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Validation of the Spanish version of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)

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Abstract

Background: To evaluate the psychometric properties of the Spanish version of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) and its effectiveness as a screening tool for problematic alcohol, tobacco and other psychoactive substance use in groups of low, moderate, and high risk users. **Methods:** A test battery including the ASSIST and several standardized screening, assessment, and diagnostic instruments was administered to 485 patients recruited in different primary health-care facilities and specialized addiction treatment units from Health Area 11 in Madrid. **Results:** ASSIST cut-off scores show a good sensitivity and specificity for discrimination between substance use and abuse and between abuse and dependence. Concurrent validity was demonstrated by significant correlations between ASSIST scores and scores from the Mini-International Neuropsychiatric Interview (MINI-Plus), the Alcohol Use Disorders Identification Test (AUDIT), the Revised Fagerstrom Tolerance Questionnaire (RTQ) and the Severity of Dependence Scale (SDS). **Conclusions:** Psychometric properties of the Spanish version of the ASSIST indicate that is a valid screening test for identifying substance use disorders in various health-care settings.

Keywords: ASSIST, screening, substances, alcohol.

Resumen

Validación de la versión española del Test de Detección de Uso de Alcohol, Tabaco y otras Sustancias (ASSIST). **Antecedentes:** evaluar las propiedades psicométricas de la versión española del test de detección de uso de alcohol, tabaco y otras sustancias (ASSIST) y su efectividad como herramienta para la detección de un uso problemático en alcohol, tabaco y otras sustancias psicoactivas en grupos de bajo, moderado y alto riesgo de consumo. **Método:** una batería de test estandarizados, de evaluación y diagnóstico incluyendo el ASSIST fueron aplicados a una muestra de 485 pacientes reclutados en diferentes centros de atención primaria y centros de tratamiento por consumo drogas, del área 11 en Madrid. **Resultados:** los puntos de corte del ASSIST muestran buena sensibilidad y especificidad para discriminar entre el uso y el abuso de sustancias, y entre el abuso y la dependencia. La validez concurrente fue demostrada con correlaciones significativas entre las puntuaciones del ASSIST y las puntuaciones de la entrevista neuropsiquiátrica Mini-International (MINI-Plus), el test de identificación de desórdenes por el consumo de alcohol (AUDIT), Cuestionario revisado de tolerancia Fagerstrom (RTQ) y escala de gravedad de la dependencia (SDS). **Conclusiones:** las propiedades psicométricas de la versión española del ASSIST indican que es un test de detección válido para identificar los desórdenes por el consumo de sustancias en varios centros de atención primaria.

Palabras clave: ASSIST, detección, sustancias, alcohol.

Substance use disorders are highly prevalent worldwide. Alcohol and drug use disorders are amongst the leading causes of morbidity and of burden of disease (World Health Organization, 2008). Approximately 20-30% of patients who routinely present in primary care are hazardous or harmful alcohol or drug users (Funk et al., 2005). Screening and early detection is therefore an essential element in primary healthcare and a major health challenge. Many existing screening tests in primary care settings have limitations (Babor, 2002; McPherson & Hersch, 2000). Some are too time-consuming to administer (McLellan et al., 1985). Some of the shorter instruments focus on substance dependence (Brown & Rounds, 1995), but are less useful for detecting problematic or hazardous drug use in nondependent individuals. Moreover, the available self-report screening tests have a number of limitations from a cross-cultural perspective. Most instruments 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 (Babor & Higgins-Biddle, 2000).

In 1997, the World Health Organization (WHO) sponsored the development of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) to address the need for a reliable and valid screening instrument for problematic or risky substance use that would also be culturally adaptable (WHO ASSIST Working group, 2002). The ASSIST was specifically designed to be used in

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primary healthcare, aiming at identifying not only those who are substance abusers or dependent users but also those individuals who are high-risk, or who may have experienced substance-related problems. It is a relatively brief instrument, comprising eight questions, covering ten substances: alcohol, tobacco, cannabis, cocaine, amphetamine-type stimulants (ATS), inhalants, sedatives, hallucinogens, opioids and other drugs. It was designed to be administered by a healthcare worker or a researcher and it is thought to be completed in approximately 10 minutes. The ASSIST explores lifetime use of each substance, the frequency of use and associated problems during the prior three months, it provides a measure of psychological dependence, a measure of harmful use and of recent problems (including whether concern has been expressed by friends or relatives), prior attempts of controlling drug use, and current or lifetime injection of drugs.

