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RESEARCH ARTICLE

Psychometric properties of the Turkish version of the Amphetamine Withdrawal Questionnaire Version 2 in patients with methamphetamine use

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ABSTRACT

Objective: Methamphetamine abuse has been a growing global problem. A variety of psychiatric problems might emerge due to chronic methamphetamine use. The aim of this study was to evaluate the psychometric properties of the Turkish version of the 10-item Amphetamine Withdrawal Questionnaire Version 2 (AWQv2).

Method: A total of 220 participants admitted to the outpatient treatment clinic for methamphetamine use were included in the study. The reliability and internal consistency of the items were examined using Cronbach's alpha. The validity of the scale was assessed through construct and convergent validity. Data were collected with the Turkish version of the Amphetamine Withdrawal Questionnaire, Montgomery-Asberg Depression Rating Scale (MADRS), Hamilton Anxiety Rating Scale (HARS), Clinical Global Impressions - Severity Scale (CGI-S), and Penn Drug Craving Scale.

Results: The majority of the group was male (84.4%). The mean age was 29.7±6.7. Half of the participants were daily methamphetamine users (50%), with most preferring inhalation (94.8%). The scale's internal consistency was found to be Cronbach's alpha of 0.80. For test-retest reliability, the Spearman rank-order correlation coefficient was high (0.83). Factor analysis using exploratory factor analysis yielded a two-factor model: affective and reversed vegetative factors. The convergent validity of the scale showed positive and significant correlations with other scales (MADRS, r=0.769, p<0.001; HARS, r=0.709, p<0.001; CGI-S, r=0.742, p<0.001; Penn Substance Craving Scale, r=0.510, p<0.001).

Conclusion: The Turkish version of the AWQv2 is a valid and reliable measurement tool for assessing methamphetamine withdrawal symptoms in a clinical sample.

Keywords: Addiction, methamphetamine, questionnaire, reliability, validity, withdrawal

INTRODUCTION

Methamphetamine abuse has emerged as a significant global problem, being reported as one of the most extensively abused illicit drugs (1). Official criminal reports from Turkiye have indicated a 70% increase in methamphetamine-related offenses compared to the previous year (2). Chronic methamphetamine abuse is associated with a range of psychiatric symptoms, including depression, anxiety, and psychosis (3). Furthermore, cognitive deficits and neurotoxic effects related to methamphetamine abuse might affect the progression of the illness (4).

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Abrupt cessation or reduction of the substance in chronic methamphetamine users can lead to a clinically distressing withdrawal syndrome, reported in 87–97% of recently abstinent methamphetamine users (5). This syndrome often presents with symptoms such as dysphoria, fatigue, vivid or unpleasant dreams, psychomotor retardation or agitation, insomnia or hypersomnia, and increased appetite. The course of the withdrawal period can be divided into two distinct phases. The first phase involves a 'crash' lasting approximately 24 hours, during which the predominant clinical features are primarily fatigue and exhaustion. In the subsequent phase, some symptoms, especially craving, may manifest over about two weeks (6). In some cases, a subacute protracted set of withdrawal symptoms has been reported that might continue for months (4).

Because symptoms of methamphetamine withdrawal are rapid-onset, medical and psychosocial treatments should be initiated immediately to provide symptomatic relief. Given that the severity of methamphetamine withdrawal symptoms has been linked to a propensity for relapse in previous studies, failure to manage these symptoms may contribute to high rates of relapse in the first days of treatment (7–9). Considering all these factors together, it is evident that evaluating the presence and severity of withdrawal symptoms is crucial for increasing treatment retention in patients with methamphetamine use disorder.

The number of scales developed to assess methamphetamine withdrawal has been limited, especially considering the global impact of the substance. Initially, efforts to define the symptoms frequently observed in cocaine users after cessation led to the term "withdrawal syndrome," underscoring the need for a scale to assess these symptoms (10). Consequently, the Cocaine Selective Severity Assessment Scale was developed, featuring 18 items primarily associated with early cocaine abstinence. This clinician-administered instrument demonstrated a Cronbach's alpha of 0.80 (11). Among psychometric scales evaluating psychostimulant withdrawal syndrome, Amphetamine Withdrawal Questionnaire (AWQ) is the most widely recognized. Developed in 1999, the AWQ measures the severity of methamphetamine withdrawal symptoms, to be administered within seven days from the last drug use (12). Its ten items are based on the diagnostic criteria for amphetamine withdrawal outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (13).

