

Abstract

Objective: ADHD begins as a childhood developmental disability and can continue into adulthood, impacting an individual's work and personal life. Currently, there are not many brief ADHD screeners available for use with good psychometrics. The ASSET (ADHD Symptom and Side Effect Tracking) was originally developed over a fifteen-year span to aid physicians in tracking response to treatment for ADHD. This study looks at the psychometric properties within the ASSET-BSS (Baseline Severity Scale), a scale developed for the purposes of screening for ADHD as a companion to the original ASSET.

Methods: Data collection was obtained from a population of 170 participants. Each participant completed the original 13-item survey focused on symptoms of ADHD. After data collection, an exploratory factor analysis was completed to determine the factor loadings of the ASSET. Based on the EFA, appropriate items were removed from the original scale, and a final 10-question, 2-subscale measure was identified. For the ten-question measure we assessed internal consistency via Chronbach's alpha, and specificity and sensitivity were assessed through an ROC curve analysis.

Results: The final EFA resulted in the removal of three items from the scale, and two factor loadings. Factor loadings were consistent with Executive Functioning and Hyperactivity/Related Emotion themes. A clinical cut off score of 32.5 was determined, as the measure obtained 82.7% specificity and 78.0% sensitivity.

Conclusions/Key Takeaways: Overall, the ASSET-BSS is showing promising psychometric properties. Future studies are in the process of being completed to validate and confirm the psychometric properties discovered in this study.

Introduction

Scale development includes multiple steps to ensure that the scale is measuring for the selected disorder, as well as for validity and, reliability, and consistency. Sample populations should contain both those with diagnosed ADHD and those without ADHD. Sample populations. They should also include both males and females, as well as individuals with other disorders or conditions (Taylor et al., 2011). For example, during the development of the Conners Adult ADHD Rating Scale (CAARS), researchers first studied factor structure to determine the subscales of the rating scale. After this, the researchers tested the rating scale on a normative sample and eventually a clinical sample (Conners et al., 1999).

This study aims to report on the development and psychometric investigation of the ASSET, a self-report ADHD measure. However, this measure is meant as a screening tool and not to be used for an official diagnosis. Results of the scale should be paired with a professional's medical opinion, as well as additional testing to determine if the patient is presenting with ADHD. Similar to Conners et al., (1999), this study is the first stage of a three-step research project on the development of the ASSET to determine the ASSET's validity, reliability, and associated psychometric properties regarding its potential clinical use. Later studies will include research on norming of the scale and additional psychometric properties with a larger clinical sample population.

Methods and Materials

The original ASSET scale included 16-items, however 13-items were selected for this study to create the ASSET-BSS. The 13-items were selected based on current DSM-5 criteria for an ADHD diagnosis.

Participants were recruited through email and word of mouth from the researchers. 170 participants responded to the survey; and, 155 participants answered each question in the original 13-item survey focused on symptoms of ADHD.

After data collection, an exploratory factor analysis was completed to determine the factor loadings of the ASSET-BSS. Based on the EFA, three appropriate items, Excessive Talking, Sleep Quality, and Brain Fog were removed from the original scale. Additionally, internal consistency, specificity and sensitivity were assessed to determine the psychometric properties of the measure.

