

Reliability and Validity of the 20-Item Taiwan Version of the Borderline Personality Inventory

Chun-Yi Lee, MD, MSc; Jung-Kwang Wen¹, MD; Wei-Chiang Yeh, MD, MSc;
Yu Lee, MD; Mian-Yoon Chong, MD, PhD, FRCPsych

Background: The Borderline Personality Inventory (BPI) is a self-reported questionnaire for screening patients with borderline personality disorder. This study aims to construct and validate a shorter version of the original 53-item BPI suitable for use in Taiwan.

Methods: A two-stage translation of the BPI was conducted and modified into colloquial language for use in Taiwan. It was tested against 3 groups of patients (borderline personality disorder, schizophrenia, neurotic disorders) and healthy subjects. After item analyses, a 20-item BPI was selected (BPI-T20), and its internal consistency was assessed. The validity was examined using relative operating characteristic (ROC) analysis.

Results: Altogether, 544 subjects successfully completed the study. The Cronbach's alpha coefficient was 0.92, while 3 factors were extracted from the questionnaire. The BPI-T20 had significant discriminatory power with satisfactory validity for borderline personality disorder, with an area under the ROC curve of 0.93 at a cut-off point of 11/12. The sensitivity and specificity were 89.8% and 82.8% respectively, with a misclassification rate of 14.7%.

Conclusion: The BPI-T20 appears to be reliable, effective and valid in screening borderline personality disorder. It could be applied in large-scale epidemiological community surveys.

(*Chang Gung Med J* 2009;32:165-71)

Key words: borderline personality disorder, 20-item Taiwan Borderline Personality Inventory

Borderline personality disorder (BPD) was first introduced as a formal psychiatric diagnosis in the third version of the Diagnostic and Statistical Manual (DSM-III) of the American Psychiatric Association (1980),⁽¹⁾ and later in the tenth version of the International Classification of Diseases (ICD-10) of the World Health Organization (1992).⁽²⁾ It was used for the emotionally unstable personality disorder typified by impulsivity and unpredictability. The term "borderline" first appeared in the literature of

psychoanalysis in the 1930s,⁽³⁾ and during the twentieth century, BPD was considered a by-product of socio-cultural changes. It emphasized adverse childhood experiences^(4,5) and vulnerability in people who were maladapted to rapid changes in the socio-cultural environment.⁽⁶⁻⁸⁾ Before its introduction in the DSM, the name "borderline personality organization (BPO)" was coined for this disorder.⁽⁹⁾ In recent years, studies focusing on biological predisposition toward borderline personality disorder have suggest-

From the Department of Psychiatry, Chang Gung Memorial Hospital-Kaohsiung Medical Center, Chang Gung University College of Medicine, Kaohsiung, Taiwan; ¹Tsyr Huey Mental Hospital, Kaohsiung, Taiwan.

Received: Aug. 29, 2007; Accepted: May 13, 2008

Correspondence to: Dr. Mian-Yoon Chong, Department of Psychiatry, Chang Gung Memorial Hospital, 123, Dapi Rd., Niasong Township, Kaohsiung County 833, Taiwan (R.O.C.) Tel.: 886-7-7317123 ext. 8756; Fax: 886-7-7326817; E-mail: mchong@cgmh.org.tw

ed a relationship of characterological affective instability and impulsive aggression with genetics and morphological changes in the brain.^(10,11)

Despite the progression, BPD remains one of the most controversial psychiatric diagnoses. Large-scale epidemiological data is thus necessary to further establish the diagnostic entity. Because of this difficulty, Gunderson and colleagues developed a semi-structured interview scale, the Diagnostic Interview for Borderline (DIB) in 1980 and its revised version, the DIB-R in 1990 with satisfactory reliability and validity.⁽¹²⁻¹⁴⁾ It was nonetheless inadequate because it was too time-consuming, and its applicability was thus restricted in large-scale epidemiological surveys. The introduction of a valid shorter form of a self-rated instrument is preferable in such instances. However, compared with structured interviews, self-report instruments have long been considered inadequate for diagnosing psychiatric disorders, especially personality disorders.⁽¹⁵⁾ To overcome these deficits, Leichsenring (1999) constructed an operationalized self-report instrument for identification of patients with borderline personality disorder, the Borderline Personality Inventory (BPI), with integration of the structures of BPO and DIB-R.^(16,17)

The BPI is a 53-item true/false self-reported questionnaire with good reliability and validity. A 20-item version (Cut-20) was further constructed from the original 53-item questionnaire, after taking account of differences in psychopathology among patients with neurosis, schizophrenia and BPD.