A study on the questionnaire's reliability, validity, and factor structure, involving 102 participants, reported an internal consistency with a Cronbach's alpha of 0.77. Test-retest reliability was found to be 0.79, and a principal component analysis revealed a three-factor model: hyperarousal, reversed vegetative, and anxiety factors (12). The AWQ version 2 (AWQv2) is an adaptation of the original AWQ, aimed at utilizing questions instead of items for assessing symptoms within the past 24 hours. This self-report scale has been validated and employed in numerous studies to examine the nature and severity of methamphetamine withdrawal (4, 14–16). Furthermore, various versions of the AWQv2 have been utilized in treatment trials for methamphetamine use disorder (17, 18).

Another tool, the Amphetamine Cessation Symptom Assessment (ACSA), was introduced in 2008. The ACSA scale includes additional items such as poor concentration, tension, and inactivity, compared to the AWQ. Its reliability was supported by a Cronbach's alpha of 0.76 (19).

In recent years, the increasing prevalence of methamphetamine addiction has emerged as a significant public health problem. Assessing and monitoring patients with methamphetamine use disorder is crucial. Thus, the importance of cross-sectional assessment and continuous monitoring of withdrawal symptoms in patients in Turkiye is clear. The absence of tools for evaluating withdrawal symptoms might hinder effective research into methamphetamine use disorder and the development of national strategies to mitigate the substance-related burden. To our knowledge, this is the first study to adapt a withdrawal scale to the Turkish language using participants with methamphetamine use disorder. The main objective of this study is to adapt the scale for Turkish society to evaluate methamphetamine withdrawal symptoms. The AWQv2 has been developed and utilized in numerous studies, including population-based screenings and drug trials. As indicated in its original application, the scale can also be used to assess withdrawal from other amphetamine-type stimulants besides methamphetamine. We hypothesize that the Turkish version of the AWQv2 scale is a valid and reliable tool for measuring withdrawal in patients with methamphetamine use disorder.

METHODS

Study Setting and Participants

This study employed a cross-sectional descriptive approach. Participants were recruited from the Ataturk State Hospital (Antalya) outpatient addiction treatment clinic, one of the largest substance use disorder treatment centers in the Mediterranean region of Turkiye. Our sample consisted of all patients with methamphetamine use who were consecutively admitted or referred to the clinic between January 2023 and July 2023. The patient demographics at the outpatient clinic varied, including patients referred for voluntary or mandated treatment under probation laws, those who applied voluntarily, and those who sought treatment at the persuasion of their families. A significant portion of the patient population also included individuals with severe addiction seeking inpatient treatment from provinces lacking such services. For scale adaptation studies employing structural equation modeling, a sample size of 100 to 200 is reported to be sufficient for scales containing 10 items. However, to account for a potential dropout rate of 10% among participants, we planned to include 220 patients in the study.

The inclusion criteria were methamphetamine use within the last month (self-report), the ability to provide a urine sample for toxicology screening, literacy, age between 17 and 65, and the ability to complete scales in Turkish. The exclusion criteria included comorbidity with additional substance use (except for tobacco products), methamphetamine use within the last 24 hours, primary psychotic disorders, intellectual disability, or unwillingness to participate in the study. All participants who met the inclusion criteria completed semi-structured interviews and self-report paper scales, which were administered face-to-face by the author. Prior to the interviews, all patients provided urine samples between 08:30 and 10:30 AM, which were screened using Enzyme-Linked Immunosorbent Assay (ELISA) test kits for amphetamines, opiates, cocaine, tetrahydrocannabinol, benzodiazepines, and synthetic cannabinoids. Patients testing positive for any illicit substances other than methamphetamine in the urine analysis were excluded from the study. Out of 4,233 patients who applied to the outpatient treatment clinic, 246 met the study criteria, but 26 declined to participate.

Procedure

The Ethics Committee of Antalya Research and Training Hospital approved the study protocol (IRB Approval Date: 22.08.2022, No.: 11/26). All participants were evaluated by the author and provided informed consent. The research was conducted ethically, in accordance with the World Medical Association's Declaration of Helsinki.

