Adult ADHD Self-Report Scale (ASRS): comprehensive psychometric study in a Spanish SUD sample.

Abstract

Objective: The purpose of this study is to provide reliability and validity evidence of the ASRS scores on different versions and scoring procedures in a Spanish Substance Use Disorder (SUD) sample.

Methods: The sample was made up of 170 outpatients diagnosed with SUD. The ASRS, the MINI International Neuropsychiatric Interview, and the Substance Dependence Severity Scale were administered.

Results: The results of the CFA showed adequate fit to the structure proposed by the DSM-IV in the 18-item version. On the screening scale, best fit was found for a model with two correlated factors (inattention and hyperactivity). The EFA showed that the ADHD items converge and are differentiated from symptoms of withdrawal. The regression analyses showed that severity of dependence is explained by the ASRS scores.

Conclusions: Both versions of the ASRS showed adequate psychometric properties. The polytomous or dichotomous score is relevant in patient classification.

Keywords: ADHD; ASRS; validity; drug abuse; psychometric properties

Attention Deficit and Hyperactivity Disorder (ADHD) begins in childhood and is maintained in adulthood (American Psychiatric Association, 2013). Several studies have shown that ADHD often appears along with other mental disorders, and is a risk factor for their development (Lin, Yang, & Gau, 2015; Meinzer, Pettit, Waxmonsky, Gnagy, Molina, & Pelham, 2015). The population study done by Kessler et al. (2006) demonstrated that individuals with ADHD have a probability of developing other disorders varying from 2.7-7.5 for mood disorders, 1.5–5.5 for anxiety disorders, and 1.5–7.9 for substance disorders. Other studies have also shown that ADHD symptoms are related to depression (Semeijn, Comijs, Kooji, Michielsen, Beekam, & Deeg, 2015; Van Morse & Flory, 2015) and anxiety (Jacob et al., 2007; Jarret, 2016; Jarrett & Ollendick, 2008; Mitchison & Njardvik, 2015). ADHD in childhood is linked as a risk factor for adult drug use (e.g. Charach, Yeung, Climans & Lillie, 2011; Groenman et al., 2013; Lee, Humpherys, Flory, Liu, & Glass, 2011).

An adequate intervention in these patients contributes to reducing their risk and improving their quality of life (Lee et al., 2016). Such intervention must be grounded in adequate diagnosis. In clinical settings, an in-depth study using interviews with the patients and family members is usually done to make the diagnosis. However, in certain clinical contexts as well as in research, the use of tests and screening instruments with proven psychometric properties is a more practical approach (Daigre et al., 2015). One of the most widely used measure of adult ADHD is the Adult Self-Report Scale (ASRS-18) developed by Kessler et al. (2005). The authors proposed 18 items for evaluating the dimensions of inattention and hyperactivity-impulsivity on the DSM-IV, and identified a group of six items which could be used for screening. Both versions have been subjected to psychometric studies in languages such as Spanish (Pedrero & Puerta, 2007), French (Morin, Tran, & Caci, 2013), Korean (Kim, Lee, & Joung, 2013) or

Chinese (Yeh, Gau, Kessler, & Wu, 2008). The six-item version is the most used in epidemiological studies, since it screens quickly, with relatively adequate sensitivity and specificity, although reporting better sensitivity than specificity (Van de Glind et al., 2013). With 18-item version, it is assumed a generic ADHD component which can be evaluated by all the items, and specificities related to inattention and hyperactivity/impulsivity (according to the DSM) or hyperactivity and impulsivity, if CIE-10 criteria are used (WHO, 1992).

Psychometric studies have tested the usefulness of both versions, although some issues are still generating controversy. Regarding the factorial structure, some studies have not been able to replicate the theoretical structure of the ASRS (Kim, Lee, & Joung, 2013; Pedrero & Puerta, 2007). While others, show a factorial solution with one global factor and three specific factors related to attention deficit, hyperactivity and impulsivity, the last of which is the weakest (Morin et al., 2013). This factorial proposal is coherent with the CIE-10 proposal for diagnosis of ADHD, although not with the DSM-IV proposal, which was followed by the authors of the scale (Kessler et al., 2005). In the six-item version, Hesse (2011) found that the two-factor solution fit the data better than just the one factor solution. Other authors, however, found the two-factor solution problematic (Daigre et al., 2009).

