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Validation of the Persian version of the AWAER questionnaire (preventive warning of relapse – revised form) in methamphetamine users

Vahid Farnia[a], Nasrin Abdoli[a], Farnaz Radmehr[a,b], Mostafa Alikhani[a], Mehdi Moradinazar[c], Mansour Rezaei[d], Behrooz Behrooz[a], and Omron Davarinejad[a,b]

[a]Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran; [b]Clinical Research Development Center, Imam Khomeini and Mohammad Kermanshahi and Farabi Hospitals, Kermanshah University of Medical Sciences, Kermanshah, Iran; [c]Behavioral Disease Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran; [d]Social Development and Health Promotion Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran

ABSTRACT

Background: The present study was conducted to validate the Persian version of the AWAER questionnaire (Preventive Warning of Relapse – Revised Form) in methamphetamine users.

Method: The statistical population consisted of all the methamphetamine users referring to the addiction treatment centers of Kermanshah, Iran, and 388 people were selected by two-step random cluster sampling.

Result: The Cronbach's alpha coefficient for the AWARE questionnaire was 0.95, indicating the desired validity of the Persian form. Exploratory factor analysis with varimax rotation indicated three factors, namely depression, anxiety, and relapse, with a total variance explanation of 63.3%. Also, the correlation coefficient obtained between the extracted factors with each other and the entire items indicated a desirable structural validity. Given the elimination of three items, the Persian version of the questionnaire was finally obtained with 25 items and three factors. Test–retest reliability was 0.79 with a one-week interval. The correlation coefficient between the AWARE questionnaire and AWQ-V2 scores was obtained as 0.526 for determining the convergent validity ($P < .01$).

Conclusion: The Persian version of the AWARE questionnaire in methamphetamine users' community has a favorable validity and reliability and can therefore be used to assess the symptoms of advance warning of relapse in Persian-speaking methamphetamine users, such as those in Iran.

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AWARE (Advance Warning of Relapse); validity; reliability; factor analysis; methamphetamine

Introduction

Drug addiction is a psychiatric disorder with a persistent tendency to continue the use of drugs with harmful consequences. Today, methamphetamine use is common in the community, especially among the youth, as a major social problem (Adinoff et al., 2010; Chalabianloo et al., 2019). The phenomenon of addiction, its realities and the associated social problems have affected the Iranian society for many years (Gholamhossenian et al., 2018). As demonstrated by the results of a survey of 120 community appraisal projects in different cities from 2009 to 2012, addiction is ranked first among the priority problems of society with a prevalence of 0.16.4 (Malekinejad et al., 2015). At present, at least two million people in Iran use drugs and eight million family members of users are directly affected by its problems (Haghdoost et al., 2014). Moreover, recent studies suggest a significant reduction in the age of methamphetamine use, such that the youth can be considered among the most significant and vulnerable groups at risk (Alammehrjerdi et al., 2018; Sharifi et al., 2017).

In recent years, many studies have been conducted on various methods for the treatment of drug dependence (e.g., methadone maintenance treatment and detoxification), the duration of treatment and the various effects of the treatments (Wang et al., 2014). The main problem in the treatment of addicts, even those with a long period of being clean, is the high rate of relapse (Matheus-Roth et al., 2016). Also, leaving treatment and the re-use of drugs are associated with more serious consequences such as the likelihood of heavy drug use, more severe drug dependence, the use of different drugs, increased criminal behaviors, and the imposition of additional costs on healthcare networks (French et al., 2008; Pierce et al., 2017). Therefore, after rehabilitation and treatment, people addicted to methamphetamine often use again after a while. The issue of repeated relapse should therefore be considered in patients (Khazaee-Pool et al., 2016). These people are still confused after rehabilitation and are constantly tempted to return to their drug use. The re-use of methamphetamine is highly likely to occur in most of these cases (Yang et al., 2015).