Results

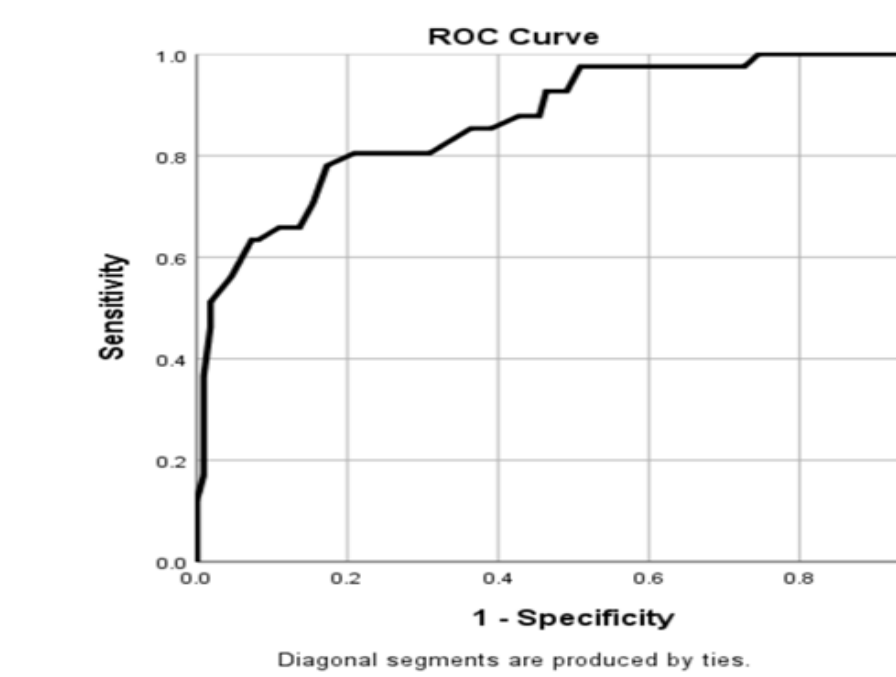
The EFA resulted in the removal of three items from the scale, and two factor loadings. Factor loadings were consistent with Executive Functioning and Hyperactivity/Related Emotion themes. The two-factor model explained 64.40% of the variance. While the KMO score and Bartlett's sphericity indicated that utilizing the 155 complete answers was adequate for exploratory factor analysis ($KMO = 0.89$, $\chi^2(45) = 978.04$, $p < .001$). An independent *t*-test indicated that those who reported having ADHD scored significantly higher on the ASSET-BSS than those that reported being ADHD negative.

Table 1. Factor Loadings for the ASSET-BSS

Item	Factor 1	Factor 2	Dimension Name
Trouble Organizing Tasks and Activities	.96		Executive Functioning
Follow-Through	.93		
Productivity	.86		
Attention Span	.66		
Misplacing Daily Items	.54		
Forgetfulness	.52		Hyperactivity and Related Emotion
Anxiety		.85	
Mood		.82	
Fidgetiness		.53	
Trouble Waiting Turn/General Impatience		.44	

Results (Continued)

Figure 2: ROC analysis of the ASSET-BSS



The chart above demonstrates the ROC curve analysis results. The area underneath the curve demonstrates that the ASSET correctly predicted 87.3% of the sample in regard to their reported history of having an ADHD diagnosis. A clinical cut off score of 32.5 was determined, due to at that value the measure achieved 82.7% specificity and 78.0% sensitivity. Thus, if a participant scored a 33 on the ASSET-BSS, there was about an 83% chance that the participant had not been diagnosed with ADHD and a greater than 78% chance that the participant had been diagnosed with ADHD.

Discussion

The ASSET-BSS was originally 13 items, however, the measure was reduced down to 10 items with two factor loadings after the factor analysis. The final ten items include questions on attention span, forgetfulness, follow-through, trouble organizing tasks and activities, misplacing daily items, fidgetiness, trouble waiting turn/general impatience, anxiety, mood, and productivity. The final factor analysis showed that the following two factor loadings were present within the scale: Executive Functioning (6 items) and Hyperactivity/Related Emotion (4 items).

In the current study population, the ASSET-BSS demonstrated a difference in scores between those who have diagnosed ADHD and those who do not. Again, the internal consistency of this measure establishes that all items in this measure are targeted toward measuring the same underlying construct. The ASSET-BSS showed a high specificity, meaning it will correctly generate a negative score for ADHD, more than 80% of the time and high sensitivity meaning it will produce a true positive over 77% of the time.

This study is the first of three planned validation studies for the ASSET-BSS. These findings are provisional and will be re-evaluated with each new study. For this reason, caution should be taken with interpreting generalizability of these results.

Contact

Richard Powell, Ph.D., J.D.
The Rochester Center for Behavioral Medicine
441 South Livernois, Suite 100, Rochester Hills, MI 48307
rpowell@rcbm.net
248-467-3550

References