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ORIGINAL PAPER

Reliability and factorial validity of the Persian Adult ADHD Self-Report scale in university students

Fiabilidade e validade fatorial da versão persa da Adult ADHD Self-Report Scale em estudantes universitários

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Abstract

Background and Aim: Adult attention-deficit/hyperactivity disorder (ADHD) is prevalent and impairing, yet underdiagnosed in many low- and middle-income countries, partly due to the scarcity of culturally adapted screening tools. This study examined the psychometric properties of a Persian version of the World Health Organization Adult ADHD Self-Report Scale (ASRS v1.1) in university students. **Method**: Participants were 128 Iranian students (52% women, 48% men) selected through simple random sampling. The ASRS v1.1 was translated using a forward–backward procedure and expert review. Content validity indices were calculated, and a multi-method psychometric approach was applied, combining classical test theory, exploratory and confirmatory factor analyses on polychoric correlations, and multidimensional item response theory. Convergent validity was examined with Conners' Adult ADHD Rating Scales – Self-Report: Short Version (CAARS-S:S) indices. **Results**: Analyses supported a 14-item, three-factor solution—Attention Problems, Hyperactivity, and Impulsivity. The model showed acceptable global fit (CFI = .91, NFI = .92, RMSEA = .07, and GFI = .89). Internal consistency was acceptable for the total score (Cronbach's α = .79) and good for the three dimensions (αs ≥ .81). Item response theory results indicated ordered thresholds, adequate discrimination, and good measurement precision from low to moderately high ADHD symptom levels. ASRS scores correlated positively with CAARS-S:S indices, supporting convergent validity. **Conclusions**: The 14-item Persian ASRS v1.1 demonstrates adequate reliability, factorial validity, and convergent validity in Iranian university students and appears suitable for research applications and preliminary screening of adult ADHD symptoms in this context.

Keywords: Attention-deficit/hyperactivity disorder; Adult ADHD Self-Report Scale; ASRS v1.1; Psychometrics; University students.

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Resumo

Contexto e Objetivo: A perturbação de hiperatividade/défice de atenção (PHDA) no adulto é prevalente e incapacitante, mas permanece subdiagnosticada em muitos países de baixo e médio rendimento, em parte devido à escassez de instrumentos de rastreio culturalmente adaptados. Este estudo examinou as propriedades psicométricas de uma versão persa da *Adult ADHD Self-Report Scale* (ASRS v1.1) da Organização Mundial da Saúde em estudantes universitários. **Método**: Participaram 128 estudantes iranianos (52% mulheres, 48% homens), selecionados por amostragem aleatória simples. A ASRS v1.1 foi traduzida para persa através de um procedimento de tradução–retradução e revisão por peritos. Foram calculados índices de validade de conteúdo e aplicada uma abordagem psicométrica multimétodo, combinando teoria clássica dos testes, análises fatoriais exploratória e confirmatória com base em correlações policóricas e modelos de teoria de resposta ao item multidimensional. A validade convergente foi examinada através das correlações com os índices do *Conners' Adult ADHD Rating Scales – Self-Report: Short Version* (CAARS-S:S). **Resultados**: As análises suportaram uma solução de 14 itens e três fatores — Problemas de Atenção, Hiperatividade e Impulsividade. O modelo apresentou ajustamento global aceitável (CFI = 0,91, NFI = 0,92, RMSEA = 0,07 e GFI = 0,89). A consistência interna foi aceitável para a pontuação total (α de Cronbach = 0,79) e boa para as três dimensões (α ≥ 0,81). Os resultados da teoria de resposta ao item indicaram limiares ordenados, discriminação adequada e boa precisão de medida em níveis baixos a moderadamente elevados de sintomas de PHDA. As pontuações da ASRS correlacionaram-se positivamente com os índices da CAARS-S:S, apoiando a validade convergente. **Conclusões**: A versão persa de 14 itens da ASRS v1.1 evidencia fiabilidade adequada, validade fatorial e validade convergente em estudantes universitários iranianos e parece adequada para aplicações em investigação e rastreio preliminar de sintomas de PHDA no adulto neste contexto.

Palavras-Chave: Perturbação de Défice de Atenção/Hiperatividade; Adult ADHD Self-Report Scale; ASRS v1.1; Psicometria; Estudantes universitários.

Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a psychological disorder in which individuals experience cognitive, behavioral, and emotional difficulties such as distractibility, problems with concentration, hyperactivity, and impulsivity (Cortese et al., 2023; Rahmani et al., 2022). Studies in recent decades indicate that symptoms and deficits associated with ADHD remain relatively stable into adulthood for most individuals diagnosed in childhood or adolescence (Gillies et al., 2023; Rahmani et al., 2023). The global prevalence of this disorder is estimated to be approximately 6.5%, and more than 50% of affected individuals continue to exhibit symptoms in adulthood, with substantial negative consequences in educational, social, marital, and occupational domains (Koncz et al., 2023).

In adults with ADHD, characteristic behavioral and motivational manifestations include hyperactivity and impulsivity, procrastination and task delay, heightened reactions to failure and frustration, low motivation, sleep difficulties, time-management problems, blunt or rude interpersonal style, suicide attempts, difficulties in self-expression, driving offences, restlessness rather than overt hyperactivity, internet addiction, substance abuse, and impaired behavioral inhibition (Shahyad et al., 2024; Ramsay & Rostain, 2011; Loh et al., 2023; Murphy, 2005; Taheri et al., 2023; Nooripour et al., 2022; Balootbangan et al., 2023; Ghavidast et al., 2023).

Emotion-related difficulties in adults with ADHD can be summarized in three components: mood problems, emotional over-reactivity, and emotional instability. These individuals often display short temper outbursts and frequent behavioral explosions. Emotional over-reactivity is reflected in a reduced ability to regulate life stressors, with a tendency to feel overwhelmed and distressed. Emotional instability refers to rapid shifts from a neutral mood to depressed or highly excited states. Psychosocial correlates of ADHD in adulthood include separation or relationship breakdown, low socioeconomic status, substantial

educational and occupational difficulties, marital problems, poor job performance, low self-confidence, and pervasive feelings of inadequacy and failure (Skoglund et al., 2023; Davidson, 2007; Soroush-Vala et al., 2023).

Considering the symptoms and difficulties described above, accurate evaluation, diagnosis, and treatment of adults with ADHD are essential and warrant particular attention. To date, semi-structured interviews and rating scales such as the Wender Utah Rating Scale, which includes 61 questions, 25 of which were designed specifically to diagnose ADHD, and the Conners' Adult ADHD Rating Scales have been used. The revised Conners' adult questionnaire has been standardized in an Iranian sample and assesses DSM-IV symptoms (Davari-Ashtiani et al., 2014), with long and short forms that are relatively time-consuming to administer. Although several child-focused ADHD measures have been translated and validated in Iran, including the Conners Early Childhood Questionnaire – Parent Form (Amiri et al., 2023) and the SNAP-IV Rating Scale (Aghaei et al., 2011), these instruments target pediatric populations. Thus, despite promising psychometric work in children, there remains no validated adult ADHD questionnaire aligned with DSM-5 criteria in Iran. Given the substantial impairment associated with adult ADHD and the limited concordance of existing adult questionnaires with DSM-5, there is a clear need to standardize a DSM-5–aligned, psychometrically robust measure that can distinguish affected adults from the general population.

The Adult ADHD Self-Report Scale (ASRS) was developed by the World Health Organization in collaboration with a group of psychiatrists and researchers as a brief self-report instrument for assessing ADHD symptoms in adults (Kessler et al., 2005). Despite the availability of several translated ADHD measures for children in Iran, the psychometric properties of an adult screening instrument such as the ASRS have not yet been systematically evaluated in this context. Therefore, the present study aimed to translate and adapt the ASRS into Persian and to examine its psychometric characteristics—specifically, its internal consistency and factorial validity—as well as its suitability as a screening tool for ADHD symptoms in Iranian university students.

Method

Design and Procedure

This methodological, cross-sectional study evaluated the psychometric properties of a Persian adaptation of an adult ADHD self-report questionnaire. The original English version was translated into Persian by a bilingual psychologist and then back-translated into English by an English-language specialist. Discrepancies between the back-translated and original versions were reviewed and resolved by one of the authors to ensure semantic and conceptual equivalence. The preliminary Persian version was subsequently reviewed by seven experts to assess fluency and comprehensibility, and minor wording revisions were implemented based on their feedback. Next, six psychology professors from Allameh Tabataba'i University in Tehran evaluated the items for content relevance and clarity. After incorporating their comments, the finalized version was administered to the study participants. All participants were informed about the aims and procedures of the study and provided written informed consent before completing the questionnaires.

