The Geriatric Depression Scale (GDS-15): Is cognitive ability associated with how geriatric patients respond to self-reported depressive symptoms?

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Introduction

1. Out of 3 older adults develop late-life depression, hence screening tools are essential for early detection and intervention.
2. The GDS-15 is a widely used “yes/no” self-report screening tool to assess severity of depressive symptoms.
3. Since it is tailored to geriatric populations, poor cognitive ability (i.e. severity of dementia) may influence the validity of self-report responses.
4. However, recent studies argue that the GDS is suitable for patients with mild to moderate dementia.
5. No studies have yet demonstrated whether older adults with low cognitive ability respond differently to the GDS-15 compared to older adults with high cognitive ability.

Purpose

1. To determine whether response patterns to the GDS-15 differ between geriatric patients with low, medium or high cognitive ability.

Methods

1. Patient chart data (n=225) were collected from geriatric outpatient clinics at the MUHC.
2. Measures: Mini-Mental State Examination (MMSE) for cognitive ability and GDS-15
3. Stratified into 3 groups based on total MMSE cut-off scores:
   - Normal ≥26 (n=96)
   - Mild Cognitive Impairment 21-25 (n=77)
   - Moderate/Severe Dementia ≤20 (n=47)

Rasch Analysis (RUMM2030 software) test unidimensionality of latent construct depression, where the probability of obtaining a specific score depends on the interaction between the person’s level of depression and severity of the GDS item.

Differential Item Functioning (DIF) Analysis compares the 3 cognitive groups for each GDS item to see whether there is a response pattern difference based on cognitive ability. (2-way ANOVA, sig. p.<.001* Bonferroni corrected)

Results

Sample Demographics

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>% of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>72</td>
<td>32%</td>
</tr>
<tr>
<td>Female</td>
<td>153</td>
<td>68%</td>
</tr>
<tr>
<td>Age (years) ≤80</td>
<td>98</td>
<td>44%</td>
</tr>
<tr>
<td>Age (years) &gt;81</td>
<td>127</td>
<td>56%</td>
</tr>
<tr>
<td>MMSE (total) ≤20</td>
<td>47</td>
<td>21%</td>
</tr>
<tr>
<td>MMSE (total) &gt;20</td>
<td>77</td>
<td>34%</td>
</tr>
<tr>
<td>Site (hospital) Royal Victoria</td>
<td>86</td>
<td>38%</td>
</tr>
<tr>
<td>Site (hospital) Montreal General</td>
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<td>62%</td>
</tr>
<tr>
<td>Test Language English</td>
<td>139</td>
<td>62%</td>
</tr>
<tr>
<td>Test Language French</td>
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<td>28%</td>
</tr>
<tr>
<td>Test Language Italian</td>
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<td>9%</td>
</tr>
<tr>
<td>Test Language Other</td>
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<td>1%</td>
</tr>
<tr>
<td>Education (years) ≥12</td>
<td>81</td>
<td>36%</td>
</tr>
<tr>
<td>Education (years) &gt;12</td>
<td>41</td>
<td>18%</td>
</tr>
</tbody>
</table>

Rasch Summary

- Fit Model? No
- Item-trait Interaction (X² test) 86, p<.0001
- Reliability (Person Separation Index) 0.70
- Test-of-fit Power Good
- Misfit Items 1)Memory problem 2)Life is empty 3)Prefer stay home 4)Good spirits

Differential Item Functioning (DIF) Graphs

1) Item 6 (afraid something bad happen) & Cognitive Ability (MMSE)
   - Fit Model? No
   - Item-trait Interaction (X² test) 86, p<.0001

2) Item 15 (most people better off than you) & Education (years)
   - Fit Model? No
   - Item-trait Interaction (X² test) 86, p<.0001

Item Hierarchy Map

- GDS-15 Items
  1) Are you basically satisfied with your life?
  2) Have you dropped many of your activities and interests?
  3) Do you feel that your life is empty?
  4) Do you often get bored?
  5) Are you in good spirits most of the time?
  6) Are you afraid that something bad is going to happen to you?
  7) Do you feel happy most of the time?
  8) Do you often feel hopeless?
  9) Do you prefer to stay at home, rather than going out and doing things?
 10) Do you feel you have more problems with memory than most?
 11) Do you think it is wonderful to be alive now?
 12) Do you feel pretty worthless the way you are now?
 13) Do you feel full of energy?
 14) Do you feel that your situation is hopeless?
 15) Do you think that most people are better off than you?

Discussion

- Our results align with previous Rasch GDS studies which found similar misfit items (memory problem, life is empty, prefer stay home).
- Item 6 (afraid something bad) showed DIF, misfit and did not contribute to the geriatric depression construct in the U.S. sample.
- This suggests that older adults with high cognitive ability may interpret “something bad” differently compared to older adults with low cognitive ability.
- Hence, rewording this question more clearly and/or specifying “something bad” may increase item response consistency.

Conclusion

- Response patterns to the GDS-15 do not differ based on cognitive ability among geriatric outpatients except for item 6.
- Fear about the future contributes less to severity of depressive symptoms in patients with lower cognitive ability.
- Further consideration of removing unstable item 6 might potentially improve GDS-15 validity among older adults with dementia.

References