Kelly et al. (2011) performed similar research to evaluate the psychometric properties of the AWARE Questionnaire (Advance WArning of RElapse). The study sample was comprised of 303 young alcoholics aged 18 to 24. The results indicated an acceptable internal consistency of the AWARE questionnaire. The results obtained from the present study in the exploratory factor analysis of a questionnaire with 25 questions were confirmed. Of the 28 items, three were removed. Accordingly, the present study results are in line

CONTACT Nasrin Abdoli Abdolinasrin511@yahoo.com Substance Abuse Prevention Research Center, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran

with those obtained from the research by Kelly et al. (2011). This indicates that cultural and regional issues are likely to be influential in how to fill out the questionnaire, and it is of high significance to formulate the questionnaires based on the specific features of every culture. In the study, a single-factor questionnaire was confirmed. This result is not consistent with the results of the present study. The reliability coefficient via the retesting method ranged from 0.74 to 0.89. In confirmatory factor analysis performed in Kelly's et al. research single-factor questionnaire was confirmed. Therefore, in general, the results from the study performed by Kelly et al. (2011) confirmed that the AWARE questionnaire is valid and has high formal reliability and convergence, and it can be used for timely diagnosis of substance use.

The likelihood of relapse in methamphetamine users is high, because the treatment methods used for addiction to stimuli have a high likelihood of failure throughout the whole world, including in Iran. Having a localized questionnaire for the detection of relapse is therefore crucial. Evaluating the psychometric indices of the AWAER questionnaire is necessary for evaluating and measuring relapse-related behaviors in methamphetamine users in Iran.

Methods

This descriptive, cross-sectional study was conducted on a statistical population consisting of all the methamphetamine users referring to addiction treatment centers in 2017.

In the confirmatory factor analysis, the minimum sample size is determined based on factors, not variables. The sample size recommended for the confirmatory factor analysis is approximately 200 for 10 factors (Browne & Cudeck, 1993; Kline, 2011). In this study, the sampling method was a two-step random cluster. Considering the exclusion and inclusion criteria, first, a list of addiction treatment centers in different districts (18 centers) was prepared, and 410 people were randomly selected from 5 centers, of these, 22 participants completed the questionnaires incompletely and finally 388 people were studied. Then, the researcher visited these centers and some psychiatric departments and provided explanations about the purpose of the study, the method of completing the questionnaire, the confidentiality of the data, and the ethical considerations of the research.

Inclusion and exclusion

The inclusion criteria consisted of the subjects' willingness to participate in the study, methamphetamine use for at least six months, and referral to addiction treatment centers for quitting, having reading literacy at least and fully answering the items in the questionnaire. The exclusion criteria consisted of the patients' unwillingness and lack of consent, their use of other drugs, alcohol consumption, and having acute/chronic psychological or physical diseases. Data were collected using the following tools:

1. The AWARE Questionnaire (Advance Warning of Relapse): This questionnaire was developed with 28 items by Miller and Harris in 2000 to assess relapse after outpatient treatment for alcohol use or drug dependence. The questionnaire is scored based on a 7-point Likert scale from 'Never' (score 1) to 'Always' (score 7) with a total score range of 28–196. The reliability of the questionnaire was measured by its developers using Cronbach's alpha coefficient ($\alpha = 0.90$) and its validity was reported as 0.80 (Kelly et al., 2011). First, after obtaining permission from the tool developers and receiving the original version, the questionnaire was translated into Persian by reverse translation. The questionnaire was then filled out by 30 people methamphetamine-dependent patients as a pilot, and any ambiguities in the items were identified and the questionnaire was prepared for the final application.

The researcher initially contacted Miller and Harris via e-mail to access the original version of the AWARE questionnaire. After receiving the questionnaire and obtaining permission to validate it in Iran, the following steps were taken:

Phase 1: Forward translation: the original English version of the questionnaire was translated into Persian by two official translators.

Phase 2: Incorporation: the two translated versions of the questionnaire were reviewed by the researchers, and then a preliminary agreed translation was obtained.