Like most developed countries, Taiwan is facing a growing problem of providing mental health services for patients with BPD. The erratic and manipulative behavior of BPD has been a focus of social attention and a problem because of repeated and inappropriate use of emergency services. Despite the high social cost and medical expenses from these patients, they are however, frequently ignored by the health-care workers. It is often difficult for non-psychiatric health workers to identify or screen these patients. This study aims to construct a shorter version of the BPI suitable for use in Taiwan, with authorization from Dr. Leichsenring.

METHODS

The BPI-T

A two-stage translation was adopted, with trans-

lation of the original BPI by the first author (CYL), with back-translation by an independent translator who had no medical background. The fluency was modified and colloquial language was used. A Taiwan version was prepared (BPI-T) after a pretest with 10 healthy subjects, taking into consideration the above translation process.

Subjects and procedures

Subjects between 18 and 45 years old, with above average intellectual capability were recruited for the study from a medical center in southern Taiwan. Subjects were excluded if they had any known or probable organic problems or mental conditions associated with substance use. Informed consent was obtained before entry into the study.

In addition to patients with borderline personality disorder, two other groups of patients (schizophrenia and neurotic disorders) and a group of healthy individuals were recruited for comparison. The subjects were referred by staff psychiatrists and were independently assessed by a senior psychiatrist (CYL) using a structured interview based on DSM-IV criteria. To avoid any other possible confounding effects, patients with borderline personality disorder comorbid with major depressive episodes were also excluded from the study.^(18,19) The patients with schizophrenia consisted of those with active or remitted symptoms; those with neurotic disorders included those with dysthymia and anxiety-spectrum disorders (e.g. generalized anxiety disorder, panic disorder, somatoform disorder, and obsessive compulsive disorder).

Statistical analysis

Like the original version, the most common 20 items were selected to form the shorter Taiwan version of the BPI (the BPI-T20). Analysis of variance (ANOVA) was used to examine the between-group differences of individual items among the four different groups.

The factor structure of the BPI-T20 was investigated with the scores from all respondents. A principle component analysis was performed with varimax rotation with Kaiser normalization. Cattell's scree test was used for selection of factors to be rotated and a threshold of > 0.5 was applied for retention of items in the factor scales.

The validity indices of the BPI-T20 were calcu-

lated, and receiver operating characteristic (ROC) analysis was used to obtain optimum cut-off scores for the BPI-T20. The area under the ROC curve was estimated to determine the discriminatory ability of the BPI-T20.

RESULTS

Characteristics of the subjects

Altogether, 544 subjects successfully completed the questionnaire, including 204 with BPD, 120 with schizophrenia, 130 with neurotic disorders and 90 healthy subjects (Table 1). Their mean age was 28.1 (S.D., 6.7) years. Patients with neurotic disorders and schizophrenia were slightly but insignificantly older than those with BPD and the healthy subjects. There were more women than men in the 4 groups of subjects, especially in the BPD and healthy subject groups.

Construction of the BPI-T20

Twenty items of the BPI-T with the highest scores in the BPD group were first selected and were compared item-to-item among the 4 groups. Among them, all were statistically significant except for item 49 (I am often insecure about questions concerning: (a) politics (b) religion (c) morals) and it was excluded in the selection process. It was replaced by the 21st most frequent item (in close relationships I am hurt again and again) to generate the BPI-T20. The corresponding frequencies of the selected items in all four groups are illustrated in decreasing order for comparison, as shown in Table 2.

