Author's response to reviews

Title: Cross-cultural adaptation of the Neck Disability Index and Copenhagen Neck Functional Disability Scale for patients with neck pain due to degenerative and discopathic disorders. Psychometric properties of the Polish versions.

Authors:

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Version: 2 Date: 7 March 2011

Author's response to reviews: see over
Authors' response to the review

**Title:** Cross-cultural adaptation of the Neck Disability Index and Copenhagen Neck Functional Disability Scale for patients with neck pain due to degenerative and discopathic disorders. **Psychometric properties of the Polish versions.**

**Authors:** Ewa Misterska, Roman Jankowski, Maciej Glowacki

Dear Editor,

We would like to thank you for giving us the opportunity to revise our manuscript. We have carefully read all the remarks made by the referees and addressed all of the reviewers’ comments. All the passages that we have changed or added to the manuscript are highlighted in gray.

Once again, thank you for considering our manuscript.

Sincerely,

Ewa Misterska, Roman Jankowski, Maciej Glowacki

**Reviewer's report**

**Title:** Cross-cultural adaptation of the Neck Disability Index and the Copenhagen Neck Functional Disability Scale for patients with neck pain due to degenerative and discopathic disorders: a validation study of the Polish versions.

**Version:** 1  **Date:** 30 January 2011

**1st Reviewer:** Leonardo Costa

**Reviewer's report:**

**Title:**

The title needs to reflect the main objectives (or findings) of the study, although the authors tested the validity, reliability and internal consistency of the instruments, they only state the validity in the title, my suggestion is to say “clinimetric properties/measurement properties or psychometric properties” instead of “validation study”.

We have corrected the title as follows:

Cross-cultural adaptation of the Neck Disability Index and Copenhagen Neck Functional Disability Scale for patients with neck pain due to degenerative and discopathic disorders. **Psychometric properties of the Polish versions.**
Abstract:
Please present the 95% confidence intervals for the reliability estimates. 3 decimal places is too much, please reduce them to two decimal places. Change 0.870 p<0.001 to 0.87 p<0.001 (i.e. replace the comma to a dot).

We have presented the 95% confidence intervals for the reliability estimates and reduced 3 to 2 decimal places in the results section.

Results. The Cronbach’s alpha values were excellent for the NDI-PL in the test and in the retest (0.84, 0.85, respectively), and for the CDS-PL (0.90 in the test and in the retest). Intraclass Correlation Coefficients were excellent for the CDS-PL and NDI-PL and equalled 0.93 (95% CI from 0.89 to 0.95) and 0.87 (95% CI from 0.80 to 0.92), respectively. The concurrent validity was good in the test and in the retest (rs=0.42 p<0.001; rs=0.40 p=0.002, respectively) for NDI-PL and for CDS-PL (rs=0.42 p<0.001; rs=0.40 p=0.001, respectively). The adapted questionnaires showed a strong inter-correlation both in the test (0.87 p<0.001) and in the retest (0.79 p<0.001).

Conclusions should state all properties, not only reliability and validity.

We have supplemented the Conclusions as follows:

Conclusions. The present versions of the NDI-PL and CDS-PL, the first to be published in Polish, have proven to be reliable and valid for patients with degenerative changes in the cervical spine. The NDI-PL and CDS-PL have excellent internal consistency and test-retest reliability, and good concurrent validity. The adapted questionnaires showed a strong inter-correlation both in the test and in the retest. No ceiling or floor effects were detected in the NDI-PL and CDS-PL. The NDI-PL and CDS-PL are comparable with other versions and can be recommended and used in international comparative studies.

Introduction:
• Page 3, last row: change “its’ function” to “its function”

We have corrected this sentence as follows:

These are classed as region-specific functional outcome questionnaires, which concentrate on specific parts of the body, therefore providing more detailed data on its
function within a defined disease entity with greater responsiveness compared to a questionnaire of a general nature such as the SF-36.

- Page 4, second row: “such as the SF-36” needs a reference... also some people might not know what SF-36 means.