The aim of the present study was to evaluate internal consistency, convergent and discriminant validity of the Spanish version of the ASSIST. For this objective, two samples of patients were selected: one came from Public Primary Health Care Centres (PCC) in the city of Madrid and the second one from two specialized facilities for the treatment of addictive disorders (Addiction Treatment Centres, ATC). This second sample was included because in Spain, disorders related to illegal drugs were very scarce in primary healthcare.

Method

Participants

A total of 485 patients were recruited from different PCC (N = 441) and specialized addiction treatment units (N = 44) of Health Area 11 of Madrid (corresponding to the "Hospital Doce de Octubre" medical zone in Madrid, a predominantly medium-low social class inner-city area), between July of 2011 and March of 2012. All participants were patients seeking treatment for their respective medical or addictive disorders. Only 38 patients refused to participate in the study (7%).

All patients recruited were randomly chosen and were excluded if they did not meet the exclusion criteria (being younger than 18 years of age, inability to communicate in Spanish and inability to give informed consent). It was scheduled that each doctor would recruit 1-3 patients everyday in a random order. If the patient agreed, the healthcare professional would administer the ASSIST and after that, a trained psychologist would carry on with the remaining assessment scales.

From the total amount of participants, 52.6% of them were men. The majority of the sample (75.5% were married while the rest of the participants were single, divorced or widowed. The mean age of the sample was 49.9 years (SD = 18.85), and the mean years of school education was 14.2 years (SD = 3.29). In addition, 77.3% of subjects identified themselves as being of low-economic income, 21.2% of medium-economic income and 1.4% of high-economic status. When entering the study, 31.1% of the sample were employed (Table 1).

There were statistically significant differences in sociedemographic characteristics between subjects recruited in PCC and subjects recruited at ATC (see Table 2). Patients from ATC were significantly younger, more likely to be male and currently employed, whilst significantly more patients in the PCC sample were married. In addition, patients from ATC had significantly higher AUDIT, RTQ, SDS and ASSIST scores than subjects recruited from PCC (Table 2). Moreover, compared to participants screened from PCC, individuals from ATC had significantly higher scores on the AUDIT, RTQ, SDC and ASSIST for all individual drugs included in the ASSIST.

Instruments

All study participants completed a comprehensive battery of assessment tools that included socio-demographic questions and the following instruments:

ASSIST V3.0. The ASSIST or Alcohol, Smoking and Substance Involvement Screening Test is a brief screening questionnaire for identifying all levels of problem risky substance use. The questionnaire addresses with its 8 questions recent and lifetime

Table 1
Sociodemographic data of study participants from primary care centres (PCC) and from specialized addiction treatment centres (ATC)

	Total sample (n = 485)	**PCC (n = 441)**	**ATC (n = 44)**	**t**	**χ^2**	**df**	**p**
Age, × SD	49.97 (18.85)	51.30 (19.20)	36.66 (5.12)	-12.234		207.902	<.001
Gender, n (%)							
Males	255 (52.6)	219 (49.7)	36 (81.8)		16.59	1	<.001
Females	230 (47.4)	222 (50.3)	8(18.2)				
Marital status, n (%)							
Married	366 (75.5)	346 (78.5)	20 (45.5)		58.60	5	.102
Single/divorced/widowed	119 (24.5)	91(21.5)	24 (54.5)				
Economic status, n (%)							
Low	375 (77.3)	341(77.3)	34 (77.3)				
Medium	103 (21.2)	93(21.1)	10 (22.7)		0.74	2	.68
High	7 (1.4)	7(1.6)	–				
Professional status n (%)							
Employed	185 (31.1)	149 (33.8)	36 (81.8)		49.50	6	<.001
Unemployed/retired	300 (68.9)	292 (66.2)	8 (9.2)				
Mean education years, × SD	14.24 (3.30)	14.04 (3.29)	16.23 (2.66)	5.073		56.913	.08

