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Translation and Validation of the 'Indian Scale for Assessment of Autism' on a Sinhala-Speaking Population of 3- to 12-year-olds in Colombo and Gampaha Districts

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ABSTRACT

There is a significant need for appropriate culturally sensitive, standardized screening tools in many countries including Sri Lanka for the accurate identification of ASD which leads to specific interventions and good prognosis. The study's aim was to investigate psychometric properties by translating and validating the Indian Scale for the Identification of Autism on a Sinhala-speaking population of 3 to 12-year-olds in Colombo and Gampaha districts to increase the efficiency and quick screening of autism in routine clinics. The methodology included the systematic forward and backward translation, Delphi process and data collection from clinical and non-clinical samples from Sinhala speaking parents of 3- to 12-year-olds in Colombo and Gampaha districts. The study had a good internal consistency reliability measured through Cronbach's alpha of .927. There was high sensitivity and specificity measures whereby a cutoff score of 68 was ensured through the Receiver Operator Characteristic Curve. Overall, the Indian Scale for Assessment of Autism is suitable to be used in routine clinics in Colombo and Gampaha districts.

1. INTRODUCTION

1 in 160 children has autism spectrum disorder (ASD) worldwide (WHO, 2018), 1.7 to 2 million children are diagnosed with ASD in India and the prevalence of ASD in Sri Lanka is 10.7 per 1000 (Hossain et al., 2017). According to Perera et al. (2017) and Muttiah (2015), there is a lack of standardized, culturally sensitive, and validated screening tools for the accurate diagnosis of ASD in Sri Lanka. A reliable and valid screening tool leads to appropriate type of intervention utilization and good prognosis (Mukherjee et al., 2015). Signs of ASD can appear much earlier in the first two years or they are mostly identified after 3 years (Miller et al., 2021). Screening processes used in Western countries such as Europe and North America cannot be used in countries such as Sri Lanka because of the significant differences in social and cultural aspects like language (Muttiah, 2015). With efficient tools for diagnosis and screening, there will be more precise epidemiological data that will help ASD individuals to access support services (Muttiah, 2015).

The psychometric properties of internal consistency reliability can be attained by Cronbach's alpha which plays a major role in determining a good screening tool (Kuiper et al., 2019). Dearth of screening tools in Sri Lanka for ages 3 years and above which gives rise to lengthy routine clinics and in-depth assessments. Tools such as the Glasgow Sensory Questionnaire (Kuiper et al., 2015) are not suitable since they are more culturally adapted to the western culture. Pictorial Autism Assessment Schedule (PECS) is culturally validated in Sri Lanka; however, it screens for ASD among 18 to 48 months toddlers (Perera et al., 2017). M-CHAT is culturally adapted to Sri Lanka; however, it cannot be used since it does not have the psychometric properties to be administered to individuals above the age of 3 years (Stewart & Lee, 2017). Moreover, according to the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD 10), symptoms of ASD can manifest till early school age-during the initial 5 years (American Psychiatric Association, 2013). Therefore, ASD may be diagnosed later in these children's lives which shows that an ASD screening tool for 3 years and above is crucial. ISAA has been compared to the gold standard of Childhood Autism Rating Scale and it has shown good psychometric properties (Chakraborty et al., 2022). ISAA is a standard free semi-structured tool that is derived from DSM 5 and ICD 10 (Dalwai et al., 2016); therefore, it is feasible and can be utilized in routine clinics as a freely available tool. Many Indian studies have shown that it has good internal consistency reliability and sensitivity and specificity measures (Chakraborty et al., 2020). Some studies show that construct validity on whole population samples is not attainable due to cross loadings and indefinite factor structure of the ISAA tool. For instance, a study conducted by Chakraborty et al. (2020) has explained that the ISAA is not suitable for whole population (non-clinical) sampling.

The significance of the study includes three areas comprising epistemological significance, social value, and value to the field of psychology. Firstly, ISAA SInhala screening tool was culturally adapted to Sri Lanka since the collectivistic cultural beliefs of India are relatively similar to Sri Lanka. Secondly, benefits of the Sinhala ISAA tool comprise of easy screening and identification of ASD among 3- to 12-year-old Sri Lankan children and adolescents. Thirdly, mental health standards in the communities were improved bringing forth value to the psychological field of study.

The study's aims were to investigate psychometric properties by translating and validating the "Indian Scale for the Identification of Autism" on a Sinhala-speaking population of 3 to 12-year-olds in Colombo and Gampaha districts to increase the efficiency and quick screening of autism in routine clinics. The specific research aims of the study were:

1. To translate the Indian Scale for the Assessment of Autism (English version) into Sinhala and to pretest the scale.

2. To assess the reliability of the Indian Scale for the Identification of Autism (Sinhala version).

3. To assess the content, consensual and criterion validity of the Indian Scale for the Identification of Autism (Sinhala version).

2. MATERIALS AND METHODS

Systematic process of cross-cultural translation and validation of the Indian Scale for Assessment of Autism (ISAA) was carried out according to the guidelines of Beaton et al. (2000) and World Health Organization (2016). Initially, permission was obtained from the original author Mr Ram Kumar at the National Institute for the Empowerment of Persons with Intellectual Disabilities of India. Systemic method of forward translation was done by a bilingual translator to translate the original ISAA to Sinhala and backward translation was conducted by another independent translator who had no knowledge in this field to translate the Sinhala translated version to English. Original English ISAA and the final backward translated English ISAA was compared for incongruities and finalized for the Delphi process. The delphi panel was a multidisciplinary team that consists of a child and adolescent developmental psychologist, a child and adolescent psychiatrist, two clinical psychologists and a speech therapist. Delphi process consisted of two rounds to achieve a favorable score to obtain content and consensual validity. Pretesting the Sinhala ISAA on a random convenience sample after the Delphi process was conducted on 20 participants (Ruel et al., 2016).