According to this suggestion, we have supplemented the description of the SF-36, as follows:

These are classed as region-specific functional outcome questionnaires, which concentrate on specific parts of the body, therefore providing more detailed data on its function within a defined disease entity with greater responsiveness compared to a questionnaire of a general nature such as the SF-36 [8], which is a multi-purpose, short-form health survey with 36 questions and yields an 8-scale profile of functional health and well-being scores as well as psychometrically-based physical and mental health summary measures [8].

- Page 4: I did not understand what the sentence “widely applied methods in research to indigenous conditions” means.

We have corrected this sentence to make it more clear, as follows:

A number of authors [3,5,10] highlight the need to adapt recognized and widely applied assessment tools in research rather than developing a new scale leading to the multiplication of outcome measures lacking the comparison of populations [2].

- Page 4: “Polish-speaking patients with neck pain has ever been validated.” Same comment as the title applies here, “validate” is only one of the tests that the authors performed, ideally would be “measurement properties” or something similar.

We have corrected this sentence:

To our knowledge, no questionnaire assessing disability in everyday activities in Polish-speaking patients with neck pain has ever been evaluated and tested for its psychometric properties.

Methods:

- “We performed an assessment of the test-retest reliability using the Pearson correlation coefficient”. Pearson’s correlation coefficients are inadequate statistics to generate reliability estimates, the authors should calculate Intraclass Correlation Coefficients (type 2,1) instead. There are many statistics guidelines suggesting against the use of Pearson’s r for reliability estimates. Please change it to ICCs and present the 95% confidence intervals for the ICCs.
According to the reviewer’s advice, we have calculated Intraclass Correlation Coefficients (ICCs) instead of Pearson’s correlation coefficients to generate reliability estimates and presented the 95% confidence intervals for the ICCs, as follows:

Abstract:

**Results.** The Cronbach’s alpha values are excellent for the NDI-PL in the test and in the retest (0.84, 0.85, respectively), and for the CDS-PL (0.90 in the test and in the retest). Intraclass Correlation Coefficients are excellent for the CDS-PL and NDI-PL and equalled 0.93 (95% CI from 0.89 to 0.95) and 0.87 (95% CI from 0.80 to 0.92), respectively. The concurrent validity was good in the test and in the retest (rs=0.42 p<0.001; rs=0.40 p=0.002, respectively) for NDI-PL and for CDS-PL (rs=0.42 p<0.001; rs=0.40 p=0.001, respectively). The adapted questionnaires showed a strong inter-correlation both in the test (0.87 p<0.001) and in the retest (0.79 p<0.001).

**Evaluation of the psychometric properties of the NDI-PL and CDS-PL**

Values of Intraclass Correlation Coefficient (ICC) above 0.80 were considered as evidence of excellent reliability [19].

**Results**

**Test-retest reliability**

Intraclass Correlation Coefficients were excellent for the CDS-PL and NDI-PL and equalled 0.93 (95% CI from 0.89 to 0.95) and 0.87 (95% CI from 0.80 to 0.92), respectively (Table 3).

Table 3. Cronbach’s alpha, criterion validity and test-retest reliability values for the NDI-PL and CDS-PL

<table>
<thead>
<tr>
<th></th>
<th>Test</th>
<th>Retest</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cronbach’s alpha</td>
<td>Concurrent validity</td>
<td>Cronbach’s alpha</td>
</tr>
<tr>
<td>NDI-PL</td>
<td>0.84</td>
<td>rs=0.42 p&lt;0.001</td>
<td>0.85</td>
</tr>
<tr>
<td>CDS-PL</td>
<td>0.90</td>
<td>rs=0.42 p&lt;0.001</td>
<td>0.90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Test-retest reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDI-PL</td>
<td>ICC=0.87 95% CI from 0.80 to 0.92</td>
</tr>
<tr>
<td>CDS-PL</td>
<td>ICC=0.93 95% CI from 0.89 to 0.95</td>
</tr>
</tbody>
</table>

NDI-PL—Neck Disability Index
CDS-PL—Copenhagen Neck Functional Disability Scale
We have corrected the following paragraph as well:

_Evaluation of the psychometric properties of the NDI-PL and CDS-PL._

5. We performed an assessment of the test-retest reliability using the **Intraclass Correlation Coefficients (ICCs)**. The NDI-PL and CDS-PL were completed twice at a 24-hour interval.

