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Validation of the French Version of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)

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Key Words
The Alcohol, Smoking and Substance Involvement Screening Test · Alcohol · Cannabis · Psychometrics · Screening test

Abstract
Background: The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) was developed to detect substance use disorders. ***Aims:*** The objective of the present study was to evaluate the psychometric properties of the French version of ASSIST in various clinical groups with different levels of substance use. ***Methods:*** 150 subjects were recruited from clients attending primary health care, psychiatric and addiction treatment facilities. Measures included ASSIST, Addiction Severity Index (ASI), Mini-International Neuropsychiatric Interview (MINI-Plus), Alcohol Use Disorders Identification Test (AUDIT) and Revised Fagerstrom Tolerance Questionnaire-Smoking (RTQ). ***Results and Conclusion:*** Concurrent validity was demonstrated by significant correlations between ASSIST scores and scores from ASI, AUDIT and RTQ, as well as significantly greater ASSIST scores for patients with a MINI-Plus diagnosis of abuse or dependence. The ASSIST questionnaire was found to have high internal consistency for the total substance involvement as well as for specific substance involvement as assessed with Cronbach's α, ranging from 0.74 to 0.93. When possibly computed, ASSIST cutoff scores have interesting sensitivity and specificity for discrimination between use and abuse and between abuse and dependence. The findings demonstrated that the French version of ASSIST is a valid screening test for identifying substance use disorders in various health care settings, including psychiatric settings.

Introduction

The World Health Organization (WHO) has identified alcohol, tobacco and illicit drug use as among the top 20 risk factors for ill-health [1], and has adopted a public health approach to screening for alcohol and drug abuse as well as early intervention for such problems [1]. Part of this approach includes the development of a reliable and valid screening instrument that can be used in primary care settings and community health care facilities to identify people with both moderate and severe substance use problems.

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The limitations of using existing screening tests in primary care settings have been outlined [2]. Many existing instruments, such as the Addiction Severity Index (ASI) [3], and expanded Substance Abuse Module of the Composite International Diagnostic Interview [4], although comprehensive, are time-consuming to administer in primary care settings. On the other hand, some of the briefer instruments available, such as the CAGE-Adapted to Include Drugs [5], have a focus on dependence, which is less useful for detecting problematic or risky drug use in nondependent persons. Moreover, the available self-report screening tests have a number of limitations from a cross-cultural perspective. Most were developed in the United States of America and do not have demonstrated sensitivity and specificity for use in other cultures, and have not been extensively validated.

In 1982, the WHO initiated a program to develop an international screening test for hazardous and harmful alcohol use. The resulting instrument was the Alcohol Use Disorders Identification Test (AUDIT) which has been demonstrated to be a reliable and valid instrument in many studies [6]. AUDIT is widely used throughout the world in primary and other health care settings as part of screening and brief intervention programs [7]. The success of AUDIT and brief intervention for alcohol led the WHO to consider a screening instrument suitable for all psychoactive substances.

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) was developed by the WHO to screen for problematic or risky substance use (available versions: http://www.who.int/substance_abuse/activities/assist/en/index.html).

ASSIST in its current version (ASSIST V3.0) consists of eight questions covering tobacco, alcohol, cannabis, cocaine, amphetamine type stimulants, inhalants, sedatives, hallucinogens, opiates and 'other drugs'. Question 1 deals with lifetime use of substances, and the second question explores the frequency of use during the prior 3 months. Responses to this question are rated on a 5-point frequency scale ranging from 'never' (in the past 3 months) to 'daily or almost daily'. If none of the substances have been used in the past 3 months, the interviewer can skip to the last three questions about problems and prior usage patterns prior in their lifetime. If any substance has been used during the past 3 months, questions 3–5 are asked, before concluding with questions 6–8. Question 3 explores the compulsion to use substances in the prior 3 months. This is a measure of psychological dependence. Question 4 screens the domains of personal health, social, financial or legal problems associated with substance use that have occurred within the previous 3 months. This is a measure of harmful use. Question 5 seeks to explore whether participants have failed to meet role obligations. Questions 6–8 screen lifetime and recent problems, including whether concern has been expressed by friends or relatives, prior attempts at controlling drug use, and current or lifetime injection of drugs.