The use of the 18-item version vs. the screening version also raises doubt among clinicians and researchers. There is not too much difference in the time needed to administer one version or the other. In prevalence studies it could be beneficial to use the screening version. However, this could lead to loss of information by not including the differential effect that inattention and hyperactivity/impulsivity dimensions could have (Toplak et al., 2009). Furthermore, discrepancies among authors raise on the specificity of the screening version when administered to drug users (Chiasson et al.,

2012; Daigre et al., 2015; van de Glind et al., 2013) because of certain overlap with key symptoms of different mental disorders (Vergara-Moragues et al., 2011; Daigre et al., 2009). Finally, the polytomous or dichotomous scoring systems are used indistinctly, and the implications of their reliability and validity have been studied little (Kessler et al., 2005, 2007).

The above discrepancies may be explained to a great extent by differences in sample and the ASRS versions used. The instructions of the AERA, APA and NCME (2014) are that information must be provided on evaluation of the validity in all target populations for whom the adapted versions are intended. Following these recommendations, the purpose of this study is to complement psychometric evidence already existing using the Spanish version of the ASRS, and provide new evidence concentrating on solving some of the controversies mentioned above. Thus the goals posed were: 1) estimate the reliability of the different versions of the Spanish ASRS in SUD patients, 2) provide evidence of validity based on the internal structure of the Spanish version of ASRS test, by replicating the study by Morin et al. (2013), 3) provide convergent and discriminant evidence on the ASRS items and symptoms of withdrawal; 4) provide evidence of validity based on the relationship with dependence severity, anxiety and mood disorders; and 5) analyze the ability of the ASRS to predict severity of substance dependence, using the screening version, the 18-item version and inattention and impulsivity/hyperactivity scores. This predictive ability was checked using polytomous and dichotomous scoring.

Method

Participants

The sample was made up of 170 SUD patients recruited by convenience sampling at the Unit for Drug Dependence in Huelva, Spain, a public center providing

treatment in an outpatient setting. All patients met criteria for alcohol, heroin, cocaine, or cannabis abuse or dependence. Patient interventions were part of the program developed by a committee of clinicians from drug treatment centers in Andalusia (Consejería de Igualdad, Salud y Políticas Sociales, 2005), periodically updated. Sample was comprised of 79.3% men, 96.4% Spanish with mean age 38.9 (SD = 10.8). The mean education was 7.1 years (SD = 1), having 23.5% higher education. At the time of interview 39.7% of the patients were employed, 43.9% unemployed, 6.1% studying and the rest (9.9%) in other situations (receiving benefits, etc.). Income of 5.1% was from illegal activities. 23.5% of patients were admitted to treatment for an alcohol-related disorder, 22.8% for cocaine, 21.5% for heroin, and 13.4% for cannabis. Criteria for multiple SUD (MSUD) were met by 18.8%. 67.7% had used more than one substance in the month before the interview. More than half (51.5%) used cannabis, 44.8% used alcohol, and 27% used heroin in the last month.

The patients who voluntarily agreed to participate were individually interviewed by a trained clinical psychologist. Patients were informed of the duration of the interview and that it was anonymous and had nothing to do with their therapy.

Instruments

The ADHD was assessed with the ASRS (Kessler et al., 2005) adapted into Spanish using the standard World Health Organization translation and back-translation protocol (National Comorbidity Survey, 2005).