Permission to adapt the AWQv2 scale to Turkish was obtained via email from Dr. Manit Srisurapanont, the developer and author of the AWQv2 scale. The scale was then translated into Turkish by a working group comprising an experienced psychiatrist, a clinical psychologist, and a professional English translator. This translation was discussed and finalized by the group and the author, and subsequently back-translated into English by the same group. The back-translated text was compared with the original scale text, and any discrepancies were resolved to finalize the text version. No changes were made to the scale items during the process of adapting and retranslating the scale into Turkish. Finally, the questionnaire was tested on 30 healthy subjects to identify and correct any potential ambiguities in the semantic interpretation of the questions.

Measurements

Amphetamine Withdrawal Questionnaire Version 2

The AWQv2 scale, developed by Srisurapanont et al., (12) is based on the DSM-IV diagnostic criteria for amphetamine withdrawal. It comprises 10 items, with responses provided on a 5-point Likert-type scale ("0" Not at all, "1" Very little, "2" A little, "3" Quite a lot, "4" Very much). The total score ranges from 0 to 40. Principal component analysis of the scale yielded a three-factor model: hyperarousal, reversed vegetative, and anxiety. The scale's Cronbach's alpha coefficient was reported to be 0.77.

Montgomery-Asberg Depression Rating Scale

The Montgomery-Asberg Depression Rating Scale (MADRS) is a clinician-rated scale designed to measure the severity of depression (20). The scale includes 10 items, each scored from 0 (symptom not present or normal) to 6 (severe or continuous presence of the symptom), yielding a total possible score of 60. The MADRS assesses apparent sadness, reported sadness, inner tension, sleep, appetite, concentration, lassitude, inability to feel (interest level), pessimistic thoughts, and suicidal thoughts. A higher score indicates increased disease severity. The Turkish validity and reliability study of the scale was conducted by Kara Ozer et al. (21).

Clinical Global Impression - Severity Scale

The Clinical Global Impression - Severity Scale (CGI-S) is used to rate the severity of illness. It is an observer-rated scale that assesses illness severity on a scale from from 1 to 7 (22).

Penn Substance Craving Scale

The Penn Substance Craving Scale is a 5-item self-report questionnaire developed to assess substance craving over the last week, including frequency, intensity, duration, urgency, and total craving. Each item is rated on a scale from 0 to 6, with the maximum total score for severe craving being 30. The scale's adaptation for substance-dependent individuals yielded a Cronbach's alpha value of 0.84 for the entire scale (23).

Hamilton Anxiety Rating Scale

The Hamilton Anxiety Rating Scale (HAM-A) is a clinician-rated instrument originally developed to quantify the severity of anxiety symptoms (24). In this study, the commonly used 14-item version was administered, with higher scores indicating greater anxiety symptom severity. The Turkish validity and reliability of the scale were established by Yazici et al. (25).

Statistical Analysis

Initially, a descriptive analysis was conducted. Although the sample consisted of 220 participants, data from 28 participants were excluded from the analysis due to missing critical values. Consequently, statistical analyses were performed with data from 192 participants. Continuous variables were subjected to normality tests. Based on the results of these tests, either the mean±standard deviation or the median (min–max) values were reported as appropriate.

Secondly, the Cronbach's alpha score was calculated to assess the reliability of the scale. The total scale score and the scores for each item were reported. Test-retest variability was examined by administering the scale twice with a one-week interval to a randomly-selected sample of 30 participants. A one-week interval was chosen as the clinical features of withdrawal may change over time (4). Spearman rank order correlation coefficients were computed to assess the test-retest reliability. The structural validity of the scale was analyzed through exploratory factor analysis and direct oblimin rotation.

The Kaiser-Meyer-Olkin (KMO) coefficient was calculated, and the Barlett's Test of Sphericity was applied to determine the suitability of the data for exploratory factor analysis (EFA). It is accepted that a KMO value higher than 0.60 and a significant outcome of Barlett's Test are indicative of data suitability for EFA (26). Confirmatory factor analysis (CFA) was performed to confirm the structure obtained from the EFA results. In this study, the Chi-Square Goodness of Fit, Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), and Tucker-Lewis Index (TLI) were used to evaluate the fit of the CFA model. The χ^2 value was divided by the degrees of freedom (df) for the Chi-Square Goodness of Fit test. Values lower than two indicate an excellent

