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Persian Manuscript of Adult Attention Deficit Hyperactivity Disorder Rating Scale Expected Internal Consistency and Factor Structure in Iranian Medical Students

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Abstract

Background: Adult attention-deficit/hyper activity disorder (ADHD) interacts with educational and occupational achievements. To introduce a valid screening tool for adult ADHD in Iranian students, the current study aimed at evaluating internal consistency and factor structure of adult ADHD self-report scale (ASRS) Persian version 1.1.

Methods: ASRS Persian version 1.1 was filled by 240 Iranian medical students aged 18 - 24 years, and Cronbach's alpha coefficient and factor analysis were performed with SPSS version 21.

Results: Cronbach's alpha coefficient was 0.76.8 for ASRS. Factor analysis confirmed two factors of attention deficit and hyperactivity for ASRS Persian version.

Conclusions: ASRS Persian version 1.1 had adequate internal consistency and saved the two structure factors of the original questionnaire, the hyperactivity and the attention deficit.

Keywords: Attention Deficit Disorder with Hyperactivity, Factor Analysis, Medical Student

1. Background

Based on various studies, 10% to 66% of childhood attention deficit/ hyperactivity disorder (ADHD) could be continued to adulthood, named adult ADHD (1). Adults' symptoms of hyperactivity or attention deficit, contributes to their life events (2). The occupation is the main affected field of patients with adult ADHD, in form of lower function, incomplete performance, poor relationships with bosses or coworkers, and finally, poor advancement in occupational skills (3, 4). Reduced occupational function leads to higher rate of unemployment, changing occupations, low socioeconomic status, and becoming highly apt to addiction, potentially (5).

Adult ADHD is not well understood and diagnosed (6). Developmental changes are not considered in diagnostic criteria of ADHD, since they are derived from validation studies in children; therefore the criteria for adulthood are restricted (7-9). Partial improvement of hyperactivity in adulthood with persistent attention deficit, overlaps with other psychiatric disorders such as depression and co-morbid diagnoses are possible reasons for omission of the adult ADHD diagnosis. At the same time, inadequate and time consuming screening tools are overwhelming (10). Further studying of such diagnosis requires an appropriate screening tool for the epidemiological studies.

The only available questionnaire for adult ADHD in Iran is Conner questionnaire, which contains 26 items and requires 10 minutes for completion. Adult ADHD self-report scale (ASRS) with 6 questions, developed by Kessler, is introduced from the world health organization (WHO) composite international diagnostic interview (CIDI). ASRS is validated in various languages (11) and used in correlational studies (12-15). The current study aimed at evaluating the internal consistency (IC) and factor structure of the ASRS Persian version 1.1 to be used in the screening studies on university students and young adults aged 18 - 24 years.

2. Methods

2.1. Population

Medical students aged 18 - 24 years were selected during the academic year 2015 - 2016. Students were invited to participate in a screening study and clinical interview of psychiatry symptoms, in the context of a research project. The selected students were assured about the confidentiality of the information and the informed consent was obtained from all the subjects accordingly; they also had no history of psychiatric disorders followed by medical intervention. Exclusion criteria were the clinical diagnosis of psychiatric disorders received medical treatments, lack of consent, or incompletely answering the questionnaire.

2.2. Questionnaires

The ASRS Persian version 1.1 has six questions. The first four questions emphasize attention deficit and the last two questions are about hyperactivity (16). English form has appropriate internal consistency (Cronbach's alpha coefficient: 0.72 - 0.63) and reliability (6). The Questionnaire was developed and introduced by WHO to be translated into different languages. Translation was done by two English experts and was matched by another one.

2.3. Statistical Analysis

Cronbach's alpha coefficient, confirmatory factor analysis, and discriminant analysis were performed. Statistical analyses were conducted with SPSS version 16 and analysis of moment structures (Amos) graphic-8.

3. Results

Out of the total 240 students, 65% were male and 35% female. Mean $\pm$ standard deviation (SD) of ASRS was 2.2 $\pm$ 1.6. ASRS (ranging 0 to 6) distribution was not normal in the current study based on the results of one-sample Kolmogorov-Smirnov test ($P < 0.05$).

