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Original Paper

Psychometric Properties of 20-Item and 10-Item Persian Versions of Drug Abuse Screening Test

Saghar Fatemi[1, 2], Robabeh Soleimani[2, 3*], Mohammad Ali Yazdanipour[4], Mohammad Hassan Novin[4], Elahe Abdollahi[2, 6]

1. Psychiatry Resident, Kavosh Cognitive Behavior Sciences and Addiction Research Center, Guilan University of Medical Sciences, Rasht, Iran.
2. Department of Psychiatry, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.
3. Professor, Kavosh Cognitive Behavior Sciences and Addiction Research Center, Guilan University of Medical Sciences, Rasht, Iran.
4. Biostatistics (MSc), Neuroscience Research Center, Guilan University of Medical Sciences, Rasht, Iran.
5. PhD in Addiction Studies, Department of Psychiatry, Guilan University of Medical Sciences, Rasht, Iran.
6. Assistant Professor, Kavosh Cognitive Behavior Sciences and Addiction Research Center, Guilan University of Medical Sciences, Rasht, Iran.

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ABSTRACT

Introduction: Substance use disorder is one of the most critical social problems in Iran. For this disorder, weneed a proper assessment tool based on our indigenous culture.

Objective: This study assesses the factor structure and psychometric properties of 10-item and 20-item Persian versions of Drug Abuse Screening Tests (DAST-10 and DAST-20).

Materials and Methods: In this cross-sectional study, we randomly selected 200 participants referred to addiction treatment centers in Rasht City, Iran. After translation to Persian and back-translation to English, the face and content validity of DAST-10 and DAST-20 Persian versions were evaluated using the opinions of a panel of expertsand calculatingthe content validity ratio and content validity index. Then, the construct validity was evaluated by Confirmatory Factor Analysis(CFA), the Cronbach α coefficient was used for assessing internal consistency, and the Intraclass Correlation Coefficient (ICC) was used for assessing test-retest reliability.

Results: The Mean±SD age of participants was 39.02±11.67 years. The majority (50%) were in the age range of 30-50 years. Based on the CFA fit indices, the two instruments had a good fit to the data, confirming the theoretical model Root Mean Square Error of Approximation (RMSEA) (RMSEA for DAST-20=0.080; RMSEA for DAST-10=0.055). The Cronbach α values of DAST-20 and DAST-10 were 0.772 and 0.749, respectively, indicating their good and acceptable internal consistency. Their test-retest reliability was reported at 0.997 and 0.995 based on the results of ICC, respectively. There was a strong and significant positive correlation between the scores of Persian DAST-20 and DAST-10 (r=0.851, P=0.001).

Conclusion: The DAST-20 and DAST-10 Persian versions which after correcting the model using confirmatory factor analysis, they were studies in DAST-8 and DAST-16 have good validity and reliability and can be used for screening the possible involvement of drugs in Iranian samples.

*** Corresponding Author:**
RobabehSoleimani, Professor.
Address: *Department of Psychiatry, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.*
Tel: *+98 (911) 1362747*
E-mail: *soleimani.dr@gmail.com*

Highlights

- Substance use disorders are one of the most critical social problems in Iran.
- Using a valid tool based on our indigenous culture to identify substance use disorders in Iran is necessary.
- The fit indices of the DAST-20 and DAST-10 Persian versions confirmed the theoretical model.
- Both DAST-20 and DAST-10 Persian versions had good and acceptable internal consistency.
- Both DAST-20 and DAST-10 Persian versions had excellent test-retest reliability.

Plain Language Summary

Drug addiction has become a global problem. For screening, diagnosis, and evaluation of Drug Addiction in Iran, one of the areas highly considered by researchers, there is no standard tool. The Drug Abuse Screening Test (DAST) is an internationally recognized tool for identifying people with drug addiction. Through self-reporting, this tool can be effective in the screening process of outpatients referred to psychiatric centers and play a role in quickly identifying individuals and referring them to clinics to receive appropriate treatments. This study aimed to assess the psychometric properties of 10-item and 20-item Persian versions of DAST. Based on the results, both questionnaires had good validity and reliability and can be used for screening the possible involvement of drugs in Iranian samples.

Introduction

Substance Use Disorder (SUD) is one of the most critical social harms and issues with an increasing prevalence among people regardless of age, gender, occupation, and social class [1]. This disorder begins with a positive attitude toward drugs. The cognitive element of SUD emphasizes the latent mental processes described by various terms such as tendencies, expectations, beliefs, attitudes, and schemas [2]. SUD is a chronic recurrence disorder associated with impulsive drug-seeking behaviors, despite its negative consequences. Various psychological variables have been identified as factors of vulnerability, persistence, aggravation, and the cause of craving and recurrence in this disorder [3].Iran has many drug addicts relative to its population [4], where SUD is the third social problem after unemployment and high prices. The attention to the issue of SUD in Iran has been growing in recent years. The prevalence of SUD in different provinces of Iran varies from 5.2% to 17%.The highest frequency is seen in the age group of 25-35 years, and about 60-70% of addicts are illiterate or low-literate people [5].