Table 1: Descriptives of sociodemographic data and clinical scales

	n=192	%
Gender		
Male	162	84.4
Female	30	15.6
Insurance status		
Insured	139	72.4
Uninsured	53	27.6
Living with		
Family	162	84.4
Friends	4	2.1
Alone	21	10.9
Shelter	3	1.6
Homeless	2	1
Employment		
Unemployed	87	45.3
Temporary/part-time	21	10.9
Full-time	84	43.8
Years of schooling		
5 years	32	16.7
6–9 years	97	50.5
10–13 years	53	27.6
>14 years	10	5.2
Relationship		
Single	90	46.9
Widowed/separated	33	17.1
In a relationship	69	35.9
Age, (mean±SD)	29.7±6.7	
MADRS, (mean±SD)	20.8±13.9	
HARS, (mean±SD)	17.1±11.7	
CGI-S, (mean±SD)	4±1.4	
Penn Craving Scale, (mean±SD)	11.8±9.6	

SD: Standard deviation; MADRS: Montgomery-Asberg Depression Rating Scale; HARS: Hamilton Anxiety Rating Scale; CGI-S: Clinical Global Impressions - Severity Scale.

Table 2: Reliability analysis results of the AWQv2 Scale

Item number	Scale mean if item deleted	Scale variance if item deleted	Item-total correlation	Cronbach's Alpha if Item deleted	Mean±SD
1. Have you been craving methamphetamine?	13.19	73.66	0.32	0.80	1.85±1.5
2. Have you felt sad?	13.18	65.76	0.61	0.77	1.85±1.6
3. Have you lost interest in things or no longer take pleasure in them?	13.09	65.59	0.62	0.77	1.94±1.6
4. Have you felt anxious?	13.60	66.79	0.62	0.77	1.43±1.5
5. Have you felt as if your movements were slow?	13.96	70.30	0.53	0.78	1±1.4
6. Have you been tired?	13.28	69.12	0.53	0.78	1.7±1.5
7. Have you been agitated?	13.22	66.55	0.63	0.77	1.8±1.5
8. Has your appetite increased, or are you eating too much?	13.92	76.57	0.26	0.81	1.1±0.4
9. Have you had any vivid or unpleasant dreams?	14.41	77.00	0.30	0.80	0.6±0.2
10. Have you been craving sleep or sleeping too much?	13.47	72.87	0.33	0.80	1.5±0.6
Total AWQ Score					15±9.2

SD: Standard deviation.

fit, lower than three a good fit, and lower than five an acceptable fit. For CFI, GFI, and TLI, values higher than 0.95 indicate an excellent fit; values between 0.90 and 0.94, a good fit; and values between 0.85 and 0.89, an acceptable fit. For RMSEA, values lower than 0.05 indicate an excellent fit, whereas values between 0.06 and 0.08 indicate an acceptable fit. Furthermore, for SRMR values, less than 0.05 indicate an excellent fit, and values between 0.06 and 0.10, an acceptable fit (27). Pearson correlation analysis was used to assess the concurrent validity of the scale.

The assumed level of significance was set at $p<0.05$. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 26.0 and AMOS version 26 (IBM Corporation, Somers, NY 10589, USA).

RESULTS

Characteristics of the Sample Demographics and Clinical Scales

Of the sample (n=192), 162 participants were male, and 30 were female. Nearly half of the participants had eight years of schooling (50.5%) and were unemployed (45.3%). The mean age was 29.7±6.7 years. Methamphetamine use per day averaged 0.9±1.2 g, the age at first methamphetamine experience was 26.5±7 years, and the duration of methamphetamine use was 30.2±24.4 months. Half of the participants were daily methamphetamine users (50%), with the majority preferring inhalation as the method of use (94.8%). Additionally, 70.8% of the patients had positive urine toxicology results for methamphetamine. Table 1 shows the sociodemographic characteristics of the sample and clinical scales.

Reliability Analysis

The Cronbach's alpha coefficient for the scale was 0.80. The corrected item-total score correlation coefficients ranged between 0.26 and 0.63. The correlation coefficient for test-retest reliability was high ($r=0.83$, $p<0.001$). Table 2 provides a detailed examination of the reliability analysis.

Structural Validity

In the structural validity analysis of the study, the KMO measure of sampling adequacy was found to be 0.764 (>0.60). Bartlett's Test of Sphericity confirmed the suitability of the data for analysis ($\chi^2=722.902$, $p<0.001$). The analysis revealed a two-factor structure in the Scree Plot graph, with eigenvalues of 3.808 for component 1 and 1.783 for component 2. These two factors explained 55.91% of the total variance of the scale. The first factor, accounting for 38.08% of the variance, was named the 'affective factor.' It comprised drug craving, sadness, loss of interest, anxiety, decreased energy, and agitation. The second factor, accounting for 17.82% of the variance, was named the 'reversed vegetative factor.' It included slowing of movement, increased appetite, craving for sleep, and vivid or unpleasant dreams. Item factor loads ranged from 0.59 to 0.85 for the first factor and from 0.50 to 0.85 for the second factor. Table 3 presents these item factor loads in more detail.