Table 1. Subject Data

	Male	Female	Total	Age	
	n (%)	n (%)	n (%)	Mean	SD
BPD	32 (15.7%)	172 (84.3%)	204 (37.5%)	27.5	6.6
Schizophrenia	57 (47.5%)	63 (52.5%)	120 (22.1%)	29.3	6.3
Neurotic disorders	61 (46.9%)	69 (53.1%)	130 (23.9%)	30.3	7.1
Healthy	29 (32.2%)	61 (67.8%)	90 (16.5%)	25.2	5.8
Total	179 (32.9%)	365 (67.1%)	544 (100)	28.1	6.7

Abbreviation: BPD: borderline personality disorder

Internal consistency and factor structure of the BPI-T20

The Cronbach's alpha coefficient of the BPI-T20 was calculated at 0.91. When principle component analysis was applied in the analysis, 3 factors were found with eigenvalues exceeding unity, accounting for 49.78% of the variance. This three-factor solution was then applied in a further principal axis factor analysis with varimax rotation for interpretation. The factorial structure from this analysis for items with significant loading on each of the factors is shown in Table 3. Factor I was general pathology of the BPI related to identify diffusion and primitive defenses, and accounted for 38.55% of the total variance, while factor II was specific for suicide and factor III related to the fear of closeness in relationships.

Validation of the BPI-T20

ANOVA showed that subjects with BPD had significantly higher scores in the BPI-T20 than the other groups ($F = 256.452, p = 0.000$). The validity coefficients at different cut-off scores of the BPI-T20 were estimated (Table 4). Using ROC analysis, the optimum cut-off point of the BDI-T20 was estimated at 11/12, with an area under the ROC curve of 0.92 (Fig. 1). The sensitivity and specificity at this cut-off point were 89.8% and 82.8% respectively, with a misclassification rate of 14.7%.

DISCUSSION

Any assessment of abnormal personality needs to take account of its relative persistence, its independence from other mental disorders and the social maladjustment caused by the abnormality.⁽²⁰⁾ Because of these considerations, the BPI-T20 was constructed and tested across different groups of patients and healthy individuals. The patients had been followed by psychiatrists for some time, and their diagnoses verified by a research psychiatrist who was blind to their original diagnoses. Subjects with BPD in this study were predominantly young and female, which is common in BPD patients.⁽⁴⁾

BPD patients are characterized by unstable and intense interpersonal relationships, frantic efforts to avoid real or imagined abandonment, recurrent suicidal behavior, gestures, threats, or self-mutilating behavior, identity disturbance, and transient, stress-

Table 2. Comparison of Each Item of the BPI-T20 among the Four Groups of Subjects

Order	Item	BPD n (%)	Schizophrenia n (%)	Neurotic Disorders n (%)	Healthy n (%)
1	Sometimes I feel like I am falling apart.	199 (97.5%)	66 (55.5%)	86 (67.7%)	23 (25.6%)
2	I often wonder who I really am.	191 (93.6%)	55 (45.8%)	73 (57.5%)	21 (23.3%)
3	I often feel a sense of worthlessness or hopelessness.	183 (89.7%)	49 (41.5%)	53 (41.1%)	4 (4.4%)
4	Sometimes I feel a sense of not being real.	174 (85.7%)	65 (54.6%)	67 (52.3%)	22 (24.4%)
5	Sometimes I act or feel in a way that does not fit me.	173 (85.2%)	56 (46.7%)	52 (40.6%)	18 (20.2%)
6	I often don't know what I really want.	173 (84.8%)	52 (43.7%)	72 (56.3%)	21 (23.3%)
7	I have intentionally done myself physical harm.	172 (84.7%)	38 (31.9%)	19 (14.7%)	8 (8.9%)
8	Sometimes I feel guilty as if I had committed a crime, although I did not really commit one.	165 (82.1%)	52 (43.7%)	52 (40.6%)	18 (20.0%)
9	I frequently experience panic spells.	164 (80.8%)	51 (42.5%)	62 (48.4%)	2 (2.2%)
10	I have attempted suicide.	164 (80.4%)	43 (36.1%)	9 (7.0%)	8 (8.9%)
11	Sometimes it is difficult for me to tell, whether something really happened, or whether it occurred only in my imagination.	164 (80.4%)	72 (60.5%)	54 (42.2%)	17 (18.9%)
12	In romantic relationships, I am often uncertain what kind of relationship I want.	159 (78.7%)	53 (44.5%)	56 (43.4%)	26 (28.9%)
13	My feelings towards other people quickly change to opposite extremes (e.g., from love and admiration to hate and disappointment).	159 (77.9%)	36 (30.3%)	31 (24.0%)	6 (6.7%)
14	Sometimes I feel a special sense of destiny (e.g., like a prophet)	154 (76.2%)	54 (45.4%)	54 (41.9%)	25 (27.8%)
15	If a relationship gets close, I feel trapped.	151 (74.8%)	42 (35.9%)	64 (50.0%)	21 (23.3%)
16	Sometimes I believe that I have a serious disease.	146 (72.3%)	74 (62.7%)	63 (51.6%)	29 (32.6%)
17	I feel smothered when others show deep concern towards me.	141 (71.6%)	59 (50.4%)	54 (42.5%)	2 (2.2%)
18	I often have the feeling that others laugh or talk about me.	145 (71.4%)	48 (40.0%)	59 (45.7%)	24 (26.7%)
19	If relationships become too close, I often feel the need to break them off.	141 (69.8%)	45 (37.5%)	30 (23.4%)	5 (5.6%)
20	In close relationships I am hurt again and again.	139 (69.2%)	40 (33.9%)	35 (27.3%)	15 (16.7%)

