and advancing process-based understanding of eating disorder psychopathology.

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Accordingly, the aim of the present study was to examine a structural model of bulimia nervosa based on emotional flexibility and self-esteem, with fear of negative evaluation as a mediating variable.

2. Methods and Materials

2.1. Study Design and Participants

Due to the confidential and sensitive nature of Overeaters Anonymous activities and limited direct access to members, data collection was conducted through a multi-layered coordination process involving the researcher, the national public relations office of Overeaters Anonymous in Iran, and local administrators of OA groups. Initially, the researcher contacted several group administrators through social media and messaging platforms such as Telegram, Eitaa, and Instagram. Subsequently, formal communication was established with the national OA public relations office to ensure compliance with organizational principles. After reviewing the research objectives and questionnaire content, official approval was granted, and OA administrators across cities were informed to facilitate questionnaire distribution.

To ensure accessibility and maintain confidentiality, all questionnaires were administered electronically via an online link. Eligible participants were able to complete the questionnaires anonymously without physical presence. The questionnaire link was shared in OA-related groups and channels by administrators and, in some cases, sent directly to eligible individuals by the researcher. Additionally, study announcements were posted on OA-related Instagram pages to enhance voluntary participation. Participants were informed that their participation was entirely voluntary, and all data were collected anonymously without recording identifying information. Ultimately, the study population comprised OA members from across Iran who gained access to the study through formal collaboration between the national OA public relations office and local OA administrators. After data cleaning and exclusion of incomplete responses, data from 163 participants were retained for final analysis.

2.2. Measures

The Binge Eating Scale (BES) developed by Gormally, Black, Daston, and Rardin (1982) was used to assess the severity of binge-eating behavior. This instrument evaluates the cognitive, behavioral, and emotional aspects of binge eating. The scale consists of 16 items, each with three or four response options scored on a four-point scale (0–3), where 0 indicates “no problem with overeating” and 3 indicates “severe problems with overeating” (Badaqi et al., 2016). Total scores range from 0 to 46, with scores below 17 indicating no binge-eating disorder, scores between 18 and 26 indicating moderate binge eating, and scores of 27 or higher indicating severe binge-eating disorder. The original developers reported a Cronbach’s alpha of 0.85. Persian validation studies have confirmed satisfactory reliability and validity of the scale (Entezari Meybodi et al., 2020).

The Emotional Flexibility Questionnaire was developed by Rashid and Bayat (2019) to assess emotional flexibility and consists of 24 items across three components: positive emotion regulation, negative emotion regulation, and emotional communication. Responses are rated on a six-point Likert scale ranging from 1 (“strongly disagree”) to 6 (“strongly agree”), yielding a total score range of 24 to 144, with higher scores indicating greater emotional flexibility. The scale demonstrated satisfactory content, face, and criterion validity, and internal consistency for the full scale was reported as $\alpha = 0.87$ (Aghaei Doost, 2021).

Rosenberg Self-esteem Scale (RSES): The Rosenberg Self-esteem Scale (1965) was used to assess individuals’ global self-worth. The scale consists of 10 items measuring positive and negative attitudes toward the self (Bridge et al., 2024). In this study, a binary response format (agree/disagree) was used. Items 1–5 are positively worded, and items 6–10 are negatively worded. Total scores range from –10 to +10, with higher scores indicating higher self-esteem. The scale has demonstrated strong psychometric properties, with reported Cronbach’s alpha coefficients ranging from 0.77 to 0.88, test–retest reliability between 0.82 and 0.88, and acceptable validity in Persian samples (Esmaeili et al., 2023).

The Fear of Negative Evaluation Scale (FNE) developed by Leary (1983) was used to assess anxiety related to negative social evaluation. The instrument includes 12 items rated on a five-point Likert scale ranging from 1 (“not at all characteristic of me”) to 5 (“extremely characteristic of me”). Items 2, 4, 7, and 10 are reverse scored. Total scores range from 12 to 60, with higher scores reflecting greater fear of negative evaluation (Leary, 1983). The scale demonstrated high internal consistency, with Cronbach’s alpha of 0.96, and acceptable reliability in Iranian samples ($\alpha = 0.84$).