3.1. Internal Consistency

Cronbach's alpha coefficient of ASRS for attention deficit, hyperactivity, and both together were 0.77, 0.73 and 0.76, respectively. Cronbach's alpha coefficients > 0.7 emphasized the acceptable internal consistency of ASRS the Persian version.

Table 1. Two Factors of Initial Values

Initial Eigen Value	Factor 1	Factor 2
Total	2.38	1.65
% of variance	39.7	27.55
Cumulative, %	39.7	67.26

3.2. Factor Analysis

In order to evaluate the construct validity of ASRS, exploratory and confirmatory factor analyses were performed by the Kaiser-Meyer-Olkin had acceptable coefficient (KMO; 0.69). The Bartlett test of sphericity was significant ($P < 0.0001$). Factors extracted by varimax analysis, are summarized in Table 1.

Exploratory factor analysis (variamx) determined two factors, which predicted 67.26% of hyperactivity and attention deficit. Factor loadings of the questions in relation to the two determined factors are showed in Table 2. The smallest acceptable factor loading of questions for the extracted factors were considered 0.50. Indeed, questions 1 to 4 constructed factor 1 and questions 5 and 6, factor 2. According to the English version of the questionnaire, factor 1 was attention deficit and factor 2 was hyperactivity.

Table 2. Factor Loadings of Questions in Relation to the Extracted Factors

Question	Factor 1	Factor 2
2- How often do you have difficulty getting things in order when you have to do a task that requires organization?	0.85	
1- How often do you have trouble wrapping up the final details of a project, once the challenging parts is done?	0.75	
4- When you have a task that requires a lot of thoughts, how often do you avoid or delay getting started?	0.72	
3- How often do you have problems remembering appointments or obligations?	0.72	
5- How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?		0.87
6- How often do you feel overly active and compelled to do things, like you were driven by a motor?		0.86

To endorse the two factor structure of the questionnaire, confirmatory factor analysis in media of AMOS-8 were performed. Goodness of the fit indexes for validation of the model is summarized in Table 3.

4. Discussion

Exploratory factor analysis determined two factors, which predicted 67.26% of hyperactivity and attention

Table 3. Goodness of Fit Indexes for Two Factor Model

	Acceptable Level	Value
Normed chi-square	3 >	2.7
Root mean square error approximation	0.1 >	0.08
Comparative fit index	0.9 <	0.97
Normed fit index	0.9 <	0.90
Goodness of fit index	0.9 <	0.96
Adjusted goodness of fit index	0.9 <	0.94

deficit. Analysis of internal consistency also revealed a Cronbach's coefficient of 76.8%; therefore, it seems that ASRS Persian version 1.1 could be useful to screen adult ADHD.

Adult ADHD is not a common diagnosis, but not due to low prevalence. Overlaps of symptoms with other psychiatric disorders, comorbidities such as substance abuse, obsessive-compulsive disorder, atypical depressions, and personality disorders are all interacting with the diagnosis. For example, impulsivity or lack of adequate attention and concentration could be a symptom of adult ADHD, but the obsessive-compulsive disorder, substance abuse, and borderline personality disorders may also cause them. A diagnostic clue is that adult ADHD starts in childhood and continues to adulthood.

Screening of adult ADHD using ASRS, followed by rolling out other psychiatric conditions could be a valuable strategy. Two main factors of the original questionnaire are hyperactivity and attention deficit. These factors, presented in patients with various degrees of severity, may be related to the age and gender of the patients. Despite attention deficit, as the main presentation of the adult ADHD, hyperactivity is less expected in males and older patients than females and children patients with ADHD. Attention deficit remains with the patients, which may receive treatment in childhood to control hyperactivity and interact with academic, occupational and personal life achievements and destruct the quality of life; not less than hyperactivity, if exists.

Results of the current study showed that translation of ASRS into the Persian language had no impact on the two factor structure of the questionnaire. IC of ASRS Persian version was also similar to those of the previous reports (17). According to the acceptable internal consistency, ASRS could be utilized in clinical diagnosis besides clinical interview and mental status examination. Small number of questions and short required time make it easy to use in epidemiological studies.

In conclusion, ASRS Persian version 1.1 had acceptable IC and confirmed the factor structure similar to the English version.

Supplementary Material

Supplementary material(s) is available here [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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