Brazilian adaptation of the McLean Screening Instrument for Borderline Personality Disorder

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Brazilian adaptation of the McLean Screening Instrument for Borderline Personality Disorder

MSI-BPD: Brazilian adaptation

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Abstract

Introduction: Borderline personality disorder (BPD) is a serious and extremely prevalent mental disorder. Early diagnosis is vital for treatment. However, there are no specific validated screening instruments for Brazilian Portuguese. This study aimed to adapt the McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD) to the Brazilian context. The MSI-BPD is a self-report instrument based on the Diagnostic and Statistical Manual of Mental Disorders - Fifth Edition (DSM-5) that allows a fast and reliable assessment of BPD, with measures of sensitivity and specificity similar to the diagnostic interview for the DSM-5 (SCID-II), taken as the gold standard. Method: Simultaneous translation, synthesis version, back-translation, and analysis by experts were performed to create the final version of the instrument in Brazilian Portuguese. The translated instrument was responded by 1,702 adults aged 18–59 years to verify validity evidence on content, internal structure, relationship with other variables, and reliability. Results: The exploratory and confirmatory factor analyses show the unifactorial structure’s adequacy. The scale showed satisfactory internal consistency (KR-20 of the Cronbach’s alpha = 0.691) and good test-retest reliability (ICC = 0.802). Logistic regression analysis using PID-5-BF (DSM-5) as reference established an ideal cut-off point of 8 symptoms, with adequate sensitivity (0.79) and specificity (0.75), similar to the original instrument. The area under the curve (AUC) was 0.830 (95% confidence interval, 0.802–0.858), with a positive predictive value of 89.2%. Conclusion: The Brazilian version of MSI-BPD has adequate psychometric properties to be used as a screening tool for BPD by the clinician.

Keywords: Borderline personality disorder, screening instrument, cross-cultural adaptation, McLean instrument, MSI-BPD.
Introduction

Borderline personality disorder (BPD) represents approximately 25% of all psychiatric admissions, 15% of outpatients, 9% of patients seeking a clinical emergency, which is approximately 1.5–5.9% of the general population in USA.\textsuperscript{1,2} BPD is also a very complex condition, challenging to treat, and associated with several comorbidities.\textsuperscript{3,4} Due to the high prevalence of several comorbidities and characteristics similar to other mental disorders, BPD is often confused with bipolar disorder, depression, and post-traumatic stress, and it is also associated with chemical dependency and other personality disorders.\textsuperscript{5} Its complexity is because BPD symptoms have a heterogeneous characteristic, comprising different psychopathological dimensions, making it difficult to diagnose.\textsuperscript{4,5}

BPD, like most mental disorders, is diagnosed through a psychiatric clinical interview based on the patient’s report, family history, past history, interpersonal, work and individual impairments and deficits, information collection with family members and clinical observation during hospitalization or outpatient follow-up. The clinician’s diagnosis is based on the Fifth Edition Statistical of Mental Disorders symptom set.\textsuperscript{6} BPD is classified according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), into a set of nine symptoms that can be clinically grouped into four psychopathological dimensions: 1) a generalized pattern of instability in interpersonal relationships; 2) low sense of identity; 3) dysregulation of affects; and 4) impulsiveness. At least five out of nine symptoms must be met to diagnose BPD.\textsuperscript{6} The DSM-5 set of nine criteria for BPD coherently represents a construct.\textsuperscript{7} Factor analysis studies found satisfactory models for the one-factor and three-factor models (unstable relationships, behavioral dysregulation, affective dysregulation), and there may also be multidimensional structures and models for the construct.\textsuperscript{7,8}
For the purposes of empirical research, the diagnosis can be made through specific semi-structured interview instruments based on the DSM set of nine symptoms, the DSM-III-R semi-structured interview instrument for personality disorders,\(^9\) considered the gold standard for psychiatric diagnosis. Due to the complexity of BPD and the difficulty in diagnosing this disorder, even for experienced clinicians, self-report instruments are of great relevance for screening BPD as a complement to the diagnostic interview. DSM-5 provides an auxiliary tool, such as Personality Inventory for DSM-5 (PID-5), as an alternative tool in the diagnosis of personality disorders. To date, there are no specific instruments for diagnosing BPD in Brazil. The McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD)\(^{10}\) was developed based on the set of symptoms in DSM-5, with the objective of being a screening tool and diagnostic complement of BPD to be used by the clinician and for empirical research purposes. The MSI-BPD is a self-report instrument with adequate psychometric properties and similar sensitivity and specificity to the The Structured Clinical Interview for DSM-5, SCID-II. In its original version, MSI-BPD had a one-dimensional structure\(^8\) and excellent levels of sensitivity (0.87) and specificity (0.90) for the cut-off point of seven positive symptoms. Currently, MSI-BPD has been used in several clinical research and has been translated and adapted to several languages, with variations in its dimensional structure and cut-off points according to the culture to which it was adapted.\(^{11-13}\) Therefore, its adaptation to Brazilian Portuguese is essential for clinical use and empirical research.