Phase 3: Backward translation: Persian translated version that was agreed upon in the previous step was translated into English by two fluent native speakers, and the finalized English version was prepared.

Phase 4: Comparison: to determine the formal validity, a Persian version of the formal questionnaire was prepared and was given to several experts to examine the items in terms of transparency, fluency, and comprehensibility, and compatibility with the cultural conditions of Iranian society.

In the present study, the majority of the items were the same and measured similar characteristics. On the other hand, a small number of the items needed to be corrected, and the rectifications were made in the Persian text. The experts corroborated that the mentioned questionnaire is formally a valid instrument.

Phase 5: To achieve a more accurate and unambiguous picture and feasibility to implement it in the original sample, a survey was performed on 30 people in the study population. In this pilot study, Cronbach's alpha for the whole item was obtained.

2. Amphetamine Withdrawal Questionnaire – Version 2 (AWQ-V2): The AWQ-V2 was developed by Manit Srisurapanont with 10 items. The questionnaire is scored based on a 5-point Likert scale from 'Not at all' (score 0) to 'Very much' (score 4) with a total score range of 0–40. The reliability of the questionnaire was calculated by its developers using Cronbach's alpha coefficient ($\alpha = 0.77$) and its validity was 0.79 (McGregor et al., 2005).

Data analysis

The reliability of the tool was investigated using internal consistency, Cronbach's alpha coefficient and test–retest. The validity of the questionnaire was measured through structural validity, exploratory and confirmatory analysis and the goodness of fit indices of the model, including X^2, degree of freedom, standardized root-mean-square residual, the goodness of fit index, the adjusted goodness of fit index, the normal fit

index and the relative fit index. Based on the common criteria, any model with a fit index higher than 0.9 is considered an acceptable model (Sobel, 1982). However, the cutoff point was taken as 0.95 for the fit indices. RMSEA values less than 0.05 indicate the acceptable fit of the model, between 0.05 and 0.08 indicate a relatively good fit, between 0.08 and 0.1 indicate a moderate fit and greater than 0.1 indicate a poor fit. Convergent validity was estimated using correlation coefficients. Data were analyzed in SPSS-25 and LISREL-8.7 software.

The fit of the analysis was evaluated in LISREL-8.7 software and the GFI, AGFI, CFI, NFI, SRMR, and RMSEA indices were 0.91, 0.90, 0.98, 0.97, 0.044, and 0.064, respectively, which indicate a highly desirable fit.

Results

The total number of subjects was 388 (including 215 women and 173 men) aged 16 to 74 years. The average and standard deviation (SD) of the subjects' age was 36.42 and 10.121, respectively (Table 1).

Table 2 presents the mean and variance of the scale after the removal of each item with a part-whole correlation. As shown, except for items 14, 20, and 25 (with reverse scoring), the correlation of each score with the total score was high, indicating the desirability of the research items. After reverse scoring the three said items (14, 20, and 25), the scale reliability increased to 0.96.

The total score of the AWQ-V2 was used to investigate the structural validity of the AWARE questionnaire. The results showed a significant relationship between the AWARE questionnaire and all of its three factors with methamphetamine withdrawal symptoms in the subjects (r = 0.526, $P = .05$). These results indicate the structural validity of the AWQ-V2. Cronbach's alpha coefficient was used to investigate the inner consistency of the AWARE questionnaire. The results of the study showed that the whole questionnaire and all its three factors had a good and significant consistency, and the Cronbach's alpha coefficient ranged from 0.59 to 0.86 for the AWARE questionnaire factors and was 0.95 for the entire tool.