The ASRS is made up of two parts—the first one (Part A, screening) includes six items which best predict the presence of ADHD; Part B is made up of the remaining 12 items. The answer choices are on a 5-point Likert scale: 0 (never), 1 (rarely), 2 (sometimes), 3 (often), and 4 (very often). To transform the 5-point scale into a dichotomous scale, the authors determined a critical point: items 1, 2, 3, 9, 12, 16, and

18, get a score of 1 (presence) on scores equal to or higher than 2 (sometimes); for the remaining, a score of 1 (presence) is assigned to scores equal to or higher than 3 (often) (see Figure 1). Dichotomized scores are mainly used in clinical practice, with a cutoff point for ADHD at 9 on the 0-18 full scale score. In research, the original scores, based on 0 to 4 for each item (0 to 72 for the full scale; cutoff point at 37), are commonly used.

The 18 ASRS items are grouped into two subtypes (according to the DSM–IV–TR; American Psychiatric Association, 2000) or presentations (DSM–5; American Psychiatric Association, 2013): Inattentive (INA) and Hyperactive/Impulsive (H/I), each one comprised of nine items. Thus, the scale permits a global ADHD diagnosis, while identifying adults who present predominant INA or H/I symptomatology, as diagnosed by the presence of six of the nine diagnostic criteria.

Evaluation of mood and anxiety disorders was done using the MINI International Neuropsychiatric Interview (Sheehawn, 1998). Only patient with the presence of these disorders during the past year were considered. The internal consistency of anxiety and mood disorders varied from .759 to .898.

The Spanish version of the Substance Dependence Severity Scale (SDSS) (Miele et al., 2000) was used (Vélez-Moreno et al., 2013; Vélez-Moreno et al., 2015). This measure assesses the severity of DSM-IV substance dependence during the 30 days prior to the interview. It is made up of 11 items that evaluate the seven DSM-IV diagnostic criteria for dependence. Seven items are scored on a 6-point scale ranging from 0 (absent) to 5 (extreme), and four items are scored from 0 (absent) to 2 (present). On all items a score of '2' shows that the diagnostic criterion was met within the 30-day time frame. Total scores for the 11 dependence items range from 0 to 43. A higher score shows greater severity of substance dependence (SSD). This scale also offers a

description of different symptoms of substance withdrawal, where the patients have to state whether they were present or absent during the period mentioned above. Test-retest coefficients were .914 for the alcohol dependence scale, .957 for cocaine, .938 for heroin and .852 for cannabis. The alpha coefficients varied from .737 to .898 for the different scales.

Analysis

Reliability was estimated using the Cronbach's alpha. To verify whether the classifications generated from the scores coincided, the kappa coefficient was calculated and the percentage of subjects classified the same way by each pair of classifications: polytomous 18 vs. dichotomous 18, polytomous 18 vs. dichotomous 6, dichotomous 18 vs. dichotomous 6.

Evidence of validity based on the internal structure was studied by confirmatory factor analysis (CFA) using robust maximum likelihood (Bentler, 2006), as items do not fit a normal distribution. To determine model fit, in addition to the Satorra/Bentler scaled χ^2 (SB/χ^2, Satorra & Bentler, 2001), NNFI, CFI (values over .90 considered acceptable fit), RMSEA and confidence interval (model fit acceptable RMSEA< .05, or lower limit of the CI under .05) (Browne & Cudeck, 1993) were used.

Seven models were tested for the 18-item version (polytomous and dichotomous versions): M1: The global factor (ADHD), M2: Two correlated factors (nine Inattention items and nine Hyperactivity/Impulsivity items as defined by the DSM-IV), M3: Three correlated factors (nine Inattention items, six Hyperactivity and three Impulsivity items as described in DSM III), M4: Three correlated factors (nine Inattention items, five Hyperactivity and four Impulsivity items, as given in the CIE10); M5: Two factors (DSM-IV, but uncorrelated) plus one global factor (ADHD), M6: Three factors (DMS-III, but uncorrelated) plus one global factor (ADHD), M7: Three factors (CIE10, but

uncorrelated) plus one global factor (ADHD). The single-factor model was also tested for the screening scale, for polytomous and dichotomous items. In the six-item version, three models were compared: S1 (single factor), S2 (two correlated factors: four inattention items and two hyperactivity items) and S3 (two uncorrelated factors).