Table 3: Rotated component matrix of principal component analysis

Item number	Factor 1 load	Factor 2 load
Item 1	0.59	
Item 2	0.85	
Item 3	0.84	
Item 4	0.79	
Item 5		0.51
Item 6	0.63	
Item 7	0.61	
Item 8		0.85
Item 9		0.50
Item 10		0.84

Oblimin rotation with Kaiser normalization was used. All items have been included in a factor with factor loadings greater than 0.50.

CFA was conducted to confirm the structure resulting from the EFA. The analysis indicated that the model demonstrated good and/or acceptable fit across several metrics (Chi-Square Goodness=2.441, GFI=0.936, CFI=0.942, TLI=0.907, RMSEA=0.08, SRMR=0.015) (Table 4). The factor load results revealed that item factor loads varied from 0.43 to 0.69 for the hyperarousal-cognitive factor, and from 0.38 to 0.82 for the reversed vegetative factor. Figure 1 presents a more detailed examination of the model.

Criterion Validity

Validity analyses with similar scales showed that the MADRS scores, HARS scores, CGI-S scores, and Penn Substance Craving Scale scores were significantly correlated with AWQv2 total scores (r=0.769, p<0.001; r=0.709, p<0.001; r=0.742, p<0.001; r=0.510, p<0.001, respectively). All scales were also significantly correlated with Factor 1 (r=0.865 for MADRS, r=0.771 for HARS, r=0.741 for CGI, r=0.562 for Penn Craving Scale; all p<0.001) and Factor 2 scores (r=0.244 for MADRS, r=0.272 for HARS, r=0.397 for CGI, r=0.183 for Penn Craving Scale; all p<0.001). Table 5 provides these correlations in more detail.

Table 4: AWQv2 scale confirmatory factor analysis fit indices

Goodness of fit criteria	Acceptable fit criteria	Research finding
CMIN/df	$0 \leq \chi^2/df \leq 5$	2.441
GFI	≥0.85	0.936
CFI	≥0.85	0.942
RMSEA	≤0.08	0.08
TLI	≥0.85	0.907
SRMR	≤0.10	0.015

DISCUSSION

The worldwide use of methamphetamine has impacted millions of people, presenting with a variety of psychiatric symptoms. Given the increasing prevalence of methamphetamine use and the decreasing mean age of first experience, diagnosing and treating patients effectively with useful diagnostic tools is vital. Thus, this study aimed to adapt the amphetamine withdrawal questionnaire into the Turkish language, and to specify the scale's validity and reliability. This represents the first evaluation of a stimulant withdrawal self-report measure in Turkish that we are aware of.

According to the results of the AWQv2 validity studies, the Cronbach's alpha internal consistency reliability coefficient was 0.80, indicating high reliability (26). Similar results (0.77) were reported for the original scale (12). The test-retest correlation coefficient of the scale was sufficient and confirmed its stability, with previous studies also reporting high correlations (12, 14). In our study, the two-factor structure explained 55.91% of the total variance.

Table 5: Correlation matrix of the scales used in the study

Scales	Factor 1	Factor 2	Total AWQv2 score	MADRS	HARS	CGI-S	Penn Craving Scale
AWQv2 factor 1	1	0.332*	0.910*	0.865*	0.771*	0.741*	0.562*
AWQv2 factor 2		1	0.693*	0.244*	0.272*	0.397*	0.183*
Total AWQv2 score			1	0.769*	0.709*	0.742*	0.456*
MADRS				1	0.853*	0.758*	0.423*
HARS					1	0.709*	0.380*
CGI-S						1	0.456*
Penn Craving Scale							1

AWQv2: Amphetamine Withdrawal Questionnaire version 2; CGI-S: Clinical Global Impression - Severity; HARS: Hamilton Anxiety Rating Scale; MADRS: Montgomery Asberg Depression Rating Scale; *: P<0.001.