The study population was Sinhala speaking parents or guardians of 3- to 12-year-olds in Colombo and Gampaha districts. A maximum age limit of 12 years was considered due to social communication deficits which are mainly seen in critical years of childhood (Deckers et al., 2017). The sampling method was purposive sampling of the one hospital, one national boys school and one girls school and one nursery from each district, and simple random sampling within these locations. In order to calculate the sample size for the assessment of criterion validity, an equation was used: $N_1 = 4\ Z^2_{\alpha}\ P\ (1\text{-}P)\ /\ W^2$. The clinical sample size from the hospitals for sensitivity is 44 and for specificity is 62. The total non-clinical sample selected randomly from the schools and nurseries was 203 participants. The total clinical sample selected randomly from the hospitals was 105 participants. The instruments used were information sheets, consent forms, demographic questionnaires, and the finalized ISAA Sinhala tool after the pre-test. Data collection was carried out in-person, through school teachers and online Google forms. The diagnosis from the mental health professional was recorded through the parent to obtain criterion validity. Data analysis consisted of utilizing SPSS-28 package for Cronbach's alpha (internal consistency reliability) and Receiver Operator Characteristic (ROC) Curve (sensitivity and specificity). Ethical clearance from the Faculty of Graduate Studies, Ministry of Education, Children's Secretariat, schools, nurseries and hospitals were obtained. Ethical guidelines were followed which included written informed consent, confidentiality, fair subject selection and anonymity.

3. RESULTS AND DISCUSSION

Table 1: *Scale Statistics of Reliability of ISAA*

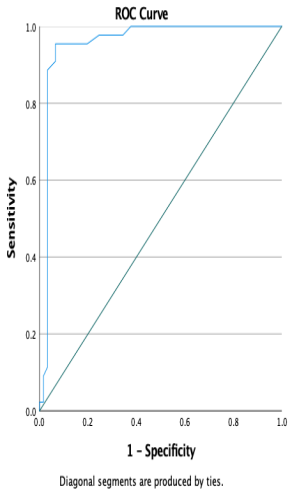
Mean	Variance	Standard Deviation	Number of Items	Cronbach's Alpha
48.11	147.652	12.151	40	.927

Source: Information from SPSS 28

Cronbach's coefficient alpha was calculated to determine the internal consistency coefficients of the 40 items in the ISAA Sinhala screening tool

(Table 1). Reliability analysis through SPSS 28 showed Cronbach's Alpha (.927) which suggests significant reliability which shows that all items of the English ISAA can be scaled into the Sinhala ISAA.

Validity testing and diagnostic power was attained through sensitivity and specificity measures. The area under the Receiver Operator Characteristic Curve area (shown below) showed a high significance of .956. It is a crucial factor to distinguish high specificity to reduce the false positive numbers (Chakraborty et al., 2020). From the coordinates of the ROC curve, it was determined then a cutoff of 68 (Sensitivity of 95.5% and specificity of 93.4%) is better suitable since it has a high sensitivity value along with low false positive scores; that is, a score of 68 or more will screen for ASD. Area under the ROC curve is close to one (.956) which suggested that the Sinhala ISAA tool has a high discriminatory power with accurate sensitivity and specificity measures. These findings suggest that Sinhala ISAA helps in reliable and valid screening procedures of ASD individuals in clinical settings.



The Sinhala ISAA has a vital cultural consideration where diversity in the scope of cultural nuances and linguistics are considered to make it culturally appropriate for the screening of ASD. The differences in social behaviors and interactions per the Sri Lankan cultural norms are attained through the different items in the Sinhala ISAA screening tool. The Sinhala ISAA screening tool was administered by assessors who were culturally competent about cultural biases which reduced biases that would lead to unfair results in this study.

The implications of the study suggests that social communication aspects that are culturally different in Sri Lanka when compared to India is attained with the translation and adaptation of the Sinhala ISAA screening tool through internal consistency reliability, content and consensual validity. This ensures that there is an epistemological significance in the study. Easy screening can be attained through the Sinhala ISAA screening tool which brings social value in easy identification of autism spectrum disorder among 3- to 12-year-old Sri Lankan children and adolescents. Thereby, there is value to the field of psychology since it improves the standard of mental health by accurately and quickly screening for autism.

4. CONCLUSION

In conclusion, the Sinhala ISAA achieved content and consensual validity through forward and backward translation and expert review by the Delphi panel. Diagnosis by the mental health professional was recorded through the parent. The Indian Scale for Assessment of Autism achieved good internal consistency reliability, and good criterion validity through sensitivity and specificity measures. Overall, the Sinhala ISAA is suitable to be used in routine clinics in Colombo and Gampaha districts since it has good psychometric properties and has high efficiency and accuracy of quick screening of autism in 3 to 12-year-olds in routine clinics in Colombo and Gampaha. The Sinhala ISAA screening tool can fill the gap in the ASD screening of 3- to 12-year-old children in Colombo and Gampaha districts. Future recommendations include the measurement of test-retest reliability to measure the temporal consistency.

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