

ORIGINAL ARTICLE

Reliability and validity of a Chinese version of the Diagnostic Interview for Borderlines-Revised

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Introduction

Borderline personality disorder (BPD) is a complex and serious mental disorder characterized by a pervasive pattern of instability in regulation of emotion, interpersonal relationships, self-image, and impulse control. In the US, the prevalence of BPD has been estimated at 1.6% (Lenzenweger *et al.*, 2007) to 5.9% (Grant *et al.*, 2008) of the general population, 10% of psychiatric outpatients, and 20% of inpatients (American Psychiatric Association, 1994). After decades of controversy and research, a clinical consensus had formed that considered BPD as a valid

Abstract

Introduction: Borderline personality disorder (BPD) is the most studied of the axis II disorders. One of the most widely used diagnostic instruments is the Diagnostic Interview for Borderline Patients-Revised (DIB-R). The aim of this study was to test the reliability and validity of DIB-R for use in the Chinese culture.

Methods: The reliability and validity of the DIB-R Chinese version were assessed in a sample of 236 outpatients with a probable BPD diagnosis. The Structured Clinical Interview for DSM-IV Personality Disorders (SCID-II) was used as a standard. Test-retest reliability was tested six months later with 20 patients, and inter-rater reliability was tested on 32 patients.

Results: The Chinese version of the DIB-R showed good internal global consistency (Cronbach's α of 0.916), good test-retest reliability (Pearson correlation of 0.704), good inter-rater reliability (intra-class correlation coefficient of 0.892 and kappa of 0.861). When compared with the DSM-IV diagnosis as measured by the SCID-II, the DIB-R showed relatively good sensitivity (0.768) and specificity (0.891) at the cutoff of 7, moderate diagnostic convergence (kappa of 0.631), as well as good discriminating validity.

Discussion: The Chinese version of the DIB-R has good psychometric properties, which renders it a valuable method for examining the presence, the severity, and component phenotypes of BPD in Chinese samples.

disorder (Morey and Zanarini, 2000; Paris, 2005; Gunderson, 2009; Skodol *et al.*, 2011), since it has characteristic clinical presentation (Gunderson *et al.*, 2011a), some known neurobiological (Torgersen, 1984; Zanarini *et al.*, 1994; Torgersen *et al.*, 2000; De la Fuente *et al.*, 2011) and environmental etiology (Herman *et al.*, 1989; Links and van Reekum, 1993; Boney-McCoy and Finkelhor, 1996; Hill *et al.*, 2000; Melchert, 2000; Goodman *et al.*, 2004;), as well as effective treatments (Linehan *et al.*, 1991; Linehan, 1993; Bateman and Fonagy, 1999). For these considerations, the diagnosis of BPD will be retained in DSM-V.

In China, however, the BPD construct has not been uniformly accepted. There is no BPD diagnosis in the third edition of the Chinese Classification of Mental Disorders (CCMD-3), although a different diagnostic category of impulsive personality disorder overlaps extensively with BPD (Zhong & Leung, 2007). Limited available studies in recent years have provided preliminary support for the construct validity of BPD in Chinese population (Yang *et al.*, 2002; Leung and Leung, 2009). For most Chinese clinicians, their knowledge about BPD is still limited. We had investigated clinician's diagnoses for 178 BPD patients who had been diagnosed by Structured Clinical Interview for DSM-IV Personality Disorders (SCID-II) in previous study, and found that none had been diagnosed with BPD, only 13 (7.3%) had been given the diagnosis of personality disorder without specifying which type, 21 (12.7%) recorded that the diagnosis was unknown, and the remaining 144 (80.9%) had been diagnosed with axis I disorders (Wang *et al.*, 2007). The clinical heterogeneity of BPD, its frequent comorbidity with other personality disorders, and periodic appearance of axis I disease make it difficult to establish a diagnosis. This has hampered further research and clinical practice on BPD in China. Valid and reliable assessment instruments for measuring BPD features are needed.