Twenty-eight domains/scores derived from ASSIST V3.0 are presented in table 1. The specific formulas for each domain together with the maximum score for this domain are shown in the last column of the table.

A test-retest reliability study for the English version was conducted in nine different countries between 1997 and 1999 [1]. It was found that ASSIST items were reliable, and that the ASSIST screening procedure was feasible in primary care settings.

A phase II validity study was subsequently conducted in seven countries [8]. One third of the subjects were recruited from specialist drug treatment settings and substance dependent. The remaining two thirds were recruited from primary care settings.

The study found significant correlations between ASSIST scores and several other measures of substance use disorders, such as the Addiction Severity Index-Lite (a short version of ASI), Severity of Dependence Scale and AUDIT. Furthermore, ASSIST scores were significantly higher for participants with a diagnosis of substance abuse or dependence. A good inter-item correlation was found for total substance involvement score and ASSIST-specific substance involvement scores. The discriminative validity was established by the good capacity of ASSIST to discriminate between substance use, abuse and dependence.

Unfortunately, very little data is available for the use of ASSIST among patients treated in psychiatric settings. This point merits improvement in light of the high prevalence of substance use in psychiatric settings [9–11], which is often underdiagnosed [12]. ASSIST may help in improving diagnosis of substance use among patients treated for psychiatric disorders. To date, one Australian study [13] has determined the reliability and validity of ASSIST for detecting substance use disorders in patients with first-episode psychosis.

The ASSIST total substance involvement score and specific substance involvement scores for cannabis, alcohol and amphetamine use demonstrated high levels of internal consistency and acceptable levels of concurrent and discriminative validity.

The primary aim of the current project is to conduct an evaluation of the construct, concurrent and discrimi-

Table 1. ASSIST V3.0: domain description, formula of each domain and domain maximum score

Domain label	Description of domain/score	ASSIST formula
1A	Lifetime substance use – including alcohol and tobacco	ΣQ1a + 1b + 1c + 1d + 1e + 1f + 1g + 1h + 1i + 1j (max. score: 30)
1B	Lifetime illicit drug use – excluding alcohol and tobacco	ΣQ1c + 1d + 1e + 1f + 1g + 1h + 1i + 1j (max. score: 24)
2A	Global continuum of substance risk – including alcohol and tobacco	ΣQ1a – j + 2a – j + 3a – j + 4a – j + 5a – j + 6a – j + 7a – j + 8 (max. score: 422)
2B	Global continuum of illicit drug risk – excluding alcohol and tobacco	ΣQ1c – j + 2c – j + 3c – j + 4c – j + 5c – j + 6c – j + 7c – j + 8 (max. score: 338)
	Specific substance involvement	
3A	– Tobacco (or ASSIST tobacco score)	Σ2a + 3a + 4a + 6a + 7a (max. score: 39)
3B	– Alcohol (or ASSIST alcohol score)	Σ2b + 3b + 4b + 5b + 6b + 7b (max. score: 39)
3C	– Cannabis (or ASSIST cannabis score)	Σ2c + 3c + 4c + 5c + 6c + 7c (max. score: 39)
3D	– Cocaine (or ASSIST cocaine score)	Σ2d + 3d + 4d + 5d + 6d + 7d (max. score: 39)
3E	– ATS (or ASSIST ATS score)	Σ2e + 3e + 4e + 5e + 6e + 7e (max. score: 39)
3F	– Inhalants (or ASSIST inhalant score)	Σ2f + 3f + 4f + 5f + 6f + 7f (max. score: 39)
3G	– Sedatives (or ASSIST sedative score)	Σ2g + 3g + 4g + 5g + 6g + 7g (max. score: 39)
3H	– Hallucinogens (or ASSIST hallucinogen score)	Σ2h + 3h + 4h + 5h + 6h + 7h (max. score: 39)
3I	– Opioids (or ASSIST opioid score)	Σ2i + 3i + 4i + 5i + 6i + 7i (max. score: 39)
3J	– Other	Σ2j + 3j + 4j + 5j + 6j + 7j (max. score: 39)
4A	Total current frequency of substance use – including alcohol, excluding tobacco and 'other drugs'	ΣQ2b – i (max. score: 48)
4B	Total current frequency of illicit drug use – excluding alcohol, tobacco and 'other drugs'	ΣQ2c – i (max. score: 42)
4C	Current frequency of alcohol use	Q2b (max. score: 6)
4D	Current frequency of cannabis use	Q2c (max. score: 6)
4E	Current frequency of cocaine use	Q2d (max. score: 6)
4F	Current frequency of amphetamine use	Q2e (max. score: 6)
4G	Current frequency of inhalant use	Q2f (max. score: 6)
4H	Current frequency of sedative use	Q2g (max. score: 6)
4I	Current frequency of hallucinogen use	Q2h (max. score: 6)
4J	Current frequency of opioid use	Q2i (max. score: 6)
5A	Dependence – all substances including alcohol and tobacco	ΣQ1a – j + 2a – j + 3a – j + 6a – j + 7a – j (max. score: 270)
5B	Dependence – illicit drugs excluding alcohol and tobacco	ΣQ1c – j + 2c – j + 3c – j + 6c – j + 7c – j (max. score: 216)
6A	Abuse – all substances including alcohol and tobacco	ΣQ1a – j + 2a – j + 4a – j + 5a – j + 6a – j (max. score: 300)
6B	Abuse – illicit drugs, excluding alcohol and tobacco	ΣQ1c – j + 2c – j + 4c – j + 5c – j + 6c – j (max. score: 240)

