Development and Validation of a Computerised Self-Report Assessment Platform at STARTTS

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NSW Service for the Treatment And Rehabilitation of Torture and Trauma Survivors
The Problem

• Many reasons & incentives to improve our client assessment methods
• Very linguistically diverse client group
• Some have low literacy in their own language
• Large client volume
• Problems with using interpreters
  – Very expensive
  – Inconsistent translations impacts on reliability & validity
• Additional data entry costs for pen and paper forms
Finding a Solution

- Meeting Julia Muller and Kristine Knaevelsrud at an ECOTS/ESTSS conference
  - Many discussions
  - Lots of translation and IT work
- MultiCASI in use at STARTTS since 2014
  - Part of routine clinical assessment
  - Installed on laptops in all counselling rooms
  - Several thousand questionnaires completed
What is MultiCASl?\(^3\)

**Multi**lingual **Computer-Assisted Self Interview**

- Created by Christine Knaevelsrud & Julia Müller (2008) at Berlin Center for Torture Victims\(^2\)
- Software platform for administering multiple choice questionnaires:
  - Users upload translations and recordings of different questionnaires
  - Clients see and hear the questions in their own language
  - Clients respond using a mouse or touch screen
  - Data is exported for analysis
- Functionality increased by adding Wizards (created by STARTTS and CTP).
MultiCASl at STARTTS

• Small assessment battery administered to all clients (optional for clients).
• Usually at end of 1st or 2nd session.
• Explained through interpreter or video.
• Client completes questionnaires following the session.
• Battery repeated every 6-10 sessions or at discharge.
Selection Wizard

Welcome to the MultiCASI Wizard. When complete, press F3 to save and view results.

<table>
<thead>
<tr>
<th>Language</th>
<th>Questionnaire(s) (Maximum 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td>Hopkins Symptom Checklist - Anxiety</td>
</tr>
<tr>
<td>Assyrian</td>
<td>Hopkins Symptom Checklist - Depression</td>
</tr>
<tr>
<td>Kirundi</td>
<td>Harvard Trauma Questionnaire - Events</td>
</tr>
<tr>
<td>Simp. Mandarin</td>
<td>Harvard Trauma Questionnaire - Symptoms</td>
</tr>
<tr>
<td>Dari</td>
<td>DASS21 modified</td>
</tr>
<tr>
<td>English</td>
<td>General Self-Efficacy Scale</td>
</tr>
<tr>
<td></td>
<td>Child PTSD Symptom Scale</td>
</tr>
<tr>
<td></td>
<td>Client Satisfaction Questionnaire</td>
</tr>
<tr>
<td></td>
<td>STARTTTS questions 2</td>
</tr>
</tbody>
</table>

MRN: MRN2016

- Live with Client
- Data Entry
- Research (Live)
- Research (Paper)
<table>
<thead>
<tr>
<th>شعور بقلة الطاقة، البطء</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling low in energy, slowed down</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>كلا على الإطلاق</th>
</tr>
</thead>
<tbody>
<tr>
<td>بعض الشيء</td>
</tr>
<tr>
<td>إلى حد كبير</td>
</tr>
<tr>
<td>بصورة شديدة</td>
</tr>
</tbody>
</table>
MRN2016-MULTICASI-L-
1/12/2016 11:39:53 AM

Hopkins Symptom Checklist - Depression

<table>
<thead>
<tr>
<th>Feeling low in energy, slowed down</th>
<th>(1) not at all</th>
<th>(2) a little</th>
<th>(3) quite a bit</th>
<th>(4) extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blaming yourself for things</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Crying easily</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Loss of sexual interest or pleasure</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor appetite</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficulty falling asleep and sleeping</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling hopeless about the future</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling blue</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Feeling lonely</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoughts of ending your life</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Feeling of being trapped or caught</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Worrying too much about things</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling no interest in things</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Feeling everything is an effort</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Feelings of worthlessness</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Advantages Over Pen and Paper

• Does not require an interpreter
  – Can be completed by client in private\textsuperscript{4}
  – Suitable for non-literate clients\textsuperscript{3,5}
  – Lower cost of administration\textsuperscript{2,6}
  – Allows client to revise and answer at own pace

• Standardised delivery
  – Improves reliability\textsuperscript{6,7}
  – Prevents missing or ambiguous responses

