PREDICTIVE MODEL ON PERFECTIONISM IN FEMALE PATIENTS WITH EATING DISORDERS

MODELO PREDICTIVO SOBRE PERFECCIONISMO EN PACIENTES MUJERES CON TRASTORNOS ALIMENTARIOS

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ABSTRACT

Eating disorders are serious medical illnesses affecting multiple aspects of an individual's life. Psychological factors such as perfectionism, body dissatisfaction, and emotional distress are commonly found in eating disorder patients. Understanding how some of these variables can predict eating disorders is crucial for developing effective interventions and prevention treatments. In this study, we aim to examine the relationship between perfectionism, body dissatisfaction, maturity fears, depression, and anxiety in a sample of Mexican patients with eating disorders. The sample was 335 women with an age range of 18 to 40 years ($M = 21.73$, $S.D = 3.633$). Patients answered two self-report questionnaires: Eating Disorder Inventory and the Hospital Anxiety and Depression Scale. Multiple linear regressions analysis was performed. The regression model for the dependent variable "perfectionism" explained 44% of the variance with a greater presence of body dissatisfaction, maturity fears, feelings of ineffectiveness, as well as greater anxiety symptoms and older age. We observed a significant increase in maladaptive perfectionism; this was attenuated in the presence of depression symptoms. In this sample, the greatest predictor of maladaptive perfectionism was maturity fears. These issues should be addressed among young people from the general population and carry out prevention and intervention programs related to eating disorders.

KEYWORDS: Eating disorders, anorexia nervosa, bulimia nervosa, perfectionism, maturity fears.

RESUMEN

Los trastornos alimentarios son padecimientos serios que afectan múltiples áreas de la vida. Factores como perfeccionismo, insatisfacción corporal y angustia emocional son comunes en estos trastornos. Comprender cómo estas variables pueden predecirlos es crucial para desarrollar intervenciones eficaces. El objetivo de nuestro estudio fue examinar la relación entre perfeccionismo, insatisfacción corporal, miedo a madurar, depresión y ansiedad en pacientes mexicanas con trastornos alimentarios. La muestra fue de 335 mujeres, rango de edad de 18 a 40 años ($M = 21.73$, $D.E = 3{,}633$). Las pacientes respondieron a dos cuestionarios de autoinforme: Inventario de Trastornos de la Alimentación y Escala Hospitalaria de Ansiedad y Depresión. Realizamos análisis de regresión lineal múltiple. El modelo de regresión para la variable dependiente "perfeccionismo" explicó el 44% de la varianza con mayor presencia de insatisfacción corporal, miedo a madurar, sentimientos de ineficiencia, así como mayores síntomas de ansiedad y mayor edad. Observamos un aumento significativo en el perfeccionismo desadaptativo; no obstante, este fue atenuado en presencia de sintomatología de depresión. El mayor predictor de perfeccionismo desadaptativo fue el miedo a madurar. Esto debe abordarse entre jóvenes de la población general y desarrollarse programas de prevención e intervención relacionados con los trastornos alimentarios.

PALABRAS CLAVE: Trastornos alimentarios, anorexia nervosa, bulimia nervosa, perfeccionismo, miedo a madurar.

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Eating disorders (ED) are serious medical illness with multifactorial etiology characterized by eating behaviors and psychological disorders, often accompanied by changes in weight and/or social disturbances, which greatly impact quality of life and social functioning (APA, 2022). Classified within the category "Feeding and Eating Disorders" in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) by the American Psychiatric Association (APA, 2022), some of these disorders include anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED), and other specified and unspecified eating disorders (EDNOS).

ED exhibits the second highest mortality rate among mental illnesses, trailing behind opioid addiction (Arcelus et al., 2011 & Hay, 2020). Often occurring concomitantly with other psychiatric and medical conditions, mood and anxiety disorders are frequently reported alongside ED (Ulfvebrand et al., 2015). Major depression, generalized anxiety disorder, and specific phobias are among the disorders most associated with these psychopathologies, with no significant gender differences (Striegel Weissman et al, 2017). Furthermore, different studies have found that perfectionism in patients with ED is associated with a broad range of psychopathology (Ulfvebrand et al., 2015; Stackpole et al., 2023).

Perfectionism is a significant contributing factor in ED (Bardone-Cone et al., 2007; Franco Paredes et al., 2005) A study conducted by Dahlenburg and colleagues (2019) provides compelling evidence in this sense, revealing that heightened concern regarding mistakes was notably linked to AN and BN. This underscores the predictive capacity of perfectionism in the manifestation of these disorders, shedding light on its pivotal role in their development and progression (Stackpole et al., 2023; Suh et al., 2021).