In this study, the main component analysis, the Screen test and varimax orthogonal rotation were used to analyze the factors of the AWARE questionnaire. First, the adequacy of the sample size was investigated using the Kolmogorov–Smirnov test, the Kaiser–Meyer–Olkin test, and Bartlett's test of sphericity. KMO was 0.959, which was satisfactory, and Bartlett's test was also significant (Bts = 7502.52, $P < .001$). The minimum factor loading was used for the factor analysis. The results presented in Table 3 show that this tool consists of three main factors. Items 2, 4–13, 15, 17, 21, and 25 pertain to the first factor and items 18, 19, 22, 23, 27, and 28 to the second factor and items 14, 20, 24, and 26 pertain to the third factor. Items 1, 3, and 16 were omitted due to the low factor loading. Since three factors had eigenvalues higher than 1, the results of the parallel analysis were used to decide on the final number of factors. The parallel analysis results using Monte Carlo software confirmed the existence of three factors. The amount of variance explained was 48.66%, 6.83%, and 8.09% for the first, second, and third factors, and together, these factors explained 63.6% of the total variance. The screen plots were used to determine the number of factors. For this purpose, given the diagram slope, the factors identified in the diagram steep slope were considered as the main factors, the scree plot contributed to the identification of the three factors as the

Table 1. Demographic characteristics of the subjects.

Variables		Total N (%)	Female N (%)	Male N (%)	P-value
Age group	16–30	112(28.86)	59(27.4)	53(30.6)	0.62
	31–41	156(40.20)	91(42.3)	65(37.6)	
	41<	120(30.92)	65(30.2)	55(31.8)	
Education	Under diploma	73(18.5)	46(21.4)	27(15.6)	0.13
	diploma	281(72.4)	147(68.4)	134(77.5)	
	Above diploma	34(8.8)	22(10.2)	12(6.9)	
Marital status	Single	95(24.7)	53(24.7)	42(24.34)	0.06
	Married	232(59/79)	120(55.8)	112(64.7)	
	Divorced/Widow	61(15.72)	42(19.5)	19(11.5)	
Addiction history	yes	176(45.36)	100(66.5)	76(43.9)	0.61
	no	212(54.63)	115(53.5)	97(56.1)	
Age of addiction	> 15	17(4.38)	10(4.7)	7(4.0)	0.81
	16–20	65(16.75)	33(15.3)	32(18.5)	
	21–30	173(44.5)	95(44.2)	78(45.1)	
	31–40	88(22.68)	53(24.7)	35(20.2)	
	41–51	45(11.59)	24(11.2)	21(12.1)	
Initial experience	Friends	278(71.6)	157(73.0)	121(69.9)	0.50
	Family	110(28.4)	58(27.0)	52(30.1)	
Get consuling	yes	160(41.23)	89(41.4)	71(41.0)	0.94
	no	228(58.76)	126(58.6)	102(59.0)	
History of family drug use	yes	176(30.7)	100(46.5)	76(43.9)	0.53
	no	212 (69.3)	115(53.5)	97(56.1)	

Table 2. Describe the profile of the research questionnaire.

Questions	*Average Scale by Removing Question*	*Scale variance by removing the question*	*Correction corrected*	*Cronbach Alpha by Removing Question*
1-I feel nervous or unsure of my ability to stay sober.	111.83	1459.235	.693	.948
2-I have many problems in my life.	111.00	1466.922	.724	.948
3-I tend to overreact or act impulsively.	111.96	1438.791	.763	.947
4-I keep to myself and feel lonely.	111.98	1435.341	.769	.947
5-I get too focused on one area of my life.	111.88	1478.949	.560	.949
6-I feel blue, down, listless or Depressed.	111.13	1439.361	.800	.947
7-I engage in wishful thinking.	111.33	1449.524	.745	.948
8-The plans that I make succeed.	111.21	1484.959	.600	.949
9-I have trouble concentrating and prefer to dream about how things could be.	111.57	1438.674	.767	.947
10-Things don't work out well for me.	111.39	1451.852	.746	.948
11-I feel confused.	111.52	1434.793	.815	.947
12-I get irritated or annoyed with my friends.	112.04	1437.720	.783	.947
13-I feel angry or frustrated.	112.00	1442.509	.762	.947
14-I have good eating habits.	111.95	1568.891	.002	.955
15-I feel trapped and stuck, like there is no way out.	111.90	1435.298	.733	.948
16-I have trouble sleeping.	111.62	1447.875	.678	.948
17-I have long periods of serious Depression.	111.66	1431.429	.783	.947
18-I don't really care what happens.	112.34	1453.409	.674	.948
19-I feel like things are so bad that I might as well drink.	112.21	1435.268	.757	.947
20-I am able to think clearly.	111.36	1564.824	.029	.954
21-I feel sorry for myself.	111.36	1449.043	.690	.948
22-I think about drinking.	112.13	1433.301	.726	.948
23-I lie to other people.	112.86	1468.900	.624	.949
24-I feel hopeful and confident.	111.76	1573.118	.026	.955
25-I feel angry at the world in general.	112.04	1458.469	.650	.949
26-I am doing things to stay sober.	111.26	1553.269	.102	.953
27-I am afraid that I am losing my mind.	112.32	1441.245	.755	.947
28-I am drinking out of control.	112.32	1455.680	.625	.949