One of the most widely used diagnostic instruments is the Diagnostic Interview for Borderline patients (DIB) (Gunderson *et al.*, 1981). The criteria and the cutoff that have defined BPD in DSM-III and IV were derived from it (Gunderson and Kolb, 1978). DIB evaluated five areas of BPD's characteristics: social adaptation, impulsive action patterns, affect, psychosis, and interpersonal relationships. The DIB was shown to be the best to identify DSM-III-R BPD when compared with Kernberg's Structural Interview, with Borderline Syndrome Index, and with Millon Clinical Multiaxial Inventory (Lewis and Harder, 1991). To improve its ability to discriminate BPD from other personality disorders, a revised version, the DIB-R, appeared in 1989. It is a semistructured interview comprising 105 items and 22 summary statements (SS) for assessing the persistence of symptoms of BPD over the course of the past two years, and offers a more comprehensive characterization of BPD, such as affective, behavioral, interpersonal, and cognitive phenotypes (Siever and Davis, 1991; Gunderson and Lyons-Ruth, 2008). Zanarini *et al.* subsequently reported that the DIB-R had good sensitivity and specificity versus other personality disorders, and had good inter-rater reliability and test-retest reliability (Zanarini *et al.*, 2002). Therefore, this interview,

which offers a considerably more detailed account of BPD psychopathology than does the DSM-IV criteria, has been widely implemented as a diagnostic tool in BPD studies in many cultures. A recent report showed that when the BPD is established by the DIB-R, it is more familial and more heritable than when the DSM-IV diagnosis is used (Gunderson *et al.*, 2011b).

The present study was designed to assess the reliability and validity of a Chinese version of DIB-R in order to introduce an effective and useful tool to assess BPD and extend the understanding about BPD in China.

Methods

Adaptation methodology

To develop the Chinese version of the DIB-R, the translation and back-translation procedure has been completed. The original interview was translated by two bilingual psychologists. One senior psychiatrist revised the language to make it convenient for clinical interview. The translations were discussed until reaching a consensus. Then, the first version was retranslated into English by another translator. This version was sent to the DIB-R authors, John Gunderson and Mary Zanarini, who verified that the adaptation accurately reflected the original text.

Raters

Two psychiatrists with experience in the use of interviews in the area of personality evaluation had been trained for rating. One of these two raters is an attending psychiatrist who has been involved in the study of personality disorders for almost eight years. The other is the associate chief psychiatrist who has been engaged in the study of bipolar disorder for many years. Both of them have previously used the SCID-II interview in their studies. For this training on the use of DIB-R, one of the raters had taken part in discussion meetings on the use of the criteria and the observation of interviews, which were held by senior psychologists, Dr. Jie Zhong and Prof. Freedom Leung, who were experts in the use of the original instrument. Then, the other rater was trained by the first rater through discussion of criteria, observing interviews, and conducting interviews with patients.

Subjects

The sample was made up of 236 outpatients who had been screened by McLean Screening Instrument for

Borderline Personality Disorder (MSI-BPD) (see description below) for score above seven. The inclusion criterion was age from 18 to 60 years. The exclusion criteria were a diagnosis of schizophrenia with acute psychotic symptoms and inability to cooperate with the study procedures; mental retardation, dementia, or intellectual impairment due to other reasons; acute post-traumatic personality changes; severe medical disease; and difficulties in verbal communication and understanding, which prevented participation. The study was approved by the Ethics Committee of Shanghai Mental Health Center, and all participants provided signed informed consent.

Instruments

Three instruments had been used in this study:

MSI-BPD (Zanarini *et al.*, 2003)

This is a self-report screening measure for DSM-IV BPD, with good sensitivity (0.81) and specificity (0.85), at a cutoff of 7. Two recent studies have revised and examined its reliability for use among college and adolescent Chinese samples (Wang *et al.*, 2008; Leung and Leung, 2009). One study reported that MSI-BPD had good internal consistency reliability (0.781) and correlated with Diagnostic Interview for Chinese Personality (0.706) when it had been used in Chinese psychiatric samples (Chen *et al.*, 2011).

Diagnostic Interview for Borderlines-Revised (DIB-R)

It is a semistructured interview comprising 127 items for assessing the symptoms of BPD in the past two years, from which 22 SS, which can have three values (0: no; 1: probable; 2: yes), are derived. The SS give rise to four area scores (AS): affect, cognition, impulse action patterns, and interpersonal relations. The AS determines the overall score on a scale ranging from 0 to 10. The cutoff score for a DIB-R BPD diagnosis is 8 or higher. This interview takes approximately one hour to administer.

SCID-II

It is a semistructured diagnostic interview of axis II disorders. It determines whether criteria are met for the 10 DSM-IV axis II personality disorders, as well as depressive personality disorder and passive-aggressive personality disorder. The SCID-II has been used extensively in the English-speaking world (Hilsenroth *et al.*,

2003). The Chinese version has been shown to have good reliability and validity (Dai *et al.*, 2006). Therefore, SCID-II is used as a "gold standard" for the BPD diagnosis in this study.