consumption of ten substances, as follows: tobacco, alcohol, cannabis, cocaine, amphetamine type stimulants (ATS), sedatives, hallucinogens, inhalants, opioids, and other drugs. Patients with ASSIST Specific Substance Involvement scores of three or less (10 for alcohol) are considered to be at a lower risk of developing problems related to the use of the specific substance involved. Mid-range scores between 4 (11 for alcohol) and 26 for each substance are an indication of hazardous or harmful use of that substance. A score of 27 or higher for any substance suggests that the patient is at high risk of dependence for that substance and is probably experiencing health, social, financial, legal or relationship problems as a result of substance abuse. Question 8 on the ASSIST asks about prior injection of drugs (WHO, 2002).

Response format and scale correction follow the same procedure used in the original version (WHO ASSIST Working Group, 2002) (first item scores 0 or 3; second, third and fourth items 0, 2, 3, 4 or 6; fifth item 0, 5, 6, 7 or 8; sixth item 0, 3 or 6; seventh and eighth items 0, 1 or 2). Total score is given by the sum of the eight items, according to WHO guidelines.

The Mini-International Neuropsychiatric Interview (MINI-Plus). In this study, only sections related to drug and alcohol abuse and dependence were administered (during the last twelve months) in order to determine the absence or presence of a substance abuse or dependence diagnosis (Ferrando, Bobes, Gibert, & Lecrubier, 1997).

The Spanish version of the Alcohol Use Disorders Identification Test (AUDIT). This instrument is a reliable and valid measure of current hazardous alcohol use and has high sensitivity and specificity for screening for alcohol abuse and dependence (Rubio Valladolid, Bermejo Vicedo, Caballero Sánchez-Serrano, & Santo-Domingo Carrasco, 1998).

The Revised Fagerstrom Tolerance Questionnaire-Smoking (RTQ) is a ten-item self-report questionnaire designed for assessing nicotine dependence (Becoña & Vázquez, 1998).

The Severity Dependence Scale (SDS) is a five-item scale, which has already demonstrated its reliability and validity as a screening instrument for a variety of substances (González Sáiz & Salvador, 1998). This scale was used for assessing severity of cannabis, cocaine, ATS, sedatives, hallucinogens, inhalants and opioid use.

Procedure

We used the Spanish version provided by WHO (JM-R). Ethical approval for the present study was obtained from the Hospital Research Ethics Committee of the "Hospital Universitario Doce de Octubre" and all of the participants were informed, read and signed the written informed consent prior to taking part in the study.

Data analysis

Mean values and standard deviations were used to describe the baseline characteristics at each recruitment setting. T test and Chi-Square were used to explore the baseline differences between the PCC and ATC groups. We used $p = .001$ to prevent experimental error rate. Appropriate corrections were made for variables that did not meet the homoscedasticity criterion (see Table 1).

The psychometric properties of the ASSIST were investigated by studying its validity. Several domains or scores derived from ASSIST together with scores from other questionnaires (AUDIT, MINI-Plus, RTQ and SDS) were used in the validation process.

Convergent validity was investigated by comparing ASSIST scores with scores obtained from the other instruments, using two-tailed Pearson's correlation. For instance, ASSIST scores for tobacco use were correlated with RTQ scores, ASSIST scores for alcohol use were compared with AUDIT scores, and ASSIST scores for other substances were correlated with SDS scores.

Table 2
Comparisons of ASSIST, AUDIT, RTQ and SDS scores between participants selected from primary care centres (PCC) and from specialist addiction treatment centres (ATC)