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2.3. Data Analysis

Descriptive statistics were conducted using SPSS version 27. Structural equation modeling and path coefficient analyses were performed using SmartPLS version 4. Mediating effects were assessed using a bootstrapping procedure with bias corrected confidence intervals, as recommended for PLS SEM. Normality of data distribution was assessed using the Shapiro–Wilk test. As the results indicated non-normal distributions, partial least squares SEM (PLS-SEM) was selected as the appropriate analytical approach. Composite reliability (CR) values for all constructs exceeded the recommended threshold of 0.70, and average variance extracted (AVE) values were above 0.50, indicating adequate convergent validity. Discriminant validity was further confirmed using the HTMT criterion, with all values below 0.85. Item removal was conducted conservatively and solely based on empirical criteria (outer loadings, CR, and AVE), in line with PLS SEM recommendations, while preserving content validity.

3. Findings and Results

Table 1 presents the descriptive statistics of participants' demographic characteristics and body weight. The mean weight of participants was 77.5 kg (SD = 13), indicating moderate variability, with values ranging from 50 to 120 kg. This range reflects a heterogeneous sample including individuals within normal and overweight categories, which is consistent with the clinical heterogeneity typically observed in bulimia nervosa populations. Of the 163 participants, 98 (60.1%) were women and 65 (39.9%) were men. Regarding educational level, the majority held a high school diploma (46.0%) or bachelor's degree (33.1%). Most participants were married 142 (87.1%), while 17 (10.4%) were single and 4 (2.5%) reported other marital statuses.

Table 1

Description of the demographic variables

variables	Groups	Frequency	Percent	
Age	17-30 years	19	11.7	
	30-40 years	41	25.2	
	40-50 years	66	40.5	
	+50 years	37	22.7	
Gender	Woman	98	60.1	
	Man	65	39.9	
Marital Status	Married	142	87.1	
	Single	17	10.4	
	Other statuses	4	2.5	
Employment Status	Associate Degree	22	13.5	
	Diploma	75	46.0	
	Bachelor Degree	54	33.1	
	Master Degree	12	7.4	
Participants' weight	mean	Sd	Min	Max
	77.5	13.0	50.0	120

