Comparing the Cognitive Screening Tools MMSE and SLUMS

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MMSE and SLUMS as Measures of Cognitive Impairment

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Mini–Mental State Examination (MMSE)

- One of the most widely used neuropsychology tests and dementia screening tool.
- Many practitioners have used MMSE scores to recommend treatment options, but are unsure how SLUMS scores compare to those well-known cut-off scores.
Introduction

- Limitations of MMSE
  - Rigid reliance on specific cut-off scores can lead to errors in diagnosis
  - Patients with higher MMSE scores can show significant cognitive impairment when given more sensitive tests
Introduction

- Saint Louis University Mental Status (SLUMS)
  - Better tests for aphasia
  - Five items to remember instead of three (MMSE)
  - Clock drawing already built-in
  - Psychometrically superior
Introduction

- Cognitive Reserve
  - May cover up neuropathophysiology of dementia

- 3 patients scored 30 at time of diagnosis; 5 patients able to score 30 on follow-up administration.
- 5 of the 27 patients scored 27 or higher with diagnosis of mild AD.
- “Normal functioning” scores on MMSE were seen with lower scores on many other assessment tools used in this study.
- Found patients with more mild AD (MMSE ≥ 21) responded better than those with severe AD in terms of language, IADLs (e.g., using telephone)

Raji, Tang, Heyn, Kuo, Owen, Singh, & Ottenbacher (2005):
- Mental status screening using SLUMS detected 60% more cases of mild cognitive impairment when compared to MMSE.
- Significant correlations found between MMSE and SLUMS.
Objective

- Establish norms to provide practitioners with a direct method of converting and comparing MMSE and SLUMS scores.
- Cognitive reserve, defined as years of education, would show a difference between MMSE and SLUMS scores.
Collected data from variety of independent and non-independent living environments.

Total of 118 participants with an average age of 80.03 (SD=8.71).

Participants had an average educational attainment of 14.97 years (SD=2.68).

Each participant was given both the MMSE and SLUMS.

- Test order counterbalanced to minimize testing bias.
Results

All Participants

<table>
<thead>
<tr>
<th>Test</th>
<th>Score On Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMSE</td>
<td>30</td>
</tr>
<tr>
<td>SLUMS</td>
<td>25</td>
</tr>
</tbody>
</table>

The bar chart shows the average score on MMSE and SLUMS tests for all participants.
Comparison of Top and Bottom Quartiles of Educational Attainment
Results

Mean Difference in Test Score by Living Environment

Test Score Difference

Independent living

Assisted living

Living Environment
Average MMSE and SLUMS scores as a function of living environment

<table>
<thead>
<tr>
<th>Living Environment</th>
<th>MMSE</th>
<th>SLUMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assisted Living</td>
<td>23.55</td>
<td>15.32</td>
</tr>
<tr>
<td>Independent Living</td>
<td>28.03</td>
<td>24.41</td>
</tr>
<tr>
<td>Skilled Nursing</td>
<td>29.00</td>
<td>24.00</td>
</tr>
<tr>
<td>Other</td>
<td>29.00</td>
<td>23.50</td>
</tr>
</tbody>
</table>
Conclusions & Implications

- It may be SLUMS is more sensitive at detecting cognitive impairments when people are in mild cognitive impairment range.
- We did not find evidence to support our cognitive reserve hypothesis.
- Practitioners can now convert SLUMS and MMSE scores with our observation that there is an average difference of 4.56
  - SLUMS is lower score.
Limitations

- Education levels may be higher than average.
- A more representative sample of relevant demographic variables is needed.
- There may have been a selection bias in the type of people who volunteered for this study.