• **Please justify the 24-hour interval for the test-retest reliability.**

We decided to chose a retest interval of 2 days, similarly to the authors of the Spanish or Iranian version of NDI, in order to avoid variations in the clinical status of the patients and to avoid the patients remembering their previous answers. As suggested by Holt et al. [12], a long interval period may be inappropriate for a test–retest study of health measures because too many changes in the patient’s health status can occur. Opinions regarding the appropriate interval have varied from 1 hour to 1 year, but a retest interval of 2 to 14 days is generally accepted [25].

• **Please change “criterion-validity” to construct validity. Criterion validity are just applicable for comparisons against a gold-standard, which does not exist for neck disability. (see Terwee et al 2007 for details)1**

According to this advice, we have changed “criterion-validity” to “construct validity”:

_Evaluation of the psychometric properties of the NDI-PL and CDS-PL._

6. For **construct-related validity**, the concurrent validity method was used. To examine the concurrent validity, the relation between the NDI-PL and CDS-PL and 100-mm Visual Analogue Scale was examined by the Spearman’s rank correlation coefficient.

• **Please explain the sentence “The Spearman's rank correlation coefficient (rS) was used to determine dependency between quantitative characteristics. The Mann-Whitney test was applied to determine dependency between quantitative and qualitative characteristics”**.

In this sentence we have described the statistical methods used to determine dependency between selected patients clinical characteristics and NDI-PL or CDS-PL. We have described the results achieved in the results section.
• The authors state that patients received treatment, so they might have answer the questionnaires after the intervention. If this is true, they could calculate the responsiveness of the measures. This would make a more powerful study.

We have explained this point, as follows:

All patients were operated on due to discopathy and vertebral degenerative changes. Surgery was carried out via anterior vertebral approach and consisted of the decompression of the spinal cord and subsequent arthrodesis. Clinical state was determined before surgery in our study.

At present, the aim of our work is control examinations in postsurgical periods of 6, 12, 24 months.

• Page 7: change melopathy to myelopathy.

We have corrected this sentence:

Local cervical spinal pain was found in 9 patients, cervicobrachialgia in 26 patients and cervicobrachialgia and myelopathy in 25 participants.

• Page 7, last paragraph: there is a lot of redundancy as most of the information is already presented in table 1.

We have shortened this paragraph as follows:

Local cervical spinal pain was found in 9 patients, cervicobrachialgia in 26 patients and cervicobrachialgia and myelopathy in 25 participants. Intensity of pain, determined in the 100-mm Visual Analogue Scale, was 47.0 mm (SD 23.0), range 1-90 during the first examination and 48.3 mm (SD 22.7), range 1-90 in the second.

• Validity: the authors should state their hypothesis for the correlations that they expected to observed prior to the study commencement. They have also to compare that hypothesis with the actual results in the results section.

We have defined the hypothesis as follows:

Our hypothesis was that if we adapt the NDI and CDS to the Polish cultural conditions and test psychometric properties of the NDI-PL and CDS-PL, such as internal consistency, test-retest reliability, concurrent validity, ceiling or floor effects and analyses of the item-total correlation, then we will achieve assessment tools that are equivalent to the original English-language questionnaires. As a result, we aimed to achieve tools that would help us properly
assess pain intensity and the related limitations of cervical spine function during the execution
of everyday activities in Polish conditions.

We have supplemented the results section as well:

The present results confirmed our hypothesis. We have proved the NDI-PL and CDS-PL have excellent internal consistency and test-retest reliability, good concurrent validity and showed a strong inter-correlation both in the test and in the retest. Moreover, no ceiling or floor effects were detected in the NDI-PL and CDS-PL

Results
• The authors calculated ceiling and floor effects, but did not mention this in the methods/stats sections, please clarify this.