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Participants

The sample comprised 128 university students recruited from Allameh Tabataba'i University in Tehran using simple random sampling. The majority were women (52%; men: 48%) and single (81.3%; married: 18.8%). Most participants were between 20 and 30 years old (85.2%), with smaller proportions aged 31–40 (7.0%), 41–50 (4.7%), and 51–60 (1.3%) years. Regarding education, 96.9% were master's students and 3.1% were doctoral students.

In line with recommendations for factor-analytic studies suggesting approximately 5–10 participants per item (Dwyer, 1983), a sample in the range of 90–180 participants was considered adequate for the 18-item ASRS. The final sample of 128 students therefore provided roughly seven participants per item, which falls within commonly accepted guidelines for scale validation while also allowing for potential attrition and incomplete responses.

Instruments

Adult ADHD Self-Report Scale (ASRS v1.1)

The primary instrument was the ASRS v.1, developed by Kessler et al. (2005) for the WHO World Mental Health Survey Initiative. The ASRS consists of 18 items reflecting DSM-IV adult ADHD symptom criteria, covering two dimensions: Inattention (Items 1–9) and Hyperactivity/impulsivity (Items 10–18). The scale is divided into Part A, the six-item screener used for quick identification of probable ADHD cases, and Part B, the remaining 12 items that provide supplementary assessment. Each item is rated on a five-point Likert-type scale ranging from 0 (*never*) to 4 (*very often*), with higher scores indicating more severe ADHD symptoms. For clinical screening, the ASRS employs a categorical algorithm in which specific response thresholds define a "positive" symptom, and endorsement of four or more positive responses among the six Part A items suggests likely ADHD. For research purposes, subscale scores are typically computed by summing the responses to the nine inattention items and the nine hyperactivity/impulsivity items, and a total ASRS score is derived by summing all 18 items (possible range = 0–72). In the present study, the Persian version developed through the translation and back-translation procedure described above was used.

Conners' Adult ADHD Rating Scales – Self-Report: Short Version (CAARS-S:S)

The Persian CAARS-S:S (Arabgol et al., 2004) was used to examine convergent validity. This questionnaire comprises 26 items rated on a four-point Likert-type scale from 0 (*not at all*) to 3 (*severe*), with higher scores reflecting greater ADHD-related difficulties. The CAARS-S:S yields five subscales (Inattention/Memory Problems, Indecisiveness/Hyperactivity, Impulsivity, Problems in Overall Self-Image), and a Hyperactivity/Inattention Index is derived from responses to all 26 items. Each of the first four subscales comprises five items, and the ADHD index reflects the individual's overall symptom level. In the study by Arabgol et al. (2004), Cronbach's alpha was .81, and in the present study was .89, indicating acceptable internal consistency.

Data Analysis

Data were analyzed using both classical test theory and item response theory frameworks. First, we screened the data for accuracy, missing values, and multivariate outliers using Mahalanobis distance. Descriptive statistics (means, standard deviations, skewness, kurtosis) were computed for all items and scale scores. Multivariate normality was evaluated via tests of multivariate skewness and kurtosis.

Within the classical approach, we computed descriptive statistics for all items and scales, examined item–total correlations, and estimated internal consistency (Cronbach's alpha) for the total ASRS score and its subscales. Content validity was evaluated using Lawshe's content validity ratio (CVR): a panel of psychology professors rated each item as "essential," "useful but not essential," or "not necessary," CVR indices were calculated, and items were retained when their CVR met or exceeded Lawshe's critical value for the given number of experts. Construct validity was investigated in two steps. For exploratory factor analysis (EFA), we assessed factorability using the Kaiser–Meyer–Olkin (KMO) index and Bartlett's test of sphericity (Bartlett, 1954; Kaiser & Meyer, 1974). Because the ASRS uses ordered categorical response options and item distributions are typically non-normal, we used principal axis factoring with oblique (Promax) rotation to allow for correlated factors (Gorsuch, 1983). Factor retention decisions were guided by eigenvalues greater than 1, inspection of the scree plot, parallel analysis, and the Very Simple Structure (VSS) criterion (Cattell, 1966; Horn, 1965; Revelle & Rocklin, 1979). Items were retained when they showed primary loadings ≥ .30 on a single factor and no substantial cross-loadings (Tavakol & Wetzel, 2020).

