

## Abstract

**Background:** Children with high functioning Autism Spectrum Disorder (ASD) are those diagnosed as ASD with normal intelligence. They usually suffer from milder and subtle deficits in social interaction, communication and repetitive behavioural pattern. Their deficits may only become apparent at school age when secondary symptoms such as internalizing and externalizing symptoms are developed. Early detection of ASD allows early intervention which improves outcome of these individuals. Currently, there is no validated screening tool for high functioning ASD in Hong Kong.

**Objective:** To develop and validate the Cantonese version of Autism Spectrum Screening Questionnaire (C-ASSQ).

**Method:** The Autism Spectrum Screening Questionnaire (ASSQ) was translated into Cantonese. The content validity was evaluated by an expert panel. Fifty-six high functioning ASD patients were recruited from Tuen Mun Child and Adolescent Mental Health Clinic (TMCAMHC) and fifty-six controls, matched with age and sex of patients, were recruited from two mainstream schools. The internal consistency, test-retest reliability and inter rater reliability were assessed. The concurrent validity was established by comparing C-ASSQ with 'Autism Diagnostic Interview- Revised version' (ADI-R). Construct validity was examined by the divergent validity of C-ASSQ with Strength and Difficulty Questionnaire (SDQ). Receiver Operating Characteristic (ROC) curve analysis was also done to determine the optimal cutoff scores above which the students should be referred to detailed diagnostic assessment of ASD.

**Results:** C-ASSQ demonstrated good internal consistency (Cronbach's alpha > 0.8) and test-retest reliability (Spearman rho's correlation coefficients > 0.7,  $p < 0.05$ ). Inter-rater reliability between parent and teacher was low, which was similar to the results of other

validation studies of ASSQ. Concurrent validity was good with high correlation with ADI-R (Cohen Kappa statistic  $> 0.8$ ,  $p < 0.05$ ). Divergent validity was established by the moderate correlation of C-ASSQ with SDQ (Spearman's rho correlation coefficients ranged from 0.292-0.529,  $p < 0.001$ ). High values of 'Area Under the Curve' (AUC 0.966 - 0.982,  $p < 0.01$ ) indicated excellent discriminative power of C-ASSQ. ROC curve analysis suggested the students who scored above the cut-off scores of 14 in parent rating (with 94.6% sensitivity and 91.1% specificity) and 11 in teacher rating (with 90.4% sensitivity and 94.6% specificity) should be referred for diagnostic assessment of ASD.

**Conclusion:** C-ASSQ was shown to be a valid and reliable instrument for screening of high functioning ASD patients who need specialist psychiatric care. Future studies should evaluate its ability to screen out milder variants of the ASD and its ability to differentiate ASD from other developmental and psychiatric conditions.

Key words: screening instrument, Autism Spectrum Disorder, high functioning, normal intelligence, Autism Spectrum Screening Questionnaire (ASSQ), Hong Kong.