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Borderline Personality Disorder (BPD) diagnosis with the self-report Personality Diagnostic Questionnaire–4+(PDQ-4+): Confirmation of the 3-factor structure

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Introduction. The clinical heterogeneity and elevated comorbidity of Borderline Personality Disorder (BPD) have suggested the possible existence of several factors or subtypes of this construct. Studies published to date mainly show that this diagnosis could be represented either as a 1-dimensional model or 3-factor model. However, most of the studies have analyzed the factorial structure of the BPD DSM-IV criteria only using semi-structured interviews. This study has aimed to analyze the factorial structure of BPD DSM-IV criteria used in the self-report PDQ-4+.

Method. A total of 159 psychiatric outpatients with suspicion of BPD diagnosis were evaluated. Confirmatory Factor Analyses (CFA) was performed for BPD criteria in PDQ-4+ and two previously defined structures were examined and compared: a 1-dimensional model and a 3-factor model.

Results. Both models showed good fit indexes. However, the results of the CFA showed better goodness of fit indexes (χ^2/gl; CFI; RMSEA; TLI; AIC and GFI) for the 3-factor model.

Conclusions. BPD is a construct that can be used to describe three factors of criteria that represent different features of this disorder. The three factors, which could be called Disturbed Relatedness, Affective Instability and Behavioral Dyscontrol, can also be explained by the combination of different diagnostic criteria. The existence of these factors could indicate the presence of different subgroups of BPD patients with different clinical patterns.

Keywords:
Borderline Personality Disorders, PDQ-4+, Self-report, Confirmatory Factor Analyses

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Diagnóstico del Trastorno Límite de Personalidad (TLP) mediante el autoinforme *Personality Diagnostic Questionnaire-4+*(PDQ-4+): Confirmación de la estructura de 3 factores

Introducción. La heterogeneidad clínica y la elevada comorbilidad del Trastorno Límite de Personalidad (TLP) han planteado la posible existencia de varios factores o subtipos dentro del mismo constructo. Los estudios publicados hasta la fecha indican principalmente que el diagnóstico puede estar representado como un constructo unifactorial o de 3 factores. Sin embargo, la mayoría de los trabajos han analizado la estructura factorial de los criterios TLP del DSM-IV utilizando entrevistas semi-estructuradas. El objetivo del presente trabajo es analizar la estructura factorial de los criterios diagnósticos DSM-IV del TLP del autoinforme PDQ-4+.

Método. Se evaluó una muestra total de 159 pacientes psiquiátricos ambulatorios con sospecha de TLP. Se realizó un Análisis Factorial Confirmatorio (AFC) de los criterios TLP del PDQ-4+, examinando y comparando dos estructuras definidas previamente: una estructura unidimensional y una de tres factores.

Resultados. Ambos modelos muestran buenos índices de ajuste al modelo. Sin embargo, los resultados obtenidos del AFC pusieron de manifiesto unos índices de bondad de

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ajuste (χ^2/gl; CFI; RMSEA; TLI; AIC y GFI) superiores para el modelo de tres factores.

Conclusiones. El TLP es un constructo bajo el cual se pueden describir 3 factores de criterios que representan distintas características del trastorno. Estos factores de TLP, que se podrían denominar como Alteración relacional, Inestabilidad afectiva y Descontrol conductual, se explicarían a partir de la combinación de los diferentes criterios diagnósticos. La existencia de estos factores podría indicar la presencia de subgrupos de pacientes TLP con perfiles clínicos diferenciados.

Palabras clave:
Trastorno Límite de Personalidad, PDQ-4+, Autoinforme, Análisis Factorial Confirmatorio

INTRODUCTION

Borderline Personality Disorder (BPD) is considered to be one of the most complex and controversial psychiatric disorders because of its elevated clinical heterogeneity and to the important comorbidity it has with other disorders. Its diagnosis, based on a list of nine polythetic criteria of the DSM-IV (DSM-IV),[1] five or more of which are required for the diagnosis, generates great heterogeneity because 151 combinations of criteria for BPD can be used for its diagnosis. This variety in the clinical presentation of BPD hinders its evaluation and generates controversy. Added to this diagnostic heterogeneity is the varied comorbidities of BPD, both in axis I as well as axis II, as described in the literature. [2] In fact, many of the diagnostic criteria of this disorder, such as emotional instability and in the disturbed relatedness or impulsiveness are common to other psychiatric disorders.