Confirmatory factor analysis (CFA) was then used to test the factorial structure suggested by EFA and by the original ASRS model. Models were estimated with robust maximum likelihood in R, and overall fit was evaluated using multiple indices: chi-square/df (χ^2/df), the Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA) with 90% confidence interval, and Standardized Root Mean Square Residual (SRMR). Conventional cutoffs (CFI/TLI ≥ .90, RMSEA ≤ .08, SRMR ≤ .08) were used as guidelines for acceptable fit.

Within the IRT framework, we fitted a multidimensional graded response model to the ASRS items, appropriate for ordered polytomous categories with non-equidistant thresholds. For each item, discrimination (slope) and threshold (β) parameters were estimated for their respective latent dimensions. Model fit was evaluated using −2 log-likelihood, Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC), and the model with the lowest information criteria was retained. Item and test information functions and conditional standard errors of measurement were inspected to evaluate the precision of the scale across the latent trait continuum.

Concurrent validity was examined by computing Pearson correlations between ASRS scores (total and subscales) and the CAARS-S:S total and subscale scores.

All analyses were conducted using SPSS 25 for descriptive statistics, reliability, and EFA, and R 3.6.1 (psych, lavaan, and mirt packages) for CFA and IRT analyses. Statistical significance was set at $p < .05$ (two-tailed).

Results

Preliminary Analyses

All 128 cases were retained for analysis; no multivariate outliers were detected using Mahalanobis distance. Tests of multivariate skewness and kurtosis indicated a significant deviation from multivariate normality (skewness: $\hat{\beta} = 39.94$, $\kappa = 6.13$, $p = .01$; kurtosis: $\hat{\beta} = 73.66$, $\kappa = 15.25$, $p = .01$). Consistent with these findings, principal axis factoring was used for exploratory factor analysis. Factorability indices were

adequate: the KMO measure was .68, and Bartlett's test of sphericity was significant, $\chi^2_{(153)} = 485.23$, $p < .001$, supporting the suitability of the correlation matrix for factor analysis.

Content Validity

Content validity indices based on two expert judgments indicated that all ASRS items met or exceeded Lawshe's critical CVR value for the given number of experts (CVR = 1), supporting adequate content coverage of adult ADHD symptoms and retention of all items for further analyses.

Factor Structure: Exploratory Factor Analysis

The EFA initially specified a two-factor solution consistent with the original ASRS structure (Inattention and Hyperactivity/Impulsivity). This model accounted for 71.16% of the common variance but revealed suboptimal performance for four items (Items 6, 15, 16, and 17), which showed low primary loadings (< .30) and weak item–total correlations. These items were therefore removed, and a subsequent EFA of the remaining 14 items, using principal axis factoring with Promax rotation, yielded a three-factor solution with correlated dimensions broadly reflecting Impulsivity, Hyperactivity, and Attention Problems. For the retained items, standardized loadings on their target factors were all ≥ .63 (Table 1), with no problematic cross-loadings, and the three factors together explained approximately 75% of the total variance.

Table 1

Exploratory Factor Loadings for the 14 Retained ASRS Items

#	Item content	*M* (*SD*)	Factor 1	Factor 2	Factor 3
1	Trouble wrapping up the final details of a project once the challenging parts are done	2.31 (0.86)	.69	—	—
2	Difficulty getting things in order when a task requires organization	2.58 (0.91)	.84	—	—
3	Problems remembering appointments or obligations	2.12 (0.88)	—	—	.72
4	Avoids or delays starting tasks that require a lot of thought	2.46 (0.93)	—	—	.84
5	Fidgets or feels restless when required to sit for long periods	2.67 (0.81)	—	.90	—
7	Makes careless mistakes when working on a boring or difficult project	2.39 (0.84)	.74	—	—
8	Difficulty keeping attention on boring or repetitive work	2.71 (0.78)	—	.85	—
9	Difficulty concentrating on what people say, even when they speak directly	2.18 (0.89)	—	—	.71
10	Misplaces or has difficulty finding things at home or at work	2.52 (0.82)	—	.63	—
11	Easily distracted by activity or noise around them	2.52 (0.82)	—	.78	—
12	Leaves seat in meetings or situations where expected to remain seated	2.76 (0.79)	.65	—	—
13	Feels restless or fidgety	2.04 (0.87)	—	.81	—
14	Difficulty relaxing during free time	2.83 (0.76)	—	.71	—
18	Interrupts others when they are talking or busy	2.47 (0.85)	—	—	.68

Note. $N = 128$. Principal Axis Factoring, Promax Rotation. Only primary loadings ≥ .30 are shown. Abbreviated item stems were based on the standard English wording of the ASRS v1.1.