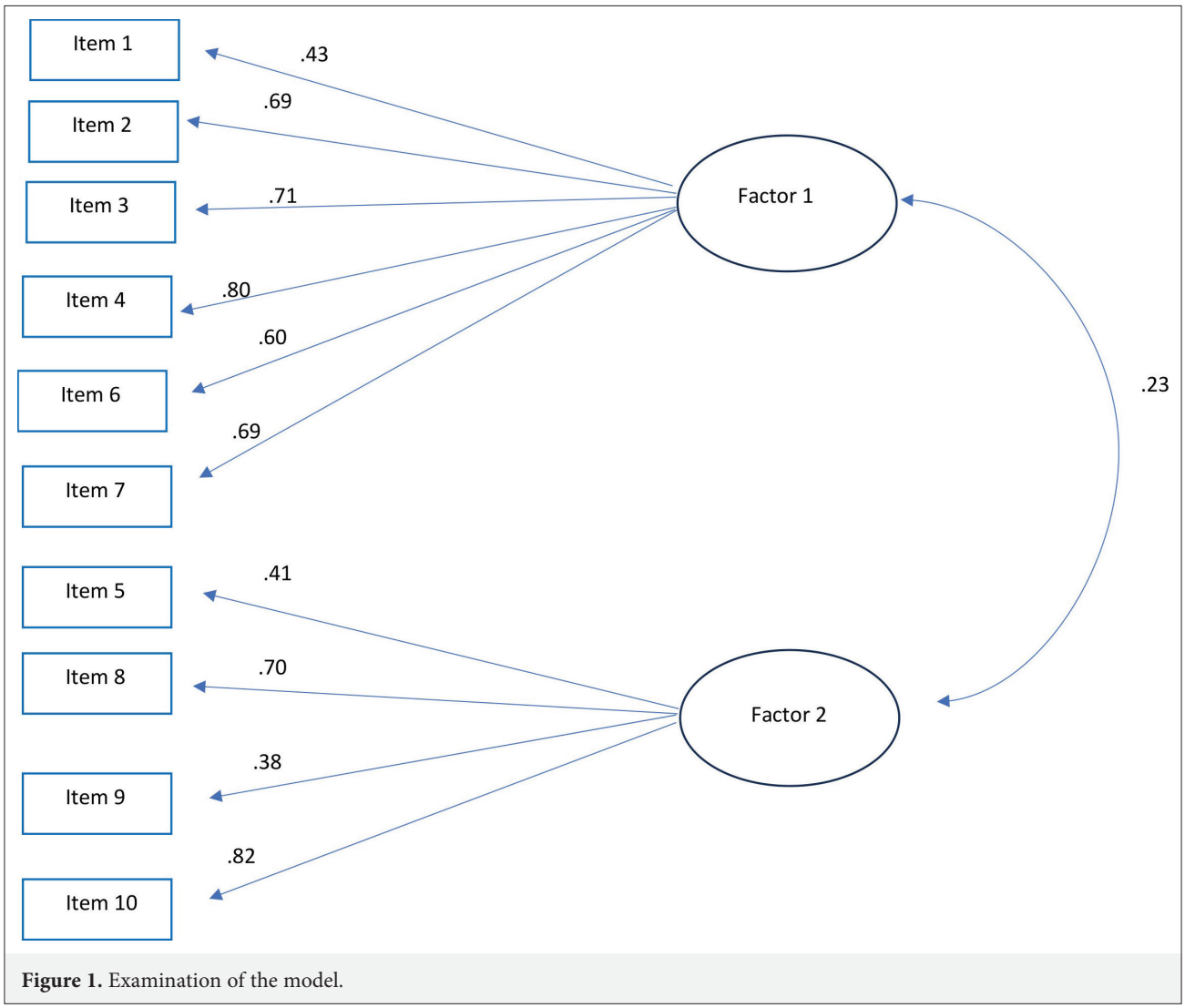

Figure 1. Examination of the model.

Within this framework the contribution of the defined factors to the total variance was deemed sufficient. In the original scale, 65% of the variance was explained by a three-factor design, while another adaptation study reported 58% (4, 12).