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Figure 1

Path coefficients between variables and p-value

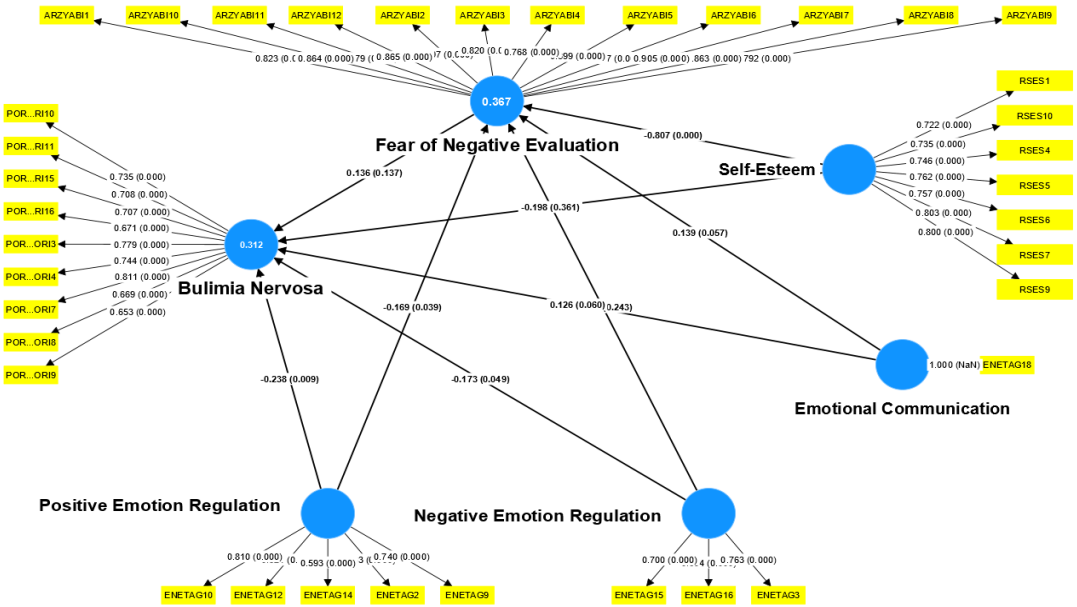

Figure 2

T-value

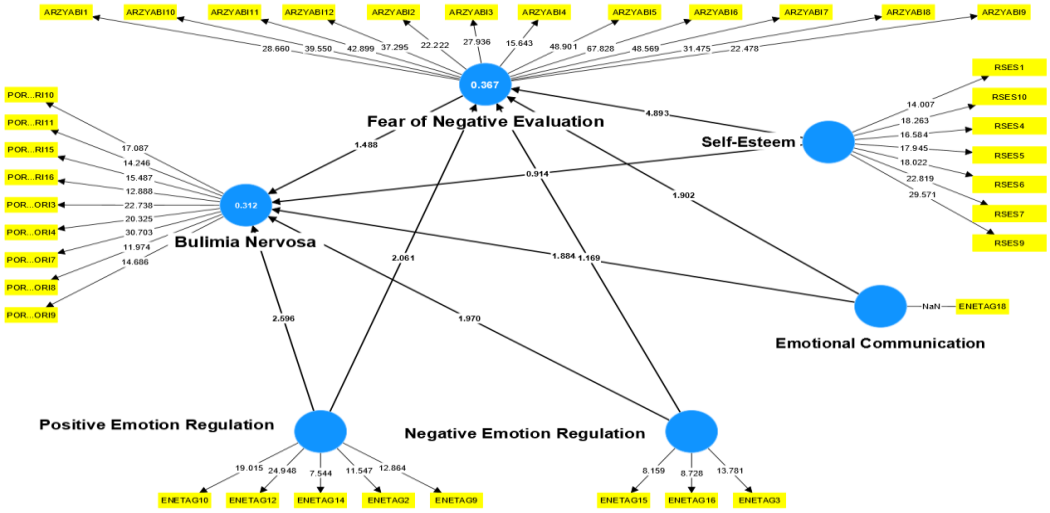

Table 2

Factor loadings and significance of questions

Items	Factor loadings	STDEV	T-value	p-value
ITEM1 <- Fear of Negative Evaluation	0.823	0.029	28.660	p < 0.001
ITEM10 <- Fear of Negative Evaluation	0.864	0.022	39.550	p < 0.001
ITEM11 <- Fear of Negative Evaluation	0.879	0.020	42.899	p < 0.001
ITEM12 <- Fear of Negative Evaluation	0.865	0.023	37.295	p < 0.001
ITEM2 <- Fear of Negative Evaluation	0.797	0.036	22.222	p < 0.001
ITEM3 <- Fear of Negative Evaluation	0.820	0.029	27.936	p < 0.001
ITEM4 <- Fear of Negative Evaluation	0.768	0.049	15.643	p < 0.001
ITEM5 <- Fear of Negative Evaluation	0.899	0.018	48.901	p < 0.001

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ITEM6 <- Fear of Negative Evaluation	0.917	0.014	67.828	p < 0.001
ITEM7 <- Fear of Negative Evaluation	0.905	0.019	48.569	p < 0.001
ITEM8 <- Fear of Negative Evaluation	0.863	0.027	31.475	p < 0.001
ITEM9 <- Fear of Negative Evaluation	0.792	0.035	22.478	p < 0.001
ITEM10 <- Positive Emotion Regulation	0.810	0.043	19.015	p < 0.001
ITEM12 <- Positive Emotion Regulation	0.821	0.033	24.948	p < 0.001
ITEM14 <- Positive Emotion Regulation	0.593	0.079	7.544	p < 0.001
ITEM15 <- Negative Emotion Regulation	0.700	0.086	8.159	p < 0.001
ITEM16 <- Negative Emotion Regulation	0.694	0.079	8.728	p < 0.001
ITEM18 <- Emotional Communication	1.000	0.000	n/a	p < 0.001
ITEM2 <- Positive Emotion Regulation	0.663	0.057	11.547	p < 0.001
ITEM3 <- Negative Emotion Regulation	0.763	0.055	13.781	p < 0.001
ITEM9 <- Positive Emotion Regulation	0.740	0.058	12.864	p < 0.001
ITEM10 <- Bulimia Nervosa	0.735	0.043	17.087	p < 0.001
ITEM11 <- Bulimia Nervosa	0.708	0.050	14.246	p < 0.001
ITEM15 <- Bulimia Nervosa	0.707	0.046	15.487	p < 0.001
ITEM16 <- Bulimia Nervosa	0.671	0.052	12.888	p < 0.001
ITEM3 <- Bulimia Nervosa	0.779	0.034	22.738	p < 0.001
ITEM4 <- Bulimia Nervosa	0.744	0.037	20.325	p < 0.001
ITEM7 <- Bulimia Nervosa	0.811	0.026	30.703	p < 0.001
ITEM8 <- Bulimia Nervosa	0.669	0.056	11.974	p < 0.001
ITEM9 <- Bulimia Nervosa	0.653	0.044	14.686	p < 0.001
ITEM1 <- Self-esteem	0.722	0.052	14.007	p < 0.001
ITEM10 <- Self-esteem	0.735	0.040	18.263	p < 0.001
ITEM4 <- Self-esteem	0.746	0.045	16.584	p < 0.001
ITEM5 <- Self-esteem	0.762	0.042	17.945	p < 0.001
ITEM6 <- Self-esteem	0.757	0.042	18.022	p < 0.001
ITEM7 <- Self-esteem	0.803	0.035	22.819	p < 0.001
ITEM9 <- Self-esteem	0.800	0.027	29.571	p < 0.001

