A Rasch Model Analysis of the Montreal Cognitive Assessment within a Cancer Population

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Background
- It has been well established that cognitive deficits are prevalent in many end-stage diseases such as HIV/AIDS and cancer.
- However, the specific aspects of cognition affected by cancer are still imprecise.
- Although the Montreal Cognitive Assessment has been validated in a geriatric population, studies have not yet shown its application to the cognitive deficits experienced by individuals affected by cancer.

Objectives
- To determine the dimensionality of the Montreal Cognitive Assessment (MoCA®) within a cancer population using statistical Rasch modeling.

Methods
- Data from 54 consecutive patients was collected retrospectively from patients enrolled in the Cancer Nutrition-Rehabilitation Program at the McGill University Health Centre – Montreal General Hospital.
- The patients’ scores on each item of the MoCA® were analyzed using Rasch modeling on RUMM 2020.
- Tests of fit statistics were used to determine items which did not fit the model.
- Inclusion Criteria: All cancer types/sites
- All stages
- Exclusion Criteria: Brain-related cancer or metastasis

Table 1: Patient Characteristics (n = 54)

<table>
<thead>
<tr>
<th>Age (years) (mean (SD))</th>
<th>58.78 (12.56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male [n (%)]</td>
<td>23 (42.59)</td>
</tr>
<tr>
<td>Female [n (%)]</td>
<td>31 (57.41)</td>
</tr>
<tr>
<td>During Chemotherapy [n (%)]</td>
<td>26 (48.15)</td>
</tr>
<tr>
<td>Post Chemotherapy [n (%)]</td>
<td>28 (51.85)</td>
</tr>
<tr>
<td>&lt;12 years education [n (%)]</td>
<td>46 (85.19)</td>
</tr>
<tr>
<td>≥12 years education [n (%)]</td>
<td>8 (14.81)</td>
</tr>
</tbody>
</table>

Results
- Distribution of Person Location (MoCA® Scores)
- Person-Item Threshold Distribution

MoCA® Items
- Perfect Score
- Mild Cognitive Deficits

Discussion
- The present study represents the first application of Rasch Analysis to the MoCA® within a cancer population.
- The results suggest that the MoCA® may be testing a unidimensional construct such as cognition of cognitive deficits.
- The only exceptions are the items abstraction and subtraction. Abstraction was removed from the model due to local dependency on abstraction. Whereas, subtraction was removed due to differential item functioning. We speculate that this may be a result of person factors.
- This study was limited by its small sample size.
- Further research is required to explore testing over multiple time points.

Conclusion
- The results of this Rasch analysis begin to indicate that the MoCA® may be used as a measure of cognition in patients with cancer.

References


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