# Cross cultural adaptation of the Repeatable Battery for the Assessment of Neuropsychological Status to a Sinhala speaking clinical population in Sri Lanka

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## Background

Sri Lanka has a dearth of culturally validated neuropsychological tests. Hence, the purpose of this study was to validate the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) in a clinical sample (patients diagnosed with schizophrenia) of 20 to 50year-old Sinhala speaking persons in Sri Lanka. RBANS seemingly possessed good psychometric properties, suitable for adaptation in the Sri Lankan setting, where the uses of locally developed psychometric tests, or globally validated international tests, are scarce. It is also apparent that cognitive assessment of individuals affected by psychiatric conditions (such as schizophrenia) has not become central to everyday clinical practice in Sri Lanka (De Silva and Gunatilake, 2002).

## Objectives

For its adaptation in Sri Lanka, the purpose of this study was to pilot test the potential clinical usefulness of RBANS in a Sinhala speaking clinical population of patients diagnosed with schizophrenia. The specific aims to research were as follows: (a) Translate the RBANS into the Sinhala language (b) Assess Judgmental Validity of the translated instrument (c) Do reliability testing of the Sinhala RBANS (c) Establish convergent, concurrent and preliminary clinical validity in 20- 50 years old patients diagnosed with schizophrenia.

## Methods

### Instruments

The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) is a brief, standardised, cognitive screening instrument designed to assess global neuropsychological functioning that evaluates several domains of interest. RBANS is a cognitive screening test composed of 10 sub-tests that are combined to form five specific cognitive ability index scores: immediate memory, language, visuospatial/constructional ability, attention and delayed memory and a total scale score (Randolph, 1998).

### Participants

The sample consisted of a group of 134 patients with Diagnostic Statistical Manual IV-TR (14) diagnosis of schizophrenia and a control group of neurologically tact age, education and gender matched 134 normal controls, recruited from the community. The group of patients was in-patients and out–patients of the Colombo South Teaching Hospital and National Institute of

Mental Health. Informed consent was obtained after a description of the study was provided to the participants. Ethical approval was obtained from the Faculty of Graduate Studies, University of Colombo.

### Translation of the RBANS

First, bilingual translators followed a systematic translation procedure to back translate the original RBANS into Sinhala. The translation process ensured the retention of the conceptual meaning of questions and its semantic equivalence, by adhering to the 'translation instructions' developed for the RBANS.

### Establishing Judgmental Validity (content and consensual validation)

Then Judgmental Validity was conducted through Delphi Method (Jones and Hunter 1995) .Five experts from Clinical Psychology, Psychiatry, and Neurology determined the judgmental validity of the Sinhala RBANS by assessing content and consensual validity.

### Pre-testing the Sinhala RBANS

Subsequently, the translated version of the RBANS underwent an empirical refinement, in the form of pre-testing (De Vaus 1991) on patients diagnosed with Schizophrenia (n=18). The first step in the process was to conduct declared pretesting of the instrument with six patients diagnosed with schizophrenia (3 men and 3 women; 1 each from ages 25, 35, and 45 years). Based on their feedback, the instrument was revised and pretested again with another group of twelve patients diagnosed with schizophrenia (6 men and 6 women, 1 each from ages 25, 30, 35, 40, 45, 50).

### Testing the reliability of the RBANS

The internal consistency reliability was assessed after collecting data from all 134 patents. The test-retest reliability was assessed with 30 patients diagnosed with schizophrenia. The test-re test interval ranged between 25–30 days, for which the mean interval was 26.7 days, (SD=2.2). The study assessed both the Pearson's r and the Intra-class Correlation Coefficient (ICC) to determine test re-test reliability of Sinhala RBANS.

### Establishing Preliminary clinical validity, convergence and concurrent validity

### Preliminary clinical validity

In order to establish preliminary clinical validity, performance of 134 schizophrenia patients and 134 age, gender, education matched normal controls were assessed using RBANS (form A). A Discriminant Function Analysis was performed to categorize and distinguish patients from that of normal controls, in order to determine test sensitivity.

### Convergent validity

As a means of establishing convergent validity, the standardized Sinhala Mini Mental State Examination (MMSE) was used on patients diagnosed with schizophrenia. Furthermore, inter-correlations of the Sinhala RBANS Index scores were assessed as a means of supporting the construct validity of the instrument.

### Concurrent validity

To establish concurrent validity, the study assessed if a patient's performance on the Sinhala version of the RBANS could be used to indicate his/her functional outcome (i.e. employment status in this study). Functional outcome was measured by the patient's stated competitive employment or unemployment. A Discriminant Function Analysis was performed to assess the extent to which employment status can be associated with the RBANS. To determine if the between group (employed Vs unemployed) cognitive differences might be accounted for by differences in education level (i.e., number of years educated), an analyses of covariance was performed covarying years of education.

**Results and Discussion**

Adequate Judgmental Validity was determined for the Sinhala RBANS. The RBANS demonstrated good internal consistency reliability for both the patients (Cronbach alpha = 0.810) and control groups (Cronbach alpha = 0.856). It also showed good test-retest reliability (ICC =0.71 and Pearson's r= 0.71), and inter rater reliability for the patients (ICC = 0.91).

Schizophrenia patients performed significantly worse (mean RBANS Total score = 60.0 (SD= 8.5) and showed more marked cognitive impairment than healthy controls (mean RBANS Total = 88.9 (SD= 12.2) on the Sinhala RBANS. The patient group was significantly different from the normal control group, on the total RBANS score (F=11.32, P <0.000). The highest Index score for patients diagnosed with schizophrenia are on the Language (88.8; SD=12.6) and Visuospacial/ Constructional indexes (67.2; SD=10.3). The lowest scores were for the Attention Index (55.6; SD = 11.0). The Sinhala RBANS was capable of classifying patients from that of controls 93% of the time or more using the RBANS Total score.

A moderate correlation was evident between the Sinhala RBANS and the MMSE ((r = 0.510, p< 0.01). Furthermore, it showed good patterns of inter-correlations within RBANS Indexes, supporting evidence for construct validity.

The results indicated that employed patients performed significantly better than unemployed patients on the Sinhala RBANS and the mean years of education were more for employed patients. It was possible to correctly classify employment status by equal to or more than 84% of the time by using the RBANS Total score, showing evidence for concurrent validity. Furthermore, analyses of covariance which was performed covarying years of education indicated that the group differences remained significant on the Immediate Memory(F=31.3,df=1,70,p<0.0000), Delayed Memory (F= 15.9 , df= 1,70 , p < 0.000), Language (F= 10.7 , df= 1 ,70 , p < 0.002), Attention(F= 6.7 , df= 1 ,70 , p < 0.012) Indexes and on the RBANS Total score (F= 45.6 df= 1,70 , p < 0.000). The results predicted the Sinhala RBANS performance is related to employment status after education differences are controlled.

**Conclusions**

The Sinhala RBANS revealed coherence in identifying cognitive impairment in schizophrenia patients, and it is shown to be a reliable and valid tool for the neuropsychological assessment of Sinhala speaking patients diagnosed with schizophrenia. The evidence-based neuropsychological assessment instrument is valid in the Sri Lankan setting and can be used as a measure to facilitate remedial action.

**Limitations of the Study**

Despite the contributions of the present study, its limitations should also be acknowledged and caution must be exercised in interpreting its results. One of the main considerations is the

difficulty in generalizing the findings beyond Sinhala speaking 20-50 year olds. Future research would need to explore the adaptation and validation of the RBANS to other populations.

**Keywords:** RBANS; Delphi Technique; Reliability; Validity; Neuro-cognition; Schizophrenia

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