The convergent and discriminant evidence was analyzed by exploratory factor analysis (EFA). As the symptoms of withdrawal are measured as presence or absence, dichotomous scores were used for the ASRS items. We performed a factor analysis of the tetrachoric correlation matrix, which takes the dichotomies in the data into account (Kubinger, 2003). Iterated principal factor analysis was used to extract the factors. Based on the examination of the scree plot and results of parallel analysis, the three, four and five-factor solutions were extracted for further exploration. As oblique methods revealed low factor correlations, the solutions were rotated using orthogonal (varimax) rotation.

To check the validity evidence based on the relationship with other variables, bivariate and regression analyses were done with both the ADHD subscales and the screening version. The correlations of the polytomous and dichotomous scores on the complete ADHD scale, inattention, hyperactivity/impulsivity, and the screening version surpassed .95 in all cases. Since the assumption of normality is accepted for the polytomous version of all the scales, this type of score was used in the bivariate and regression analyses. The severity of dependence scores also showed normality for all drugs, except heroin (K-S=2.411, $p<.05$).

Descriptive, reliability, EFA, bivariate and regression analyses were performed by STATA 13. CFA models were checked using the EQS software (Bentler, 2006).

Results

Estimation of reliability and patient classification

In the 18-item version, internal consistency of the scale was .83 when estimated with polytomous score, .81 when dichotomized. Alpha coefficients for the inattention subscale scored polytomously and dichotomously were .78 and .74, respectively. On the hyperactivity/impulsivity subscale, alpha coefficients were .73 and .71, respectively. Screening scale internal consistency was .56 when the items were scored polytomously and .53 with a dichotomous format. The split halves showed reliability coefficients of .64 with dichotomous scores and .56 with polytomous.

The prevalence of patients with ADHD vs. no ADHD varied depending on the scoring system used. The screening version showed a prevalence of 29.41%, while 18-item version had a prevalence of 24.12% on polytomous scoring, and 34.71% with dichotomous scoring. Kappa coefficient between the 18-item version with polytomous and dichotomous items was k=0.75 (89.8% agreement). Finally, the kappa between the 18-item and the screening version (with dichotomous items) was k=0.55 (80.4% agreement).

Evidence of validity based on internal structure

Table 1 compares the fit statistics of the various factorial structures. Model 5 shows the best fit indices on the 18-item version with both scoring systems. This model has two factors plus one global factor (ADHD). The proposal which best fits the screening scale considers the hyperactivity and inattention factors related to each other (S2).

Evidence based on the relationship with other variables: convergent and discriminant evidence

Table 2 shows the factor loadings of impulsivity, inattention and substance withdrawal symptoms when factorial solutions with three, four and five factors are considered. It is observed that the 18 ASRS items are clustered together and not with

symptoms of withdrawal in any of solutions. In the five-factor solution, Factors III and IV are made up of the ASRS items, all with factor loadings over .35. In the four-factor model, the first two are symptomatology factors, and Factors III and IV are made up of ASRS items. Finally, in the three-factor solution, all the items of the ASRS are in the first factor.

Therefore, none of the factorial solutions mix ADHD diagnostic criteria with the symptoms of withdrawal: ADHD diagnostic criteria converged with each other and are discriminated from the withdrawal symptoms.

Evidence based on relationship with other variables: relationships with severity of dependence, anxiety and mood disorders.

Table 3 shows the relationships of polytomous scores on the ASRS with anxiety, mood disorders and severity of dependence. Higher correlation coefficients show that the disorders analyzed are mostly associated with the 18-item version scores and on the hyperactivity/impulsivity dimension than with the screening version scores or on the inattention dimension.

When patients are classified as ADHD/no ADHD, statistically significant relationships are observed with anxiety and mood disorders. Classification of patients with the 18-item version shows statistically significant relationships with severity of dependence on the four substances studied. When the screening version is used, statistically significant relationships are observed with the severity of dependence on cocaine and cannabis (Table 4).