**Methods**

**Translation of MSI-BPB into Brazilian-Portuguese procedures**

Initially, two independent translations of the MSI-BPB into Portuguese were carried out. One of them was performed by a professional bilingual translator native to English; the other was
performed by a professional bilingual translator native to Portuguese. Then, a compilation of the translations was carried out by a psychiatrist with clinical experience in BPD, who compared the translations performed with the diagnostic criteria of DSM-5 (in Portuguese) for TPB. This compiled version was evaluated by another bilingual researcher with experience in the development of psychological instruments. After minor adjustments in the wording of some items, this version was sent to three bilingual students for back-translation without prior knowledge about the instruments or concepts studied. After this step, the items' back-translation and the original instrument were presented to a research team of about 20 people, including the researchers involved in the translations and back-translations. After this section, new minor adjustments in the wording were made, and the final version of the instrument was reached to be put on the empirical test (Appendix).

Participants
A total of 1,429 adults from all regions of Brazil participated in the study. The mean age was 26.0 years ($SD = 9.05$), ranging from 18 to 59 years. Of all participants, 66.3% were women, 30.5% were men, and the remaining 3.2% declared themselves “other” concerning gender. Regarding the maximum level of education, 11.3% had incomplete high school, 35% of the participants had completed high school, 32.2% had incomplete higher education, 21.5% had completed higher education. Most participants resided in the Southeast (52.6%) and South (27.7%) regions, while 19.7% are from other regions of Brazil. The family income of the participants was up to R$2,090.00 for 48.9% of them, from R$2,090.01 to R$4,180.00 for 33.2% of them, higher than R$4,180.00 for 17.9% of them. Regarding race/color/ethnicity, most of the participants identified themselves as white (61.1%), followed by brown (25.2%) and black (7%). Although the collection was carried out in a non-clinical population, 46.7% of
the sample reported having received a previous psychiatric diagnosis, with anxiety disorder being the most prevalent (33.5%), followed by a previous depressive episode (30.6%), BPD (11.3%), and bipolar disorder (9.3%).

Instruments
We used an online questionnaire available on the internet. The questionnaire contained sociodemographic questions, the Brazilian adaptation of the McLean screening instrument for Borderline Personality Disorder (MSI-BPD)\textsuperscript{10}, and the personality inventory for DSM-5.\textsuperscript{14}

Sociodemographic questions
Sociodemographic questions are a set of questions to survey the sociodemographic and economic profile of participants, including questions such as age, gender, sexual orientation, education, race/color/ethnicity, information on mental health, psychiatric diseases and psychological care.

MSI-BPD\textsuperscript{8}
The MSI-BPD is a 10-item self-report instrument representing BPD symptoms described in DSM-5 with categorical responses (yes or no). Each item corresponds to a symptom of the nine symptoms described in the DSM-5, except for the symptom referring to identity disturbance, which has two items. This tool is based on a subset of questions that make up the Diagnostic Interview for Personality Disorders Module DSM-5 or SCID-II, a semi-structured interview for diagnosing axis II disorders.\textsuperscript{15} In the original study, Zanarini et al.\textsuperscript{10} evaluated test-retest reliability, internal consistency, validity evidence, and diagnostic efficiency to identify the presence of BPD in respondents aged 18–59 years. With a cut-off point of seven symptoms (seven yes answers), MSI-BPD showed good sensitivity (0.81) and specificity (0.85) in a
sample of non-psychotic and non-manic individuals.\textsuperscript{10} This high level of diagnostic efficiency is consistent with that found for screening measures for major depression,\textsuperscript{16} bipolar spectrum disorders,\textsuperscript{17} and post-traumatic stress disorder.\textsuperscript{18}

