

# Prediction of Bulimia Nervosa Based on Personality Traits with the Mediation of Emotional Intelligence in Nurses

Reza Shahi<sup>\*1</sup>, Rana Peyghami<sup>2</sup>, Saba Mohammadi Delband<sup>3</sup>, Atefeh Hojjati<sup>4</sup>

## Abstract

**Objective:** The purpose of this study was to provide a structural equation modeling for the effect of personality traits on bulimia nervosa with the mediating role of emotional intelligence in nurses.

**Method:** This research was a descriptive-correlational study that employed structural equation modeling with partial least squares. The research population consisted of all nurses of medical sciences hospitals in Tabriz in 2022. The research sample was 335 people who were selected using stratified sampling. The research tools employed for this purpose were the shorter form of NEO-FFI (NEO Five-Factor Inventory; 1985), the Binge Eating Scale (BES; Gormally et al., 1982), and Schering's Emotional Intelligence Questionnaire (1996). Partial least squares structural equation modeling (PLS-SEM) and Smart PLS 3 plus SPSS 26 were used for data analysis.

**Results:** The results showed that in the proposed model, the five main personality traits, except the extroversion variable, have a significant direct and indirect effect on bulimia nervosa, and another implication of this research is the significant direct effect of emotional intelligence on bulimia nervosa. Another finding was the significant direct effect of the main personality traits on emotional intelligence.

**Conclusion:** The results suggest that interventions for bulimia nervosa should embed education on personality traits and emotional intelligence because, according to the findings, the lower the personality traits, such as neuroticism and higher emotional intelligence, the lower the probability of bulimia nervosa.

**Keywords:** Bulimia Nervosa , Main Personality Traits , Emotional Intelligence.

## Introduction

Nurses are rightfully perceived to be among the largest sect of health service providers whose mental and psychological health have a significant effect on those of patients owing to their close relationship and interaction with patients and

their relatives (Farhangian, Mihandoost & Ahmadi 2021; Araghian Mojjarrad, Amir Khanlou & Jafari., 2021). Nurses are involved in critical departments, such as intensive care departments, requiring high awareness and preparation; therefore, paying attention to their feelings and emotions is of paramount significance (Raisi et al., 2019). There are four categories of emotional intelligence: self-awareness, self-regulation, empathy, and social awareness (Raisi et al., 2019). Emotional intelligence can be explained as how much a person is aware of and control emotions. Individuals with higher emotional intelligence can

1. Assistant Professor, Department of Statistics, Tabriz Branch, Islamic Azad University, Tabriz, Iran;

2. PhD student in psychology, Department of Psychology, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

3. PhD student in psychology, Department of Psychology, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

4. PhD student in psychology, Department of Psychology, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

\*Corresponding Author: Reza Shahi, Email: shahi@iaut.ac.ir

perform well in different situations and exhibit higher levels of efficiency and better performance in the occupational environment (Vosoghi et al., 2020). Through managing feelings and emotions, emotional intelligence alleviates the negative effects of job pressure (Yari et al., 2021).

Esfahani, Abedi, and Namdarpour (2022) showed that emotional intelligence has a significant positive relationship with occupational adaptability. Honarvar, Doustkam, and Tozandeh Jani (2022) stated that awareness can help enhance performance and is the most critical capacity of emotional intelligence that makes people aware of themselves. High emotional intelligence makes people perceivably more tolerant in the face of discomfort and more dismissive of destructive mechanisms, such as binge eating when highly negative emotions come to the fore (Parsamanesh et al., 2017).

Bulimia, short for bulimia nervosa, is simply one of the complications that may arise in nurses as a result of high work-related stress. It is an eating disorder characterized by episodes of eating more than what the body consumes in calories (Erfani et al., 2022). Such people use foods for feelings of relaxation and indulge in the physical act of eating under the misperception that makes unpleasant emotions go away (Asghari & Aghili, 2022). Recently, the prevalence of eating disorders and the ensuing have staggeringly increased (Rezaei, Mohammadkhani, & Jafari Roshan, 2021). Psychological, biological, psychodynamic, and personal factors are shown to be involved in the etiology of eating disorders (Kazemi Forushani, Mirdarikund, & Ghazanfari, 2019). Research has shown that sleep-related complications, anxiety, and worry are strongly correlated to psychiatric diseases, eating disorders being no exception (Ralph-Nearman et al., 2021).

