Shortening the HIV Disability Questionnaire (HDQ) for use in Clinical Practice: A Rasch Analysis

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Results: Rasch Model - HIV Disability Questionnaire Domains

### HDQ Domain

<table>
<thead>
<tr>
<th>Original Number of Items</th>
<th>Proposed Number of Items in Short-Form (SF-HDQ)</th>
<th>Model Fit Chi Square; p value; (n)</th>
<th>Coefficient Alpha; Person Separation Index (PSI) (ideal ≥ 0.70)</th>
<th>Unidimensionality (% paired t-tests significant) (ideal ≤ 5%)</th>
</tr>
</thead>
</table>

### Physical Symptoms and Impairments
20 items, 10 items
- Good Fit 3.04; χ²(10) = 6.03 (n=981)
- 0.79
- 0.4%

### Cognitive Symptoms and Impairments
3 items, 3 items
- Good Fit 7.93; χ²(3) = 3.73 (n=730)
- 0.71
- 1.2%

### Mental-Emotional Health Symptoms and Impairments
11 items, 5 items
- Good Fit 5.38; χ²(7) = 5.83 (n=930)
- 0.79
- 1.1%

### Uncertainty or Worry about the Future
14 items, 5 items
- Good Fit 5.87; χ²(4) = 5.06 (n=930)
- 0.82
- 1.7%

### Difficulties with Day-to-Day Activities
9 items, 5 items
- Good Fit 7.68; χ²(3) = 7.75 (n=930)
- 0.79
- 0.7%

### Challenges to Social Inclusion
12 items, 7 items
- Good Fit 8.67; χ²(4) = 8.93 (n=930)
- 0.79
- 1.3%

### Item Fit Residuals
- All items residuals were within -2.5 to 2.5 except for:
  - Social Inclusion: HQD68 (tend to isolate self from others because HIV positive).
  - Item Residual: -3.142 (p<0.003).

*Item retained due to clinical importance.

### Item Threshold Maps

- Physical Symptoms and Impairments (10 items)
- Cognitive Symptoms and Impairments (3 items)
- Mental-Emotional Health Symptoms and Impairments (5 items)
- Uncertainty (5 items)
- Difficulties with Day-to-Day Activities (5 items)
- Challenges to Social Inclusion (7 items)

### Category Probability Curves (Examples)

- Category Probability Curve (HQD3) (example): Originally HQD3 had Disordered Thresholds (see category 3 option)
- New Category Probability Curve (HQD3): Rescored HQD3 (nausea) to collapse '3' and '4' options. Items now have 4 response options (see below)

### Uncertainty Example - Category Probability Curve: HQD3.5.
- Each category (representing the 5 response options from 0 [no worry] to 4 [extreme worry]) has distinct areas for probability of response across the logit scale.

### Item Threshold Maps: Items all ordered. 2 items in Social Inclusion Domain (HQD63 and HQD67) were rescored from 5 to 3 response options.

### Conclusions
- The 35-item SF-HDQ offers a brief yet comprehensive patient-reported outcome measure of episodic disability to measure the nature and extent of disability experienced by adults living consultation with clinicians and community to refine the SF-HDQ for use with adults living with HIV.
- Next steps involve assessing the utility of the SF-HDQ and its measurement properties in clinical and community-based settings with adults living with HIV.

### Discussion
- We propose a short-form version of the HIV Disability Questionnaire (SF-HDQ) comprised of 35 items, reduced from the original 69 items.
- Decisions to retain or remove items required consideration of the Rasch model results in combination with clinical relevance of items.
- Among the remaining items, 3 items were reordered (1 item in physical; 2 items in social); all domains met overall fit criteria; all domains met the unidimensionality test.

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