No. of subjects: BPD = 204, Schizophrenia = 120; Neurotic disorders = 130; Healthy = 90; ANOVA, $F = 256.45$, $df = 543$, $p = 0.000$.

Table 3. Factor Structure of the BPI-T20

Factor I	Factor II	Factor III
General pathology	Self-destructive behavior	Fear of closeness
Item 11 (0.71)	Item 10 (0.84)	Item 19 (0.84)
Item 6 (0.68)	Item 7 (0.76)	Item 17 (0.60)
Item 16 (0.67)		
Item 8 (0.65)		
Item 4 (0.65)		
Item 2 (0.64)		
Item 9 (0.63)		
Item 3 (0.63)		
Item 1 (0.60)		
Item 15 (0.57)		
Item 14 (0.56)		
Item 5 (0.56)		
Item 12 (0.54)		
Item 18 (0.53)		
Item 13 (0.52)		

Cumulative variance = 49.77%

related paranoid ideation or severe dissociative symptoms. Clinically, patients with BPD can be differentiated from those with neurotic disorders and schizophrenia in terms of their defense mechanisms. Unlike patients with neurotic disorders, patients with

Table 4. Validity Coefficients (%) of the BPI-T20 at Different Cut-off Scores Using DSM-IV Criteria for Definition of Borderline Personality Disorder

Cut-off point	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Misclassification rate
8/9	98.9	65.2	58.6	97.9	22.4
9/10	97.3	71.8	62.4	99.1	18.8
10/11	94.6	78.4	66.8	97.8	15.6
11/12	89.8	82.8	71.8	96.1	14.7
12/13	86.6	85.9	75.2	93.2	13.9

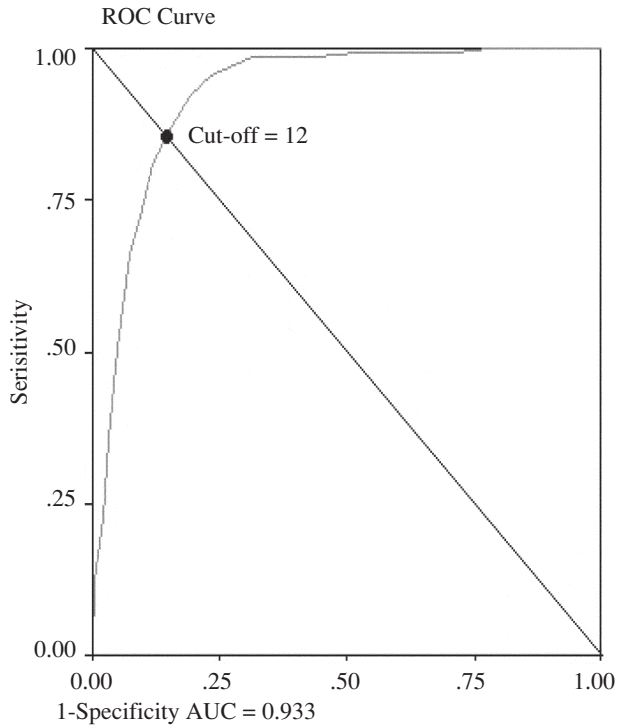


Fig. 1 Receiver Operating Characteristic (ROC) curve for the BPI-T20. (AUC = 0.933)

BPD have identity diffusion and primitive defense mechanisms. The disorder can be differentiated from schizophrenia by reality testing ability.⁽⁹⁾

Like the Cut-20, the construction of the BPI-T20 was done to make it an easy-to-administer short questionnaire which would cause minimal discomfort and be acceptable to subjects, while still sustaining its discriminatory ability. It started with item analysis to exclude those of its 53 original items that demonstrated weak discriminatory power and less ability to distinguish BPD from other groups of patients and healthy subjects. When items were examined item-by-item instead of in clusters, item 49 was excluded because it had less significant discriminatory power with other groups, and it was replaced by the next most frequent item.