It is important to differentiate between adaptive and maladaptive perfectionism. Adaptive perfectionism involves a healthy pursuit of excellence and growth, while maladaptive perfectionism is characterized by unrealistic standards, intense self-criticism, and negative psychological consequences (Stackpole et al., 2023). In the case of ED, maladaptive perfectionism not only predicts concerns about body image, but also contributes to a range of extreme behaviors aimed at alleviating distress. These behaviors may include compulsive exercise, strict dietary restrictions, self-induced vomiting, and abuse/misuse of laxatives or diuretics, among others. Individuals with maladaptive perfectionism may engage in these behaviors as a means of attaining the perceived "perfect" body they desire, often at the expense of their physical and mental health (Boone et al., 2013).

According to the integrative model of perfectionism, supported by the current bioecological model, perfectionism emerges through a combination of external influences within the family or environment, as well as personal factors related to a child's temperament or disposition. For instance, evidence suggests that both anxiety and maladaptive perfectionism have moderate heritability (Franco Paredes et al., 2005). On an individual level, perfectionism plays a significant role in shaping personality traits and is regarded as a cognitive pattern that can either enhance or impede relevant skills. While maladaptive perfectionism may hinder problem-solving abilities or metacognitive regulation, it is also associated with high intellectual capacity, leading to the pursuit of excellence (Livazović & Kuzmanović, 2022). Additionally, sociodemographic traits, such as relationships with family, peers, and colleagues, as well as life satisfaction and media content interests could represent significant perfectionism predictors (Dahlenburg et al., 2019; Pérez Bustinzar et al., 2023).

Given the above, perfectionism could be influenced by a complex interplay of psychological and physiological variables like body dissatisfaction, maturity fears, feelings of ineffectiveness, anxiety, and depression. In this way, anxiety and depression may act as triggers or

maintenance factors, while maturity fears can intensify the desire to control body and weight. Meanwhile, body mass index (BMI) may serve as a physiological indicator of the severity of the disorder, though it does not always reflect the complexity of underlying psychological processes (Sahle et al., 2019). Therefore, in this study, we aim to analyze the role of maladaptive perfectionism in ED, considering other variables such as body dissatisfaction, maturity fears, feelings of ineffectiveness, anxiety, depression, and BMI in a sample of Mexican female patients with ED.

METHOD

Sample

The sample consisted of 335 females within an age range of 18 to 40 years (M = 21.73, S.D = 3.633). In the sample, we included patients diagnosed with AN, BN, BED, and EDNOS recruited from an Eating Disorders Clinic between January 2013 and March 2022. Patients met the diagnostic criteria for an ED according to DSM-5 (APA, 2013) (Table 1). The mean weight was 54.89 kg, with an average BMI of 21.01kg/m^2. Assessment for primary ED and comorbid conditions were conducted through a clinical interview and questionnaires applied by the institution's team of psychologists.

TABLE 1.
Sociodemographic Data of the Patients (*N*=335).

Variables		*n*	%
Sex	Female	335	100%
Age (18-40 years)			
BMI	Underweight	153	45.60%
	Normalweight	105	23.10%
	Oveweight	51	15.20%
	Obesity	26	7.20%
Eating Disorder			
	AN	129	38.60%
	BN	98	30%
	BED	38	11.90%
	EDNOS	60	19.40%

Note: BMI=body mass index; AN=anorexia nervosa; BN=bulimia nervosa; BED=binge eating disorder; EDNOS=eating disorder not otherwise specified

Instruments

General Data Sheet. Created for this study, this sheet consists of 8 questions regarding sociodemographic information such as age, sex, height, weight, origin, family history of illnesses, diet history, and eating habits.

Interview for Eating Disorder Diagnosis (IDED). This instrument is based on DSM-5 criteria and in accordance with the IDED interview for eating disorders (Williamson et al., 1995). It is a semi-structured interview consisting of 18 questions. Differential diagnoses between AN, BN, and BED are conducted. The interview covers aspects related to problem history, eating symptomatology, and general assessment items. It typically lasts 30 to 45 minutes. Among its psychometric properties for the Spanish version, it have adequate levels of internal consistency for its subscales (AN α=.75, BED α=.96, and BN α=.75). Likewise, it has been shown to have content, concurrent and discriminant validity (Vázquez Arévalo et al., 2000).