Because of the complexity in its diagnosis, it has been suggested that BPD may not be a single construct, that is, BPD could possibly be best explained according to the existence of several constructs or latent classes. Along this line, a series of works have been published up to date that have studied the relation between the BPD criteria of the DSM, using different statistical procedures.[3-12] The methods used the most have been the exploratory factor analysis (EFA),[3, 4, 8] the confirmatory factor analysis (CFA)[5, 7, 9, 10] and the latent class analysis (LCA).[5, 7, 11] The results of said studies have identified, in general, two possible underlying factor structures. While some works defend that the DSM criteria of the BPD are organized following a three-factor structure,[4, 6, 8, 9, 12] others have suggested the existence of a single dimensional construct.[3, 5, 7]

Standing out among the works that defend the existence of a three-factor model obtained from the use of the EFA is that of Clarkin et al.[4] These authors study the factorial structure of the BPD according to the DSM-III-R criteria. They describe three factors that they identify as Identity Problems and interpersonal difficulties (it would include the criteria of identity disorder, chronic feelings of emptiness, efforts to avoid abandonment instability in relationships); Affective dyregulation (criteria: inappropriate anger, affective instability and suicide); and Impulsivity (single criterion- impulsivity). After, Sanislow et al.,[9] using the 3-factor structure previously obtained by these same authors with the EFA,[8] analyzed the DSM-IV criteria by CFA. The authors proposed the existence of a model having three-factor model underlying the BPD construct. These factors could be defined as disturbed relatedness (consisting in unstable relationships, identity disturbance and chronic emptiness), behavior dyregulation (impulsivity and suicidal criteria) and affective instability (criteria of affective instability, inappropriate anger and efforts to avoid abandonment). These results were confirmed later by Johansen et al.,[6] who replicated the tridimensional structure of Sanislow using the same type of analysis in a Norwegian sample, also indicating that said factors are highly correlated. The 3-factor structure was also recently replicated by our group in a sample of Spanish patients, using the complementary information of the two semi-structured interviews used most in the investigation of BPD.[12]

Standing out among the studies that defend BPD as a unidimensional construct is the work of Fossati et al.[7] carried out using a CFA and also a CLA of the DSM-IV criteria. The authors found evidence favoring the description of BPD as a single factor, although they state that these results would not necessarily imply the non-existence of subtypes of patients. After, and coinciding with these results, Clifton and Pilkonis[5] compared unidimensional models and those of 3-factors using the same statistical analysis (CFA and LCA) in clinical and non-clinical samples. They concluded that although the 3-factor model obtains acceptable fit indexes, the diagnosis of BPD is better explained from a unidimensional model. For these authors, the unidimensional model is preferable given the elevated correlation existing between the factors when dealing with a tridimensional model. The unidimensional model has also been recently confirmed by Becker et al.,[3] although this is being done by an EFA.

Thus, the review of the mentioned studies indicates a lack of unanimity regarding which one of the empirical models described (the one or three factors) can best explain the factorial structure of the BPD. Considering that most of the works performed have been based on semistructured clinical interviews, the present work proposes to replicate the previously mentioned works, analyzing the factorial structure based on a self-report that follows the DSM-IV criteria for the diagnosis of Personality Disorders (PD). Confirmation of some of the previously-described results beginning with the use of a different procedure of evaluation would increase the validity of the structure obtained.[9] In this sense, the present work proposes to study the factorial

structure of the DSM-IV criteria of the BPD using the Personality Diagnostic Questionnaire-4+ (PDQ-4+),[13] studying and comparing the two factorial structures that have received the best previous empirical support in the literature: the unifactorial structure supported by authors such as Fossati et al.[7] and that of the three factors of Sanislow et al.[9]

METHODOLOGY

Participants

In the study, 159 psychiatric patients consecutively seen in our outpatient program of the Hospital Psychiatry Service participated for evaluation and treatment of BPD. Exclusion criteria were: patients over 50 years, intellectual retardation, past or current diagnoses of psychotic disorders or bipolar type I disorder, presence of organic disease that could better explain the symptoms, and active substance abuse disorder. No patient was excluded from the study due to these criteria.

