



RESEARCH ARTICLE

Validity and reliability study of the Turkish version of the Addiction Severity Index

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ABSTRACT

Objective: The increasing prevalence of alcohol and substance use disorders (ASUD) worldwide has raised the demand for more efficient treatment and monitoring. Comprehensive assessment tools are crucial for evaluating substance use, as well as medical, legal, and psychosocial aspects to provide holistic care. The Addiction Severity Index (ASI) is a commonly used tool to assess these dimensions. The purpose of this research is to validate the ASI-Treatnet version in a sample from Turkiye.

Method: The research was carried out at AMATEM clinics in Istanbul and Antalya, involving 141 patients who had been diagnosed with ASUD based on the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria. The ASI was translated into Turkish, and its reliability and validity were assessed through a methodology that included testing for test-retest and interrater reliability using Spearman-Brown correlation coefficients.

Results: The results indicated high reliability for all subscales. Internal consistency was assessed through Cronbach's alpha, resulting in an acceptable value of 0.82. Concurrent validity was established by examining the correlations with the Michigan Alcoholism Screening Test (MAST), the Drug Abuse Screening Test (DAST-10), and the Beck Depression Inventory (BDI), all of which demonstrated significant correlations with the ASI subscales.

Conclusion: The study revealed that the Turkish adaptation of the ASI is a reliable and valid instrument for evaluating ASUD. Its strong correlations with established screening tools confirm its concurrent validity. The ASI's multidimensional approach allows for a comprehensive assessment, facilitating individualized treatment planning and monitoring. Future research could explore expanded and online-adapted versions of the ASI to enhance its practicality.

Keywords: Addiction Severity Index, reliability, validity, Turkish population

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INTRODUCTION

Alcohol and substance use disorders (ASUD) and the use of over-the-counter (OTC) drugs have become major public health problems worldwide in recent years. As this global problem grows, so does the need for effective treatment and follow-up. Early comprehensive evaluation, individualized intervention strategies, and consistent monitoring have been proven successful in managing ASUD (1). Besides evaluating substance use characteristics, it is essential to also consider the medical, legal, and psychosocial aspects of patients to ensure appropriate referrals to other needed services as part of the treatment and follow-up plan (2). A comprehensive and multidimensional evaluation is necessary for gaining insight into patients' requirements, establishing individualized treatment objectives, monitoring treatment progress, assessing results, and understanding the effectiveness of treatment (3, 4). Using standardized assessment tools also allows for the comparison of treatment programs and their results on a national and international scale (3).

Early diagnosis and intervention in alcohol and drug use disorders play a crucial role in mitigating the harmful impact on the lives of individuals and society. Practical and valid screening tests are available for early diagnosis and identification of possible risk situations. The Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) is a practical scale that has been used effectively to screen and diagnose addiction (4). Nevertheless, to acquire precise and thorough information regarding the extent of addiction, it is essential to utilize additional scales. When diagnosing ASUD, it is crucial to have a scale that specifically measures the severity of addiction. Additionally, the evaluation of severity is known to be helpful in predicting prognosis, assessing treatment outcomes, and planning the level of treatment required (5).

The Addiction Severity Index (ASI) is one of the most commonly used assessment tools in addiction treatment and clinical trials. Developed by McLellan (6) and colleagues approximately four decades ago, mainly for research purposes, this scale has been extensively utilized in treatment facilities and clinical studies in the United States (USA) and later on a global scale. Additionally, it has been translated and adjusted for application in various languages and nations (7).

McLellan and his team underscored the necessity of a more comprehensive assessment to enhance our

understanding of addiction. They also emphasized the importance of considering alcohol- and substance-using patients holistically, rather than solely focusing on their patterns of use. Alcohol and drug use disorders can lead to significant legal problems as well as psychiatric, physical, and social impairments (1). Therefore, they highlighted the need for a more extensive evaluation because of the health, social, and legal issues that arise as a direct consequence of the addiction process (8). As a semi-structured interview, the ASI assesses seven areas related to ASUD. These are medical status; employment and support; alcohol, drug, and medication use; legal status; family and social functioning; and psychiatric disorders (2). The ASI is a comprehensive interview that can be utilized for admission to treatment as well as for monitoring recovery and change during follow-up. In a study of 310 patients in methadone maintenance treatment for two years, Bovasso and colleagues showed that the multidimensional structure of the ASI is sensitive and specific to the problems in the domains measured (9). Hubicka and colleagues also found that the ASI profile has prognostic value for relapse (10).