Eating Disorder Inventory (EDI). Constructed and validated by Garner and colleagues (1983), this inventory evaluates cognitive-behavioral characteristics associat-

ed with AN and BN. The inventory comprises 64 items with a six-point Likert-type response scale. The original version was developed in a sample of 113 women diagnosed with AN and 557 university women (Garner et al., 1983). The 64 items significantly differentiated between the samples, with 61 items correlating above .40 with the total score. The validation for Mexico (Santoncini et al., 2006) indicated internal consistency of α=.92 and all EDI items, except for item 1, correlated with the total score. Exploratory factor analysis (EFA) identified eight factors grouping 44 items, explaining 41.7% of the total variance; this structure coincided with Garner and colleagues' proposal (1983). In the present study, we used the subscales of maladaptive perfectionism, body dissatisfaction, fear of maturation, and feelings of ineffectiveness.

Hospital Anxiety and Depression Scale (HADS). This scale comprises two subscales, Depression and Anxiety, each with seven items. Subscale scores can range from 0 to 21 points, as each item offers four response options ranging from 0 (absence/minimal presence) to 3 (maximum presence). Higher scores indicate greater intensity or severity of symptoms. The assessment covers the past seven days. The Cronbach's alpha coefficient of the scale ranges from 0.81 to 0.90. Barriguete and colleagues (2017) validated the scale for patients with eating disorders in Mexico, demonstrating good reliability and validity. In this study, we utilized the subscales for anxiety and depression, as well as the total score (Barriguete Meléndez et al., 2017).

Procedure

We carried out this study in an intensive outpatient clinic for ED. An intensive outpatient clinic for eating disorders is a specialized treatment facility that provides structured therapy and support for these individuals. Unlike inpatient or residential treatment programs where patients reside full-time within the facility, intensive outpatient programs offer more flexibility by allowing patients to continue living at home while attending therapy sessions and receiving support during scheduled hours throughout the week. They receive between 5 and 6 hours of treatment a day. Clinical psychologists, in collaboration with the medical and nutritional team, conducted initial assessments and diagnosed ED following DSM-5 criteria (APA, 2022).

Ethical Considerations

This study received ethical approval from the Ethics Committee of the Eating Disorders Clinic. We ensured participants absolute confidentiality through the signing of informed consent forms. Furthermore, we provided them with detailed information about the purpose of the study, the procedures involved, and how their data was handled and protected. We informed them that data collection would be used solely for academic purposes.

Statistical Analysis

We utilized SPSS Statistics 27 for data processing and statistical analyses. Descriptive statistics were used to describe sociodemographic data. To calculate associations, we employed Pearson correlation coefficients, and interpreted effect sizes based on Cohen's criteria: 0.10= small, 0.30=moderate, and 0.50=large correlation. We conducted a series of tests to verify the assumptions necessary for multiple linear regressions. These include data normality, linearity of the relationship between predictor variables and the outcome variable, absence of multicollinearity, and absence of outliers. We applied the Kolmogorov-Smirnov test to assess data distribution.

Regarding data inclusion in the analysis, we only considered completed questionnaires. Partial or missing responses resulted in the exclusion of questionnaires. We established a significance level of $p < 0.05$ to determine statistical significance. We conducted Spearman correlations to test hypotheses given that variables did not meet the normality assumptions and performed simple and multiple linear regressions for modeling purposes.

RESULTS

Descriptive Analysis

In Table 2, we display descriptive statistics for the clinical sample. The average total score on the Eating Disorder Inventory was 68 and on the Hospital Anxiety and Depression Scale was 34.33.

TABLE 2.
Descriptive Analysis of all Measurements (N=335).

	M	*S.D*	Min.	Max.
Eating Disorders Inventory (EDI)				
1. Body Dissatisfation	10.43	8.56	0.00	27.00
2. Perfectionism	8.39	4.73	0.00	18.00
3. Maturity Fears	7.48	5.85	0.00	24.00
4. Feelings of ineffectiveness	6.38	7.06	0.00	30.00
5. EDI TOTAL	68.00	16.73	31.00	108.00
Hospital Anxiety and Depression Scale (HADS)				
6. Anxiety	9.87	4.61	1.00	9.87
7. Depression	5.59	4.09	0.00	5.59
8. HADS TOTAL	34.33	4.44	20.00	34.33

Note. *M*=Mean; *SD*=Standard Deviation

Correlation Analysis

The analysis of bivariate correlations we conducted on the sample (Table 3) revealed that the factors from the EDI (Garner et al., 1983) exhibited significant positive correlations ranging from low to medium (20 and .48), with the variables from the HADS (Barriguete et al., 2017). Our findings partially support the hypothesis that there is an association between maladaptive perfectionism, body dissatisfaction, fear of maturation, depression, and anxiety in patients with ED as all the predicted variables are interrelated.

TABLE 3.
Correlations Between the Assessments.