The study was approved by the Hospital Ethics Committee. Once the patients were duly informed in writing about the study, voluntarily accepted to participate and signed an informed consent after having received complete information about the study.

A total of 76.7% (n = 122) of the total sample were women. Mean age of the patients was 29.14 years (SD = 7.80) and 73.5% of the patients (n = 117) were single. Of the patients, 38.2% (n = 58) had completed studies equivalent to a high school diploma while only 11.3% (n = 18) had university studies or were currently in the university. Of the total sample, 37.9% (n=58) were actively working while 49% (n=75) were inactive (unemployed, with unemployed benefits or on sick leave). The most frequently diagnosed comorbid disorders on Axis I were substance abuse disorder (SAD) due to alcohol (n=52; 33.3%) and to cannabis (n=46; 29.5%), and anxiety disorders without agoraphobia (n=47; 30.1%) and major depressive disorder (n=37; 23.9%). In regards to the comorbidities with Axis II, these were more frequent with Obsessive-Compulsive PD (n=31; 19.6%), followed by Paranoid and Antisocial PD (in both n=28; 17.8%) and Avoidance PD (n=27; 17.1%).

Instruments

The SCID-II interview and PDQ-4+ self-report were used to diagnose BPD following the DSM-IV criteria. The Structured Clinical Interview for the PDs of Axis II of the DSM-IV (SCID-II)[14] is a structured clinical interview that allows the evaluation of all the specific PDs of Axis II of the DSM-IV as well as the 2 PDs of the Appendix and the nonspecific PD. The Structured Clinical Interview for the Disorders of Axis I of the DSM-IV (SCID-I)[15] is an interview that evaluates all the disorders of Axis I described in the DSM-IV.

The PDQ-4+ (Personality Diagnostic Questionnaire-4+)[13] is a 99-item self-report designed to evaluate the 12 PDs of Axis II of the DSM-IV (10 specific PDs included in Axis II and 2 PDs of Appendix B diagnoses pending study). Each item corresponds to a diagnostic criterion and the items are ordered randomly. Therefore, each PD has the same number of items that define each psychopathological entity of Axis II. The BPD Scale of the PDQ-4+ is made up of the nine items established as diagnostic criteria of the DSM (items 6, 19, 32, 45, 58, 69, 78, 93 and 98). This self-report makes it possible to obtain, in the first place, a general index of presence *versus* absence of PD in general. In the second place, the PDQ-4+ obtains a specific score for each PD, established according to the threshold score of the DSM-IV. The PDQ-4+ has demonstrated adequate psychometric properties[13] and its Spanish version has been validated by Calvo et al.[16] Although most of the works have used the complete version of the instrument, many of the recent studies have analyzed the psychometric properties of the BPD scale of the PDQ-4+ independently in clinical samples,[17-21] obtaining adequate coefficients of internal consistency.[17, 18, 22]

Procedure

All of the patients were interviews three times. The first was a clinical interview that screened for the clinical diagnosis of BPD according to the DSM-IV criteria and the study of the inclusion criteria. In the next two interviews, the SCID-II interview for diagnosis of BPD, the SCID-I for the diagnoses on Axis I and the self-report PDQ-4+ for the study of the presence of BPD were administered. These interviews were administered by three psychologists trained in the use of these instruments.

Statistical analysis

The statistical program AMOS (Analysis of Moment Structures Software)[23] was used to study which of the two factorial models most adequately represented the structure of the BPD according to the PDQ-4+. Goodness of fit of the models was evaluated using different fit indexes.[24] The indexes used were the Chi squared value divided by degrees of freedom (χ^2/gl), the Bentler Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA) and the Tucker-Lewis coefficient (TLI) were used. This study, following the Hu and Bentler criteria,[24] considered that a model was acceptable when the χ^2/gl was $\leq$ 2.0 (the lower the index, the better the fit). CFI values of approximately 0.95 were used to accept the model. Values in the RMSEA

Table 1 Goodness of Fit Indexes of the different models based on the Confirmatory Factorial Analysis