As shown in Table 2, all twelve items of the Fear of Negative Evaluation (FNE) construct demonstrated high and statistically significant factor loadings ($p < 0.001$), indicating strong convergent validity.

Within the Self esteem construct, items 2, 3, and 8 were removed due to insufficient factor loadings and inadequate construct validity. The remaining items exhibited satisfactory reliability and validity.

Regarding Emotional Flexibility, several items from the Positive Emotion Regulation, Negative Emotion Regulation, and Emotional Communication components were excluded due to low factor loadings that weakened the measurement model. Retained items demonstrated adequate loadings and conceptual coherence with their respective dimensions. Consistent with the PLS SEM approach, single item components were retained where theoretically justified.

In the Bulimia Nervosa construct, items with low factor loadings were removed, and the remaining indicators demonstrated acceptable reliability and validity, supporting the adequacy of the final measurement model for assessing bulimic symptomatology.

Table 3

Direct and indirect coefficients between research variables

Result of the hypothesis	Path	STDEV	p-value	T-value	Confidence Interval		Result
					۲٫۵٪	۹۷٫۵٪	
Emotional Communication -> Bulimia Nervosa	0.126	0.067	0.060	1.884	-0.003	0.257	Reject
Emotional Communication -> Fear of Negative Evaluation	0.139	0.073	0.057	1.902	-0.010	0.280	Reject
Fear of Negative Evaluation -> Bulimia Nervosa	0.136	0.091	0.137	1.488	-0.045	0.317	Reject
Negative Emotion Regulation -> Bulimia Nervosa	-0.173	0.088	0.049	1.970	-0.351	-0.006	confirmation
Negative Emotion Regulation -> Fear of Negative Evaluation	-0.102	0.088	0.243	1.169	-0.280	0.062	Reject

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Positive Emotion Regulation -> Bulimia Nervosa	-0.238	0.092	0.009	2.596	-0.416	-0.056	confirmation
Positive Emotion Regulation -> Fear of Negative Evaluation	-0.169	0.082	0.039	2.061	-0.334	-0.013	confirmation
Self-esteem -> Bulimia Nervosa	-0.198	0.217	0.361	0.914	-0.627	0.233	Reject
Self-esteem -> Fear of Negative Evaluation	-0.807	0.165	p < 0.001	4.893	-1.126	-0.482	confirmation
indirect coefficients between research variables and significance							
Emotional Communication -> Bulimia Nervosa	0.019	0.016	0.239	1.177	-0.009	0.054	Reject
Negative Emotion Regulation -> Bulimia Nervosa	-0.014	0.018	0.435	0.781	-0.059	0.009	Reject
Positive Emotion Regulation -> Bulimia Nervosa	-0.023	0.021	0.285	1.068	-0.075	0.008	Reject
Self-esteem -> Bulimia Nervosa	-0.109	0.080	0.172	1.367	-0.281	0.033	Reject

As presented in Table 3 and Figures 1 and 2, emotional communication did not show a statistically significant association with bulimia nervosa symptoms ($\beta = 0.126$, $t = 1.884$, $p = 0.060$) nor with fear of negative evaluation ($\beta = 0.139$, $t = 1.902$, $p = 0.057$). Fear of negative evaluation itself was not significantly related to bulimia nervosa ($\beta = 0.136$, $t = 1.488$, $p = 0.137$).

Negative emotion regulation demonstrated a weak but statistically significant negative association with bulimia nervosa symptoms ($\beta = -0.173$, $t = 1.970$, $p = 0.049$), whereas its relationship with fear of negative evaluation was non significant. In contrast, positive emotion regulation showed significant negative associations with both bulimia nervosa symptoms ($\beta = -0.238$, $t = 2.596$, $p = 0.009$) and fear of negative evaluation ($\beta = -0.169$, $t = 2.061$, $p = 0.039$).