Tables 5 and 6 show the regression models for determining the explanatory power of the different versions of the ASRS for severity of dependence, controlling for anxiety and mood disorders. These tables show that the use of polytomous and dichotomous scoring provides similar results, with slight variations in coefficients.

When the dependent variable is severity of dependence on alcohol, only the hyperactivity/impulsivity dimension improves the explanatory power of the model. With cocaine, explained variance increases significantly with scores on the screening version, with total scores on the 18-item version and with scores on the hyperactivity/impulsivity dimension. In the explanation of severity of dependence on cannabis, explained variance increases significantly with scores on the screening version, with total scores on the 18-item version and with scores on the inattention dimension.

The analysis of the explanatory power of the ASRS for severity of dependence on heroin did not show any statistically significant improvement with any of the versions.

Discussion

This study provide evidence of the psychometric properties of the Spanish version of the ASRS and its screening version, in a sample of drug users patients. We believe that these analyses help to reasoned decision-making of using the different ASRS versions and scoring systems.

The internal consistency found in the 18-item version, as well as in the inattention and hyperactivity subscales, endorse the reliability of these scores on the Spanish version. Similar results have been found on the Chinese (Yeh, Gau, Kessler, & Wu, 2008) or Korean version (Kim et al., 2013). However, on the screening version, the internal consistency found in this study was below psychometric recommendations (Nunnally, 1978). Compared with results by other authors, they were found to be slightly higher in other studies (Pedrero & Puerta, 2007; Kessler et al., 2007). However, the coefficients were not high in any of these studies. Kessler et al. (2007) suggested that the process of constructing the screening version lead to select items differentiated

from each other, reducing internal consistency. This explanation is consistent with the fact that, reliability improves considerably when the items are scored polytomously and the split-halves method is used.

With respect to the reliability in classifying patients as ADHD/no ADHD, and according to the classification procedure proposed by Kessler et al. (2005), there was a considerable kappa coefficient between the polytomous and dichotomous systems. Nevertheless, there was a 10% difference between the prevalence estimated with both types of scoring. On the other hand, the kappa was moderate when agreement between the 18-item version and the six-item version was analyzed (Landis & Koch, 1977). Therefore, false positives and false negatives arise depending on the version used. Other authors, such as Kooij et al. (2008), studied the agreement among different ADHD scales. These authors found high concordance among the scales, although they also found some differences in patient classification.

Another contribution of our work was the study of the factorial structure of the Spanish version in drug patients. For this, the models analyzed by Morin et al. (2013) with the 18-item French version in a general population were replicated. The results of our study show acceptable fit to the structure proposed by those authors: a general factor and three specific factors, inattention, hyperactivity and impulsivity. However, the fit indices are slightly better when the structure proposed is for ADHD as a global syndrome composed of the two subtypes or presentations (inattention and hyperactivity/impulsivity) described in the DSM classification system on which Kessler et al. (2005) was originally based. On the contrary, our results differ from those found by Pedrero and Puerta (2007) with the Spanish version. Whether two or three factors are considered, both the results of Morin et al. (2013) and those of this study, support the differentiation of ADHD into subtypes or presentations. This distinction has also been

widely demonstrated in other studies using neuropsychological tests (Nikolas & Nigg, 2013; Solanto et al., 2007; Wahlstedt, Thorell, & Bohlin, 2009). It should also be mentioned that our study tested different structures by using both polytomous and dichotomous items. The use of one or the other scoring system did not affect the ASRS factorial structure.

One of the relevant contributions of this study is the analysis of specificity of ADHD symptoms. Some authors have suggested that low specificity of the ASRS administered to drug users is due to the overlap of ADHD symptoms with certain intoxication or withdrawal symptoms (Chiasson et al., 2011; Daigre et al., 2009; Vergara-Moragues et al., 2011). The results of this study have shown that the symptoms are not confused: The ADHD symptoms converge, while at the same time they are discriminated from symptoms of withdrawal. This evidence is in line with the conclusions of van de Glind et al. (2013), who argued for the use of this scale regardless of the treatment stage the patients are in. However, as mentioned by Dakwar et al. (2012), after studying different scales, the difficulty in adequately diagnosing ADHD leads to using an in-depth interview when this disorder is suspected.