During the diagnosis and treatment of ASUD, the ASI has been modified to be utilized at every stage due to its capacity to assess the issues identified. These revisions allow the scale to remain relevant at all times (8). The ASI-Treatnet version is an updated version of the ASI adapted to different cultures and life experiences (11). The aim of this study is to develop the Treatnet version of the Addiction Severity Index that can be used as a standard assessment tool in the Turkish sample of patients diagnosed with alcohol and substance use disorders.

METHODS

Study Setting

The study was conducted at the inpatient and outpatient AMATEM clinics (Research, Treatment, and Training Center for Alcohol and Substance Use) of Erenköy Mental and Neurological Diseases Training and Research Hospital, and also Ataturk State Hospital, Antalya. The AMATEM clinic of Erenköy Mental and Neurological Diseases Training and Research Hospital provides outpatient and inpatient detoxification treatment, long-term psychotherapeutic interventions, and psychosocial rehabilitation services for addiction in Istanbul. The treatment team consists of a multidisciplinary team including psychiatrists, clinical psychologists, social

workers, and nurses. Treatment is voluntary, and a comprehensive assessment is made for each patient to determine the need for inpatient or outpatient treatment and appropriate pharmacological and psychosocial interventions.

Sample Selection

The study was conducted in a cross-sectional and methodological manner, involving 141 patients who were between the ages of 18-65 and had been diagnosed with alcohol and/or substance use disorder based on the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria. These patients were undergoing outpatient or inpatient treatment at addiction treatment centers in two prominent cities in Türkiye – Istanbul and Antalya. The diagnosis of alcohol and/or substance use disorder was made by a psychiatrist. Participants were included in the study consecutively from June 1, 2022 to December 31, 2022. Intellectual disability, cognitive dysfunction, and general medical condition were identified as exclusion criteria. The study received ethical committee approval from the Clinical Research Ethics Committee of Erenköy Mental and Neurological Diseases Training and Research Hospital, Istanbul (20.06.2022/34). It was conducted in accordance with the Declaration of Helsinki and the guidelines of International Good Clinical Practices. Informed consent was obtained from all patients for inclusion in the study.

Method

Upon providing written informed consent, participants completed a demographic information form, the Michigan Alcoholism Screening Test (MAST), the Drug Abuse Screening Test (DAST-10), and the Beck Depression Inventory (BDI). Permission to use the Addiction Severity Index in the study was obtained as required. The Addiction Severity Index was translated into Turkish by a team of addiction professionals proficient in English. Once items with different translations were identified, the translator proceeded to back-translate. The scale was finalized by selecting items that accurately represented the original scale, were easy to comprehend, and culturally suitable. Clinical psychologists conducted interviews with patients upon admission for treatment, with each interview typically lasting around 45-50 minutes. Interviewers reviewed the ASI-Treatnet guide to understand the application and evaluation methods of the interview, as well as the scale, before conducting the interview.

Instruments

Demographic Information Form

The researcher utilized a demographic information form to gather personal, sociocultural, and demographic data relevant to the variables under investigation in this study. The form inquired about participants' ages, genders, marital status, levels of education and income, occupational statuses, general medical conditions, medical history, family dynamics, and legal backgrounds.

Addiction Severity Index (ASI)

Developed by McLellan and colleagues, this scale is a 200-item semi-structured interview (6). The interview begins with a general information section covering demographic details such as age, gender, address, and information about the referral source, followed by the assessment of six core domains: (a) medical status; (b) employment/support; (c) alcohol, substance, and medication use; (d) family and social functioning; (e) legal status; and (f) psychiatric disorders. With the inclusion of the general information section, a total of seven areas are evaluated. Both the patient and the interviewer utilize distinct rating scales to evaluate the extent of issues in each domain, while the interviewer also evaluates the trustworthiness of the data collected (whether the patient attempted to deceive with their responses or understood them accurately). The patient evaluates the severity of the issue and the significance of the requirement for counseling, outpatient, or inpatient treatment for each of the seven problematic areas using a scale of 1-5.