native validity of the French version of ASSIST (online suppl. material, www.karger.com/doi/10.1159/000326073). Furthermore, the study aims to assess this screening instrument among patients with a broad spectrum of substance use and recruited from various settings, i.e. primary care, psychiatric and substance use disorder treatment settings.

Subjects and Methods

ASSIST was translated into French according to the WHO guidelines for translation and adaptation of instruments (http://www.who.int/substance_abuse/activities/assist/en/index.html). The present study was approved by the ethical committee of the Geneva University Hospitals and all participants gave written informed consent to take part.

Participants and Procedure

All of the 150 participants were recruited from the Geneva University Hospitals between January 2009 and July 2009. Fifty subjects were recruited from the outpatient clinic of primary health care (Department of Community Medicine), 50 patients were recruited from general psychiatric facilities (Department of Mental Health and Psychiatry) and the remaining 50 subjects were recruited from clients attending the specialized addiction treatment facilities of the Division of Addictology (Department of Mental Health and Psychiatry).

All adult patients in treatment in these settings were eligible for inclusion in the study. Exclusion criteria were the following: younger than 18 years of age, inability to communicate in French, and inability to give informed consent (cognitive impairment, acute severe behavior and/or mental health problem, drug and alcohol intoxication or severe withdrawal, etc.).

The recruitment procedure involved advertising with flyers at the treatment setting, or direct canvassing of patients by the interviewer-researcher or treating clinician. The participants were

administered the measures at one time point in face-to-face interviews with a trained psychologist or psychiatrist. Participants were compensated for their time with a voucher (CHF 20) for a supermarket which does not sell tobacco and alcohol.

Measures

Participants were administered a questionnaire collecting basic information on sociodemographic variables including age, gender, marital status, religion, ethnicity, and educational and occupational status.

Substance use measures included the French versions of:

- ASSIST V3.0.
- ASI [3, 14, 15]. ASI is an interview that assesses history, frequency and consequences of alcohol and drug use. The subsections related to lifetime and recent drug and alcohol use (3 months) were used.
- The Mini-International Neuropsychiatric Interview (MINI-Plus) [16]. In this study, only the sections related to drug and alcohol abuse (lifetime and last 12 months) and dependence were administered in order to determine the presence or absence of diagnosis of dependence and/or abuse for (i) alcohol and (ii) the two other most frequently used drugs by the participants as assessed by ASSIST.
- The French version of the self-reported AUDIT [17]. This 10-item measure is a reliable and valid measure of current alcohol use and has high sensitivity and specificity for the screening of alcohol abuse and dependence.
- The Revised Fagerstrom Tolerance Questionnaire-Smoking (RTQ) [18] was also used. RTQ is a 10-item self-report questionnaire designed to measure nicotine dependence.