components of the AWAER questionnaire. Accordingly, the screen plot below illustrates the distinction between the three factors relative to the rest and followed by the third factor, the remaining factors are almost in the same slope (Figure 1).Thus, the items (2, 4, 5, 6, 7,8,9,10,11,12,13,15,17,21,25) were loaded on factor 1 (i.e. Depression); the items (18,19,22,23,27,28) were loaded on factor 2 (i.e. Relapse); the items (14, 20, 24,26) were loaded on factor 3 (i.e. Anxiety). The three factors explained 0.63.6 of the total variance (Figure 2).

The fit of the analysis was evaluated in LISREL-8.8 software and the GFI, AGFI, CFI, NFI, SRMR, and RMSEA indices were 0.91, 0.90, 0.98, 0.97, 0.044, and 0.064, respectively, indicating a highly desirable fit (Table 4).

Discussion

The present study was conducted to validate the Persian version of the AWAER questionnaire in methamphetamine users. Based on the analysis of the main components and varimax orthogonal rotation according to the factor matrix, parallel analysis, gradient chart, and explained variance percentage from the total of 25 remaining items, three factors were extracted, which explained 63.6% of the total variance of all the variables, 48.66% of the variance of the first factor, 6.83% of the variance of the second factor and 8.09% of the variance of the third factor, indicating that the questionnaire has adequate and favorable reliability and validity. The factors obtained in this study are consistent with the results of studies by Kelly et al. (Miller et al., 1996).

The factor matrix showed that the first factor had the highest factor loading and the largest share as well. The first factor has a strong correlation with 15 items and indicates depression. Depression is one of the most common psychiatric disorders that is associated with a combination of sadness, loneliness, worthlessness, hopelessness, avoidance of social relationships, sleep disorders, suicide, and even psychotic symptoms. It had the highest lifetime prevalence of about 17% among all psychological problems Desrosiers et al. (Desrosiers et al., 2013). Although depression is one of the most common and recent psychiatric disorders comorbid with addiction and disorders related (Harrell and Karim, 2008), some studies have considered depression one of the causes of inclination to use and also one of the effects and consequences of use Kessler et al. (1996).

The second factor has a correlation with six items and indicates anxiety. Anxiety is the response to an unknown, intrinsic, obscure, unpleasant, and inclusive threat that is often associated with symptoms such as headache, sweating, palpitations, and chest pain (Sadock et al., 2015). Anxiety is a mediator in the process of addiction and relapse. Anxiety-creating life events can be predictors of the heavy use of cocaine and other drugs (Garland et al., 2011). Anxiety can also

Table 3. Matrix Element.