Babadi et al. (2020) reported that the lack of necessary skills in managing emotions and stress

with specific personality traits can lead to bulimia nervosa. As such, evidence from the literature plentifully suggests that personality traits are the leading factor involved in bulimia. Personality is relatively stable and unique patterns of thoughts, feelings, and actions. Personality traits are thus attitudinal, motivational, experiential, and emotional styles that remain relatively stable (Taheri, Rahmati, & Bagheri, 2019). Since people's specific personality traits lead to different coping strategies, people respond to stress, pressures, and tensions differently (Sa'adat Azhar, Sobhi Gharamaleki, & Zargham Hajebi, 2021). The most common and practical model for determining personality traits is McCree and Costa's five-factor model of personality (Poier, 2021). The five main dimensions are extroversion, neuroticism, agreeableness, openness (short for openness to experience), and conscientiousness (Sadeghi et al., 2021).

Tabe'e Bordbar, Isa Khani, and Esmaili (2021) established, among others, that there is a positive correlation between neuroticism and anxiety and a negative relation between conscientiousness, agreeableness, extroversion, and openness to experience and anxiety. Findings from Ebrahimi, Zanganeh Motlagh, and Pirani (2022) showed a significant relationship between personality traits and cognitive regulation of emotion. The increasing prevalence of bulimia nervosa and the features it holds with other psychological disorders have necessitated the need to perform extensive studies. Furthermore, the literature addressing the correlation between bulimia nervosa and personality traits is uncharacteristically thin, especially in nurses. So, the purpose of the current study was to examine the role of five main personality traits and job stress of nurses in the prevalence of bulimia nervosa disorder with the mediating role of emotional intelligence.

## Method

### Participants and Procedure

Partial least squares Structural equation modeling (PLS-SEM) was used to test the hypotheses. The measurement model examines the reliability and validity of the measurement tools and research structures. The structural model examines hypotheses and relationships of the latent variables, and the Variance Inflation Factor (VIF) test was applied to examine the multicollinearity of the variables.

This current research is an applied study that employs a descriptive correlational design for data collection. The statistical population of this research was all the nurses of medical sciences hospitals in Tabriz in 2022, estimated to be 2000 people. According to the previous studies and based on the Morgan-Krejcie Table (1970), 335 people were selected using the stratified sampling method. Research questionnaires were administered to nurses on online platforms to collect data. The resulting data were analyzed using Smart PLS 3 and SPSS 26 and Partial least squares structural equation modeling (PLS-SEM)

### Ethical Statement

The participants were given necessary explanations on the purpose of the study and how to complete the questionnaires. No personal information was requested from the participants, and they participated in the research anonymously and with full consent and knowledge.

### Measures

In addition to the demographic questionnaire, which covered data regarding age, gender, education level, work experience, marital status, and employment status, the following questionnaires were used.

*NEO-FFI Personality Questionnaire:* The NEO-FFI questionnaire is the short form of the NEO

personality questionnaire designed in 1985 by McCree and Costa. This questionnaire contains 60 items addressing five main factors of personality, namely, neuroticism (N), extroversion (E), openness (O), agreeableness (A), and conscientiousness (C), for which the five-point Likert scale is used to score (Garussi-Farshi, Mehriar, & Ghazi Tabatabai, 2001). The reported alpha coefficient of this questionnaire by McCree and Costa is between 0.74 and 0.89 (Azizi & Salari Pak, 2021). The validity and reliability of this questionnaire have been confirmed both in terms of content and structure (Cheshme Sohrabi, Balochi, & Nouri, 2018).

*The Binge Eating Scale:* The Binge Eating Scale was developed by Gormally et al. (1982) and includes 16 items that evaluate the severity of overeating in obese people and extract the cognitive-emotional and behavioral dimensions of binge eating disorder (Niko Sarasht & Shomali Oskoui, 2021). The items are scored on a 4-point Likert score, and hence the total score falls in the range of 0-64 (Badaghi, Hasani, & Moradi, 2016). Molodi examined the psychometric properties of the Iranian version of this scale and reported its Cronbach's alpha as 0.85, and its reliability as 0.85. Furthermore, the pre-intervention Cronbach's alpha of this scale was calculated as 0.94 (Taghijatqavi et al., 2021).

