

ABSTRACT

Name of Project: The development of screening scales for attention deficit hyperactivity disorder (ADHD) in Thai children and adolescents age 3-18 years

Head of Project: Chanvit Pornnoppadol, M.D.

Research Team: Vinadda Piyasilp, M.D.

Jitraporn Jittorn, M.A.

Duration of Study: July 2009 – June 2010

Objectives: To develop reliable and valid screening scales called Thai Attention Deficit Hyperactivity Disorder Screening Scales (THAI ADHD SS) to screen for attention deficit hyperactivity disorder (ADHD) among Thai children and adolescents age 3-18 years.

Methods: Thai ADHD SS were newly developed screening scales comprised of 3 versions including Preschooler (age 3-5 years), Child (age 6-12 years) and Adolescent (age 13-18 years) versions. Each version contains 30 items assessing hyperactive-impulsive symptoms (items 1-15) and inattentive symptoms (items 16-30). The reporters of Thai ADHD SS were children themselves, their parents and their teachers. The reliability of Thai ADHD SS was evaluated by item analysis, two-week test-retest reliability assessment and internal consistency measurement. The opinions of 33 ADHD experts were gathered to calculate content validation index (CVI). Area under curve (AUC) of receiver operating characteristic curves (ROC curves) was measured to help select the appropriate cut-off point. Diagnostic Interview for Children and Adolescents (DICA)-ADHD section was used as a gold standard to determine the ADHD diagnosis. The results of Thai ADHD SS were compared with the ADHD diagnosis obtained from DICA. Sensitivity, specificity, positive and negative predictive value were analyzed to determine the criterion validity. Exploratory and confirmatory factor analyses were also performed to assess the scales' construct validity.

Results: Fifteen thousand three hundred sixty subjects (4,608 children, 8,064 parents and 2,688 teachers) participated in this study and completed 20,464 forms of Thai ADHD screening scales. All versions of Thai ADHD SS have shown an excellent internal consistency. Cronbach's alpha coefficient ranged from 0.94 – 0.98. Item analysis revealed that all items have Corrected Item-Total Correlation of more than 0.3. Two-week test-retest reliability confirmed the scales' stability. Pearson's correlation coefficient (r) ranged from 0.70 - 0.88 (mean = 0.80, $p < 0.001$).

When used “separately”, at T-score ≥ 61 , Thai ADHD SS - self report, parent’s report and teacher’s report form- have an AUC of 0.64 (95% CI = 0.56-0.71, $p < 0.01$), 0.74 (95% CI = 0.68-0.79, $p < 0.001$) and 0.61 (95% CI = 0.55-0.67, respectively and have fair sensitivity (0.57 – 0.63) and specificity (0.49 – 0.55). When used “altogether”, at T-score ≥ 61 , Thai ADHD SS - self report, parent’s report and teacher’s report form- revealed good sensitivity (0.90) and specificity (0.88) which emphasized the paramount of using multiple raters for better screening. Exploratory and confirmatory factor analyses confirmed that Thai ADHD SS contain two domains including hyperactivity-impulsivity domain and inattentiveness domain. All items have loading factors of more than 0.4.

Conclusion: Thai ADHD Screening Scales are reliable and valid screening scales for attention deficit hyperactivity disorder (ADHD). When Self version, Parent version or Teacher version was used separately, Thai ADHD Screening Scales have fair sensitivity and specificity. When the results were combined altogether, however, the sensitivity and specificity of Thai ADHD SS were significantly increased. Therefore, Thai ADHD Screening Scales are useful screening scales for further clinical or epidemiological study related to ADHD especially when Self version, Parent version and Teacher version are used altogether.

Keywords: Development, attention deficit hyperactivity disorder, ADHD, Screening, Scales, Thai