Damages caused by SUD expose the users and their family members to stressful situations and a high risk of psychological disorders [4]. Therefore, the issue of drug addiction has become a global problem [3]. Sociologists believe this issue, along with natural disasters, diseases, and war, is among the four fundamental issues of today's world and human society, challenging different societies and people [6]. Development of scales, questionnaires, checklists, and various assessment tools for screening, diagnosis, and evaluation of SUD are considered basic measures [7]. Reliability and validity of the assessment tool ensure researchers and readers about the validity of research findings. In this regard, the necessity and importance of providing sufficient information about the validity and reliability of the used tools have been mainly recommended [8, 9]. The Drug Abuse Screening Test (DAST) is an internationally recognized tool for identifying people with SUD [10-12]. Through self-reporting, this tool can be effective in the screening process of outpatients referred to psychiatric centers [13]. The tool can play a significant role in preventing drug addiction by identifying individuals and referring them to receive treatment.

For screening, diagnosis, and evaluation of the harms of SUD in Iran, one of the areas highly considered by researchers, there is no standard tool. It is a necessity to use a valid tool that is also based on the indigenous culture of the target groups. For this purpose, we should present evidence that shows the validity of the tool as well as its reliability. The scores of an unreliable test cannot help the examiner decide whether to accept or reject participants in a training course [14].

Also, given no study on assessing the psychometric properties of 10-item DAST (DAST-10) and 20-item DAST (DAST-20) Persian versions, we decided to assess the factor structure and psychometric properties of the Persian versions of these tools.

Materials and Methods

This research is a cross-sectional study. The study population consisted of all people referred to hospitals in Rasht City, Iran, for treatment. Of whom, we selected those who had consented to participate in the study, were literate, and had one year passed since their first visit to the treatment centers. The minimum acceptable sample size for factor analysis of the two tests is 180 [15]. By considering a 10% dropout, the sample size was increased to 200. The participants were selected from each treatment center using a random sampling method depending on the proportion of patients (10%) per month.

Data collection tools comprised a demographic form (with 6 questions), the DAST-10, and DAST-20. Skinner designed the DAST in 1982 to screen the possible involvement with drugs [16]. After obtaining permission from the author of the original version and based on the method suggested by Wild et al. [17], the DAST tools were translated to Persian by two freelance Persian-speaking translators simultaneously. Then, they were translated back to English by two other experts. After the final editing, the Persian versions were prepared by the researcher. The tools' content validity was assessed qualitatively and quantitatively. For qualitative assessment (face validity), the questionnaires were sent to the professors of Addiction Studies in the Department of Psychiatry, Guilan University of Medical Sciences, to confirm the validity of questionnaires. After modifications based on their opinions, the content validity index (CVI) and content validity ratio (CVR) were calculated. The questionnaires were sent to 20 professors of Psychiatry at Guilan University of Medical Sciences to assess the difficulty, relevance, and clarity of the questions. The CVR of all questions was above 0.79, indicating acceptable content validity according to the Laws he method. Hence, no question was removed. The final versions of two questionnaires were distributed among 200 participants.

After collecting data, they were analyzed in SPSS v. 26 software. LISREL 8.8 was used to perform the confirmatory factor analysis (CFA) and assess the fit of the measurement model. Considering that the theoretical model has been approved with a single factor in various studies [12, 13], only the CFA of the single-factor theoretical model was performed in this study. The Kolmogorov-Smirnov test evaluated the normality of distribution in questionnaire scores, where the results and the stem-and-leaf plot and Q-Q plot showed that the data distribution was not normal. Therefore, the robust maximum likelihood, absolute index, comparative index, and parsimonious index were used for CFA. To evaluate the internal consistency of the questionnaires, the Cronbach α coefficient was used, and test-retest reliability and Intra class Correlation Coefficient (ICC) were used to determine the reproducibility of the questionnaires. For test-retest reliability with a 10-day interval, the questionnaires were completed by 30 participants. The Spearman correlation test was used to evaluate the correlation between the scores of the two questionnaires. The significance level of the statistical tests was considered $P<0.05$.