Finally, this study analyzed the relationship of the ASRS versions with other disorders and severity of dependence. Regardless of the version used, the relationships found by others were detected (Jacob et al., 2007; Jarret, 2016; Jarrett & Ollendick, 2008; Lee et al., 2011; Semeijn et al., 2015; Van Morse & Flory, 2015; Mitchison & Njardvik, 2015). However, in the regression models, it was observed that the explanatory power of the model for dependence on alcohol improved when the scores on the hyperactivity/impulsivity dimension were entered. Similarly, when scores on this dimension were entered in the multivariate analysis with severity of dependence on cocaine, the explained variance increased more than when each of the total scores on the

screening and 18-item versions was entered. For severity of dependence on cannabis, the inattention dimension has the highest explanatory power. These results are coherent with the study by Alwis et al. (2014). These authors found that hyperactive-impulsive symptoms are more related to a lifetime history of substance use disorders for all substances except cannabis. For this substance, inattentive symptoms are more related than hyperactivity/impulsivity symptoms.

In conclusion, we consider that both use of the screening version and the 18-item version with their different scoring systems are useful versions. For an explanatory purpose, it may be more appropriate to use the 18-item version. The screening version, needing less time for administration, provides results of interest, although it could lose some ability to interpret results.

Despite the contributions made, some considerations should be kept in mind. The ASRS cutoff points proposed by Kessler et al. (2005) were relevant to our work because the proposed screener was based on the precision and discriminatory power of ASRS items at those cutoffs. However, the accuracy of those cutoffs in patients with SUD has only been partially supported (Daigre et al., 2009, and van de Glind et al., 2013; Chiasson et al., 2012). Hence, the validity of the ASRS cutoff points for SUD populations should be the focus of further research. Moreover, new research should also take into account the slightly looser DSM–5 criteria for adult ADHD (American Psychiatric Association, 2013; van de Glind et al., 2013).

For other hand, ADHD diagnostic criteria in this study were based only on ASRS scores. Previous research has shown the usefulness of other self-report instruments, such as the Conners Adult ADHD Rating Scale (Conners, Erhardt, & Sparrow, 1999), Conner's Adult ADHD Diagnostic Interview for DSM–IV–TR (Epstein, Johnson, & Conners, 2000) or the Wender Utah Rating Scale (Ward, Wender,

& Reimherr, 1993), for ADHD diagnosis in SUD patients. More than one of these diagnostic instruments should be used in future research testing to provide complementary information. This would enable us to verify the good diagnostic properties shown by our version of screening in samples of SUD patients.

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Table 1.

Confirmatory Factor Analysis Models for the complete scale and the screening version

		Complete scales (18 items)							Screening scale (6 items)		
		M1	M2	M3	M4	M5	M6	M7	S1	S2	S3
Polytomous	S-B χ^2	249.21	208.60	204.81	194.05	152.82	160.32	155.04	24.50	5.26	13.01
	df	135	134	132	132	117	117	117	9	9	10
	CFI	.80	.87	.87	.89	.94	.92	.93	.84	1.00	.99
	NNFI	.77	.85	.85	.87	.92	.90	.91	.74	1.00	.99
	GFI	.83	.87	.87	.88	.90	.90	.90	.95	.99	.98
	RMSEA	.07	.06	.06	.05	.04	.05	.04	.10	.00	.05
Dichotomous	S-B χ^2	204.66	174.25	172.99	168.77	131.30	135.11	133.49	20.90	10.87	18.77
	df	135	134	132	132	117	118	118	9	9	10
	CFI	.85	.91	.91	.92	.97	.96	.97	.86	.99	.93
	NNFI	.83	.90	.90	.91	.96	.95	.96	.77	.98	.96
	GFI	.86	.89	.89	.89	.92	.91	.92	.96	.98	.97
	RMSEA	.06	.04	.04	.04	.03	.03	.03	.09	.03	.07

Note: M1 to M7 and S1 to S3: Confirmatory Factor Analysis Models described above. S-B/χ^2 = Scaled Satorra-Bentler chi-square; df = degree of freedom; CFI = comparative fit index; NNFI = nonnormed fit index; GFI = goodness of fit index; RMSEA = root-mean-square error of approximation.