\textit{Personality Inventory for the DSM-5-Brief Form (PID-5-BF) Brazilian version}\textsuperscript{14}

PID-5-BF Brazilian version is an adaptation of the Krueger’s PID-5-BF.\textsuperscript{19} It is a self-report instrument for assessing the five pathological personality traits described in DSM-5 in the Alternative Model of Personality Disorders. It can be used as an alternative diagnostic tool for DSM-5 Personality Disorders. As a tracking measure for personality pathology, the PID-5-BF has 25 items (5 items per factor) and measures five pathological personality factors (negative affectivity, distancing, antagonism, disinhibition, psychoticism). The use of PID-5 for the diagnosis of BPD showed moderate to excellent accuracy (AUC, 0.87; SE, 0.01, \(p < .001\)) with a good balance of specificity (SP, 0.76) and sensitivity (SN, 0.81) compared to the gold standard psychiatric diagnostic instrument SCID-II-PQ that showed SP of 0.80 and SN of 0.78.\textsuperscript{20}

\textbf{Procedures}

\textit{Data collection}

Data collection occurred entirely on the internet. A social media campaign was carried out on the internet to recruit participants for the study. Invitations with links to the questionnaire were also sent by email and social media. The questionnaire was administered through an Internet data collection platform. Participants were asked to answer the scale again 2 weeks after the initial collection to test the temporal consistency of the instrument.

Data collection started after the project was approved by the Ethics and Research Committee.
of the Educational Institution and Plataforma Brazil. All research followed established ethical standards; the research was approved for data collection under protocol n° 46662821.5.0000.5281. The confidentiality and anonymity of the data obtained from the participants were guaranteed. All participants received an informed consent form.

**Data analyses**

Initially, data cleaning was performed, excluding participants with incorrect answers to the control questions. To analyze the internal structure of MSI-BPD, we randomly divided the sample into two parts. In the first half, an exploratory factor analysis (EFA) was performed (n = 691). In EFA, the Robust Diagonally Weighted Least Squares (RDWLS) method was used based on the polychoric correlation matrix using the Factor software. The decision of the factors to be retained was made using a parallel analysis with random data permutation. Then, a confirmatory factor analysis (CFA) was performed with the other half of the sample (n = 738), using the Lavaan package, version 0.6.9, and the R version 4.1 software. The Diagonally Weighted Least Squares estimator was used in this analysis.

The evidence of validity based on the relation to other sociodemographic variables was evaluated through one-way analysis of variance (one-way ANOVA). For the analysis of the comparison of the averages of the MSI-BPD scores in relation to age, the sample was separated into six groups by increasing age, with a cut-off point of seven years from the age of 18 years. For the analysis of the comparison of the averages of the MSI-BPD in relation to family income, the sample was subdivided into three groups (up to R$2,090.00, R$2,090.01 to R$4,180.00 and higher than R$4,180.00). For the analysis of the comparison of means in relation to gender, the sample was subdivided into three groups (female, male and other).

Regarding reliability indicators, the scale’s internal consistency was assessed using the Kuder–Richardson coefficient (KR-20). Temporal stability was assessed using the intraclass
correlation coefficient (ICC) for part of the sample \((n = 90)\) that responded to MSI-BPD 2 weeks after the first response. For the sensitivity and specificity indicators, an assessment of diagnostic agreement was performed between the translated and adapted version of the MSI-BPD and the PID-5-BF Brazilian version. According to the PID-5-BF criteria for the diagnosis of BPD, scores of >9 in the negative affectivity domain (at least three items of negative affect with the maximum score), scores of >3 in the domain of disinhibition/impulsiveness (at least one item with the maximum score) and impairment in at least two areas of personality functioning (two positive items out of four categorical statements) were considered positive diagnosis.

### Results

#### Validity evidence based on the internal structure

To assess the internal structure of the instrument, an EFA was performed using the parallel analysis method, with approximately 50% of the sample randomly selected \((n = 691)\). Initially, the adequacy of factorization was tested, with satisfactory KMO and Barlett’s Test (KMO = .80; Barlett’s test: \(\chi^2 = 1746.8, df = 45.0, p < .001\)). The factors to be retained were carried out through a parallel analysis with random data permutation, which found a single factor with a greater explained variance than in the random model. Parallel analysis was performed using the robust method (RDWLS) based on a polychoric matrix and the Hull method\(^{20}\) for item retention, with eigenvalues >1 for the retention of an item and an explained variance for the one-dimensional model of 53.9%.