*Emotional Intelligence Questionnaire:* This scale was designed by Siberia Schering in 1996 and includes five components of emotional intelligence, namely self-regulation, self-motivation, self-awareness, social skills, and social awareness (Salibi, 2022). This scale has 33 items scored on a five-point Likert scale (Yari et al., 2021). This test has been standardized for the Iranian population by Mansouri (2010), and its Cronbach's alpha was 0.85 (Vosoughi et al., 2001). Hatam Kia et al. reported the Cronbach's alpha of this scale to be 0.84 (Ebrahimi et al., 2020).

## Results

In this research, 335 people participated, of which 23% were women and 77% were men. Regarding marital status, 45.1% of participants were single, 52.5% were married, and 2.4% fell into other categories. Regarding educational level, 82.8% had bachelor's degrees, 15.6% had master's degrees, and 1.6% had Ph.D. Furthermore, 23.8% of participants were short-term contracted, 9.8% were contracted by outsourcing companies, 26.2% were middle-term contracted, and 40.2% were officially employed.

Partial least squares Structural equation modeling (PLS-SEM) was used to test the hypotheses. The measurement model examines the reliability and validity of the measurement tools and research structures, while the structural model examines hypotheses and relationships of the latent variables. Based on the analysis, the absolute values of the standardized factor loadings of all research items are greater than 0.5 and are significant, at least

at the 0.01 level. Therefore, all the items in the questionnaires are of sufficient reliability.

The Variance Inflation Factor (VIF) test was used to examine the multicollinearity of the variables. Based on the analysis, the VIF value of none of the items was higher than 5, and hence, there is no multicollinearity among model parameters. Table 1 shows the composite reliability, Cronbach's alpha, and AVE indices for the research variables.

Results from Table 1 indicated that the values of the composite reliability and Cronbach's alpha for the research variables are higher than 0.7, while that of the AVE index value is greater than 0.5. As a result, the validity of measurement tools and research structures is confirmed.

Table 2 presents the Pearson correlation coefficients and the discriminant validity index. The values on the main diameter of this matrix represent the square root of the average variance extracted (AVE). The discriminant validity requires that the value of the square root of the average explained

**Table 1.** Reliability of research variables

Variables	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Agreeableness	0.747	0.779	0.587
Bulimia nervosa	0.905	0.918	0.521
Conscientiousness	0.859	0.871	0.541
Emotional intelligence	0.887	0.902	0.581
Extroversion	0.804	0.809	0.556
Neuroticism	0.844	0.858	0.522
Openness	0.759	0.806	0.504

**Table 2.** Pearson correlation coefficients and discriminant validity index

Variables	1	2	3	4	5	6	7
1- agreeableness	0.622						
2- bulimia nervosa	0.392	0.722					
3- conscientiousness	-0.469	-0.344	0.736				
4- emotional intelligence	-0.571	-0.343	0.470	0.762			
5- extroversion	-0.407	-0.370	0.143	0.480	0.746		
6- neuroticism	0.613	0.136	-0.458	-0.749	-0.607	0.723	
7- openness	-0.318	-0.110	0.542	0.320	0.258	-0.194	0.710

variance (AVE) is greater than the absolute value of all the correlation coefficients of the relevant variable with the rest of the variables (Chen, 1988). Note: The main diameter shows the square root of the AVE