Table 2.

Factorial structure of the combination of items from the ASRS and the withdrawal syndrome

	5 factors					4 factors				3 factors		
	I	II	III	IV	V	I	II	III	IV	I	II	III
INA_1			**.46**					**.46**		**.55**		
INA_2			**.48**	.45				**.49**	.43	**.65**		
INA_3			.47	**.52**				.48	**.51**	**.69**		
INA_4				**.67**					**.67**	**.40**		
INA_5				**.73**					**.73**	**.42**		
INA_6				**.74**					**.73**	**.58**		
INA_7			.37	**.44**				.36	**.43**	**.55**		
INA_8			**.51**	.38				**.52**	.36	**.64**		
INA_9			.31	**.38**				.31	**.38**	**.47**		
H/I_1			**.58**					**.59**		**.58**		
H/I_2			**.69**					**.66**		**.53**		
H/I_3			**.70**					**.71**		**.70**		
H/I_4			**.60**					**.61**		**.63**		
H/I_5			**.55**					**.55**		**.35**		
H/I_6			**.48**					**.48**		**.49**		
H/I_7				**.35**					**.35**	**.41**		
H/I_8			**.72**					**.72**		**.62**		
H/I_9			**.50**	.32				**.51**	.31	**.60**		
Nausea	**.75**				.50	**.71**	.35				**.71**	.35
Convulsions	**.86**					**.85**					**.85**	
Palpitations	**.89**					**.90**					**.89**	
Irritability	**.64**	**.57**				**.64**	**.57**				**.64**	.57
Sleeping problems	.47	**.80**				.47	**.81**				.48	**.77**
Shaking hands	**.94**					**.95**					**.95**	
Restlessness	**.69**	.67				**.68**	.62				**.69**	.63
Hallucinations	**.l81**					**.81**					**.81**	
Appetite alter.		**.76**					**.70**					**.67**
Tiredness		**.88**					**.83**					**.85**
Sweating		**.81**					**.85**					**.85**
Muscle pain		**.72**			.60		**.78**					**.79**
Yawning		**.66**			.42		**.72**					**.73**

Table 3.

Correlation coefficients of polytomous ASRS scores with anxiety disorder, mood disorder and severity of dependence

		Anxiety disorder	Mood disorder	Dep. Alcohol	Dep. Cocaine	Dep. Cannabis	Dep. Heroin
Score polytomous items	Total	.450**	.439**	.383**	.399**	.390**	.288*
	Screening	.347**	.334**	.307**	.355**	.355**	.125
	Inattention	.378**	.316**	.208*	.273**	.341**	.206
	Hyperactivity/Impulsivity	.516**	.444**	.462**	.400**	.332**	.284*

Table 4.

Means, standard deviations and correlations of severity of dependence as a function of diagnostic classifications

		Dep. Alcohol		Dep. Cocaine		Dep. Cannabis		Dep. Heroin	
		Mean (SD)	*t*	Mean (SD)	*t*	Mean (SD)	*t*	Mean (SD)	*t*
Classification with 18 items polytomous	No	11.07 (10.20)	2.89**	7.88 (10.10)	4.49**	7.05 (6.03)	2.26*	5.43 (8.85)	2.00*
	Yes	18.82 (13.24)		17.81 (11.76)		11.19 (10.54)		10.26 (9.99)	
Classification with 18 items dichotomous	No	10.22 (9.79)	3.77**	6.71 (9.22)	5.11**	6.79 (5.64)	2.20*	4.31 (7.30)	2.93**
	Yes	19.44 (12.75)		16.79 (11.96)		10.43 (9.85)		10.44 (11.03)	
Classification with dichotomous screening version	No	11.95 (11.12)	1.50	7.55 (9.78)	4.32**	6.96 (6.49)	2.15*	5.83 (8.78)	1.14
	Yes	16.19 (12.06)		16.63 (12.17)		10.72 (9.19)		8.47 (10.41)	

Table 5.