Procedure

All the participants, who got a score on the MSI-BPD above 7, were interviewed with DIB-R and with the BPD part of the SCID-II. To establish the inter-rater reliability of the instrument, two psychiatrists jointly assessed 32 patients. When one performed the interview, the second independently evaluated the patient according to this interview. The remaining subjects were interviewed by one rater. Another research assistant arranged the schedule for subjects to be reviewed according to subjects' will, so the order of interviews might not influence the result. After six months, 20 subjects were reinterviewed by the DIB-R by the same interviewer.

Statistical analysis

Data were analyzed by SPSS 13.0 statistic program (SPSS Inc., Chicago, IL, USA). Estimation of homogeneity or internal consistency of the interview was evaluated with Cronbach's α coefficient. The test-retest reliability was analyzed by paired sample *t*-test. The inter-rater reliability was analyzed using the intra-class correlation coefficient (ICC). By comparing the DIB-R and SCID-II interview, criterion validity (kappa index), sensitivity, and specificity were established. The cutoff selection was determined by the receiver operating characteristic curves (ROC curves).

Results

Sociodemographic characteristics

A total of 236 subjects screened by MSI for tendency of BPD finished the DIB-R evaluation, and 234 of them finished the SCID-II for BPD part evaluation, between January and November 2011. Among them, there were 99 men and 137 women with a mean age of 27.95 years (standard deviation 6.837, range 18–57). Table 1 shows the main sociodemographic variables.

Reliability

Internal consistence of the DIB-R and its component phenotypes

The result shows that the Cronbach's α for internal global consistency is 0.916. Table 2 shows that the

Table 1. Sociodemographic variables

		<i>n</i> (%)
Gender	Male	99 (41.9)
	Female	137 (58.1)
Marital status	Unmarried	136 (57.6)
	Married	76 (32.2)
	Separate-divorced	17 (7.2)
	Remarried	7 (3.0)
Occupation	Students	53 (22.4)
	Employed	144 (60.8)
	Unemployed	38 (16.0)
Education	<9 years	2 (0.8)
	9 years	22 (9.3)
	12 years	44 (18.6)
	>12 years	168 (71.2)

Table 2. Internal consistency of the Diagnostic Interview for Borderlines-Revised and its component phenotypes

Phenotypes	Cronbach's α
Affect	0.856
Cognition	0.824
Impulsive behavior pattern	0.816
Interpersonal relationship	0.885
Global	0.916

Table 3. Test–retest reliability of the DIB-R and its component phenotypes after six months

Phenotypes	Fist test (mean \pm SD)	Retest (mean \pm SD)	Pearson correlation
Affect	1.80 \pm 0.41	1.85 \pm 0.37	0.840**
Cognition	1.30 \pm 0.66	1.15 \pm 0.75	0.656**
Impulsive behavior pattern	1.70 \pm 1.34	1.75 \pm 1.37	0.786**
Interpersonal relationship	2.05 \pm 1.28	2.10 \pm 1.17	0.633**
Global	6.85 \pm 1.95	6.85 \pm 2.28	0.704**

**correlation is significant at the 0.01 level (two-tailed).

DIB-R, Diagnostic Interview for Borderlines-Revised; SD, standard deviation.

Cronbach's α obtained in each component phenotype is in the extension from 0.816 to 0.885.

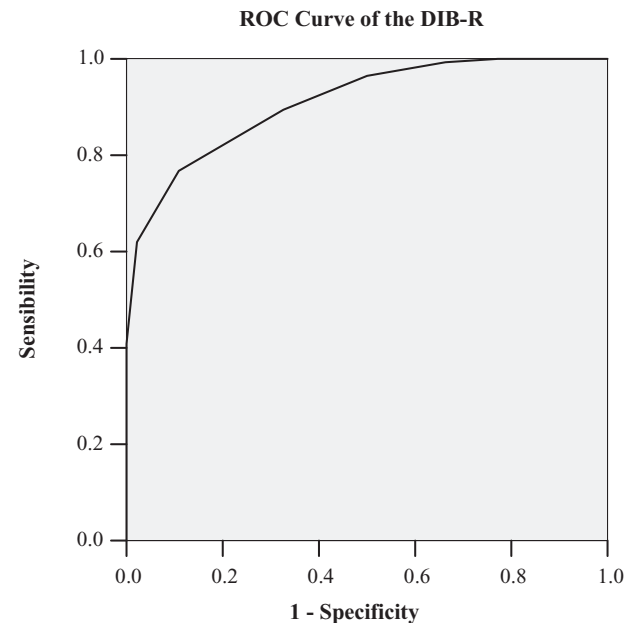
Test–retest reliability of the DIB-R and its component phenotypes