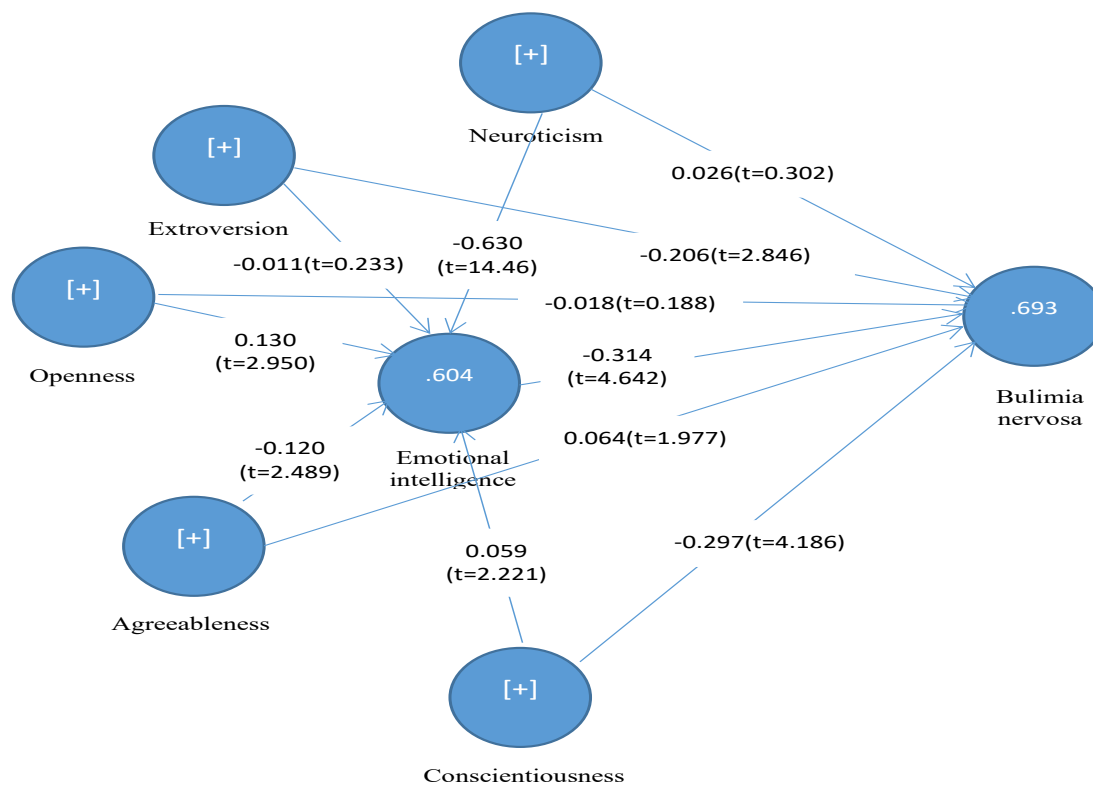
Table 2 indicates that the values on the main diameter have the highest value of the column, which indicates the validity of the constructs. After confirming the reliability and validity of measurement tools and research constructs (external model), the correlation of latent variables (representing the internal model) must be examined as well. In the analysis of structural equation modeling with partial least squares, which is done with PLS software, GOF, and NFI indices are usually reported for the goodness of fit of the model. These indicators are reported in Table 3.

**Table 3.** Goodness of fit indicators

Variables	GOF	NFI
Values	0.431	0.828

According to Table 3, because the GOF value is greater than 0.4 and the NFI value is close to 1. Therefore, the model used in this research is a suitable model. For this purpose, the proposed research model with details of path coefficients and t-statistics is presented in Figure 1.

The results from the PLS-SEM are shown in Table 4, suggesting that hypotheses 1, 3, 7, 10, and 11 have t-statistic values of greater than 2.58 and are hence confirmed at a significance level of 0.01, while hypotheses 4, 5, 9 have t-statistic values of greater than 1.96 and were confirmed at a significance level of 0.05. Nevertheless, hypotheses 2, 6, and 8 are rejected. The validity of the model was determined using the coefficient of determination (R<sup>2</sup>). It measures the explained variance of an endogenous variable by exogenous variables. The



**Figure 1.** The proposed research model based on path coefficients and t-statistics( The number in parentheses)

coefficient of determination for the endogenous variable of “emotional intelligence” was calculated to be 0.604; That is, 60.4% of changes in emotional intelligence can be explained through changes in neuroticism, agreeability, extroversion, openness to experience, and conscientiousness variables. Also, the coefficient of determination of the dependent variable “Bulimia nervosa” was calculated to be 0.693, i.e., 69.3 percent of the changes in “Bulimia nervosa” can be explained through changes in neuroticism, agreeability, extroversion, openness to experience, conscientiousness, and emotional intelligence.