Self esteem was not directly associated with bulimia nervosa ($\beta = -0.198$, $t = 0.914$, $p = 0.361$); however, it demonstrated a strong and significant negative association with fear of negative evaluation ($\beta = -0.807$, $t = 4.893$, $p < 0.001$). Importantly, none of the indirect pathways through fear of negative evaluation were statistically significant.

Table 4

Coefficient of determination of the model

Variables	R-square	R-square adjusted
Bulimia Nervosa	0.312	0.290
Fear of Negative Evaluation	0.367	0.351

As shown in Table 4, the R^2 and adjusted R^2 values for bulimia nervosa were 0.312 and 0.290, respectively, indicating that approximately 29–31% of the variance in bulimic symptoms was explained by the model. For fear of negative evaluation, the R^2 value was 0.367 (adjusted $R^2 = 0.351$), reflecting acceptable explanatory power of the proposed model.

4. Discussion and Conclusion

The present study examined a structural model of bulimia nervosa symptoms based on emotional flexibility and self-esteem, with fear of negative evaluation positioned as a potential mediating mechanism. Overall, the findings provide a nuanced picture in which intrapersonal emotional regulation processes play a more decisive role than interpersonal evaluative concerns in explaining bulimic symptomatology. The model demonstrated acceptable explanatory power, accounting for a meaningful proportion of variance in bulimia nervosa symptoms and fear of negative evaluation, which supports the theoretical relevance of the selected constructs while also highlighting important distinctions in their functional roles.

One of the central findings of the study was the nonsignificant direct association between emotional communication and bulimia nervosa symptoms. Although emotional communication is often considered an important aspect of emotional functioning, this result suggests that the mere capacity to express or communicate emotions may not be sufficient to influence bulimic behaviors in individuals who already experience clinically relevant symptoms. This finding is consistent with transdiagnostic models of eating disorders, which emphasize that maladaptive behaviors such as binge eating and purging are more closely linked to how emotions are regulated rather than how they are verbally expressed (Mallorquí-Bagué et al., 2018; Ren, 2024). Prior research has similarly shown that individuals with eating disorders may be able to articulate emotional experiences

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while still relying on rigid or ineffective regulatory strategies, thereby maintaining symptom cycles (Mikhail et al., 2024). From this perspective, emotional communication may become clinically meaningful only when accompanied by adaptive regulation capacities, a distinction that helps explain its lack of predictive power in the present model.

In contrast, both negative and positive emotion regulation emerged as significant predictors of bulimia nervosa symptoms, underscoring the centrality of emotional flexibility in bulimic pathology. The negative association between negative emotion regulation and bulimia nervosa symptoms supports a substantial body of evidence conceptualizing binge–purge behaviors as maladaptive attempts to cope with aversive affective states such as anxiety, shame, and guilt (Hill et al., 2024; Mallorquí-Bagué et al., 2018). Individuals who are better able to regulate negative emotions appear less reliant on disordered eating behaviors as emotion-focused coping strategies. This finding aligns with longitudinal work demonstrating that changes in affect mediate the relationship between emotion regulation strategies and disordered eating over time (Mikhail et al., 2024). It also resonates with clinical studies in Iranian samples showing that rumination and deficits in emotion management significantly predict emotional eating and related behaviors (Arghavani Hadi et al., 2023).

Notably, positive emotion regulation showed a stronger association with bulimia nervosa symptoms than negative emotion regulation. This result adds to a growing body of literature suggesting that eating disorders are not solely maintained by heightened negative affect, but also by impairments in experiencing, sustaining, or tolerating positive emotional states (Mikhail et al., 2024; Ren, 2024). Individuals with bulimic symptoms may struggle with savoring positive experiences or may rapidly dampen positive affect due to fear of loss of control or subsequent emotional contrast. Such difficulties can paradoxically increase vulnerability to binge–purge behaviors as a means of regulating emotional arousal. This interpretation is consistent with evidence indicating that instability in affective states, rather than negative affect alone, plays a critical role in eating disorder behaviors (Hill et al., 2024). The present findings therefore support theoretical accounts that conceptualize bulimia nervosa as a disorder of emotional inflexibility broadly defined, encompassing both negative and positive affective domains.

With respect to self-esteem, the study revealed a strong and significant association with fear of negative evaluation, but no direct relationship with bulimia nervosa symptoms. This pattern suggests that self-esteem primarily operates through interpersonal evaluative processes rather than exerting a proximal effect on bulimic behaviors. Extensive prior research has documented the link between low self-esteem and heightened sensitivity to social judgment, criticism, and rejection (Pérez-Fuentes et al., 2019; Zanella & Lee, 2024). Structural modeling studies have further shown that low self-esteem influences disordered eating indirectly via executive functioning, social cognitions, and interpersonal conflict (Zanella & Lee, 2024). The present findings are consistent with this literature, indicating that diminished self-esteem substantially increases fear of negative evaluation, which reflects vulnerability in the social-evaluative domain.