Scales	Total sample (n = 485)	PCC (n = 441)	ATC (n = 44)	t	DF	p
AUDIT, ×, SD	6.44 (8.76)	4.34 (5.92)	27.48 (2.86)	25.6	483	<.01
RTQ, ×, SD	2.08 (3.77)	1.12 (2.34)	11.61(1.08)	29.40	483	<.01
SDS for cannabis, ×, SD	0.75(2.30)	0.23(1.97)	11.47(2.93)	3.57	483	<.01
SDS for amphetamine , ×, SD	0.01(0.19)	0.00(0.00)	0.83(1.11)	6.67	483	<.01
SDS for cocaine, ×, SD	1.13(2.77)	0.46(1.51)	8.45(1.27)	33.43	483	<.01
SDS for inhalants, ×, SD	0.01(0.18)	0.00(0.00)	0.92(2.11)	7.23	483	<.01
SDS for sedatives, ×, SD	0.88(2.29)	0.79(2.14)	1.79(3.33)	2.76	483	<.01
SDS for hallucinogens, ×, SD	0.02(0.28)	0.01(0.19)	0.18(0.72)	3.87	483	<.01
SDS for opioids, ×, SD	0.09(1.01)	0.00(0.00)	1.00(3.24)	6.52	483	<.01
ASSIST scores						
Tobacco	9.65 (11.36)	7.61(9.78)	30.07 (2.26)	15.s17	483	<.01
Alcohol	7.68 (10.57)	4.95 (6.25)	35.11(3.14)	31.59	483	<.01
Cannabis	2.32 (6.07)	0.77 (3.43)	17.82 (4.87)	30.09	483	<.01
Cocaine	3.21 (9.47)	0.34 (2.19)	31.98 (5.37)	76.00	483	<.01
ATS	0.60 (4.48)	0.80 (1.67)	5.84 (12.89)	8.75	483	<.01
Inhalants	0.34 (3.46)	0.11 (1.85)	2.59 (9.68)	4.62	483	<.01
Sedatives	2.40(6.53)	2.05 (5.80)	5.89 (10.98)	3.76	483	<.01
Hallucinogens	0.14 (1.54)	0.14 (0.81)	1.16 (4.34)	4.07	483	<.01
Opioids	0.22 (2.45)	0.00 (0.00)	2.45 (7.86)	6.62	483	<.01

In addition, specific scores for each substance in the ASSIST were compared with MINI-Plus diagnoses of abuse and dependence.

Internal consistency and discriminant validity. Internal consistency was assessed using Cronbach's coefficient. The ASSIST was also investigated for its ability to discriminate between three groups: non-problematic use, abuse and dependence. These three groups were reflecting the severity of problematic substance use: low, moderate or high risk, respectively. This classification was based on MINI-Plus diagnosis. For each specific substance, data were divided into use, abuse and dependence. These scores were compared using independent groups analysis of variance (ANOVA). These same groups were used as well to determine cut-off scores for moderate and high-risk use and to investigate the sensitivity and specificity of the cut-off scores, conducting receiver operating characteristic (ROC) analysis. All data were analyzed using SPSS for Windows, version 15.0.

Results

Comparison of ASSIST scores with AUDIT, RTQ and SDS. As reported in Table 3, there were large and significant positive correlations between the ASSIST Specific Substance Involvement scores for alcohol and tobacco and the AUDIT and RTQ total scores, respectively, among individuals with either substance abuse or dependence. The ASSIST Specific Substance Involvement scores for cannabis, cocaine, amphetamine, inhalants, sedatives, hallucinogens and opioids were also significantly and positively correlated with the respective SDS scales (Table 3). These correlations were large for cannabis and cocaine and moderate for amphetamine, inhalants, sedatives, hallucinogens and opioids for individuals with substance abuse or substance dependence.

ASSIST scores according to MINI-Plus diagnoses. Study participants were divided into three categories according to the presence or absence of a MINI-Plus diagnosis of abuse or dependence for each specific substance addressed in the ASSIST: substance users (a formal substance use disorder diagnosis is absent), substance abusers or substance dependent individuals. Those with a current or lifetime diagnosis of abuse or dependence on the MINI-Plus had significantly higher ASSIST Specific Substance Involvement scores for that substance compared to those without a diagnosis of abuse or dependence (Table 4).

Internal consistency. The ASSIST Global Continuum of Risk showed high internal consistency for high-risk scores, with a Cronbach coefficient of .93 (95% CI: 0.89, 0.92, p<.001). Furthermore, ASSIST Specific Substance Involvement scores showed high internal consistency, as follows .86 for tobacco, .89 for alcohol, .87 for cannabis, .97 for cocaine, .96 for ATS, .95 for inhalants .95, .86 for sedatives .86, and .96 for opioids. Due to insufficient cases, these calculations were not possible for hallucinogens.