Regression models using polytomous ASRS scores as predictors and severity of dependence as dependent variables

		Alcohol			Cocaine			Cannabis		
	Models	β	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2
ASRS Screening	*Step 1.*		.23	.23**		.06	.06*		.07	.07*
	Anxiety	.27*			.078			.04		
	Mood	.28*			.203			.24		
	Step 2.		.25	.02		.15	.09**		.15	.08**
	Anxiety	.25*			-.01			-.12		
	Mood	.24*			.16			.21		
	ADHD	.13			.31**			.34**		
Scores 18-items version	*Step 1.*		.23	.23***		.06	.06*		.07	.07*
	Anxiety	.27*			.08			.04		
	Mood	.28*			.20			.24		
	Step 2.		.25	.02		.17	.11**		.18	.11**
	Anxiety	.22			-.06			-.17		
	Mood	.22			-.12			.17		
	ADHD	.19			.38**			.41**		
Scores on inattention and hyperactivity items	*Step 1.*		.23	.23***		.06	.06*		.07	.07*
	Anxiety	.27*			.08			.04		
	Mood	.28*			.20*			.24*		
	Step 2.		.31	.08*		.18	.12**		.18	.11**
	Anxiety	.23*			-.06*			-.18		
	Mood	.17			.10			.19		
	Inattention	-.13			.13			.28*		
	H/I	.36**			.33**			.20		

Note. β = standardized regression coefficients; R^2 = proportion of explained variance; ΔR^2 = change in proportion of explained variance; Step 1 = MINI variables: anxiety and mood disorders; Step 2 = MINI + ASRS variables; H/I = Hiperactivity/Impulsivity
* $p < .05$; ** $p < .01$; *** $p < .001$

Table 6. Regression models using ASRS dichotomous scores as predictors and severity of dependence as dependent variables

		Alcohol			Cocaine			Cannabis		
	Models	β	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2
ASRS Screening dichotomous	*Step 1.*		.23	.23**		.06	.06*		.07	.07*
	Anxiety	.27*			.08			.04		
	Mood	.28*			.20			.24		
	Step 2.		.25	.02		.15	.09**		.13	.06*
	Anxiety	.25*			-.01			-.10		
	Mood	.24*			.17			.22		
	ADHD	.15			.32**			.28*		
Dichotomous scores 18-item ver.	*Step 1.*		.23	.23**		.06	.06*		.07	.07*
	Anxiety	.27*			.08			.04		
	Mood	.28*			.20			.24		
	Step 2.		.26	.03		.20	.14**		.14	.07*
	Anxiety	.22			-.09			-.13		
	Mood	.22			.11			.19		
	ADHD	.18			.44**			.33*		
Dichotomous scores on inattention and hyperactivity items	*Step 1.*		.23	.23**		.06	.06*		.07	.07*
	Anxiety	.27*			.08			.04		
	Mood	.28*			.20			.24		
	Step 2.		.29	.06*		.23	.17**		.14	.07*
	Anxiety	.22			-.08			-.14		
	Mood	.19			.09			.20		
	Inattention	-.08			.10			.23*		
	H/I	.31**			.42**			.15		

Note. β = standardized regression coefficients; R^2 = proportion of explained variance; ΔR^2 = change in proportion of explained variance; Step 1 = MINI variables: anxiety and mood disorders; Step 2 = MINI + ASRS variables; H/I = Hiperactivity/Impulsivity
* $p < .05$; ** $p < .01$; *** $p < .001$