The Sobel test was used to test the significance of the indirect effect of personality traits on the variable “Bulimia nervosa” through the mediator variable

“Emotional Intelligence”. The results of this test are shown in Table 5, where Z-values larger than 2.58 indicate significance at the level of 0.01, while Z-values larger than 1.96 reflect a significance level of 0.05. The results from Table 5 show that the effect of the variables of “neuroticism”, “openness to experience”, and “conscientiousness” on bulimia nervosa through the mediating variable of “emotional intelligence” is significant at the level of 0.01 ( $Z > 2.58$ ). Also, the effect of “agreeableness” on bulimia nervosa through the mediating variable “emotional intelligence” is significant at the 0.05 level ( $Z > 1.96$ ).

The findings nevertheless indicated that the effect of “extroversion” on bulimia nervosa through the mediating variable of “emotional intelligence”

**Table 4.** Path coefficients, t-statistics, and results of research hypotheses

	Research hypothesis	Path coeff.	t-value	Coeff. Of determination	Result
1	Neuroticism → Emotional Intelligence	-0.630	14.466*	0.604	Accepted
2	Extroversion → Emotional Intelligence	-0.011	0.233		Rejected
3	Openness → Emotional Intelligence	0.130	2.950**		Accepted
4	Agreeableness → Emotional Intelligence	-0.120	2.489*		Accepted
5	Conscientiousness → Emotional Intelligence	0.059	2.221*		Accepted
6	Neuroticism → Bulimia nervosa	0.026	0.302	0.693	Rejected
7	Extroversion → Bulimia nervosa	-0.206	2.846**		Accepted
8	Openness → Bulimia nervosa	-0.018	0.188		Rejected
9	Agreeableness → Bulimia nervosa	0.064	1.977*		Accepted
10	Conscientiousness → Bulimia nervosa	-0.297	4.186**		Accepted
11	Emotional Intelligence → Bulimia nervosa	-0.314	4.642**		Accepted

Note:  $1.96 < |t|$  Indicates significance at the 0.05 level

Note:  $> 2.58 |t|$  Indicates significance at the 0.01 level

**Table 5.** Sobel test

Indirect effects	Z statistics	VAF Index	Result
«neuroticism « → »emotional intelligence«→ »bulimia nervosa»	8.571**	0.884	Accepted
«extraversion→ » emotional intelligence«→ »bulimia nervosa	0.228	0.017	Rejected
«openness« →» emotional intelligence« → »bulimia nervosa»	-3.091**	0.694	Accepted
«agreeableness« → » emotional intelligence« → »bulimia nervosa»	2.374*	0.371	Accepted
«conscientiousness« →» emotional intelligence«→ »bulimia nervosa»	-4.360**	0.144	Accepted

is not significant ( $Z < 1.96$ ). Finally, the results revealed that the mediating variable of “emotional intelligence” could predict 88.4% of the total effect of the “neuroticism” variable, 69.4% of the total effect of the “openness to experience” variable, 37.1% of the total effect of the “agreeableness” variable, and 14.4% of the effect of “conscientiousness” on “Bulimia nervosa.”

### Discussion

The current research sought to examine the direct and indirect effects of emotional intelligence and the mediating role of personality traits on bulimia nervosa. Sobel test and partial least squares structural equation modeling were used to evaluate the direct and indirect effects of variables in explaining the model proposed for bulimia nervosa. The results showed that in the proposed model, the five main personality traits, except the extroversion variable, have a significant direct and indirect effect on bulimia nervosa. The findings of Kazemi Forushani, Mirdarikund, and Ghazanfari (2019), Babadi et al. (2022), and Ham, Iorio, and Sovinsky (2022) showed that personality traits can play a role in decreasing or increasing the incidence of bulimia nervosa, and can predict a significant amount of variation in this disorder. That is, given that there is a significant difference in the personality traits of people with and without bulimia nervosa, and the damage in the personality hinders adaptive coping

styles, people turn to maladaptive coping strategies such as bulimia nervosa (Mirzahosseini, Arjmand, & Munirpour, 2018).