We have clarified the calculation of the ceiling and floor effects in the Evaluation of the psychometric properties of the NDI-PL and CDS-PL section:

Evaluation of the psychometric properties of the NDI-PL and CDS-PL.

2. We analyzed floor and ceiling effects (% of patients with the minimal score and % of patients with the maximum score). Ceiling and floor effects are considered to be present if more than 15% of respondents achieved the lowest or highest possible total score [26].

• Ceiling and floor effects, the authors should state that no ceiling/floor effects were detected as less than 15% got the minimum/maximum possible scores.

According to the reviewer’s suggestion, we have corrected the results section, as follows:

We have analyzed floor and ceiling effects for the general results of the CDS-PL and NDI-PL. In the case of CDS-PL, in both the test and retest, 3.3 % of patients received the minimum score (2 participants), and the 1.7% of patients received the maximum score (1 participant). Patients with the minimum and maximum score were not identified in the test nor in the retest of the general result of the NDI-PL. Both in the CDS-PL and NDI-PL floor or ceiling effects were not detected as less than 15% achieved the minimum or maximum possible scores.

• Again, re-calculate the test-retest reliability replacing the Pearsons’ r to ICCs (and 95% CI).
According to the reviewer’s advice we have calculated Intraclass Correlation Coefficients instead of Pearson’s correlation coefficients to generate reliability estimates and presented the 95% confidence intervals for the ICCs.

• Please comment about table 6.

We have supplemented Table 6 with the Spearman's rank correlation coefficients (rS) and described the results achieved, as follows:

We have also assessed the correlation between selected patient clinical characteristics and the results of the adapted assessment tools. The only statistically significant correlations were identified between CDS-PL and changes in signal intensity in spinal cord in MRI (p=0.29) and between NDI-PL and changes in signal intensity in spinal cord in MRI (p=0.44) and the sagittal dimension of the vertebral canal on the discopathy level (p=0.23), in the first completion of the questionnaires (Table 6).

Table 6. Correlation between the selected clinical patients characteristics and general results of NDI-PL and CDS-PL

<table>
<thead>
<tr>
<th></th>
<th>Number of discopathy levels</th>
<th>Changes in signal intensity in spinal cord in MRI</th>
<th>Sagittal dimension of vertebral canal on the discopathy level</th>
<th>Neck pain duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDS-PL</td>
<td>p=0.660</td>
<td>p=0.029*</td>
<td>p=0.132</td>
<td>rS=0.17 p=0.172</td>
</tr>
<tr>
<td>NDI-PL</td>
<td>p=0.632</td>
<td>p=0.044*</td>
<td>p=0.023*</td>
<td>rS=0.19 p=0.137</td>
</tr>
<tr>
<td>Retest</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDS-PL</td>
<td>p=0.759</td>
<td>p=0.059</td>
<td>p=0.145</td>
<td>rS=0.11 p=0.378</td>
</tr>
<tr>
<td>NDI-PL</td>
<td>p=0.814</td>
<td>p=0.193</td>
<td>p=0.350</td>
<td>rS=0.19 p=0.127</td>
</tr>
</tbody>
</table>

NDI-PL-Neck Disability Index
CDS-PL-Copenhagen Neck Functional Disability Scale
*p<0.05

According to these results, we have supplemented the discussion section, as follows:

Our examinations proved that the degree of spinal cord compression and spinal cord ischemic changes, expressed as changes in MRI signal intensity, correlate with the disability scales NDI-PL and CDS-PL. Intervertebral cervical disc herniation and degenerative changes are associated with narrowing of the sagittal diameter of the spinal canal. Progressive compression may lead to spinal cord ischemia, leading to histopathological changes of the spinal cord. Nonetheless, these changes may or may not be symptomatic [9,32].
Discussion
• “Our study indicated that NDI-PL and CDS-PL are valid and reliable methods for measuring disability in Polish patients with neck pain.” The authors can only claim that the measures are valid if the hypothesis were confirmed.

We have defined the hypothesis in the Introduction section. The results achieved confirm our hypothesis.