Discriminant validity. ROC analysis showed that ASSIST scores could be used to discriminate between use, abuse and dependence. Cut-off scores that best separate groups and their respective sensitivities and specificities for the main substances and area under the ROC curve (AUC) are presented in Table 5. Full values for tobacco, alcohol, cannabis, cocaine, ATS and sedatives are reported. The closer the AUC is to 1, the more distinct the groups are, therefore the results in the present study with AUC values of at least .75 showed good discriminant efficiency. When recommended WHO's cut-off values were used they also showed appropriate discriminant efficiency. There were insufficient cases to conduct analyses for inhalants, hallucinogens and opioids.

Table 3
Correlations between ASSIST Specific Substance Involvement scores for tobacco, alcohol, sedatives and illicit drugs and the respective AUDIT, RTQ and SDS scales scores by diagnosis group

	Individuals with abuse or dependence	Individuals with abuse	Individuals with dependence
Alcohol ASSIST Score and AUDIT Score	(n = 112) .812**	.580**	.873**
Tobacco ASSIST Score and RTQ Score	(n = 225) .799**	.567**	.713**
Cannabis ASSIST score and SDS score for Cannabis	(n = 69) .759**	.879**	.654**
Cocaine ASSIST score and SDS score for cocaine	(n = 56) .854**	.822**	.836**
Amphetamine ASSIST Scores and SDS score for amphetamine	(n = 10) .392**	.311*	.412**
Sedatives ASSIST score and SDS score for sedatives	(n = 71) .419**	.409**	.469**

(n=) number of subjects with abuse or dependence
* p<.05, ** p<.01

Discussion

The results of the present study indicate that the Spanish version of ASSIST is a valid screening instrument for psychoactive substances in individuals attending primary healthcare or specialized addiction treatment centres, therefore, with varying degrees of substance use and substance-related problems in the Spanish context. Our findings agree with previous studies on the validity of ASSIST as a valid screening instrument for early detection of hazardous or harmful use of alcohol, tobacco and illicit drugs, as well as for substance use disorders in individuals who use a number of different substances in various cultural and clinical settings (Hides et al., 2009; Humeniuk et al., 2011; Humeniuk et al., 2012; WHO ASSIST Working Group, 2002).

Concurrent validity is evidenced by significant positive correlations obtained between ASSIST and AUDIT, MINI-Plus, RTQ and SDS scores, which provides collateral validation of

Table 4
Comparison of mean ASSIST Specific Substance Involvement scores according to the presence of absence of MINI-Plus diagnosis of abuse or dependence

Substance	Diagnosis absent	Diagnosis present	t	DF	p
Tobacco	0.45 (1.63)	20.28(8.01)	-36.482	240.23	<.001
Alcohol	2.87 (2.68)	23.71(11.20)	-19.526	114.85	<.001
Cannabis	0.11 (0.62)	15.62(7.09)	-18.145	68.17	<.001
Cocaine	0.02 (0.25)	27.64(10.06)	-20.534	55.01	<.001
Amphetamine	0.00 (0.00)	29.20(12.22)	-7.552	9	<.001
Inhalants	0.02 (0.38)	38.00(0.00)	-196.31	483	<.001
Sedatives	0.06 (0.42)	16.03(8.52)	-15.78	70.06	<.001

Table 5
Discrimination between use and substance use disorders (abuse and dependence) by receiver operating characteristic (ROC) analysis using cut-off scores based on our study and on WHO-ASSIST recommendations from the original validation study

Substance			Substance use disorders			Substance use disorders		
	AUC	p	Cut-off score	Sensitivity	Specificity	Cut-off score (*)	Sensitivity	Specificity
Tobacco	.641	<.05	5.00	94	62	4	97	62
Alcohol	.849	<.05	9.50	95	84	11	63	89
Cannabis	.913	<.05	3.50	99	90	4	98	91
Cocaine	.892	<.05	4.50	98	89	4	100	89
Amphetamine	.983	<.05	3	99	98	4	97	98
Sedatives	.920	<.05	3	99	91	4	95	92

(*) Cut-off score recommended by WHO-ASSIST original team
AUC: area under the ROC curve

non-problematic substance use, abuse and dependence. Therefore, these results indicate that the Spanish version of the ASSIST is a valid measure of tobacco, alcohol and other substances related problems. The moderate correlations between ASSIST scores for amphetamine, inhalants, hallucinogens and opiates, and SDS scores most likely reflects the lower rates of individuals using these specific substances.