Confirmatory Factor Analysis

A CFA was conducted on the final 14-item, three-factor model identified in the EFA (Impulsivity, Hyperactivity, Attention Problems). The model showed acceptable global fit, $\chi^2/df = 1.96$, CFI = .91, NFI = .92, RMSEA = .07, and GFI = .89, indicating that the three-factor structure provided a reasonably good representation of the data despite GFI being slightly below the conventional .90 cutoff. Standardized

factor loadings, *z* statistics, and p values for the final 14-item, three-factor CFA model are shown in Table 3. For the Impulsivity factor, loadings ranged from .40 (Item 7) to .67 (Item 2); for Hyperactivity, from .42 (Item 8) to .75 (Item 13); and for Attention Problems, from .41 (Item 18) to .56 (Items 4 and 9). All loadings were statistically significant (z = 2.63–4.42, all p < .01), indicating that each item contributed meaningfully to its respective latent construct.

Table 2

Standardized Factor Loadings, z Statistics, and p Values for the 14 ASRS Items in the Three-Factor CFA Model

Factor	Item no.	Item content	λ	*z*	*p*
Impulsivity					
	1	Trouble finishing the final details of a project	.41	3.20	.001
	2	Difficulty getting things in order when a task requires organization	.67	3.88	.001
	7	Makes careless mistakes on boring or difficult projects	.40	3.03	.001
	12	Leaves seat in meetings or situations where expected to remain seated	.52	3.53	.001
	14	Difficulty relaxing during free time	.62	3.80	.001
Hyperactivity					
	5	Feels angry or restless when required to sit for long periods	.45	3.61	.002
	8	Difficulty maintaining concentration on boring or repetitive work	.42	2.63	.009
	10	Misplaces or has difficulty finding things at home or at work	.56	3.99	.001
	11	Easily distracted by activity or noise around them	.46	3.57	.001
	13	Feels restless or fidgety	.75	4.42	.001
Attention Problems					
	3	Problems remembering appointments or obligations	.48	3.52	.001
	4	Avoids or delays starting tasks that require a lot of thought	.56	3.77	.001
	9	Difficulty staying focused when others are speaking directly	.56	3.78	.001
	18	Interrupts others when they are talking or busy	.41	3.20	.001

Note. N = 128. All factor loadings are standardized. All z statistics were significant at $p \leq .01$ (two-tailed). Abbreviated item stems were based on the standard English wording of the ASRS v1.1.

Internal Consistency

Internal consistency estimates for the Persian ASRS v1.1 were satisfactory. Cronbach's alpha was .79 for the total 14-item scale. At the subscale level, alphas were .81 for Impulsivity, .87 for Hyperactivity, and .71 for Attention Problems, indicating acceptable to good internal consistency across all three dimensions.

Item Response Theory Analyses

A multidimensional graded response model was fitted to the 14 ASRS items to examine item functioning across the three latent dimensions. The graded response model showed better fit than alternative polytomous IRT models, as indicated by lower −2 log-likelihood, AIC (4482.45), and BIC (4679.24) values, supporting its appropriateness for the data.

Item discrimination (slope) parameters (α) ranged from 0.66 to 1.87 across factors (Table 3). Within the Impulsivity factor, slopes ranged from 0.85 (Item 7) to 1.62 (Item 2); for Hyperactivity, from 0.66 (Item

8) to 1.87 (Item 13); and for Attention Problems, from 0.99 (Item 4) to 1.48 (Item 9). Items 2 and 13 showed the highest discrimination, indicating strong differentiation between individuals with lower versus higher levels of the corresponding traits. Items 4, 7, and 8 presented comparatively lower, but still acceptable, discrimination parameters, suggesting somewhat weaker precision at certain trait levels while remaining contributory to the overall scales.

Threshold (β) parameters were well ordered and adequately spaced for all items, with each response category occupying a distinct range on the latent trait continuum. This pattern indicates that the Likert-type response options functioned as intended, with no category redundancies or disordered thresholds.