Statistical and Data Analysis

To ensure the quality of the data, all data were entered twice.

Data were analyzed using SPSS for Windows, version 15.0. Proportions, mean values and standard deviations were used to describe the baseline characteristics at each recruitment setting, i.e. community medicine, general psychiatry and addiction centers. Baseline differences within these three recruitment groups were investigated by one-factor ANOVA or by χ^2 tests. Bonferroni's correction was used for multiple comparisons, i.e. between community medicine and general psychiatry, community medicine and addiction center, and general psychiatry and addiction center. Therefore, $p = 0.0166$ was considered statistically significant (0.05/3).

We investigated the psychometric properties of ASSIST V3.0 by studying its criterion validity. Several domains or scores derived from ASSIST together with scores from other questionnaires, namely AUDIT, MINI-Plus, RTQ and ASI were used in the validation process. ASSIST consists of eight questions, covering ten substances: tobacco, alcohol, cannabis, cocaine, amphetamine-type stimulants, inhalants, sedatives, hallucinogens, opioids and 'other drugs'.

Concurrent validity was investigated by correlating ASSIST domain scores with other similar instrument scores using Pearson's correlation. For instance, ASSIST alcohol and opioid scores were correlated with ASI alcohol and opioid scores. ASSIST tobacco scores were correlated with RTQ, and ASSIST alcohol scores with AUDIT. The total substance involvement score, excluding tobacco, was compared to the total number of MINI-Plus diagnosis, which comprised the sum of current and lifetime diagnosis of abuse and dependence for all drugs except tobacco. These investigations led to five pairwise comparisons, hence, test results are reported as significant when $p < 0.01$ (0.05/5). Finally, ASSIST-specific substance involvement scores for each substance were also compared in the presence or absence of a MINI-Plus diagnosis of current or lifetime abuse or dependence. To this end, two-tailed t tests (or Mann-Whitney tests when assumptions of variance homogeneity were violated) were used.

Internal consistency was assessed by Cronbach's coefficient. Many scale development researchers that use this tool are of the opinion that the higher the coefficient, the better, without formal justification. As for us, we endorsed the point of view of Streiner and Norman [19] (2008), who advise caution in front of a 'too high' value of α. They recall that α is dependent not only on the magnitude of the correlations among the items, but also on the number of items in the scale. Hence, a too high value of α may be the sign of a high level of item redundancy, i.e. a number of items asking the same question in slightly different ways. Consequently, they suggest that α be above 0.70, but not much higher than 0.90.

Finally, ASSIST was investigated for its ability to discriminate between three groups: nonproblematic use, abuse and dependence.

Clinically, these three groups reflect the risk status of patients, i.e. low, moderate or high risk. This classification was made according to MINI-Plus diagnosis. For a specific substance, people were classified in the low-risk group if they had no current abuse or dependence. They were classified in the moderate-risk group if they had current abuse. Finally, the high-risk group was composed of people with a current dependence diagnosis. Due to the small sample size, specific substance scores were compared using an independent group Kruskal-Wallis test as an overall test and Mann-Whitney test for multiple comparisons whenever the overall test was significant. With two comparisons (use vs. abuse and abuse vs. dependence), α was set at 0.025 to keep the overall α at the 0.05 level.

The same groupings were also used to perform receiver operating characteristic (ROC) analysis in order to obtain further information concerning the ability of ASSIST to discriminate between groups. Sensitivity and specificity values were reported at specified cutoff scores recommended by the ASSIST working team (ASSIST V3.0 study). Area under the curve (AUC) was also reported.

Results

Sample Characteristics

150 patients (64% men) were interviewed for this study. The average age was 41 years and did not significantly differ between groups [$F_{(2,148)} = 2.5$, $p = 0.09$]. However, significant between-group differences were found for sex, marital status, school level, occupational status, and AUDIT and ASSIST scores for tobacco, alcohol, cocaine, sedatives and opioids. Even after correcting for multiple comparisons by Bonferroni, these differences continued to be significant (table 2).