Twenty subjects were reinterviewed by DIB-R after about six months. Paired sample *t*-test shows that there is no significant difference of the mean scores between the first test and retest ($P > 0.05$) (in Table 3). The Pearson correlation between these tests ranges from 0.633 to 0.840, with significant positive correlation.

Table 4. Inter-rater reliability of DIB-R and its component phenotypes

Phenotypes	ICC	<i>F</i>	<i>P</i>
Affect	0.972	71.710	<0.001
Cognition	0.588	3.850	<0.001
Impulsive behavior pattern	0.957	45.291	<0.001
Interpersonal relationship	0.857	12.966	<0.001
Global	0.892	17.457	<0.001

DIB-R, Diagnostic Interview for Borderlines-Revised; ICC, intra-class correlation coefficient.

**Figure 1.** Logistic regression analysis. DIB-R, Diagnostic Interview for Borderlines-Revised; ROC, receiver operating characteristic curve.

Inter-raters reliability of the DIB-R and its component phenotypes

Thirty two subjects were rated by two psychiatrists together. The intra-class coefficient (ICC) obtained in global DIB-R interview is 0.892 (in Table 4), and the values of ICC for each phenotype are in the extension from 0.588 to 0.972.

Validity

Sensitivity and specificity

To compare the diagnostic concordance between the SCID-II and DIB-R, we used ROC curve to establish an optimum discrimination between BPD and non-BPD subjects diagnosed by SCID-II. Figure 1 shows the ROC curve, which indicates that the DIB-R has a global functioning with an area under the curve of 0.910 ($P < 0.001$). The optimum cutoff would be 7,

Table 5. Discriminating validity of DIB-R

Phenotypes	BPD (<i>n</i> = 142)	Non-BPD (<i>n</i> = 92)	<i>t</i>	<i>P</i> (two-tailed)
Affect	1.80 ± 0.48	1.38 ± 0.68	5.199	<0.001
Cognition	1.42 ± 0.66	1.02 ± 0.80	4.188	<0.001
Impulsive behavior pattern	1.95 ± 1.16	0.67 ± 1.05	8.520	<0.001
Interpersonal relationship	2.60 ± 0.79	1.24 ± 1.27	9.180	<0.001
Global	7.77 ± 1.63	4.32 ± 1.88	14.895	<0.001

BPD, borderline personality disorder; DIB-R, Diagnostic Interview for Borderlines-Revised.

since it shows relatively good sensitivity (0.768) and specificity (0.891). With this cutoff as diagnostic criteria, the diagnostic convergence between DIB-R and SCID-II is kappa of 0.631, and the diagnostic consistency between raters is kappa of 0.861.

Discriminating validity

We obtained the discriminating validity of the DIB-R by comparing the mean score of each phenotype and global DIB-R interview between 142 BPD and 92 non-BPD subjects, which had been diagnosed with SCID-II. Table 5 shows that the means of each phenotype and global interview in BPD group are significantly higher than non-BPD group.

Discussion

BPD is by far the most studied and well validated of the personality disorders, yet there is no Chinese version of semistructured interviews specific for BPD. The DIB-R is particularly valuable because it gives the most detailed portrait of BPD psychopathology and provides continuity with prior BPD research, and defines the clinical entity for which effective treatments exist. The absence of adequate psychometric tools in the research and clinical practice in China leads to the difficulty identifying BPD patients effectively. This study has made it possible to obtain the Chinese version of the DIB-R.