Validity usually refers to how well an instrument, such as the ASSIST, measures what it is designed to measure (Cronbach, 1951). The results of this study indicate that the Spanish version of the ASSIST is a valid screening test for psychoactive substances in individuals attending primary care or specialist addiction services, who use a number of different substances and have varying degrees of substance involvement. In our study the results show the substantial validity of the ASSIST, evidenced by the construct validity of ASSIST with Cronbach ranging from .86 to .97, suggesting that the items had good internal consistency for measuring the same construct.

A good screening test should not only discriminate between those who are at a high risk of developing problems, and therefore likely to have a diagnosis substance use disorder, from non-dependent users who are at low or moderate risk of developing problems, but also between individuals who are at moderate risk of developing problems from those at low risk. The discriminant validity of the ASSIST was examined using ROC analysis to determine sensitivity and specificity of cut-off scores. The cut-off scores that were most efficient (higher sensitivities and specificities) to separate risk groups were very similar to those recommended by WHO investigators (WHO ASSIST Working Group, 2002). Furthermore, high efficiency levels were observed with these cut-off points, as well.

Previous studies have shown that the scores derived from the ASSIST are reliable and capable of discriminating between different levels of risk associated with the specific substances (Humeniuk et al., 2008; WHO ASSIST Working Group, 2002). Accordingly, the overall results in the present study show that the ASSIST can discriminate between non-problematic substance use, and a diagnosis of abuse and dependence for the different specific substances scores. ROC curve analyses were able to provide a series cut-off scores for the Spanish sample. It appears that the Spanish version of the ASSIST has enough sensitivity for screening for the most commonly abused substances, with the possible exception of inhalants, hallucinogens and opioids, seemingly as a result of the reduced number of patients using these substances.

The present results show that the ASSIST is a good and potentially useful instrument in primary care and specialist care settings. The observed differences in ASSIST scores found among the groups assessed (low and moderate-high risk) add further evidence for the construct validity of ASSIST, and its ability to discriminate between populations with various substance use involvements.

Preventive intervention programs are aimed at targeting populations at risk, in early stages of disease, when they are at risk of developing a problem. It is therefore important to provide healthcare workers in various clinical settings with adequate screening instruments that are easy to administer for alcohol, tobacco and other psychoactive substances. Prevention interventions can be intended to raise awareness of the problem and induce changes. Thus, screening instruments, such as the ASSIST, can provide an opportunity to detect and engage those individuals who are in need of treatment and it may be a useful tool to raise motivation and behaviour change (Agerwala & McCance-Katz, 2012; Humeniuk et al., 2012). For those people whose substance use is not risky or harmful, screening can be used to reinforce that what they are doing is responsible and encourage them to continue their current low-risk substance use patterns. Therefore, this may advantageous not only for patients' health but may also save healthcare costs (Wutzke, Shiell , Gomel, & Conigrave, 2001).

Screening is most effective for those found to be at risk when it is combined with a brief intervention. Indeed, the use of a reliable and valid screening instrument is considered a key aspect of a public health approach to early intervention for substance-related problems, particularly when associated with a brief intervention programme (Bien, Miller, & Tonigan, 1993). There is strong evidence for the effectiveness of screening and early intervention in reducing excessive or problematic alcohol use (Akin, Johnson, Seale, & Kuperminc, 2012; Bien et al., 1993; Heather, 1996) and growing evidence for the effectiveness of brief intervention for other forms of high risk substance use (Humeniuk et al., 2012).

The present study has several limitations, for instance, we could not calculate sensitivity and specificity for several substances, due to the small number of individuals in our sample who had ever used certain substances (e.g. inhalants, hallucinogens). Also, the cross-sectional nature of this study did not allow assessment of the predictive validity of this screening instrument. In spite of these limitations, our findings suggest that the Spanish version of the

ASSIST could be used as part of a more general public health approach for screening of substance use disorders in primary care, as well as in specialist addiction treatment services. An on-going project from our group is in the process of evaluating the usefulness of an online version of the ASSIST for general population.

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