For instance, in the primary healthcare group, we observed a greater proportion of women, married persons,

Table 2. Sociodemographic and clinical data

	Total	Community medicine (n = 50)	Psychiatry (n = 50)	Addiction treatment (n = 50)	p value*
Mean age in years (SD)	41 (11.5)	38.9 (12.5)	40.3 (10.7)	43.8 (10.9)	0.09
Sex, n (%)					<0.0005
Male	96 (64)	21 (42)	32 (64)	43 (86)	
Female	54 (36)	29 (58)	18 (36)	7 (14)	
Civil status, n (%)					<0.0005
Married	35 (23.3)	21 (42)	10 (20)	4 (8)	
Single/divorced/separated	115 (76.7)	29 (58)	40 (80)	46 (82)	
Nationality, n (%)					0.05
Swiss	79 (53)	21 (42)	25 (50)	33 (66)	
Other	71 (47)	29 (58)	25 (50)	17 (34)	
Education, n (%)					0.009
Elementary school	39 (26)	11 (22)	18 (36)	10 (20)	
Apprenticeship	56 (37.3)	12 (24)	20 (40)	24 (48)	
Secondary school and higher	55 (36.7)	27 (54)	12 (24)	16 (32)	
Professional status, n (%)					0.001
Working	47 (31.5)	26 (52)	10 (20)	11 (22)	
Not working	102 (68.5)	24 (48)	40 (80)	32 (78)	
Mean AUDIT score (SD)	10.8 (10.1)	5.6 (4.9)	10.9 (10.2)	15.8 (11.6)	<0.0005
Mean ASSIST score (SD)					
Tobacco	13.7 (10.2)	9.6 (10.5)	14.9 (10.3)	16.5 (8.7)	0.002
Alcohol	12 (11)	6.3 (6.1)	12.8 (11.7)	17 (11.6)	<0.0005
Cannabis	4.2 (8.7)	2.1 (5.4)	5.6 (11.2)	5 (8.3)	0.1
Cocaine	2 (6)	0	1.5 (4.8)	4.7 (8.8)	<0.0005
ATS	0.6 (3)	0	0.8 (3.8)	1 (3.5)	0.2
Inhalants	0.03 (0.3)	0	0	0.1 (0.5)	0.1
Sedatives	2.2 (6.6)	0.4 (2)	1.8 (6.4)	4.5 (9)	0.008
Hallucinogens	0.4 (2.2)	0	0.2 (0.8)	0.9 (3.7)	0.08
Opioids	3 (7.9)	0	0.6 (0.3)	8.3 (11.8)	<0.0005

* Obtained by one-factor ANOVA and χ^2 test, respectively. ATS = Amphetamine-type stimulants.

people with professional training or university background, and those who were active professionally. This group showed lower AUDIT mean scores for alcohol and also lower ASSIST mean scores for alcohol and tobacco as compared to the groups from the other two recruitment places. Patients in the specialized drug treatment group had higher ASSIST mean scores for opioids than in the other groups and higher ASSIST mean scores for cocaine than in the primary healthcare group.

The study was well accepted by a very large majority of patients, and provided an occasion for several to discuss previously unaddressed use of substances. The duration of the interview was between 10 and 50 min, depending on the number of substances used. This variation in time is due to the fact that for patients who do not use a given substance, there is no need to further pursue ASSIST assessment for this substance with these patients. For example, ASSIST evaluation needs more time for a patient using cannabis, tobacco, alcohol, opiates and cocaine than for a patient using only tobacco.

Concurrent Validity

Comparison with ASI, AUDIT and RTQ. Selected domain scores of ASSIST, such as alcohol and opioids, had large positive correlations with ASI composite scores for the aforementioned substances: r = 0.84 0.77, respectively; $p < 0.0005$. There was also a significant correlation between ASSIST scores for alcohol and AUDIT (r = 0.83; $p < 0.0005$). Finally, ASSIST tobacco scores showed a moderate, albeit significant, correlation with the RTQ (r = 0.45; $p < 0.0005$). Correlation coefficients were also calculated within each of the three study groups (table 3).