Table 3

Item Discrimination and Threshold Parameters for the 14 ASRS Items in the Multidimensional Graded Response Model

Factor (dimension)	Item no.	α (slope)	β_1	β_2	β_3	β_4
Impulsivity						
	1	1.01	3.28	0.93	−1.41	−3.60
	2	1.62	3.17	−1.10	−2.63	−3.02
	7	0.85	4.09	0.47	−1.98	−4.16
	12	1.08	1.14	−1.50	−2.95	−4.47
	14	1.57	1.75	−1.96	−3.48	−4.91
Hyperactivity						
	5	1.38	2.67	0.67	−0.72	−2.90
	8	0.66	3.04	0.27	−1.48	−3.38
	10	1.29	1.83	−0.51	−2.17	−3.67
	11	1.00	1.26	0.58	−1.45	−3.60
	13	1.87	2.85	0.60	−2.47	−4.89
Attention Problems						
	3	1.06	0.58	−1.26	−2.78	−3.92
	4	0.99	2.45	−0.48	−2.58	−3.87
	9	1.48	1.69	−1.33	−3.41	−4.85
	18	1.18	1.90	−1.08	−3.79	−4.23

Note. N = 128. α = discrimination parameter; β_1–β_4 = category thresholds. More positive β values indicate that higher levels of the latent trait are required to endorse higher response categories.

Test Information and Final Scale Version

Test information functions indicated that the three ASRS dimensions provided the greatest measurement precision (and lowest standard errors) for latent trait levels in the range of approximately −2 to +2, suggesting that the Persian ASRS is most informative for individuals with low to moderately high ADHD symptom levels (Figure 1).

Converging evidence from CTT (EFA, CFA, internal consistency) and multidimensional IRT analyses supported a refined 14-item Persian ASRS v1.1, with four poorly performing items (Items 6, 15, 16, and 17) removed. This 14-item, three-factor version was retained as the final instrument for subsequent research and screening applications in Iranian university students.

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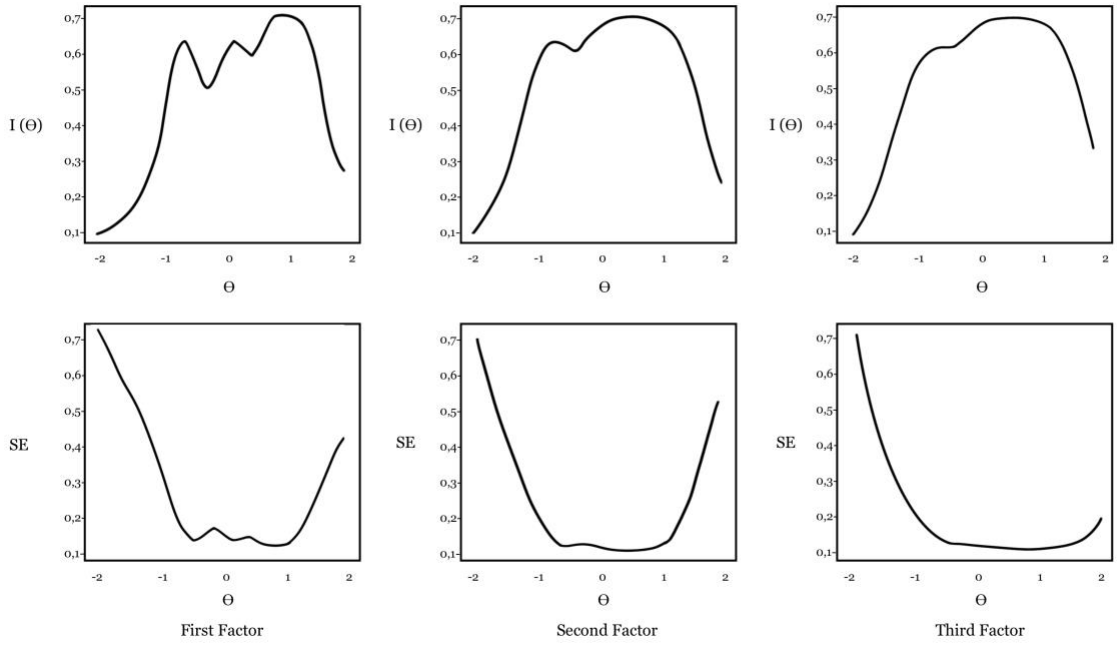
Figure 1

Test Information and Conditional SE of Measurement Functions for the Three Persian ASRS v1.1 Factors



Note. I(θ) = test (factor) information at a given level of the latent trait θ; SE = conditional standard error of measurement. Higher I(θ) and lower SE indicate greater measurement precision.