• Immediately scores tests and provides data to clinician

• Data is already in digital form
  – No data-entry
  – Exports data to clinical data base
## Challenges of MultiCASI versus Paper Assessment

### MultiCASI
- Questionnaire translation ✔
- Questionnaire administration ✔
- Some refugee languages don’t have a written form ✔
- Some clients lack the required level of reading comprehension in their own language and English ✔
- Client and counsellor attitude/knowledge of computers ¹⁸, ¹⁹

### Paper Assessment
- Reliability requires standardised presentation ⁶ ✔
- Interpreter may change meaning of items ²
- Interpreter’s delivery may influence response ¹⁰ ✔
- Clients may be less forthcoming with interpreter/privacy issues ¹¹
- Interpreter’s cultural background might be problematic ¹⁰
Procedural Validation Study: Rationale

• Important to ascertain that presenting the test in a computerised form:
  – Does not alter the test’s reliability and validity\textsuperscript{12}
  – Does not affect acceptance by clients\textsuperscript{8,12}
  – Is equal to or better than pen and paper format

• This is needed to:
  – Guide service provision
  – Support studies that use computer administered psychometric tests

• Essentially, this study is a prelude to more interesting studies later on
Pilot Study

- 61 STARTTS clients randomly assigned to complete the Hopkins Symptom Checklist\textsuperscript{13} (HSCL) using either MultiCASI or pen and paper
- Participants completed an 11-item Acceptability Questionnaire\textsuperscript{5,14}
- Participants were a convenience sample who completed the forms in English or Arabic
Pilot Study Results: HSCL and Time

- No significant differences were obtained between groups* for:
  - Anxiety
    \( t = 0.51, p = 0.60 \)
  - Depression
    \( t = 0.28, p = 0.78 \)
  - Time taken to complete forms
    \( t = -0.37, p = 0.71 \)

* The study had sufficient power to identify a medium effect size.
<table>
<thead>
<tr>
<th>Survey Item</th>
<th>Pen &amp; Paper (PP)</th>
<th>MultiCASI (MC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No/little experience with questionnaires</td>
<td>80%</td>
<td>90%</td>
</tr>
<tr>
<td>Problems completing questionnaires</td>
<td>47%</td>
<td>23%</td>
</tr>
<tr>
<td>Which mode helps to protect privacy?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomous condition (PP/MC)</td>
<td>33%</td>
<td>45%</td>
</tr>
<tr>
<td>Being asked by a staff member</td>
<td>30%</td>
<td>13%</td>
</tr>
<tr>
<td>No difference/don’t know</td>
<td>37%</td>
<td>42%</td>
</tr>
<tr>
<td>Which mode helps to answer openly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomous condition (PP/MC)</td>
<td>30%</td>
<td>55%</td>
</tr>
<tr>
<td>Being asked by a staff member</td>
<td>30%</td>
<td>19%</td>
</tr>
<tr>
<td>No difference/don’t know</td>
<td>40%</td>
<td>26%</td>
</tr>
<tr>
<td>How was it/would it be to use the computer?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comfortable</td>
<td>43%</td>
<td>81%</td>
</tr>
<tr>
<td>Uncomfortable*</td>
<td>27%</td>
<td>10%</td>
</tr>
</tbody>
</table>

*p<0.05*
International Multicenter Procedural Validation Study

• Consortium members:
  – STARTTS, NSW
  – UNSW Psychiatry Research and Teaching Unit, (PRTU), Liverpool Hospital, NSW
  – ASeTTS, WA
  – Refugees As Survivors New Zealand (RASNZ)
  – Auckland University of Technology, NZ
  – Competence Centre for Transcultural Psychiatry (CTP), Denmark.

• 280 subjects
• Estimated completion: December 2017
Multicentre Study: Method

Administer HSCL\textsuperscript{13} using both pen and paper and MultiCASI
• 15-20 min break between administrations
• Order “randomized” based on MRN
  - Group 1 (odd numbers): Pen and paper first
  - Group 2 (even numbers): MultiCASI first

