

Reliability and Validity of the Bipolar Depression Rating Scale on an Iranian Sample

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Abstract:

Background: The Bipolar Depression Rating Scale is an instrument to measure depression severity in patients diagnosed with bipolar disorder. This study has reevaluated the psychometric values of the Bipolar Depression Rating Scale through assessing an Iranian sample of patients with bipolar depression.

Methods: A total of 60 patients (36 males and 24 females) with bipolar depression referred to four medical centers in Tehran, Iran were interviewed with the Structured Clinical Interview for DSM-IV axis I Disorders, Young Mania Rating Scale, center for Epidemiological Studies Depression Scale, and the Bipolar Depression Rating Scale. Internal consistency and inter-rater reliability of the Bipolar Depression Rating Scale, and Pearson's correlation coefficient between the Bipolar Depression Rating Scale and Young Mania Rating Scale/Center for Epidemiological Studies Depression Scale were calculated.

Results: The Cronbach's alpha coefficient was 0.81. The Pearson's correlation coefficients of the Bipolar Depression Rating Scale with the Center for Epidemiological Studies Depression Scale and Young Mania Rating Scale were 0.73 and -0.82, respectively. The correlation coefficients between the two raters for the total score of the Bipolar Depression Rating Scale according to the Pearson's correlation and intraclass correlation tests were 0.83 and 0.89, respectively.

Conclusion: The Bipolar Depression Rating Scale is a reliable and valid instrument to use in studies on Iranian clinical patients with bipolar depression.

Keywords: Bipolar disorder - bipolar depression - Bipolar Depression Rating Scale - reliability - validity

Introduction

The depressive picture is the common clinical manifestation of two major mood disorders—major depressive disorder (MDD) and bipolar disorder (BD). It is usually difficult to diagnose whether a cross-sectional depressive picture is related to MDD or BD. Given that this differentiation is of clinical significance regarding different therapeutic options for each disorder, detecting the variation of the major depressive episode (MDE) between MDD and BD could be necessary.

There are some differences between BD and MDD for the MDE characteristics. Some of these characteristics which are seen more in bipolar depression are as follows: depression with few manic symptoms (depressive mixed state), depression with a family history of BD,¹ depression with a history of treatment-associated hypomania,^{2,3} early-onset depression,^{4,5} highly-recurrent depression,^{5,6} brief depressive episodes,^{1,7} depression with cyclothymic^{8,9} or hyperthymic temperament,¹⁰ atypical depression,^{5,11} depression with psychomotor retardation,^{11,12} psychotic depression,^{11,13} treatment-resistant depression,^{5,13} melancholic depression,^{11,12} and depression with specific obsessive-compulsive symptoms.^{14,15} Nevertheless, the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, Text Revision (DSM-IV-TR)¹⁶ did not consider specific diagnostic criteria for either of the essential types of depression (bipolar and unipolar). Although some bipolar depressive features have received attention in the Bipolar Spectrum Diagnostic Scale (BSDS),^{17,18}

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one of the screening tests for BD, the instruments provided for measuring the depression severity have been designed without regard to the differences between bipolar and unipolar depression. Also, validation of these instruments has been carried out on patients diagnosed with unipolar depression.¹⁹ The Hamilton Depression Rating Scale (HDRS)²⁰ and Montgomery-Åsberg Depression Rating Scale (MADRS)²¹ are among these tools. Therefore, utilizing the above scales in research on bipolar patients could be misleading, and obtaining more valid data would need the use of a more specific instrument for patients with BD. Hence, Berk and colleagues introduced a new scale termed the Bipolar Depression Rating Scale (BDRS).^{19,22} This scale measures depression severity and has been designed based on the HDRS, by taking into consideration changes and adaptations for patients with BD. The BDRS rates the mixed clinical picture of mood disorders and covers some symptoms commonly seen in bipolar depression that have not generally been considered in other depressive rating scales, such as the HDRS. The BDRS is utilized by psychiatrists or trained personnel and includes 20 items that individually could be rated from 0 to 3. To the best of our knowledge, the only published study for the psychometric evaluation of the BDRS is the study by Berk and colleagues²² which was undertaken on 44 males and 78 females diagnosed with bipolar depression. They reported that the BDRS has favorable internal consistency and strong correlation coefficients with the HDRS and MADRS. The present study has tried to reevaluate the psychometric values of the BDRS through assessing an Iranian sample of patients with bipolar depression by using a different rating scale for depression against the BDRS. Internal consistency, inter-rater reliability, and concurrent validity were considered to be evaluated.