Convergent Validity

As expected, higher scores on the ASRS were positively associated with higher scores on the CAARS-S:S. The ASRS total score showed a moderate-to-strong correlation with the CAARS-S:S total score and Hyperactivity/Inattention Index (Table 4), indicating good convergent validity. ASRS Inattention and Hyperactivity/Impulsivity subscales were differentially related to the corresponding CAARS-S:S subscales, with the strongest correlations observed between conceptually overlapping dimensions (e.g., ASRS Hyperactivity/Impulsivity with CAARS-S:S Indecisiveness/Hyperactivity and Hyperactivity/Inattention Index). All correlations were in the expected direction and statistically significant (*ps* < .05).

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Table 4

Pearson Correlations Between ASRS and CAARS-S:S Scale Scores

Scale	*M* (*SD*)	1	2	3	4	5	6	7	8	9
1. ASRS Total	2.48 (0.68)	—								
2. ASRS Inattention	2.52 (0.71)	.81***	—							
3. ASRS Hyperactivity/Impulsivity	2.43 (0.74)	.78***	.63***	—						
4. CAARS-S:S Total	1.92 (0.59)	.72***	.69***	.66***	—					
5. CAARS Inattention/Memory Problems	1.97 (0.62)	.68***	.74***	.52***	.79***	—				
6. CAARS Indecisiveness/Hyperactivity	1.88 (0.57)	.63***	.57***	.71***	.76***	.65***	—			
7. CAARS Impulsivity	1.85 (0.60)	.59***	.48***	.73***	.68***	.52***	.70***	—		
8. CAARS Problems in Overall Self-Image	1.74 (0.66)	.45***	.41***	.38***	.56***	.49***	.44***	.40***	—	
9. CAARS Hyperactivity/Inattention Index	2.03 (0.64)	.74***	.70***	.69***	.82***	.76***	.71***	.64***	.52***	—

Note. N = 128. Values are Pearson correlations. CAARS-S:S = Conners' Adult ADHD Rating Scales – Self-Report: Short Version.
***p < .001.

Discussion

The primary aim of this study was to evaluate the psychometric properties of the Persian version of the Adult ADHD Self-Report Scale (ASRS v1.1) in a sample of Iranian university students. Using a multi-method approach combining content validity indices, classical test theory, and multidimensional item response theory, we identified a refined 14-item version of the ASRS that demonstrated a clear three-factor structure—Impulsivity, Hyperactivity, and Attention Problems—with acceptable model fit in both EFA and CFA, satisfactory internal consistency for the total scale and subscales, and well-functioning item parameters. Test information functions further indicated good measurement precision across low to moderately high levels of ADHD symptoms, and the ASRS scores showed theoretically coherent, positive associations with the CAARS-S:S indices, supporting convergent validity.

The three-factor structure identified in the present study both converges with and diverges from previous work on adult ADHD measures. In the original ASRS development and in subsequent European validation studies, a two-factor solution reflecting Inattention and Hyperactivity/Impulsivity was consistently supported (Kessler et al., 2005; Van de Glind et al., 2013).

Similarly, Mokhtari et al. (2015) reported adequate fit for an 18-item, two-factor Persian ASRS, with all items retained and good internal consistency. By contrast, our analyses, conducted with more stringent item-retention criteria and integrating both CTT and multidimensional IRT, favored a refined 14-item, three-factor solution (Impulsivity, Hyperactivity, Attention Problems). Internal consistency was satisfactory for the total scale (α = .79) and for the three subscales (αs = .71–.87), falling within commonly accepted ranges for research instruments. This pattern is closer to findings by Manavipour

et al. (2020), who also reported three factors—impulsivity, hyperactivity, and concentration problems—and comparable reliability indices (α ≈ .79). Our IRT results likewise paralleled Manavipour et al. (2020), with items showing highest information and lowest standard error in the latent range between approximately −2 and +2. Together with the coherent correlations between ASRS scores and CAARS-S:S dimensions, these convergences suggest that, despite minor structural differences, the Persian ASRS captures the core ADHD symptom domains in a manner broadly consistent with prior international and Iranian findings.