	Rotational element matrix			
		Factor		
Element matrix	each question eigenvalue)SD(	*1*	*2*	*3*
1	1.5303 ± 0455	.515	.492	
2	1.4586 ±.0325	.678		
3	1.4004 ±.0275	.540	.592	
4	1.3496 ±.0245	.657		
5	1.3026 ±.0225	.542		
6	1.2571 ±.0225	.781		
7	1.2163 ±.0202	.790		
8	1.1787 ±.0158	.714		
9	1.1408 ±.0189	.739		
10	1.1110 ±.0160	.765		
11	1.0831 ±.0135	.807		
12	1.0491 ±.0171	.648		
13	1.0243 ±.0149	.644		
14	0.9933 ±.0174			.843
15	0.9641 ±.0181	.603	.554	
16	0.9361 ±.0144	.489		
17	0.9073 ±.0142	.643		
18	0.8845 ±.0170		.627	
19	0.8551 ±.0155		.747	
20	0.8251 ±.0165			.744
21	0.7931 ±.0166			
22	0.7675 ±.0188		.766	
23	0.7389 ±.0155		.766	
24	0.7128 ±.0179			.800
25	0.6800 ± 0172	.591		
26	0.6513 ±.0187			.665
27	0.6184 ±.0179	.52		.610
28	0.5708 ±.0241			.695

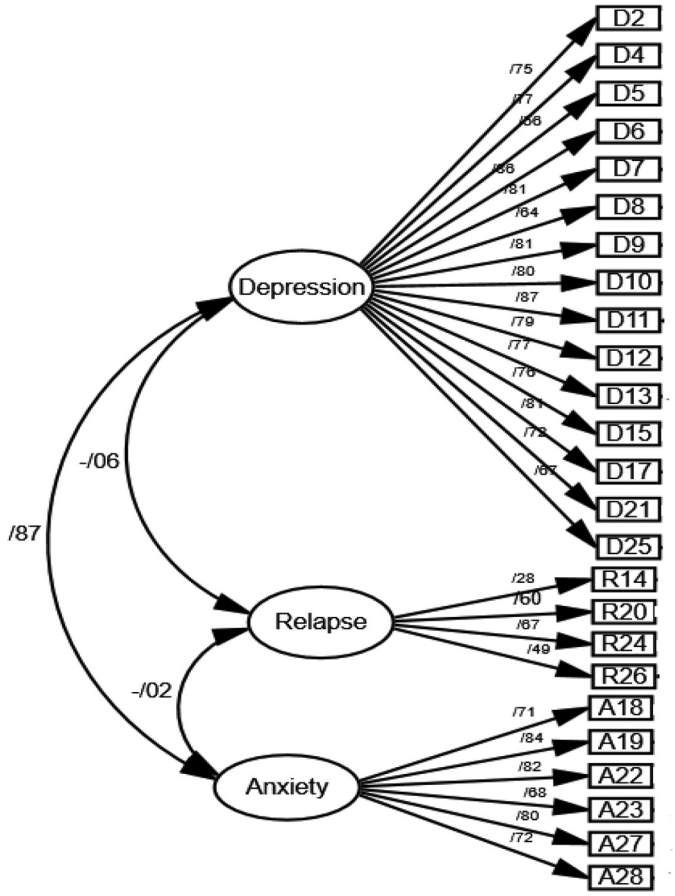

Figure 2. Of path coefficient mapping of Factor Factor Verification Form Farsi Questionnaire.

stimulate craving and relapse in rehabilitating people, as animal studies indicate that anxiety causes increased drug-seeking behavior in mice (Banna et al., 2010).

The third factor has a correlation with three items and indicates use relapse. The main feature of addictive behaviors is their relapsing nature (Arnold et al., 2002). Use relapse has many causes, the most common of which are psychological Sadock et al. (2015) Examining the factors affecting the relapse of alcohol consumption revealed four causes, including unpleasant life events, cognitive assessment, disease adaptation resources, and mood status (Miller et al., 1996), which appear to be associated with relapse in addiction to other substances as well. The results of this study therefore showed that the AWARE questionnaire as a whole and all its three factors have a desirable and significant consistency, and the Cronbach's alpha