The results of this study have shown that the Chinese version of DIB-R has good reliability and validity index, which are comparable with those obtained in other studies of the original instrument. We found that the global internal consistency of the Chinese version of DIB-R was excellent ($\alpha = 0.916$), and the internal consistency of each phenotype was in good range from 0.816 to 0.885. This indicates noticeable homogeneity and interdependence among items of each section as well as the global interview. For test–retest reliability, we found it was good with Pearson correlations of all four component

phenotypes and the global interview in the range of 0.633–0.843, which suggests that the syndromal and subsyndromal phenomenology of BPD obtained by the Chinese version of DIB-R was stable over time, which is comparable to the original one (Zanarini *et al.*, 2002). For inter-rater reliability index, in our study, we found that the ICC for global interview was good (0.892), and for affect, impulsive behavioral pattern, and interpersonal relationship these phenotypes were excellent, with the range of 0.857–0.972, while for cognitive phenotype the result was compromised (0.588). The divergence between two raters largely derived from ratings of the cognitive phenotype; specifically, the odd thinking/unusual perceptual experiences, such as the items of magic thinking, the six senses, telepathy, overvalued ideas, depersonalization, and derealization. For these questions, patients reported difficulty in understanding and gave unclear answers during the interview, which might result in the divergent judgment between interviewers. This problem had not been reported for the original DIB-R (Zanarini *et al.*, 2002). So the compromised result in cognitive phenotype in our study might indicate that we need to revise the language of some items to make it more understandable and suitable for patients from different educational levels.

In regard to validity index, the value of sensitivity, specificity, and discriminating validity obtained in this study indicates that the Chinese version of DIB-R is effective to determine the presence of BPD in Chinese clinical samples. The DIB-R had been shown to have a sensitivity of 0.82, a specificity of 0.80, a positive predictive power of 0.74, and a negative predictive power of 0.87 at a cutoff of 8, when using clinical diagnoses as standard (Zanarini *et al.*, 1989). In this study, we used SCID-II as the standard and found a moderate diagnostic overlapping (kappa of 0.631), relatively lower sensitivity (0.768), and good specificity (0.891) at a cutoff of 7. Compared with the original version of DIB-R, the Chinese version has shown a relatively lower sensitivity and different cutoff value in our study. The reason for this might be that we used SCID-II instead of clinical diagnoses as standard. We

did so for the following considerations: first, there is not BPD diagnosis in the CCMD system, and usually clinicians do not give diagnosis of BPD, so we cannot get samples with diagnosis of BPD from clinicians. Second, clinicians are not familiar with BPD, so it might be more convincing to identify samples by SCID-II interview rather than clinical diagnosis. In our study, we got a moderate diagnostic overlapping between DIB-R and SCID-II interviews. The reason for this might be related to the properties of these two interview instruments. SCID-II was developed to diagnose all the DSM personality disorders, based on atheoretical approach (American Psychiatric Association, 2000), while DIB-R was based on psychoanalytic orientation (Gunderson *et al.*, 1981) to only diagnose BPD. Additionally, they use different scoring methods. SCID-II includes the nine DSM polythetic criteria set for BPD, which often leads to a heterogeneous group of patients being diagnosed with BPD, while DIB-R uses a pyramidal scoring system to recognize the limitation of, and minimize the weight of, any piece of information (Gunderson *et al.*, 1981). The Spanish version of DIB-R also showed moderate convergent validity of the diagnosis with the SCID-II ($\kappa=0.59$) (Szerman *et al.*, 2005). It had been reported that SCID-II showed less validity when compared with the DIB-R's more rigorous clinical criteria and which tends to be more sensitive than specific in the case of BPD (Zanarini *et al.*, 1991). Meantime, we found that it required more detailed and greater severity of symptoms to obtain a diagnosis of BPD with DIB-R than SCID-II, which might have lowered the sensitivity but might have elevated the specificity of the diagnosis of BPD with DIB-R, while it is necessary to maintain a good specificity in such a heterogeneous disorder as BPD in research and clinical practice.

We need to point out that our study had some limitations that might have influenced the results. First, the method used in this study, that two raters evaluated patients jointly, might have reduced divergence between raters, since it is possible that when one interviewer guides the interview, the second evaluator might be influenced by his/her tone or explanation. Second, 20 subjects who got retest were not selected randomly, but those who were reachable after six months; this might have weakened the representation of the results of retest index. With the awareness of these limitations, we can draw the conclusion carefully that when used in Chinese clinical samples, the Chinese version of DIB-R has good psychometric properties, which is equivalent to the original one. Compared with SCID-II, the Chinese version of DIB-R is more rigorous and helpful to elevate the

specificity of the diagnosis of BPD, and it might be useful to determine the presence, the severity, and component phenotypes of BPD in Chinese samples. In order to make it adapt to Chinese background better, some items need to be improved.

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