The KMO coefficient, used to test the suitability of the sample size for factor analysis, was found to be 0.76. Values higher than 0.60 are considered acceptable for the KMO value (28). Upon performing Bartlett's test, the result was significant, confirming that the sample size was adequate for factor analysis and the data were suitable for analysis. Structural validity analyses, including CFA and EFA, were conducted to evaluate the scale structure in Turkish samples. Although literature reports factor loads higher than 0.30 as acceptable, we set a threshold value of 0.50 (26). Items related to drug craving, sadness, loss of interest, anxiety, agitation, and fatigue loaded onto the first factor. Items related to slowing of movement, increased appetite, craving for sleep, and vivid or unpleasant dreams loaded onto the second factor.

While the original study reported a three-factor model, our study found that depression and anxiety symptoms loaded onto the first factor, whereas reversed vegetative symptoms loaded onto a second factor (12). During the structural validity analyses, a three-factor structure was not forced due to the outcomes not presenting an advantage in terms of significant variance change and item load difference compared to a two-factor structure. In the Persian validity study of the AWQv2 scale conducted in Iran, factor structures showed differences which the authors potentially attributed to cultural characteristics (16). Therefore, the results in our study might be influenced by different cultural structures. In alignment with our findings, previous studies have reported that chronic methamphetamine use is associated with affective and psychomotor symptoms as distinct

dimensions. Affective symptoms include depressive mood, suicidality, anxiety, and hostility/agitation, while psychomotor symptoms encompass tension, excitement, motor hyperactivity, and distractibility (29). Thus, considering these as the inverse of intoxication symptoms, our finding that withdrawal symptoms were categorized into a two-factor model aligns with this perspective. Based on the literature, we named the first factor 'affective,' emphasizing depressive-anxiety (agitation) symptoms, and the second factor 'reversed vegetative factor,' highlighting psychomotor symptoms and changes in sleep and appetite.

The construct validity of the AWQv2 was evaluated through confirmatory factor analysis. Analysis of the goodness-of-fit indices indicated that the model was at an acceptable level, with values for Chi-Square Goodness, GFI, CFI, TLI, RMSEA, and SRMR being satisfactory. According to the CFA, factor loads ranged from 0.38 to 0.82, demonstrating that the two-factor model was valid. This contrasts with a previous study using CFA, which reported lower factor loads ranging from 0.06 to 0.72 (14).

The convergent validity analysis of the scale indicated a significant and positive correlation between the AWQv2 scale scores and measures of depressive symptoms, anxiety, clinical global impression, and craving scores. Previous studies have suggested that the state of craving is linked to mesolimbic and glutamatergic neuroadaptations associated with chronic drug use (30, 31). Chronic use of all major drugs of abuse has been shown to increase stress and anxiety-like responses, contributing to protracted withdrawal (32). As tolerance and withdrawal develop, brain stress systems such as corticotropin-releasing factor (CRF), norepinephrine, and dynorphin are recruited in the extended amygdala, contributing to the development of negative emotional states during withdrawal (33). Our study, aligning with previous neurobiological findings, found that more severe withdrawal symptoms were associated with increased illness severity, higher craving levels, and more severe depressive and anxiety symptoms.

This research has several limitations. One such limitation was the female-to-male ratio. Men more frequently use methamphetamine than women (1, 2), resulting in a significantly higher number of male participants in our study and creating gender asymmetry. Previous studies have shown that women do not significantly differ from men in terms of the age of first substance use; however, women are more likely to report problems associated with substance use earlier in life (34, 35). This could lead to a hypothesis that items associated with affective symptoms might be overrepresented in women with methamphetamine use, leading to an incorrect interpretation of withdrawal symptoms. Additionally, the stigmatization of women in eastern countries might deter those experiencing mild withdrawal symptoms from seeking treatment at outpatient clinics (36). Therefore, our findings, especially regarding women, might not be generalizable to all female patients. Another limitation was the specificity of the drug type studied; participants in this study were exclusively methamphetamine users, who represent a relatively higher ratio among all psychostimulant users. Further studies incorporating different types of stimulants might broaden our understanding of withdrawal symptoms.

CONCLUSION

In summary, the AWQv2, developed with ten items and a two-subscale structure, was validated as a reliable measurement tool. Given the clinical need, this scale could significantly contribute to the effective clinical assessment and monitoring of patients with stimulant use disorders. We anticipate that the scale will stimulate further research, which might improve the quality of life for individuals with methamphetamine use disorder.

Ethical Approval: The Antalya Training and Research Hospital Ethics Committee granted approval for this study (date: 22.08.2022, number: 11/26).

Conflict of Interest: The author declare that they have no conflict of interest.

Informed Consent: Informed consent was obtained from all participants.

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