Although ADHD was historically conceptualized as a childhood-limited disorder, accumulating evidence indicates that a substantial proportion of individuals continue to experience clinically relevant symptoms and functional impairment into adulthood and later life (Dobrosavljevic et al., 2020; Kooij et al., 2016; Torgersen et al., 2016). Adult ADHD is associated with wide-ranging difficulties, including academic and occupational impairment, accidents and driving offences, substance use, and emotional dysregulation, yet many adults remain unrecognized in clinical settings and do not receive appropriate treatment. Current clinical guidelines provide relatively sparse, age-specific recommendations for older adults with ADHD, and management typically follows general adult protocols that combine psychoeducation, psychosocial interventions, and pharmacotherapy, with careful monitoring of physical comorbidities and potential drug interactions (Rosso et al., 2023). In this context, brief, psychometrically robust self-report instruments such as the ASRS are essential to facilitate systematic screening, to inform diagnostic assessments, and to support research on the presentation and impact of ADHD symptoms across adulthood, including in under-studied populations such as Iranian university students and, in future work, older adults.

The present findings also extend prior Persian validation studies by providing evidence of convergent validity with an established adult ADHD measure. ASRS total and subscale scores showed theoretically coherent, positive associations with the CAARS-S:S total score and Hyperactivity/Inattention Index, as well as with conceptually related subscales (Inattention/Memory Problems, Indecisiveness/Hyperactivity). This pattern supports the external convergence of the Persian ASRS with an independent self-report instrument that is widely used in clinical and research settings. Although we did not estimate diagnostic sensitivity and specificity in this student sample, studies using the ASRS in Iranian and European contexts have documented satisfactory screening performance, with sensitivities around 70–84% and very high specificities (e.g., Mokhtari et al., 2015; Van de Glind et al., 2013). Taken together, the current convergent associations with CAARS-S:S scores and the broader screening evidence from previous work suggest that the 14-item Persian ASRS has the potential to function as an efficient, psychometrically supported tool for identifying adults at elevated risk for ADHD in university and, potentially, community settings.

Beyond its psychometric performance, the Persian ASRS v1.1 has several practical advantages for use in academic and clinical contexts. The instrument is brief (14 items), easily understood, and quick to administer and score, which makes it suitable for screening in busy university counselling centers and research protocols that already include multiple measures. The three-factor structure allows clinicians

and researchers to distinguish between relatively more impulsive, hyperactive, and attention-related symptom profiles, while the IRT findings indicate that the items provide their greatest precision in the low to moderately high range of ADHD symptoms—precisely where a screening tool is most useful. In combination with its acceptable reliability, factorial validity, and convergent associations with the CAARS-S:S, these features suggest that the Persian ASRS may be an efficient first-step instrument to flag adults who should receive a more comprehensive, multi-informant diagnostic evaluation.

Limitations

Despite its strengths, this study has several limitations that should be acknowledged. First, the sample comprised university students from a single institution in Tehran, which restricts the generalizability of the findings to other age groups, educational levels, and clinical populations. Second, data were obtained exclusively through self-report questionnaires, without clinician-administered diagnostic interviews or informant reports, increasing the risk of reporting bias and limiting conclusions about diagnostic accuracy. Third, although we conducted comprehensive cross-sectional analyses (EFA, CFA, internal consistency, multidimensional IRT, and convergent validity), we did not examine test–retest reliability, longitudinal stability, or measurement invariance across sex, age, or other key subgroups. Fourth, content validity was assessed by only two expert judges, which limits the robustness of Lawshe-based indices and should be strengthened in future studies by involving larger expert panels. Fifth, the refinement from the original 18-item ASRS to a 14-item version may affect strict comparability with international studies, and future work should directly compare the performance of the original and shortened forms in both community and clinical samples.

Conclusion

This study provides evidence that the Persian version of the Adult ADHD Self-Report Scale (ASRS v1.1) is a psychometrically sound instrument for assessing ADHD symptoms in Iranian university students. Using content validity indices, classical test theory, and multidimensional item response theory, we identified a refined 14-item version with a three-factor structure—Impulsivity, Hyperactivity, and Attention Problems—that showed acceptable model fit in both EFA and CFA, satisfactory internal consistency for the total scale and subscales, and well-functioning item parameters. Test information functions indicated that the scale is most precise in the low to moderately high range of ADHD symptoms, which is optimal for a screening tool.

The Persian ASRS v1.1 also demonstrated convergent validity through coherent, positive associations with CAARS-S:S total and subscale scores, suggesting that it captures core adult ADHD symptomatology in a manner consistent with an established comparison measure. Taken together, these results support the use of the 14-item Persian ASRS v1.1 as a brief, reliable, and valid screening instrument for identifying adults at elevated risk for ADHD in university settings. Future studies should extend this work by testing the scale in more diverse and clinical samples, examining diagnostic accuracy indices (sensitivity and specificity), and evaluating longitudinal stability to further consolidate its role in research and clinical practice.

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