Psychometric properties and validity of Beck Depression Inventory-II in Multiple Sclerosis

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Introduction
Depression is the most common psychiatric disorder in Multiple Sclerosis (MS) with annual prevalence rates of 20% and lifetime prevalence ranging 40%-60% across studies.[1-2] Self-report depression scales are frequently used as screening, diagnostic and grading instruments of depression.[3] The aim of the present study was to explore the psychometric characteristics and the validity of Beck Depression Inventory-II (BDI-II) in a sample of Italian MS patients. We also aimed at identification of an optimal cut-off to provide physicians with a rapid screening tool for detecting clinically relevant depressive symptoms in MS.

Methods
A sample of 141 consecutive non-demented MS patients was recruited from the MS Center of the Second University of Naples. All patients underwent a clinical interview, a neurological and neuropsychological evaluation, including the Brief RAO Battery (BRB), the assessment of disability by the Expanded Disability Status Scale (EDSS) and Fatigue Severity Score (FSS) questionnaires.[10] The presence of clinically relevant depressive symptoms was evaluated by Chicago Multiscale Depression Inventory (CMDI) and BDI-II questionnaires.

Results
The sample included 42M and 99F with different MS phenotype (4 CIS, 113RR, 18SP and 6 PP). Clinical and demographic characteristics of the sample are summarized in Table 1.

The BDI-II mean (SD) and median values were 11.94 (9.87) and 10.00, respectively. Cronbach’s alpha value was 0.89. All Item Total Corrected Correlation (ITCC) between individual items and BDI-II total score were ≥0.30 except for item 18 (change in appetite), but removal of this item did not increase internal consistency (Cronbach’s alpha value 0.90). A principal components analysis revealed a two-factor structure assessing cognitive-affective and somatic-depressive symptoms, respectively (Table 3). BDI-II also showed good convergent and divergent validity in our MS population. With respect to CMDI serving as the “gold standard”, the receiver operating characteristic curve revealed that BDI-II is an adequate diagnostic measure and that the optimum total cut-off score was 18.5. Such score identified clinically relevant depressive symptoms in 25.5% of our MS sample.

Conclusion
BDI-II is a reliable and valid tool for detecting, grading and monitoring depressive symptoms in Italian MS patients. This scale is simple and requires less time than other validated questionnaires for depressive symptoms (e.g., CMDI).

References

Table 1. Demographic and clinical characteristics of MS sample

<table>
<thead>
<tr>
<th>Age</th>
<th>Mean(SD)</th>
<th>Median</th>
<th>Range (Min-Max)</th>
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<tbody>
<tr>
<td>45</td>
<td>50.7 (13.9)</td>
<td>50.0</td>
<td>18-82</td>
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Table 2. Factor analysis of BDI-II

Factor 1 Factor 2
Item 14. Feelings of worthlessness -0.50 -0.24
Item 3. Pessimism -0.16 -0.32
Item 13. Indifference -0.35 -0.47
Item 4. Loss of pleasure -0.40 -0.40
Item 5. Depressive mood -0.40 -0.40
Item 1. Feeling sad -0.51 -0.30
Item 6. Self-criticalness -0.40 -0.40
Item 2. Guilty feelings -0.25 -0.25
Item 15. Loss of energy -0.62 -0.62
Item 21. Loss of interest in sex -0.80 -0.80
Item 9. Self-estimation -0.40 -0.40
Item 10. beach -0.40 -0.40
Item 17. Sleeplessness -0.40 -0.40
Item 16. Change in sleeping pattern -0.35 -0.35
Item 18. Change in appetite -0.80 -0.80
Item 11. Agitation -0.35 -0.35
Item 12. Loss of interest -0.80 -0.80
Item 19. Concentration difficulty -0.40 -0.40

Table 3. Factor analysis of CMDI

Factor 1 Factor 2
Item 6. -0.50 -0.40
Item 3. -0.50 -0.40
Item 4. -0.50 -0.40
Item 5. -0.50 -0.40
Item 7. -0.50 -0.40
Item 8. -0.50 -0.40
Item 9. -0.50 -0.40
Item 10. -0.50 -0.40
Item 11. -0.50 -0.40
Item 12. -0.50 -0.40
Item 13. -0.50 -0.40
Item 14. -0.50 -0.40
Item 15. -0.50 -0.40
Item 16. -0.50 -0.40
Item 17. -0.50 -0.40
Item 18. -0.50 -0.40
Item 19. -0.50 -0.40

Select coefficients (r≥0.35) are bolded. Factor 1 = Cognitive-Affective symptoms; Factor 2 = Somatic-Depressive symptoms.