When its reliability was examined for internal consistency using Cronbach's alpha, a very satisfactory result was seen. Furthermore, three factors were identified that well illustrated the dimensions of BPD, i.e., identity diffusion and primitive defenses, self-destructive behavior and fear of the closeness of relationships.

In the BPI-T20, the two items, "I have intentionally done myself physical harm" and "I have attempted suicide" indicate recurrent suicidal behavior or self-mutilating behavior, and are pathognomonic of BPD. The item "my feelings towards other people quickly change into opposite extremes" reflects the typical unstable and intense interpersonal relationships of patients with BPD. There are as many as five items related to problems of intimacy, i.e., "In romantic relationships I am often uncertain what kind of relationship I want", "If a relationship gets close, I feel trapped", "I feel smothered when others show deep concern towards me", "If relationships become too close, I often feel the need to break them off" and "In close relationships I am hurt again and again", all of which point to the BPD patients' ambivalent struggle in dealing with intimate relationships and their frantic efforts to avoid real or imagined abandonment. The items "I often wonder who I really am", "Sometimes I feel a sense of not being real" and "Sometimes it is difficult for me to tell whether something really happened or whether it occurred only in my imagination" may well illustrate BPD patients' manifestations of identity diffusion.

Despite problems with mood, relationship and repetitive self-destructive behavior that are phenomena seen with the BPI, short-lived doubtful psychotic symptoms might exist especially in crisis conditions. An example was illustrated in the item "I often have the feeling that others laugh or talk about me" which exhibits the characteristic transient, stress-related paranoid ideation or dissociative symptoms of BPD. In addition, items like "Sometimes I believe that I have a serious disease", and "I frequently experience panic spells" that elucidate BPD patients' propensity for somatizing their psychic pain often make it difficult to separate it from neurotic symptoms in panic disorder and hypochondria.

When the validity coefficients of the BPI-T20 were calculated at the cut-off scores of 11, 12, and 13, it was found that the sensitivity values were 94.6%, 89.8% and 86.6%, and the specificity 78.4%, 82.8% and 85.9% respectively. At the optimal cut-off point at 12, it had a negative predictive value of 96.1% and a high discriminatory ability using ROC analysis. The high negative predictive values and low misclassification rate of the BPI-T20 demonstrated that it can include as many cases as possible and is suitable for use in large-scale community sur-

veys in screening for cases of BPD.

Acknowledgements

This study was supported by a grant from the Chang Gung Medical Research Project (CMRP 1277). The authors would like to thank Professor Falk Leichsenring for his advice and comments, and Miss Cheng Hao-Jen for her statistical assistance.