Patients and Methods

A total of 60 depressed patients (with major or nonspecific depression), including 36 males and 24 females, who referred to four centers in Tehran, Iran were selected as nonrandomized participants. The researchers enrolled the probands through a convenience sampling.

These centers included Razi Hospital, Rasoul Akram Medical Center, Roozbeh Hospital, and

Sharif University Clinic. Other inclusion criteria were aged 18 – 65, diagnosed with BD according to the registered diagnosis on the hospital files by psychiatrists, and giving informed consent. Individuals were excluded if they were not diagnosed with BD according to the DSM-IV-TR criteria based on the Structured Clinical Interview for DSM-IV axis I Disorders (SCID-I).²³ There were 50 inpatients (83.3%) and 10 outpatients (16.7%) who were entered into the study.

The SCID-I,²³ Young Mania Rating Scale (Y-MRS),²⁴ Center for Epidemiological Studies Depression Scale (CES-D),^{25,26} and BDRS^{19,22} were utilized for the probands.

The BDRS is an observer-rated research tool to rate depression severity through 20 items that are scored from 0 to 3 (no symptoms=0, mild=1, moderate=2, severe=3). Therefore, the total score of the BDRS ranges from 0 to 60.

All patients were interviewed face-to-face according to the SCID-I by two trained researcher (M.S. students of psychology). The Y-MRS, CES-D and BDRS were also administered by the same researchers. CES-D and Y-MRS were utilized in order to assess the concurrent validity of the BDRS through measuring correlations between their scores. Given that the CES-D and BDRS measures the severity of depression, and the Y-MRS rates manic symptoms severity, it was expected that the changes of the first two scales' scores would be in the same direction, and in the opposite direction of the Y-MRS scores.

Descriptive statistics, internal consistency (Cronbach's alpha), inter-rater reliability (Pearson's correlation and intraclass correlation), and Pearson's correlation test between the BDRS and Y-MRS/CES-D were used. *P* value<0.05 was considered statistically significant in all instances.

Results

Demographic features of the probands and diagnoses are shown in Table 1. Most patients had highly recurrent depression (i.e. five or more depressive episodes in 86% of the probands) with an extensive history of this disorder (mean time interval from the first visit to a mental health professional was 11.23±8.23 years).

Calculation of the Cronbach's alpha coefficient indicated that BDRS had a favorable internal consistency.

Table 1. Demographic features of the probands (n=60) and the diagnoses.

Variable	N	Percentage
Gender		
Female	24	40
Male	36	60
Marital status		
Never married	20	33.3
Divorced	14	23.3
Married	26	43.3
Widowed	0	0.0
Education level		
Under diploma	41	68.3
Diploma and college	19	31.6
Diagnoses		
Bipolar type I	35	58.3
Bipolar type II	14	23.3
Bipolar NOS*	9	15.0
Cyclothymic disorder	2	3.3
*Not otherwise specified		

tency ($r=0.81$).

Pearson's correlation coefficient between each item and the total BDRS score was identified (item-total correlations). All items significantly correlated with the total score at the 0.05 level. The weakest correlation was for irritability (item 16) and the strongest correlations were seen in reduced motivation (item 6) and anxiety (item 8) (Table 2). As seen in Table 2, omission of some of the BDRS items changed the Cronbach's alpha coefficient (total minus item). In this regard, the reduced motivation (item 6) was different from the other items. Therefore, the omission of item 6 led to the greatest decrease in the Cronbach's alpha coefficient of the BDRS.

The Pearson's correlation coefficients of BDRS with CES-D and Y-MRS were high and in the predicted direction: $r=0.73$ and $r=-0.82$, respectively.

A sample of 20 patients was evaluated to identify the inter-rater reliability. The patients were interviewed by one interviewer in the presence of another interviewer, who was an observer (the concurrent rating). The Pearson's and intraclass correlation coefficients between the two raters for the total BDRS score were 0.83 and 0.89, respectively. The related findings (intraclass correlation coefficients for each item) are shown in Table 2.

Discussion

To the best of our knowledge, this is the first published psychometric study of a scale for rating bipolar depressive symptoms on an Iranian sample. The findings demonstrated that the BDRS had a favorable internal consistency, significant item-total correlations (although in a range of 0.26 to 0.62), strong positive correlation with the depressive symptoms severity according to CES-D, strong negative correlation with the manic/hypomanic symptoms severity based on the Y-MRS, and robust inter-rater reliability for the total score. Consequently, the BDRS could be a reliable and valid instrument to be used in the studies on Iranian clinical patients with bipolar depression. Nevertheless, the two raters' agreements concerning the score of the BDRS items ranged from 0.21 to 0.82 which implies that there is a variety in the reliability of rating different items.