	χ^2(gl)	χ^2/gl	CFI	RMSEA	TLI	AIC	GFI
1 Factor	53.14(27)	1.968	0.860	0.078	0.813	89.137	0.939
3 Factors	41.52(24)	1.730	0.906	0.068	0.859	83.518	0.953

χ^2(gl) = Chi squared (degrees of freedom); (χ^2/gl) = Chi squared divided by degrees of freedom; CFI = Comparative Fit Index of Bentler; RMSEA = Root Mean Square Error of Approximation ; TLI = Tucker-Lewis coefficient; AIC = Akaike Information Criterion ; GFI = Goodness of fit index.

equal to or less than 0.06 indicate very good fit (the lower the value, the better the fit), considering values of approximately 0.08 as acceptable, and the TLI with values of approximately 0.95 to accept the model. The group of indexes was completed with the Akaike Information Criterion (AIC;) and the Lisrel goodness of fix index (GFI). The AIC is a relative indicator: in the absence of other sustantive criteria, the best model is that having a lower AIC (the lower the value, the better the fit). In order to have a good fit, the GFI value should be close to 0.90 (the higher the value, the better the fit). Finally, the significance of the difference of the χ^2 statistics of the two models (χ^2_{diff}) was calculated. The significance of χ^2_{diff} shows the superiority of the model controlled by the degrees of freedom.

The factorial structure of the items of the BPD scale of the PDQ-4+ (DSM-IV) was studied, comparing the two models informed on in previous works with CFA: the unifactorial model supported by Fossati et al.[7] and the 3-factors model described by Sanislow et al.[9] The latter was made up of 3 factors that grouped different DSM-IV criteria for each one. Factor 1, defined as "disturbed relatedness" included criteria 2 (unstable and intense interpersonal relationships), 3 (identity disturbance) and 7 (chronic feelings of emptiness); Factor 2, called "Behavior dyregulation," criteria 4 (impulsivity) and 5 (suicidal behaviors and self-mutilation); and Factor 3, labeled as "affective instability," criteria 6 (emotional instability due to important reactivity of the mood state), 8 (inappropriate and intense anger and difficulties to control it) and 1 (efforts to avoid abandonment).

RESULTS

Of the total sample of 159 patients evaluated, 93 (58.5%) fulfilled the criteria for the diagnosis of BPD while 66 (41.5%) did not receive said diagnosis.

The goodness of fit indexes of the confirmatory factorial analysis (CFA) of the two models studied (unifactorial and the three factors) are shown in Table 1. These results indicate that the two structures have, in general, levels of fit between acceptable and excellent. The indexes for the unifactorial model were χ^2/gl = 1.97; CFI = 0,86; RMSEA = 0.08; TLI = 0.81; AIC = 89.14 and GFI = 0.94. The one-factor model showed some standardized factorial weights for the BPD criteria that ranged from 0.06 (item 98 of PDQ-4+ that corresponds to criterion 4 of the DSM-IV) and 0.41 (item 58: criterion 6). (Table 1)

In regards to the 3-factor model, the indexes of fit obtained were χ^2/gl = 1.73, CFI = 0.91; RMSEA = 0.07; TLI = 0.86; AIC = 83.52 and GFI = 0.95 (see Table 1). As observed in Figure 1, the three factors show correlations between moderate and elevated (r = 0.59; 0.68 and 0.78). In reference to the standardized factorial weights obtained between the criteria of each one of the three factors, the factorial weights of the Disturbed Relatedness Factor were between 0.21 (item 93 of the PDQ-4+ corresponding to criterion 9 of the DSM-IV) and 0.44 (item 32: criterion 3); Affective Instability Factor between 0.10 (item 6: criterion 1) and 0.69 (item 58: criterion 6); and finally, the Behavior Dyregulation Factor between 0.08 (item 98: criterion 4) and 0.19 (item 45: criterion 5). (Figure 1).

Finally, the two models were compared, calculating the differences of the statistics (χ^2_{diff}). The comparison of the two models significantly showed the superiority of the 3-factors model (χ^2_{diff} = 11.62; gl = 3; p = 0.01).