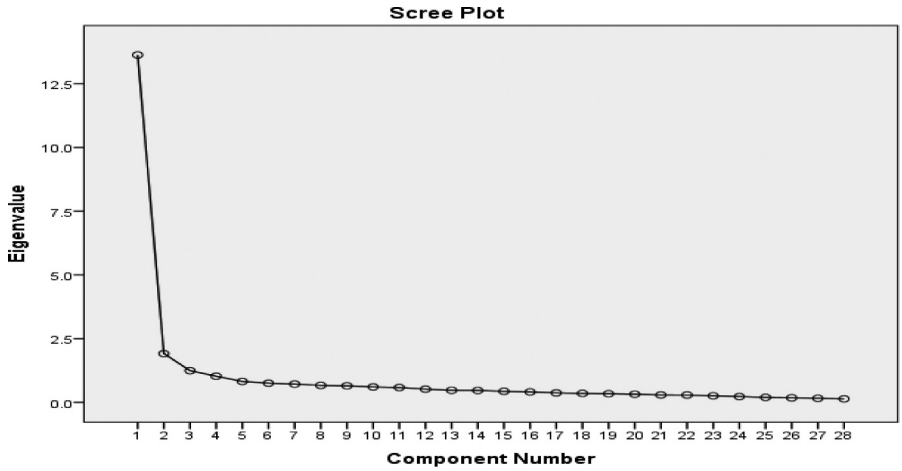

Figure 1. The scree plot showing the eigenvalues of the pattern based on the items for determining the factor weighting pattern of the AWARE questionnaire items.

Table 4. Evaluation of confirmatory factor analysis indicators.

Statistical title	X^2	X^2/Df	Df	RMSEA	GFI	AGFI	CFI	NFI	SRMR
Desired limit				0.08≤	0.9≥	0.9≥	0.9≥	0.90	<0.05
Estimate	779.96	3.13	249	0.074	0.89	0.87	0.97	0.96	0.046
Estimate dafter correction	639.71	2.60	246	0.064	0.91	0.90	0.98	0.97	0.044

coefficient for the whole tool was estimated to be 0.95. This finding was in line with the results of a study by Adinoff et al. (2010) who showed that the AWARE questionnaire is one of the best tools for assessing the pathology of relapse to drug and alcohol use that has a positive correlation with diagnostic and convergent validity based on clinical classifications (Adinoff et al., 2010). The results also showed a moderate and significant correlation between the AWARE questionnaire and its triple factors with the total score of AWQ-V2, which shows that all the factors measure one construct; these results are consistent with the findings of Kelly et al. (2011) and Pashaei et al. (2013).

Adinoff et al. showed that the Time to Relapse Questionnaire (TRQ) was able to classify relapse among drug addicts with a high validity in three time groups, including sudden relapse, early relapse, and late relapse. In Iran (Khazaee-Pool et al., 2018, 2016). Pashaei et al. (2013) showed that the TRQ has an acceptable validity, but unlike the present study, which focuses on a specific group of addicts, i.e., methamphetamine users, Adinoff et al. (2010) and Pashaei et al. (2013) examined the time of relapse in users of different drugs. Focusing on people who use one type of drug helps determine the advance warnings of relapse specific to each substance and use suitable interventions for preventing repeated relapse (Khazaee-Pool et al., 2016).

Conclusion

Considering the objectives of the localized Persian version of the AWARE questionnaire, it can be used for Persian-speaking populations, such as people living in Iran. It can also be used in addiction treatment centers for methamphetamine users to increase the accuracy of treatment and ensure the timely diagnosis of relapse symptoms. The strengths of this study include its focus on methamphetamine users and its acceptable sample size and the fact that it is applicable to both male and female groups. The limitations of the study include it being conducted in methamphetamine user, which means that its results cannot be generalized to the community of users of other substances. This study is therefore recommended to be conducted among users of other substances.

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ORCID

Vahid Farnia http://orcid.org/0000-0003-0666-453X
Mostafa Alikhani http://orcid.org/0000-0001-6848-3027
Omron Davarinejad http://orcid.org/0000-0002-4267-7867

Declaration of interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the paper.

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