The interviewer assesses the patient's requirement for additional treatment in each category using a 9-point scale. This assessment takes into account the patient's symptom history, current condition, and the patient's self-evaluation. The interviewer rates the level of treatment needed in different aspects, ranging from 0 (no treatment required) to 9 (necessary for life-threatening situations). Another evaluation carried out by the interviewer focuses on the patient's reliability. This assessment offers insight into the "quality" of the interview, such as whether the patient tried to deceive the interviewer or fully understood the questions.

Michigan Alcoholism Screening Test (MAST)

The Michigan Alcoholism Screening Test (MAST) is a 25-item self-report assessment tool developed by Gibbs (12) to identify alcohol use problems. This scale is highly effective in distinguishing individuals with alcohol use disorders, as it assesses impairment in social functioning related to alcohol use and can indicate alcoholism based

on high scores. The cut-off score for determining alcohol use disorder is typically between 5 and 9. In the Turkish version of the scale, a cut-off score of 5 has a sensitivity of 79% and specificity of 99%, while a cut-off score of 9 has a sensitivity of 91% and specificity of 95% (13).

Drug Abuse Screening Test (DAST-10)

The Drug Abuse Screening Test (DAST-10) is commonly used as an assessment tool. The Drug Abuse Screening Test is modeled on the Michigan Alcoholism Screening Test and consists of 28 questions that help identify individuals with varying levels of substance use problems. DAST assesses substance use and its consequences within the last year (14). In the Turkish adaptation of DAST-10, scores fall between 0 and 10, and a score of 4 or greater may indicate a substance use issue.

Beck Depression Inventory (BDI)

The Beck Depression Inventory was created to assess the severity of depressive symptoms (15). Each of the 21 items in this scale is rated on a scale of 0 to 3 based on the intensity of depression, resulting in a total score that falls between 0 and 63. A score of 0-9 on the scale suggests the absence of depression. Mild depression is indicated by a score of 10-16, moderate depression by a score of 17-24, and severe depression by a score of 25 or higher.

Statistical Analysis

All statistical analyses were performed using SPSS v27.0 and included descriptive statistics for all categorical and continuous variables. We calculated the minimum sample size for the analysis of variance (ANOVA) test (significance level: 0.05, number of groups: 3, effect size: 0.4) as 64.

The data analysis displayed descriptive statistics, showing the range from minimum to maximum values and the median for variables that were not normally distributed. Normally distributed variables were characterized by their mean and standard deviation. Categorical variables were reported as frequencies and percentages. Patient rating scales were used for all seven areas, following standard procedures (6, 7). Inter-rater reliability, test-retest reliability, and internal consistency among the reliability indicators were examined. Concurrent reliability was examined in a design in which 30 subjects were randomly selected in one center (Antalya) for a second interview.

In the first and second interview, the same clinically experienced psychologist from the center applied the scale. The ratings on the seven problem areas were compared. The stability of the measures over time was

evaluated by comparing rating scores between the first and second interviews with a time interval of seven days. Test-retest and inter-rater reliability were assessed using the Spearman-Brown correlation coefficient. Discriminant validity was assessed by comparing the scores from the ASI with those obtained from the MAST, DAST-10, and BDI. To assess the validity of the ASI severity ratings, the total patient population was divided into low, medium, and high severity groups based on their ratings in each of the ASI problem areas. Low-severity patients had scale points of 0 or 1, while medium- and high-severity groups had scale values of 2 or 3, and 4, respectively. These comparison items were taken from the items describing the trouble or bother that patients experienced in each ASI problem area. The three groups were then compared on each of the items using analysis of variance. Bonferroni post hoc comparisons were employed to analyze subgroups. The exploratory factor analysis literature provides a wide range of rough guidelines regarding an adequate sample size. Most of these guidelines consistently advocate for large samples (say, a sample size of at least 200) to obtain high-quality factor analysis solutions (16). Given the current sample size, exploratory factor analysis could not be employed. Internal consistency was calculated using Cronbach's alpha test. The significance level (p value) was set at 0.05.