Client completes Acceptability Questionnaire\textsuperscript{5,14}
Counsellor completes Demographics Form
Researchers compare MultiCASI responses to pen and paper
### Preliminary Results: Participants (1)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>(n=58)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>Male 79%</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td>M (SD) 50.5 (10.9)</td>
</tr>
<tr>
<td><strong>Country of birth</strong></td>
<td>Iraq 32.8% Sri Lanka 17.2%</td>
</tr>
<tr>
<td></td>
<td>Iran 20.7% Other* 29.3%</td>
</tr>
<tr>
<td><strong>Years in Australia</strong></td>
<td>M (SD) 4.2 (4.4)</td>
</tr>
<tr>
<td><strong>Education (years)</strong></td>
<td>M (SD) 11 (3.4)</td>
</tr>
<tr>
<td><strong>Preferred language</strong></td>
<td>Arabic 34.5% Tamil 17%</td>
</tr>
<tr>
<td></td>
<td>English 26% Dari 2%</td>
</tr>
<tr>
<td></td>
<td>Farsi 21%</td>
</tr>
</tbody>
</table>

* Other countries of birth: Afghanistan, Algeria, Bangladesh, Burundi, Democratic Republic of Congo, Indonesia, Morocco, Pakistan, South Sudan, Sudan, Syria
Preliminary Results: Participants (2)

- Most scored above the clinical cut-off on the HSCL
  (Anxiety: 84.5% Depression: 86% Total: 88%)
- 47% had no previous experience with questionnaires
- 31% had no previous experience with computers
- 22% had the pen and paper form read to them by an interpreter
## Preliminary Results: Pen and Paper vs MultiCASI

<table>
<thead>
<tr>
<th></th>
<th>Pen &amp; Paper</th>
<th>MultiCASI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing/invalid item responses</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Average scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>2.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Depression</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Total</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Subscale variability (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.68</td>
<td>0.67</td>
</tr>
<tr>
<td>Depression</td>
<td>0.65</td>
<td>0.61</td>
</tr>
<tr>
<td>Total</td>
<td>0.63</td>
<td>0.61</td>
</tr>
<tr>
<td>Internal consistency (Cronbach’s α)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.88</td>
<td>0.90</td>
</tr>
<tr>
<td>Depression</td>
<td>0.91</td>
<td>0.89</td>
</tr>
<tr>
<td>Total</td>
<td>0.94</td>
<td>0.94</td>
</tr>
</tbody>
</table>

- No significant differences between the questionnaires for
  - Average subscale scores
  - Proportion of clients categorised as clinical ‘cases’
Preliminary Results: Psychometric Analysis of HSCL via MultiCASI

- **Alternate forms reliability**
  Anxiety: $r = 0.91$ Depression: $r = 0.94$ Total: $r = 0.92$

- **Test validity** (taking paper form as “gold standard”)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>92%</td>
<td>67%</td>
</tr>
<tr>
<td>Depression</td>
<td>100%</td>
<td>75%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>86%</td>
</tr>
</tbody>
</table>

- **ROC curve analysis**

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Area Under the Curve (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>0.888 – 1.000</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Depression</td>
<td>1.000 – 1.000</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total</td>
<td>0.980 – 1.000</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Preliminary Results: Acceptability

Comparing computer to pen & paper
- 55% Prefer computer
- 30% Prefer pen & paper
- 15% No difference/ don't know

Comparing computer to staff member
- 53% Prefer computer
- 37% Prefer staff member
- 10% No difference/ don't know

Legend:
- No difference/ don't know
- Prefer computer
- Prefer pen & paper
- Prefer staff member
Conclusions

Pilot

• No significant differences between MC & PP in terms of test scores, reported problems, timing
• Actual discomfort is lower than anticipated discomfort

Current study

• MC & PP are extremely similar in terms of test scores, variability and internal consistency
• Alternate forms reliability is excellent
• Specificity (ability to identify ‘true positives’) is excellent
• Sensitivity (ability to identify ‘true negatives’) may be a little low for HSCL Anxiety (more data is needed)
• Most participants either see no difference between MC and other modes, or prefer computers
• More data is needed to examine influence of demographics
Future Plans

1. Complete the multicentre procedural validation study
2. Develop a new, improved computer based assessment platform
3. Develop a new, culturally robust psychometric tool that addresses a larger number of presenting problems
4. Share 2 and 3 with IRCT members for free
CAMLAP
Computer Administered Multi-Lingual Assessment Platform

• Commissioned from original MultiCASI developer (Switzerland)
• Estimated completion date: December 2017
• Improved compatibility with new operation systems
• Modular design
• More user-friendly
• Full IP, so can be distributed to other centres for their own use
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References (1)