Our hypothesis was that if we adapt the NDI and CDS to the Polish cultural conditions and test psychometric properties of the NDI-PL and CDS-PL, such as internal consistency, test-retest reliability, concurrent validity, ceiling or floor effects and analyses of the item-total correlation, we will achieve assessment tools that are equivalent to the original English-language questionnaires. As a result, we aimed to achieve tools that would help us properly assess pain intensity and the related limitations of cervical spine function during the execution of everyday activities in Polish conditions.

Tables
• Table 1: the SD for the variable “Neck pain intensity after 2 days (VAS), (mm)” seems wrong (i.e. 227).

We have corrected the SD for the variable “Neck pain intensity after 2 days” in the Table 1, as follows:

Table 1. Demographical and clinical characteristics of study participants (n=60)

<table>
<thead>
<tr>
<th>Variable</th>
<th>All study participants *</th>
<th>Range**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26 (43.3%)</td>
<td>---</td>
</tr>
<tr>
<td>Female</td>
<td>34 (56.7%)</td>
<td>---</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>47.1 (8.9)</td>
<td>28-60</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>73.2 (15.7)</td>
<td>40-122</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>168.4 (8.8)</td>
<td>155-192</td>
</tr>
<tr>
<td>Neck pain duration (months)</td>
<td>41.8 (60.0)</td>
<td>3-360</td>
</tr>
<tr>
<td>Neck pain intensity (VAS) (mm)</td>
<td>47.0 (23.0)</td>
<td>1-90</td>
</tr>
<tr>
<td>Neck pain intensity after 2 days (VAS) (mm)</td>
<td>48.3 (22.7)</td>
<td>1-90</td>
</tr>
<tr>
<td>Number of discopathy levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 level</td>
<td>20 (33.3%)</td>
<td>---</td>
</tr>
<tr>
<td>2 or more levels</td>
<td>40 (66.7%)</td>
<td>---</td>
</tr>
<tr>
<td>Changes of signal intensity in spinal cord in MRI</td>
<td>13 (21.7%)</td>
<td>---</td>
</tr>
<tr>
<td>Sagittal dimension of vertebral canal on the discopathy level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 9 mm</td>
<td>28 (46.7%)</td>
<td>---</td>
</tr>
<tr>
<td>≤ 9 mm</td>
<td>32 (53.3%)</td>
<td>---</td>
</tr>
<tr>
<td>Symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local cervical (neck) pain</td>
<td>9 (15.0%)</td>
<td>---</td>
</tr>
<tr>
<td>Cervicobrachialgia</td>
<td>26 (43.3%)</td>
<td>---</td>
</tr>
<tr>
<td>Cervicobrachialgia and melopathy</td>
<td>25 (41.7%)</td>
<td>---</td>
</tr>
</tbody>
</table>

*Continuous data are mean (SD); categorical data are N (%)  
**Range (min-max) for continuous data

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**  
I declare that I have no competing interests

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**2nd Reviewer's report**

**Title:** Cross-cultural adaptation of the Neck Disability Index and the Copenhagen Neck Functional Disability Scale for patients with neck pain due to degenerative and discopathic disorders: a validation study of the Polish versions.

**Version:** 1  
**Date:** 8 February 2011

**Reviewer:** Amanda Hall

Review of BMC Manuscript – Cross-cultural adaptation of the Neck Disability Index and the Copenhagen Neck Functional Disability Scale for patients with neck pain due to degenerative and discopathic disorders: a validation study of the Polish versions.

This study addresses an important issue of appropriately adapting existing questionnaires to be used across various cultural groups. There is good description of the questionnaires. The methods for translation, cross-cultural adaptation and psychometric testing are also described in detail and appropriately followed according to Beaton et al 2000. However, there are a number of areas in the Background where the sentence structure can be improved, and a point in the methods for psychometric testing that could be included. These are also listed under

Minor essential revisions.
MINOR Essential Revisions

1. Page 3: “Pain in the cervical region of the spine is almost as common as back problems: annually about 30% of the population experiences neck pain (neck pain-NP), 14% of whom report complaints lasting longer than 6 months [2,13].

   a. Recommend to define type of back problems and provide reference or delete it altogether
   b. Recommend to change “experiences” to “experience”

According to this suggestion, we have deleted the part of this sentence about the back problems and corrected the word “experiences” to “experience”, as follows:

Annually about 30% of the population experience neck pain (neck pain-NP), 14% of whom report complaints lasting longer than 6 months [2,16].