RESULTS

The study included a total of 141 participants, with a mean age of 33.7 years (standard deviation [SD]=11.59). Of the participants, 127 (90%) were male and 14 (10%) were female. Further descriptive characteristics are presented in Table 1.

Reliability Studies

In the reliability studies, a test-retest reliability analysis was conducted with a 7-day interval on a randomly selected group of 30 subjects. Following the initial ASI interview, subjects were evaluated in a second interview by the same interviewer. The participants were asked to describe the last 30 days during the second interview. The Spearman's correlation coefficients for each subscale were as follows: 0.81 for medical status, 0.69 for employment/support status, 0.88 for alcohol/drug use status, 0.91 for legal status, 0.79 for family-social relations status, and 0.90 for psychiatric status (all $p < 0.05$).

The interrater reliability was examined using a design in which two interviewers evaluated the same 31 participants through separate interviews during the same time period. The severity ratings for

Table 1: Descriptive characteristics of the sample (n=141)

Variable	n (%) / Mean \pm SD
Age (years)	33.70 \pm 11.59
Gender	
Male	127 (90)
Female	14 (10)
Marital status	
Single	76 (53.9)
Married	42 (29.7)
Divorced	23 (16.3)
Education	
Primary	26 (18.6)
Secondary	62 (43.9)
High school	31 (21.9)
University	22 (15.6)
Employment status	
Employed	96 (68)
Unemployed	45 (32)
Diagnosis	
Alcohol use disorder	28 (19.8)
Substance use disorder	113 (80.2)

n: Number; SD: Standard deviation.

the six problem areas were compared. The interrater reliability coefficients for each subscale were as follows: 0.91 for medical status, 0.72 for employment/support status, 0.85 for alcohol/drug use status, 0.95 for legal status, 0.73 for family-social relations status, and 0.89 for psychiatric status (all $p < 0.05$). Interrater reliability coefficients are shown in Table 2.

Cronbach's alpha correlation coefficients were calculated for the internal reliability analysis after excluding the nominal values. Cronbach's alpha value was 0.82, indicating acceptable internal consistency. Cronbach's alpha values for subgroups were as follows: medical 0.77, employment 0.68, alcohol/drug use 0.85, legal 0.71, family/social 0.66, and psychiatric 0.81.

Validity Studies

The discriminant validity of psychiatric status and alcohol use problems was assessed by utilizing the Turkish version of the BDI and MAST. The correlation between the total BDI score and the severity rating of psychiatric status was 0.32 ($p = 0.002$). A high correlation was found between the total MAST score and the severity rating of alcohol problems, with a coefficient of 0.71 ($p < 0.001$). The drug problems score showed a moderate correlation with DAST-10 ($r = 0.51$, $p < 0.001$). The discriminant validity of the scale is shown in Table 3.

Table 2: Interrater reliability coefficients (correlation analysis results)

Scales	Interrater reliability coefficients
Medical	0.91
Employment	0.72
Alcohol/drug use	0.85
Legal	0.95
Family/social	0.73
Psychiatric	0.89

Table 3: Discriminant validity of the scale

Scales	BDI	MAST	DAST-10
Psychiatric severity rating	0.32**	-0.07	0.22*
Alcohol severity rating	0.35***	0.71***	-0.51*
Drug severity rating	0.11	-0.52*	0.51***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. BDI: Beck Depression Inventory; MAST: Michigan Alcohol Screening Test; DAST: Drug Abuse Screening Test.

The total patient population was divided into low, medium, and high severity groups based on their ratings in each of the ASI problem areas. Concurrent validity analyses were conducted among the three groups. There were notable distinctions among the groups in terms of all problem areas and items, indicating that the ASI demonstrates concurrent validity. Concurrent validity of the scale is shown in Table 4.