Comparison with MINI-Plus. Participants recording a current or lifetime abuse or dependence diagnosis on MINI-Plus had significantly higher ASSIST-specific substance involvement scores for all substances compared with those for whom the same diagnosis was absent (table 4). Total substance involvement score (without tobacco) correlated well with the total number of MINI-Plus diagnosis ($r = 0.79$; $p < 0.0005$).

Construct Validity

Internal Consistency. ASSIST was found to have high internal consistency for the Global Continuum Substance Risk Score or the Total Substance Involvement Score with a Cronbach α coefficient of 0.91 (95% CI: 0.89, 0.93, $p < 0.0005$). Moreover, all ASSIST-specific substance scores showed good internal consistency ranging from 0.74 to 0.93. The calculation of Cronbach's α for the ASSIST inhalant substance was not possible due to insufficient data.

Discriminative Validity. Table 5 shows specific substance involvement scores grouped by diagnosis for nonproblematic use (low risk), abuse (moderate risk) and dependence (high risk). Due to the small sample size, the Kruskal-Wallis nonparametric test, an equivalent to ANOVA for more than two independent groups, was conducted (except for alcohol where ANOVA was used). The last column shows the Mann-Whitney post-hoc comparison results (Games-Howell for alcohol). Significant differences were found between use and abuse and between abuse and dependence for alcohol. For cannabis, cocaine, sedatives and hallucinogens, significant differences were found between use and abuse only. It was not possible to investigate for the other substances due to small sample size or lack of data.

Discrimination between use and abuse and between abuse and dependence was also investigated by ROC (table 6). Data columns 1–5 show AUC, p values, sensitivity and specificity. The last two values are associated with the cutoff scores recommended by the ASSIST working team (ASSIST V3.0). Again, due to the small sample size, only values for alcohol and cannabis are reported. AUC were significant for the different discriminations, except for cannabis abuse ($p = 0.06$).

Table 3. Correlations of ASSIST-specific scores with other scores of similar construct by diagnostic group

Comparison of scales	Use	Abuse	Dependence
ASSIST alcohol and ASI alcohol scores	0.77	0.43	0.68
ASSIST alcohol scores and AUDIT	0.63	0.72	0.45
ASSIST opioid and ASI opioid scores	0.66	–[1]	0.09

[1] Empty group.

Table 4. Comparison of mean ASSIST-specific substance scores (SD) according to the presence or absence of MINI-Plus current or lifetime diagnosis of abuse or dependence

Substance type	Does subject meet MINI-Plus criteria for current or lifetime diagnosis of abuse or dependence for a specific substance?		T value (p value)
	diagnosis present	diagnosis absent	
Alcohol	15 (11.3)	3.9 (4)	–9 ($p < 0.0005$)
Cannabis	13.1 (12.4)	1.1 (3.6)	–6 ($p < 0.0005$)
Cocaine	10.3 (10.9)	0.9 (4)	–3.6 ($p < 0.0005$)
ATS	5.8 (9.2)	0.4 (2.4)	–1.3 ($p = 0.3$)
Inhalants[1]	–	–	–
Sedatives	17 (12.3)	1.2 (4.6)	–4 ($p = 0.003$)
Hallucinogens	6.3 (9.6)	0.1 (0.6)	–1.6 ($p = 0.2$)
Opioids	16.6 (11.7)	0.3 (1.9)	–6.9 ($p < 0.0005$)

[1] Insufficient data to allow comparison.

Discussion

The results of this study indicate that the French version of ASSIST is an acceptable and valid screening test for substance abuse and dependence in an adult population. The findings are convergent with previous works on the validity of ASSIST as a screening instrument for substance use disorders.

Concurrent validity is evidenced by the significant positive correlations obtained between ASSIST scores and ASI, MINI-Plus, AUDIT and RTQ. The moderate correlation with RTQ is probably due to the fact that ASSIST is more of a behavioral measure of addiction than RTQ, which is more a measure of somatic aspects of nicotine dependence.

Moreover, ASSIST-specific substance involvement scores were significantly greater for those participants who received a diagnosis of abuse or dependence on MINI-Plus.