Assessment	1	2	3	4	5	6	7	8
1. Body dissatisfaction	-							
2. Maladaptive perfectionism	.24**	-						
3. Maturity fears	.35**	.35**	-					
4. Feelings of Ineffectiveness	.48**	.35**	.57**	-				
5. EDI TOTAL	.48**	.34**	-.36**	-.45**	-			
6. Anxiety	.44**	.30**	.46**	.57**	-.49**	-		
7. Depression	.38**	.20**	.39**	.57**	-.38**	.71**	-	
8. HADS TOTAL	.40**	.26**	.40**	.48**	.41**	-.81**	-.54**	-

Note. **Correlation is significant at the 0.01 level (bilateral).

Multiple Linear Regression

Based on the preceding results, we conducted a series of multiple linear regression analyses, incorporating the independent variables. The dependent variable we introduced was maladaptive perfectionism. To determine the candidate variables for inclusion in the multiple linear regression model, we performed an analysis with each of the independent variables. The variables that did not prove significant were sex, diagnosis, and BMI. In Table 4, we present the initial results upon including all the selected variables.

TABLE 4.
First Regression Model for the Variable "Perfectionism".

Variable	Coefficient	Std. error	*p*	exp (B)
Constant	4.22	1.33	0.002	
Body dissatisfaction	0.04	0.03	**0.005***	0.07
Maturity fears	0.17	0.04	**0.001***	0.21
Feelings of Ineffectiveness	0.13	0.04	**0.006***	0.19
Anxiety	0.16	0.07	**0.034***	0.15
Depression	-0.16	0.08	**0.053***	-0.13
Age	0.21	0.09	**0.029***	0.11
Diagnosis	0.11	0.09	0.242	0.05
BMI	-0.05	0.04	0.239	-0.07

Note: BMI=body mass index

The regression model for the dependent variable maladaptive perfectionism (Table 4) accounted for 44% of the variance. According to the obtained model, higher levels of body dissatisfaction, fear of maturation, feelings of ineffectiveness, as well as greater anxiety symptoms and older age, are associated with higher maladaptive perfectionism. However, the presence of depressive symptoms is associated with lower maladaptive perfectionism.

Subsequently, a regression model was constructed using only the significant variables. In this second model, the variable that did not prove significant was body dissatisfaction. We present the results of this second model in Table 5.

TABLE 5.
Second Regression Model for the Variable "Perfectionism".

Variable	Coefficient	Std. error	*p*	exp (B)
Constant	4.66	0.622	0.002	
Body dissatisfaction	0.02	0.03	0.42	0.04
Maturity fears	0.18	0.04	**0.001***	0.22
Feelings of Ineffectiveness	0.12	0.04	**0.009***	0.18
Anxiety	0.16	0.07	**0.030***	0.16
Depression	-0.15	0.08	**0.06***	-0.13
Age	0.18	0.09	**0.05***	0.95

The second regression model for the dependent variable maladaptive perfectionism (Table 5) accounted for 43% of the variance. According to the obtained model, higher levels of fear of maturation, feelings of ineffectiveness, greater anxiety symptoms, and older age are associated with higher maladaptive perfectionism. However, the presence of depressive symptoms is associated with lower maladaptive perfectionism.

Finally, we constructed a regression model using only sociodemographic variables. This regression model for the variable maladaptive perfectionism (Table 6) accounted for 6.1% of the variance. The only significant variable in this model was age.

TABLE 6.
Regression Model for the Variable "Perfectionism" with Sociodemographic Variables.

Variable	Coefficient	Std. error	*p*	exp (B)
Constant	8.75	1.38	0.001	
Age	0.27	0.13	**0.039***	0.144
Sex	0.18	0.99	0.855	0.009
Marital status	-1.03	0.60	0.086	-0.114
Diagnosis	0.04	0.10	0.676	0.022
BMI	-0.01	0.04	0.762	-0.176

Note: BMI=body mass index

DISCUSSION

The main purpose of our research was to investigate the role of maladaptive perfectionism in the context of ED. Through descriptive, correlational, and regression analyses, we delved into the interactions between maladaptive perfectionism and factors such as body dissatisfaction, maturity fears, depressive and anxiety symptoms, and sociodemographic variables.

The descriptive analysis provided a snapshot of the clinical sample, indicating an average total score of 68 on the EDI and 34.33 on the HADS. In the latter scale, the scores related to depression were higher comparing to the general population (cutoff point 12). These underline the severity of symptoms experienced by individuals within the sample, highlighting the need for further investigation into underlying psychological constructs contributing to ED pathology. In this way, earlier research has indicated that perfectionism among individuals with ED is linked with conditions such as depression and anxiety disorders (Behar et al., 2014; Bizeul et al., 2003 & Ernst et al., 2021). This suggests that ED pathology is not only characterized by disordered eating behaviors but also by significant comorbid psychological symptoms, which may exacerbate the complexity of diagnosis and treatment.