Neuroticism is a personality trait that is associated with stress, anxiety, and emotional instability (Sharifi et al., 2018), and instability and emotional dysregulation are known risk factors for bulimia nervosa. Stress-related complications directly affect the hypothalamus, pituitary, and adrenal glands, causing an increase in cortisol levels, which has a direct role in binge eating behavior. Bulimia nervosa is a global level complication (Babadi et al., 1990). Also, according to the research of Rozbahani et al. (2020), stress can change biological function, which in turn causes changes in personality traits such as neuroticism, extroversion, openness to experience, etc. Consequently, they are related to bulimia nervosa. People who score high in agreeableness and conscientiousness exhibit highly desirable and adaptive responses to any situation, have more stability in their emotions, and are hence less vulnerable to stress and anxiety (Ebrahimi, Zanganeh Motlagh, & Pirani, 2022).

People with such traits are less likely to suffer from bulimia nervosa. People who score high on openness are more inherently ready for pleasurable experiences (Khalatbari et al., 2019), and since eating is considered a pleasurable activity, they are more susceptible to bulimia nervosa. Another implication of this research is the significant

direct effect of emotional intelligence on bulimia nervosa. In other words, the higher the level of emotional intelligence, the less the incidence of bulimia nervosa. The findings from ParsaManesh et al. (2017), Einipour and Mohsenzadeh (2019), Mahmoud Shaker et al. (2022), and Chen et al. (2022) indicated that people with eating disorders are less aware of their emotions and that such individuals fail to come up emotional regulatory practice at least in half of the episodes of bulimia nervosa (Shaker et al., 2022).

The ineffective emotion regulation strategy of people with bulimia nervosa leads them to eat as a coping mechanism for dealing with strong negative emotions (Shaker et al., 2022). Emotional intelligence is a multi-faceted construct that is made of several related emotional, social, and personal abilities that help us face the demands of daily life (Ebadi Vashmehsara & Khademi, 2013) and indicates better management of one's own and others' emotions, leading to a more sustained relationship with others (Rezaei-Far et al., 2020). As such, people with higher emotional intelligence are capable of better channeling their emotions and hence perform properly in stressful situations. Another finding of the current research was the significant direct effect of the main personality traits on emotional intelligence. The more adaptive personality traits, such as adaptability and openness in people, the more emotional intelligence will be (Naseer & Mussarat, 2022). Likewise, Saadat Azhar, Sobhi Gharamaleki, and Zargham Hajeji (2021) and Ebrahimi, Zanganeh Motlagh, and Pirani (2022) also showed that since different personality traits lead to different coping strategies, individuals act differently when faced with stress and emotions and that there is a significant relationship between personality traits and cognitive regulation of emotions. That is, individuals with proficiency, self-confidence, talent, and high personality skills are

also efficient in emotional intelligence features such as the ability to regulate emotions, intrapersonal and interpersonal skills, problem-solving, and high scores in traits of extroversion, agreeableness, openness, and neuroticism is associated with high scores in emotional intelligence (Naseer & Mussarat, 2022).

## Conclusion

The findings of this research can have far-reaching implications for the literature on the mediating role of emotional intelligence in the relationship between personality traits and bulimia nervosa. That is, participants who had a higher score in the personality trait of neuroticism were more susceptible to bulimia nervosa. Moreover, participants who had a high score in openness, adaptability, and conscientiousness traits could seemingly cope more effectively with the impulses of bulimia nervosa. Therefore, the findings of this research reflect the potential of interventions based on personality traits in reducing bulimia nervosa and that training emotional intelligence can be used to increase self-control and hence reduce the incidence of bulimia nervosa in individuals.

**Limitations:** One of the limitations of the present research is the use of convenience sampling. Also, using questionnaires, which rely on self-reporting, was another limitation of this research. Despite the suitability of the sample size employed for the current study, a larger sample can increase the statistical relevance and generalizability. Another limitation is the cross-sectional nature of the present study.

**Suggestions:** In future studies, it is suggested that to reduce the effects of cross-sectional, the availability of samples, and the self-report feature of questionnaires, longitudinal studies, convenience sampling, and parallel questionnaires be used, which were not possible due to some limitations in this study.



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