Table 5. Comparison of ASSIST domain scores as grouped by diagnosis using Kruskall-Wallis for overall tests and Mann-Whitney for post-hoc tests

Domain	Use		Abuse		Dependence		χ^2 value[1]	p value	M-W[2]
	mean (SD)	n	mean (SD)	n	mean (SD)	n			
3A: SSI score for tobacco	n.a.		n.a.		n.a.		n.a.		
3B: SSI score for alcohol	5.3 (5.3)	85	11.1 (7.1)	16	24 (9.2)	49	110.9	<0.0005	*, **
3C: SSI score for cannabis	0.8 (2.4)	120	14.3 (6.7)	7	34 (n.a.)	1	42.7	<0.0005	*
3D: SSI score for cocaine	0.5 (1.7)	135	24 (n.a.)	1	23.4 (9.6)	5	46.2	<0.0005	*
3E: SSI score for ATS	0.6 (3)	149	n.a.	0	n.a.	0	n.a.		n.a.
3F: SSI score for inhalants	n.a.		n.a.		n.a.		n.a.		n.a.
3G: SSI score for sedatives	1 (4.2)	139	16 (n.a.)	1	31.5 (10.6)	2	24.8	<0.0005	*
3H: SSI score for hallucinogens	0.1 (0.5)	146	11 (n.a.)	1	24 (n.a.)	1	43.5	<0.0005	*
3I: SSI score for opioids	1.1 (3.8)	138	n.a.	0	25.3 (10.4)	11	n.a.		n.a.

SSI = Specific substance involvement; n.a. = not available, information not available from questionnaire or unable to perform post-hoc test because of empty groups; ATS = amphetamine-type stimulants. * Significant difference between use and abuse; ** significant difference between abuse and dependence.

[1] χ^2 values from Kruskal-Wallis tests are reported except for alcohol, where the F value is reported.

[2] Mann-Whitney post-hoc tests (Games-Howell for alcohol): exact significance not shown.

Table 6. Discrimination between use and abuse and between abuse and dependence by ROC analysis

Domain	AUC	p value	Sensitivity %	Specificity %	Cut-off[1]
3B: SSI score for alcohol					
Use/abuse	0.74	0.002	50	89	11.5
Abuse/dependence	0.87	<0.0005	65	100	24.5
3C: SSI score for cannabis					
Use/abuse	0.98	<0.005	1	88	2.5
Abuse/dependence	0.76	0.06	70	71	17.5

[1] Recommended by working Assist team (ASSIST V3.0).

Similarly, there is evidence for the construct validity of ASSIST with Cronbach's α ranging from 0.74 to 0.93, suggesting that the items had good internal consistency in measuring the same constructs.

The present results show that ASSIST is a good and potentially useful instrument in various health care settings. Particularly interesting is the finding that ASSIST might be useful in general psychiatric settings. As the instrument was originally designed for screening in primary healthcare settings, the results of our study give preliminary potential usefulness in a wider spectrum of healthcare settings which the instrument's original design did not include. The simplicity of ASSIST and the prevalence of substance use disorders in general psychiatric care settings lead us to consider the ASSIST instrument as a useful application for mental health promotion in this population often neglected for substance consumption.

The observed differences on ASSIST scores found among the three assessed groups add further evidence for the construct validity of ASSIST, which is able to discriminate between populations with various involvements in substance use.

Using the same items' weighting and cutoff scores than the proposed ones on ASSIST V3.0, it appears that ASSIST has sufficient sensitivity for screening alcohol and cannabis abuse and dependence. In the present sample, sensitivity for screening between alcohol use and abuse does not seem as good (50%). However, the specificity remains very good.

The present study has several limitations, such as the relatively small sample sizes, the rarity of certain substance use disorders (e.g. inhalants) in the studied population, and not allowing the calculation of sensitivity and specificity for several substances. The study presents, however, these findings for alcohol and cannabis – two widely used substances. Finally, the cross-sectional nature of the study did not allow assessment of its predictive validity.

In spite of these limitations, our results suggest that the French version of ASSIST could be used as part of a more general public health approach to the screening of substance use disorders in primary care, general psychiatric services and substance use disorder treatment facilities. A further project in the pipeline is to assess the impact of linking therapeutic interventions such as brief interventions to ASSIST screening in different populations.

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