REFERENCES

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 3rd ed. Washington DC: American Psychiatric Press, 1980:321-3.
2. World Health Organization. Pocket Guide to ICD-10 Classification of Mental and Behavioural Disorders with Glossary and Diagnostic Criteria for Research. Geneva: World Health Organization, 1994:228-9.
3. Stern A. Psychoanalytic investigation and therapy in the borderline group of neuroses. *Psychoanal Q* 1938;7:467-89.
4. Akhtar S, Byrne JP, Doghramji K. The demographic profile of borderline personality disorder. *J Clin Psychiatry* 1986;47:196-8.
5. Zanarini MC. Childhood experiences associated with the development of borderline personality disorder. *Psychiatr Clin North Am* 2000;23:89-101.
6. Millon T. On the genesis and prevalence of the borderline personality disorder: a social learning thesis. *J Personal Disord* 1987;1:354-72.
7. Paris J. Social risk factors for borderline personality disorder: a review and hypothesis. *Can J Psychiatry* 1992;37:510-5.
8. Paris J. Personality disorders, parasuicide and culture. *Transcult Psychiatry* 1991;28:25-39.
9. Kernberg OF. Borderline personality organization. *J Am Psychoanal Assoc* 1967;15:641-85.
10. Gurvits IG, Koenigsberg HW, Siever LJ. Neurotransmitter dysfunction in patients with borderline personality disorder. *Psychiatr Clin North Am* 2000;23:27-40.
11. Silk KR. Borderline personality disorder. Overview of biologic factors. *Psychiatr Clin North Am* 2000;23:61-75.
12. Kolb JE, Gunderson JG. Diagnosing borderline patients with a semistructured interview. *Arch Gen Psychiatry* 1980;37:37-41.
13. Zanarini MC, Gunderson JG, Frankenburg FR, Chauncey DL. Discriminating borderline personality disorder from other axis II disorders. *Am J Psychiatry* 1990;147:161-7.
14. Armelius BA, Kullgren G, Renberg E. Borderline diagnosis from hospital records. Reliability and validity of Gunderson's Diagnostic Interview for Borderlines (DIB). *J Nerv Ment Dis* 1985;173:32-4.
15. Loranger AW. Are current self-report and interview measures adequate for epidemiological studies of personality disorders? *J Personal Disord* 1992;2:313-25.
16. Conte HR, Plutchik R, Karasu TB, Jerrett I. A self-report Borderline Scale. Discriminative validity and preliminary norms. *J Nerv Ment Dis* 1980;168:428-35.
17. Leichsenring F. Development and first results of the Borderline Personality Inventory: a self-report instrument for assessing borderline personality organization. *J Pers Assess* 1999;73:45-63.
18. Sullivan PF, Joyce PR, Mulder RT. Borderline personality disorder in major depression. *J Nerv Ment Dis* 1994;182:508-16.
19. Gunderson JG, Morey LC, Stout RL, Skodol AE, Shea MT, McGlashan TH, Zanarini MC, Grilo CM, Sanislow CA, Yen S, Daversa MT, Bender DS. Major depressive disorder and borderline personality disorder revisited: longitudinal interactions. *J Clin Psychiatry* 2004;65:1049-56.
20. Tyrer PJ. Measurement of abnormal personality: A review. *J Royal Soc Med* 1987;80:637-9.

台灣邊緣型人格量表之信度與效度研究

李俊毅 文榮光¹ 葉偉強 李昱 張明永

- 背景：** 邊緣型人格量表 (BPI) 是一個具有良好信度與效度之自填問卷，本研究的目的是在於建構一簡短適用於台灣使用之邊緣型人格量表 (BPI-T20)，並檢定其信效度。
- 方法：** 邊緣型人格量表經由兩階段翻譯，修飾後編譯成台灣習慣用語之版本，並施測於三組個案 (邊緣型人格疾患、精神分裂症與精神官能症) 以及正常對照組。經過逐步項目分析，篩選出二十題項之台灣邊緣型人格量表 (BPI-T20)，進一步以內部一致性檢定法評估其信度，及以操作特徵曲線分析法 (ROC) 來評估其效度。
- 結果：** 個案及正常組共有 544 位完成 BPI-T20 之檢測。結果發現其內部一致性 Cronbach's alpha 係數為 0.92，經因素分析法得到三個有意義的因素。其效度均頗具顯著區辨邊緣型人格疾患能力，在 12 分列點時，ROC 曲線面積值為 0.93；敏感度與特异性分別為 89.8% 與 82.8%，誤認率則為 14.7%。
- 結論：** 本研究證實 BPI-T20 是一個具有良好信度與效度之自填問卷，能有效的篩選邊緣型人格違常個案，可用於台灣大規模之社區流行病學調查。
(長庚醫誌 2009;32:165-71)

關鍵詞： 邊緣型人格，台灣邊緣型人格量表 (BPI-T20)

長庚紀念醫院 高雄院區 精神科；長庚大學 醫學院；¹慈惠醫院

受文日期：民國96年8月29日；接受刊載：民國97年5月13日

通訊作者：張明永醫師，長庚紀念醫院 精神科系。高雄縣833鳥松鄉大埤路123號。Tel.: (07) 7317123轉8756;

Fax: (07) 7326817; E-mail: mchong@cgmh.org.tw