Subsequently, a CFA was performed for the one-factor model with the other part of the sample selected randomly \((n = 738)\). The CFA for the one-factor model was satisfactory, with \(\chi^2, \chi^2/df\), and adequate fit indices \(\chi^2 = 71.5, df = 35; \chi^2/df = 2.04, p < .001; CFI = 0.96; TLI = 0 .95;\)
NFI = 0.95; GFI = 1.00; RMSEA = 0.038; 95% confidence interval [CI], 0.025–0.050). As a result of the CFA for the one-dimensional model, the factor loadings found for the items ranged from 0.37 to 0.51. Figure 1 shows the model and loading of items.

Figure 1. One-dimensional CFA of the McLean Screening Instrument for Borderline Personality Disorder

Validity evidence based on relationships with other variables

Evidence of convergent validity was assessed using Spearman’s correlation. Correlations between the mean score of the MSI-BPD, the mean score of the PID-5-BF factors, and age
were evaluated. The MSI-BPD score showed moderate to high correlations with the five pathological personality traits assessed by PID-5-BF and a moderate negative correlation with age. Table 1 shows these results.

Table 1 - MSI-BPD and PID-5-BF Factors Pearson Correlations Coefficients

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MSI-BPD</td>
<td>7.43</td>
<td>2.11</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PID-5-BF - Negative affect</td>
<td>2.09</td>
<td>0.63</td>
<td>.53**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PID-5-BF - Disinhibition</td>
<td>1.49</td>
<td>0.78</td>
<td>.51**</td>
<td>.48**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>PID-5-BF - Detachment</td>
<td>1.64</td>
<td>0.67</td>
<td>.39**</td>
<td>.23**</td>
<td>.27**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>PID-5-BF - Antagonism</td>
<td>1.06</td>
<td>0.69</td>
<td>.39**</td>
<td>.32**</td>
<td>.43**</td>
<td>.23**</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>PID-5-BF - Psychoticism</td>
<td>1.58</td>
<td>0.82</td>
<td>.60**</td>
<td>.46**</td>
<td>.51**</td>
<td>.43**</td>
<td>.42**</td>
</tr>
<tr>
<td>7</td>
<td>Age</td>
<td>26.0</td>
<td>9.05</td>
<td>-.18**</td>
<td>-.16**</td>
<td>-.15**</td>
<td>-.07*</td>
<td>-.17**</td>
</tr>
</tbody>
</table>

*Note. MSI-BPD = The McLean Screening Instrument for Borderline Personality Disorder. PID-5-BF = Personality Inventory for the DSM-5-Brief Form (PID-5-BF) Brazilian version. N = 1,429. *p < .05 **p < .01.

The validity evidence based on the relationship with other variables was evaluated through a one-way analysis of variance. MSI-BPD showed significant differences in the mean of the groups divided by age, with higher values between groups up to 31 years compared to the other groups and decreasing values with increasing age, F(6, 166.4) = 11.6, p < .001. Regarding family income, significant differences were also found in the groups, with a lower mean in the higher income groups F(5, 173.2) = 15.5, p < .001. In relation to gender, significant differences with a higher mean were found in the group that identified themselves as “other,” while no significant differences were found in the MSI-BPD means between men and women (Welch’s F(2, 131.3) = 13.4, p < .001).
Internal consistency

The Brazilian version of the MSI-BPD presented a satisfactory Cronbach’s alpha coefficient (KR-20 = 0.691) for the evaluated sample, with a total score ranging from 0 to 10 points and a mean of 7.32 (SD = 2.17).

Temporal stability

Test–retest reliability was performed with a subsample of 90 study participants, who performed the MSI-BPD retest after two weeks, using the ICC between the MSI-BPD scores obtained in consecutive collections. The scale showed excellent test-retest reliability (ICC = 0.802).

Sensitivity and specificity

The Brazilian version of the MSI-BPD had a sensitivity of 0.88 and a specificity of 0.65 for the cut-off point of 7 points, established in the original version and most translations and adaptations to other languages and using the PID5-BF Brazilian version as a standard diagnostic reference. Using the cut-off point of 8 points, the Brazilian version maintained good sensitivity (0.75) and showed improved specificity (0.79). Improvement in specificity without significantly impairing sensitivity would justify using the cut-off point of 8 points in the Brazilian version. The Youden test\(^2\) estimated the ideal cut-off point of 8 for the Brazilian version of the evaluated sample.