DISCUSSION

This study is, to our knowledge, the first that has analyzed the factorial structure of the BPD using a self-report design based on the diagnostic criteria proposed in the DSM-IV in a sample of psychiatric outpatients who previously presented with suspicion of BPD. The purpose of this study was to study the factorial structure of the DSM-IV diagnostic criteria of the BPD in the PDQ-4+,[13] using a Confirmatory Factorial Analysis (CFA). On the contrary to other previous works,[6,7,9] the present study included a self-report and not an interview to study said factorial structures. The two structural models of BPD that

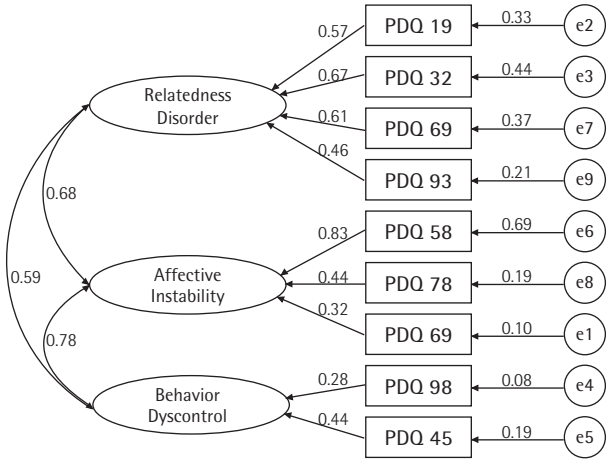

Figure 1 Correlations and factorial weights between BPD criteria of the PDQ-4+ in 3-factor Model

had been previously replicated the most in the scientific literature were compared. These models were the unidimensional model defended by Fossati et al.[7] and the 3-factor model proposed by Sanislow et al.[9]

Although the indexes of goodness obtained in the CFA when the PDQ-4+ was used were adequate in the two models proposed, they were superior in the 3-factor model. Furthermore, the comparison of both models significantly showed that the 3-factor model is superior to the unifactorial one. Our results would replicate those obtained by Sanislow et al.,[9] which defended the existence of a structure of three-factors underlying the BPD construct. On the contrary to said work and also to that of Johansen et al.,[6] which had observed correlations between factors superior to 0.85, those observed in our study were inferior, although they were also high, with values between 0.59 and 0.78. Even so, the existence of correlations between factors would not necessarily imply that they should be considered as a single construct. The existence of different constructs that present high correlations is somewhat common in the field of medicine, where similar phenomena are found. For example, diabetes: even though the manifest symptoms can lead to the belief that it is a unitary syndrome, the laboratory findings demonstrate the existence of two different types of this disease. [7] On the contrary, these data show even more clearly that under the label of BPD, different factors exist, which could represent subtypes of said disorder.

The proposal of the BPD diagnosis as a 3-factor construct could explain its heterogeneity better, and therefore its different clinical presentation. The idea that there are subgroups of BPD patients has been previously defended.[11, 25] In fact, when the characteristics of BPD patients are analyzed according to the comorbidity the patients present, different profiles have been observed between BPD patients depending on whether there are certain comorbid disorders or not. Along this line, a recent work of our group[25] that compared BPD patients with and without comorbidity with the Attention-Deficit/Hyperactivity Disorder (ADHD) disorder points to the existence of a subtype of BPD having greater impulsivity and greater intragroup comorbid homogeneity when occurring comorbidly with an ADHD compared to the patients diagnosed of BPD without comorbid ADHD. The latter group of patients would be characterized by a greater heterogeneity in the comorbid disorders, with greater frequency of affective disorders, of anxiety and less consumption of illegal substances.

CONCLUSIONS

The present study concludes that BPD appears to be a disorder that is better described on the basis of the existence of 3 different factors, depending on the combinations of their DSM-IV criteria. These different factors could be reflecting the existence of different subtypes of BPD patients with differential characteristics. The study of the possible existence of subgroups of BPD patients, which could be characterized by the predominance of symptoms of one of the factors, will allow a greater understanding of the heterogeneity of the disorder, improve the study and knowledge of the etiology, defining the possible different etiopathogenic bases that can exist behind this complexity and a better identification of different psychopathological profiles, which can have different clinical profiles with different prognoses. All this could be very useful to establish the basis of the study of the different therapeutic options that are most adequate for the BPD, both pharmacological and psychotherapeutical.

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