However, fear of negative evaluation did not show a significant direct association with bulimia nervosa symptoms, nor did it mediate the relationships between emotional flexibility components or self-esteem and bulimic symptomatology. This is a critical finding that refines existing theoretical assumptions. While interpersonal fears and concerns about social judgment are commonly reported in individuals with eating disorders, the current results suggest that, in a symptomatic sample, these concerns may function more as contextual or correlational features rather than as core mechanisms driving bulimic behaviors. Once binge–purge patterns are established, intrapersonal processes related to emotion regulation may overshadow interpersonal evaluative fears in maintaining symptoms. This interpretation is consistent with reviews emphasizing that emotional dysregulation constitutes a more central and proximal mechanism in bulimia nervosa compared to social-cognitive variables (Melisse & Dingemans, 2025; Ren, 2024).

The nonsignificant mediating role of fear of negative evaluation also aligns with findings from studies suggesting that interpersonal evaluative concerns may be more influential during the onset or early stages of disordered eating, rather than during later, more entrenched phases (Khalid et al., 2025). In adolescent populations, peer influence and fear of negative evaluation have been shown to predict loss-of-control eating, particularly in interaction with low self-esteem and body dissatisfaction (Beckers et al., 2025). In contrast, adult clinical samples often exhibit symptom patterns that are maintained by habitual emotion regulation strategies and neurocognitive processes, which may reduce the relative impact of social evaluative fears (Norrlin & Baumann, 2025). The present findings therefore contribute to a more differentiated understanding of when

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and how fear of negative evaluation is relevant in bulimia nervosa.

Taken together, the results underscore the primacy of emotional flexibility, particularly positive and negative emotion regulation, as direct determinants of bulimia nervosa symptoms. Self-esteem appears to play a more distal role by shaping vulnerability to interpersonal evaluative concerns, while fear of negative evaluation does not function as a mediating mechanism within the tested model. These findings are broadly consistent with intervention research demonstrating that treatments directly targeting emotion regulation capacities and maladaptive self-schemas yield significant improvements in bulimic symptoms (Ashrafi, 2020; Bagheri Sheikhangafsheh et al., 2024; Ebrahimi Khabir, 2023). Compassion-based and cognitive-behavioral interventions focused on enhancing emotional skills and self-worth have likewise shown preliminary efficacy in related populations (Bridge et al., 2024). The present study therefore provides empirical support for transdiagnostic and process-based treatment approaches that prioritize emotional flexibility over exclusive focus on social evaluation concerns.

Despite the contributions of the present study, several limitations should be acknowledged. The cross-sectional design precludes causal inference and limits conclusions to associative relationships among variables. The reliance on self-report instruments may have introduced response biases, including social desirability and inaccurate reporting of binge–purge behaviors. The sample, while clinically relevant, was not diagnosed through structured clinical interviews, which may limit generalizability to formally diagnosed bulimia nervosa populations. Additionally, potentially relevant variables such as body image dissatisfaction, shame, attachment insecurity, and trauma history were not included in the model, which may have constrained the explanatory scope of the findings.

Future research would benefit from longitudinal and experimental designs to clarify the temporal ordering and causal pathways among emotional flexibility, self-esteem, fear of negative evaluation, and bulimia nervosa symptoms. Incorporating multimethod assessments, including clinician-rated measures and behavioral or physiological indicators of emotion regulation, could enhance measurement validity. Further studies should also examine whether fear of negative evaluation plays a stronger mediating role in adolescent or subclinical samples, as well as explore potential moderators such as gender, cultural context, and illness duration. Expanding structural models to include additional interpersonal and developmental variables may provide a more comprehensive understanding of bulimic pathology.

From a practical standpoint, the findings suggest that clinical interventions for bulimia nervosa may be most effective when they directly target emotional regulation capacities, particularly skills related to managing both negative and positive emotions. Strengthening emotional flexibility and fostering stable, non-contingent self-esteem may reduce reliance on binge–purge behaviors as maladaptive coping strategies. While addressing interpersonal concerns remains important for overall functioning, these results indicate that prioritizing intrapersonal emotional processes in assessment and treatment planning may yield greater therapeutic benefit for individuals with bulimia nervosa.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

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

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent.

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