The significant correlations identified between factors from the EDI and HADS corroborate the notion that maladaptive perfectionism, along with other factors such as body dissatisfaction and maturity fears, play an important role in the manifestation of depressive and anxiety symptoms among individuals with ED. This finding coincides with existing literature that has established associations between eating behaviors, depressive symptoms, and perfectionism (Ferreira et al., 2014). Moreover, the predictive capacity of perfectionism regarding both the onset and maintenance of ED emphasizes the enduring influence of perfectionistic tendencies throughout the course of the disorder (Hicks et al., 2022). In this way, individuals with elevated levels of perfectionism may face prolonged disease durations and poorer prognoses (Laporta-Herrero et al., 2020). This emphasizes the multifaceted nature of ED pathology. Furthermore, these findings highlight the importance of early identification and intervention for perfectionistic traits in individuals at risk for or already diagnosed with ED. By addressing perfectionism as an important component of intervention and prevention treatment.

The multiple linear regression analyses offered deeper insights into the predictors of maladaptive perfectionism within the sample. Refining the regression model by including only significant variables maintained its robust predictive capacity, explaining 43% of the variance. This model underscored the significance of maturity fears as a key predictor. Body dissatisfaction was not significant in the second model; this finding was similar to research conducted by Mahoney (2018). They found out that anxiety and various life challenges may contribute to the exacerbation of psychopathological development with age. However, it is worth noting that while age could indeed play a pivotal role in this process, its correlation with body dissatisfaction might not follow a straightforward path.

It is important to highlight the findings related to maturity fears as it was one of the variables that most explained maladaptive perfectionism. However, it is a scarcely investigated factor in the literature and warrants greater attention due to its prognostic importance in patients with ED. Previous research has suggested that taking on certain adult roles and responsibilities, such as having a life partner and becoming a mother, can predict a reduction in eating psychopathology (Fitzgerald et al., 2021). Recent observations indicate that maturity fears have increased generationally for both men and women, and cultural attitudes toward aging have become increasingly negative

over time. Therefore, further investigation and clinical interventions addressing this issue with patients are necessary (Wick et al., 2021).

Finally, among sociodemographic variables, only age demonstrated a significant influence on maladaptive perfectionism. Despite the prevalent focus on studying eating psychopathology in adolescents (Stabouli et al., 2021), it is crucial to acknowledge that the complexities of maturation extend beyond adolescence into adulthood. Notably, a substantial portion of our sample comprised adults, underscoring the importance of examining how challenges associated with aging may persist beyond adolescence.

This study presents both strengths and limitations. An important strength was the large clinical sample of patients with ED that were evaluated, and another significant contribution was the use of standardized and structured instruments to measure mental disorders. However, the study does have limitations that must be acknowledged. Uncontrolled variables that might affect the relationships between variables could exist (e.g., comorbid mental health conditions, personality traits, cultural factors, trauma history, among others). Additionally, the sincerity of participants' responses was left to their discretion, as self-report measures were employed. The results are all comparing maladaptive perfectionism. Although this information is important, more research and analyses are required to determine if individuals are more adaptively perfectionistic compared to those with other psychological disorders. As for future research directions, other more comprehensive assessment instruments for perfectionism could be considered, in addition to replicating the research in clinical samples with a larger number of subjects. Other types of variables that might be related to maladaptive perfectionism, such as low self-esteem, dietary restriction, and emotional regulation, should also be considered.

In conclusion, the findings of this study underscore the significant role of perfectionism in the context of ED, as evidenced by its robust associations with various psychological factors. The strong associations identified between perfectionism and these psychological constructs highlight the multifaceted nature of ED pathology, emphasizing the interplay between cognitive, emotional, and behavioral factors. By targeting perfectionism as a central component of therapeutic interventions, clinicians can effectively address underlying vulnerabilities and facilitate more comprehensive recovery outcomes for individuals grappling with ED.

Research Ethical Standards

Funding: This study did not receive any funds.

Declaration of Conflicting Interest: The authors declared no conflicts of interest.

Approval from the Institutional Review Board for Human Research: The research protocol does not have a number of approvals. However, the Ethics Committee of the Eating Disorders Clinic where the study was conducted revised the protocol, ensuring that it complied with the Helsinki Declaration.

Informed Consent/Assent: The authors considered ethical responsibilities in line with the journal's standards and gave informed consent to participants in this research.

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