Receiver Operating Characteristic (ROC) curve and logistic regression analysis

ROC curve analysis was performed using the PID-5-BF-Brazilian version criteria as a standard reference. For the cut-off point of 8 points in the total sample, the area under the curve (AUC) was .83 (95% CI, .802–.858) with a positive predictive value of 89.2%. Figure 2 shows these results.
Discussion

This study sought to fill a gap regarding instruments to screen BPD conditions in Brazil, adapting and seeking validity evidence for the MSI-BPD to the Brazilian context. MSI-BPD is a helpful tool in clinical practice, both for its speed and ease of application and self-reported. We found adequate validity evidence for the MSI-BPD Brazilian version, as shown in this study.
The translation and back-translation procedures followed the translation and cross-cultural adaptation guidelines of the psychological instruments.\(^{26,27}\) In translation and back-translation, the content validity of the items and their adaptation to the Brazilian context were evaluated. The evaluation of the content of the items by the research team in the final instrument proved adequate for both the Brazilian context and comparison of the back-translation with the original instrument, with little to no differences regarding the content.

Regarding the validity indicators based on the internal structure, the analysis of the dimensional structure of the Brazilian version found a one-factor solution consistent with the clinical concept of the disorder, which is considered a single score for diagnostic criteria.\(^6\) However, BPD is a heterogeneous disorder, comprising up to four distinct dimensions of psychopathology, which would explain satisfactory solutions for the structure of up to two factors in versions translated into other languages.\(^7,8\)

When comparing the MSI-BPD with the other variables, the evidence of convergent validity was evaluated in the comparison of the instrument with the PID-5, with a high correlation of the MSI-BPD with the five pathological traits evaluated by the PID-5 and with the age, as expected. Evidence of discriminant validity was assessed by the instrument’s ability to differentiate the different groups related to sociodemographic variables, with significant differences being found in the average of the MSI-BPD in relation to age, family income and gender (other), as expected.

The analysis of reliability indicators found satisfactory internal consistency (KR-20 = .69) and test-retest reliability (ICC = .80). Similarly, adequate sensitivity and specificity values were found for the cut-off points of 7 symptoms (SN = .88 and SP = .65) and 8 symptoms (SN = .75 and SP = .79) with good diagnostic efficiency (AUC = 0.83) compared to PID-5-BF. Although SCID-II is considered the gold standard for diagnosing BPD, we chose to use PID-5-BF as a diagnostic reference due to the possibility of an online application and the ability to obtain an
expressive sample, in addition to presenting diagnostic accuracy (AUC = 0.87), sensitivity (0.81), and specificity (0.76), similar to SCID-II (SN = 0.78 and SP = 0.80).

This study has some limitations. Since data collection was carried out online, the lack of clinical evaluation and the application of the semi-structured interview prevents greater accuracy in the assessment of the cut-off point and the sensitivity and specificity indices, as well as the possibility of comparison between clinical and non-clinical groups. The sample selection bias due to the campaign that focused on diagnostic symptoms and the assessment of BPD was significant in the descriptive assessment of the data. A large percentage of participants reported prior psychiatric diagnosis and treatment for psychiatric disorders, including BPD. Another selection bias due to online collection is the social stratum of the sample, which has a very high average income compared to the Brazilian population.

Some hypotheses can be raised from these data. According to previous studies, the first hypothesis is that BPD would be underdiagnosed and underreported. A second hypothesis is that BPD would be confused with other disorders (anxiety disorder, depression, and bipolar disorder) due to the high prevalence of these comorbidities and the preference for these diagnoses over BPD diagnoses. Another hypothesis is that there are cultural differences that would change the original cut-off point according to the population studied. These differences are evidenced when comparing the cut-off point for the French population (≥5) with that of the Spanish and American population (≥7).

Conclusion

In conclusion, the Brazilian version of MSI-BPD has adequate psychometric properties to be used as a screening instrument for BPD by the clinician. We suggest that future clinical studies should be carried out using the Brazilian version of MSI-BPD to estimate its sensitivity and
specificity indices more accurately and validate its diagnostic efficacy in BPD. Although MSI-BPD does not replace the semi-structured clinical interview, it can help the clinician diagnose patients with BPD. That could reduce the number of underdiagnosed and underreported cases and, therefore, not adequately treated, which would be directly benefit.

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