To the best of our knowledge, the only published research which has identified BDRS psychometric values was the study by the BDRS designers²² which researched 122 clinical patients with bipolar depression, aged 18 – 65, from a few centers in Geelong and Sydney, Australia. They obtained a Cronbach's alpha of 0.92 and correlation coefficients of 0.91 and 0.74 between BDRS and MADRS and BDRS

Table 2. Item-total correlations, Cronbach's alpha (total minus item), and intraclass correlation (agreement) for the BDRS items

BDRS items	Item-total correlations	Cronbach's alpha (total minus item)	Intraclass correlation coefficient
1- Depression	0.45	0.81	0.82
2- Sleep disturbance	0.27	0.82	0.49
3- Appetite disturbance	0.32	0.82	0.29
4- Social impairment	0.45	0.80	0.40
5- Activity/energy reduction	0.34	0.82	0.27
6- Reduced motivation	0.62	0.79	0.57
7- Reduced concentration	0.46	0.80	0.34
8- Anxiety	0.62	0.80	0.71
9- Anhedonia	0.48	0.81	0.49
10- Flattened affect	0.34	0.82	0.47
11- Worthlessness	0.40	0.81	0.44
12- Helplessness	0.52	0.80	0.40
13- Suicidal ideation	0.48	0.81	0.57
14- Guilt	0.42	0.81	0.43
15- Psychotic symptoms	0.60	0.80	0.21
16- Irritability	0.26	0.82	0.45
17- Lability	0.56	0.80	0.62
18- Increased motor drive	0.43	0.81	0.34
19- Increased speech	0.46	0.81	0.48
20- Agitation	0.49	0.80	0.66

and HDRS, respectively. These data were in line with the present findings.

In Table 2, depression had the highest inter-rater reliability followed by anxiety, agitation, lability, reduced motivation, and suicidal ideation. The highest item-total correlation coefficients were calculated for reduced motivation and anxiety, followed by psychotic symptoms, lability, and helplessness.

A search for the best questions to screen bipolar depression indicated that the correlation of the item depression with the total score of the BDRS was 0.45. This indicates that questioning solely about depressed mood would be an ineffective way to screen for bipolar depression, even its inter-rater reliability was highest. On the other hand, with regards to the common items between the two groups of the items with higher item-total correlation and the items with higher inter-rater reliability; we can recommend the items

anxiety, reduced motivation, and lability as the most useful symptoms which can be applied in screening for BD. Among them, reduced motivation is unique with regard to showing the most reduction in internal consistency of the BDRS following its omission in comparison with the other items (Table 2).

It is interesting that in the shortened forms of the HDRS,²⁰ despite omitting several items from the original scale, the items related to anxiety and reduced motivation have always been included and their sensitivity to change with treatment have been favorable as seen in the studies of Bech et al. (HDRS₆),²⁷ Maier and Phillip (HDRS₆),²⁸ McIntyre et al. (HDRS₇),²⁹ and Gibbons et al. (HDRS₈).³⁰ However, lability had not been considered for the HDRS versions but now it has been included in the BDRS for adaptation with bipolar depression. Mood lability has been in a close relationship with BD,

particularly type II. Akiskal and colleagues³¹ have reported that “mood swings with rapid shifts” in depressed patients is the hallmark of unipolar depression with the potential of switching to BD type II. Also, examining the MDE cases diagnosed with BD type II or MDD has implied that mood swings could be a predictor of BD type II with a sensitivity of 62.9% and specificity of 62.7%.³²

The weakest total-item correlation was for irritability (0.26); a key symptom of mania/hypomania which has been cited as a diagnostic clue in the depressive episode of BD by some researchers.³³ The present finding is in line with the findings of Perlis et al.³⁴ who demonstrated that irritability is not always a bipolar spectrum index in different groups of patients presenting with BD. Therefore it seems that there is a subgroup of BD patients with irritability as a prominent symptom during the depressive episode.³⁵

This study was carried out on an Iranian sample of clinical patients speaking Persian language (predominantly hospitalized), therefore generalization of the findings should be done regarding these sample characteristics. Nevertheless, the cases were recruited from multiple sites and the varieties of the patients with regards to demographics and type of BD were taken into consideration. It is suggested that the study be replicated utilizing a larger sample size with higher numbers of patients diagnosed with BD type II, cyclothymic disorder and BD not otherwise specified, in order to evaluate the sensitivity of the BDRS to change with treatment and to fluctuations during the natural course of the disorder.

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