2. Page 4: “A number of authors [3,5,8] highlight the need to adapt recognized and widely applied methods in research to indigenous conditions instead of developing a new scale leading to the multiplication of outcome measures lacking the comparison of populations [2].

   a. This sentence is setting up the rationale for you study. Currently it is awkward to read and requires revising for clarification.

   For example: By “methods” do you mean “assessment tools” ie. questionnaires? This should be revised for the reader.

We have revised this sentence, according to this suggestion, as follows:

A number of authors [3,5,10] highlight the need to adapt recognized and widely applied assessment tools in research rather than developing a new scale leading to the multiplication of outcome measures lacking the comparison of populations [2].

3. Page 4: “The NDI is the scale most commonly applied, extensively tested and translated.”

   a. Please provide a context for this statement.

   The NDI is the scale most commonly applied, extensively tested and translated. The English version of the NDI has shown moderate differences in reliability and validity with different patient populations [20]. The responsiveness of the NDI is unknown, however concurrent validity when compared with the Visual Analog Scale has been reported [28].

   The NDI was proven to be a valid and reliable instrument to measure disability related to neck pain in studies conducted for French, Brazilian-Portuguese, Iranian, Greek, Finnish,
Spanish, Turkish, Korean, Dutch, Chinese populations and slightly modified for Swedish-speaking patients [1,2,4,14,18,20,22,23,26,28,30].

4. Page 4: ‘The NDI was proved to be a valid and reliable instrument to measure disability related to neck pain [9,14,22].’

a. Recommend changing proved to proven

b. Please provide context for validation; ie which version and for what populations

The NDI was proven to be a valid and reliable instrument to measure disability related to neck pain in studies conducted for French, Brazilian-Portuguese, Iranian, Greek, Finnish, Spanish, Turkish, Korean, Dutch, Chinese populations and slightly modified for Swedish-speaking patients with neck pain [1,2,4,14,18,21,23,24,27,29,31].

5. Page 11: “15 (25%) of the patients participating in our study omitted the section concerned with driving (section 8).”

a. Change “15” to “fifteen”

We have corrected this sentence:

Fifteen (25%) of the patients participating in our study omitted the section concerned with driving (section 8).

6. Abstract: “60 patients treated due to degenerative and discopathic disorders in the cervical spine filled out the NDI-PL and the CDS-P”

a. Change “60” to “Sixty”

We have corrected this sentence:

Sixty patients were treated due to degenerative and discopathic disorders in the cervical spine filled out the NDI-PL and the CDS-PL.

7. Lastly, with respect to the methods for psychometric testing, there are two areas that were not explored that are recommended by Beaton et al. and are very useful for research purposes. These could be discussed in the discussion under future research.

a. Responsiveness: Although this property could not be assessed due to the study design, it remains a useful property required for determining if the measures are sensitive to detect change over time. This should be noted, perhaps in future research.
b. Item-level analyses: This approach based on item-response theory such as Rasch and would be helpful in future research to provide a more detailed analysis of the functioning of the items for the population. Also recommend including in a section on future research.

According to the reviewer’s advice, we have supplemented the discussion section with a Future research paragraph, as follows:

**Future research**

Despite the fact that we confirmed that both adapted assessment tools have excellent internal consistency, test-retest reliability, and good concurrent validity, further investigation is required to provide additional data for the evaluation of the psychometric properties of the NDI-PL and CDS-PL. In future studies responsiveness, which is a useful property required for determining if the measures are sensitive to detect changes over time, should be tested. Likewise, the item-level analyses of the NDI-PL and CDS-PL would be helpful in future research to provide a more detailed analysis of the functioning of the items for the population.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
I have no competing interests.