DISCUSSION

The objective of this study was to validate the ASI in the Turkish language. This study found that the Turkish adaptation of the ASI demonstrates strong reliability and validity when evaluating individuals with ASUD. Both the test-retest and interrater reliabilities of the Turkish version of the ASI were found to be high. In a study involving drug-dependent patients, the Chinese version of the ASI showed test-retest correlation coefficients ranging from 0.68 to 0.84 and interrater correlations ranging from 0.74 to 0.98 (17). Another study, using the adaptive version of the ASI, found that interrater correlations ranged from 0.88 to 0.96 (7).

On the other hand, some previous studies have reported that the legal, drug, and family/social scales have low internal consistency (18, 19). The original American study with patients admitted to an outpatient clinic reported Cronbach's alpha values ranging from 0.58 to 0.74 (20). However, in this study, the internal consistency with Cronbach's alpha values was significantly high for the total score. These differences in the results may be attributed to methodological variations between previous studies and our study.

Table 4: Concurrent validity of the scale (analysis of variance results)

Severity rating scales	Low (0-1) n	Moderate (2-3) n	High (4) n	p	F	η^2
Medical status	91	23	27	0.01 (III>II, III>I)	4.73	Medium
Employment/support	65	45	31	0.01 (III>I, II>I)	4.78	Medium
Legal status	97	29	15	<0.001 (III>I, III>II, II>I)	9.70	Large
Alcohol/drug use	45	52	44	<0.001 (III>I, III>II, II>I)	9.92	Large
Family/social relations status	35	43	63	0.02 (III>I)	3.94	Small
Psychiatric status	29	59	56	<0.001 (III>I, III>II, II>I)	10.22	Large

η^2 : Effect size (small: 0.01, medium: 0.06, large: 0.14). I: Low; II: Moderate; III: High.

The correlations between the composite score of the ASI and each of the severity scores of the subscales were statistically significant. The correlations ranged from 0.52 to 0.97. This result was similar to that of previous studies, which also reported similar findings (6, 21, 22). In their studies, correlation coefficients between the corresponding severity ratings and composite scores ranged from 0.22 to 0.93.

In this study, the discriminant validity of the ASI was determined for the psychiatric status and alcohol/drug use subscales. Studies focused on substance users demonstrated that the correlation of the substance score with MAST and DAST-10 was significant. Similarly, Dixon et al. (23) found a significant relationship between the psychiatric status subscale of the ASI and mood and anxiety disorders. The findings indicated that individuals with substance use disorder often have various psychiatric issues that can be accurately identified using the ASI. The results of the current study regarding the validity levels of the alcohol/drug use and psychiatric status subscales were consistent with those reported in earlier research by Dixon et al. (1996) and Zanis et al. (1994) (23, 24).

In this research, the concurrent validity analysis was conducted in a manner similar to the study by McLellan et al. (6). The results of the ANOVA revealed a significant correlation between the specific items identified and the corresponding problem area. It should be noted that the relationship of the patient's subjective assessments to the more objective items varies from one area to another.

This study has some limitations. First, the utilization of a wider range battery to evaluate patients' psychiatric comorbidities could lead to a more accurate discriminant analysis. Additionally, the inclusion of individuals who use both alcohol and other substances in the sample group may have resulted in heterogeneous data. Thus, lack of validity analyses in terms of diagnostic subgroups might have influenced the results. Finally, the scale's lack of

sub-items related to behavioral addictions may have resulted in certain deficiencies.

CONCLUSION

To conclude, the findings of this study suggest that the ASI is a reliable and valid instrument for conducting a thorough evaluation of the biological, social, and psychiatric well-being of patients. It is also an appropriate tool for offering information and counseling to individuals struggling with substance use disorders. Additionally, the ASI can be used for different types of mentally ill patients who have co-occurring substance abuse disorders. In light of recent research, it is clear that further studies on expanded and online-adapted versions of the ASI will be essential moving forward.

Ethical Approval: The University of Health Sciences, Erenkoy Training and Research Hospital for Psychiatry and Neurological Diseases Ethics Committee granted approval for this study (date: 20.06.2022, number: 34).

Informed Consent: Informed consent was obtained from all participants.

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