Results

The Mean±SD age of participants was 39.02±11.67 years (range: 18-65 years). The majority (50%) of them were in the age range of 30-50 years, were male (91%), had undergraduate education (56.5%), employed (69.5%), and married (47%). The highest percentages in choosing “yes” in the Persian DAST-20 were 90%, 89.45%, and 86% related to items 19, 20, and 9, respectively. The lowest percentages were 29%, 36.5%, and 37.5% belonged to items 18, 2, and 1, respectively. The highest percentages in choosing “yes” in the Persian DAST-10 were 84.50% and 79.50% related to items 6 and 5, respectively. The lowest percentages were 27%, and 37.5% belonged to items 10 and 1, respectively.

Regarding CFA of the DAST-20 Persian version, after removing items 1, 2, 18, and 20 (due to having t values between 1.98 and -1.98), 16 questions remained (Table 1). For the same reason, items 1 and 10 were omitted in the DAST-10 Persian version. Therefore, they were abbreviated as DAST-16 and DAST-8.In the DAST-16 Persian version, based on the results of CFA, the highest factor load was related to items 14 (Have you gotten into fights when under the influence of drugs?) and 16 (Have you been arrested for possession of illegal drugs?) (Figure 1). In the DAST-8 Persian version,the highest factor load was related to items 7 (Have you neglected your family because of your use of drugs?) and 8 (Have you engaged in illegal activities in order to obtain drugs?) (Figure 2, Table 2).The fit indices of DAST-16 and DAST-8 showed that the one-factor model had an acceptable fit (Table 3).

Table 1. Factor loads of items in the DAST-16 Persian version based on confirmatory factor analysis

Items	Factor Load	t	R^2
3- Do you abuse more than one drug at a time?	0.31	2.94	0.097
4- Can you get through the week without using drugs?	0.27-	2.80-	0.071
5- Are you always able to stop using drugs when you want to?	0.18-	2.06-	0.031
6- Have you had memory impairment or memory loss due to drug use?	0.45	3.65	0.21
7- Do you ever feel bad or guilty about your drug abuse?	0.42	3.55	0.18
8- Does your spouse (or parents) ever complain about your involvement with drug?	0.50	3.76	0.25
9- Has drug abuse ever created problems between you and your spouse or your parents?	0.49	3.75	0.24
10- Have you lost friends because of your use of drugs?	0.64	4.02	0.40
11- Have you neglected your family because of your use of drugs?	0.58	3.94	0.34
12- Have you been in trouble at work or school because of drug abuse?	0.60	3.97	0.36
13- Have you lost a job because of drug abuse?	0.39	3.44	0.15
14- Have you gotten into fights when under the influence of drugs?	0.75	4.15	0.56
15- Have you engaged in illegal activities in order to obtain drugs?	0.62	3.99	0.38
16- Have you-been arrested for possession of illegal drugs?	0.68	4.06	0.46
17- Have you ever experienced withdrawal symptoms when you stopped taking drugs?	0.50	3.74	0.25
19- Have you gone to anyone for help for a drug problem?	0.36	3.27	0.13

The Cronbach α coefficients of DAST-16 and DAST-8 were 0.772 and 0.749, respectively, indicating good and acceptable internal consistency. Moreover, both questionnaires had excellent test-retest reliability and ICC. The ICC value of DAST-16 was reported to be 0.997 with a confidence interval (CI) of 0.99-0.998 and P<0.001. Its test-retest reliability was equal to 0.997. The ICC value for DAST-8 was 0.995 with a confidence interval of 0.989-0.998 and P=0.001. Its test-retest reliability was 0.987. The Mean±SD score of DAST-16 (from 0 to 20) was reported as 11.04±3.41 (95% CI; 10.56-11.51).This score had a median value of 12 and a mid-quartile range of 8.5-14. The score ranged from 2 to 16.

Table 2. Factor loads of items in the DAST-8 Persian version

Items	Factor Load	t	R^2
1- Do you abuse more than one drug at a time?	0.26	3.01	0.066
2- Are you unable to stop abusing drugs when you want to?	-0.11	-1.98	0.012
3- Have you ever had “blackouts” or “flashbacks” as a result of drug use?	0.50	6.13	0.25
4- Do you ever feel bad or guilty about your drug use?	0.42	5.01	0.17
5- Does your spouse (or parents) ever complain about your involvement with drug?	0.45	5.45	0.20
6- Have you neglected your family because of your use of drugs?	0.69	8.47	0.48
8- Have you engaged in illegal activities in order to obtain drugs?	0.56	6.90	0.31
9- Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?	0.34	4.09	0.12

Table 3. Fit indices of the two questionnaires

Questionnaire	RMSEA	CFI	AGFI	GFI	χ^2/df
DAST-16	0.080	0.94	0.82	0.90	1.47
DAST-8	0.055	0.96	0.93	0.97	1.62

Abbreviations: DAST, drug abuse screening test; GFI, the goodness of fit index; AGFI, adjusted goodness of fit index; CFI, comparative fit index; RMSEA, root mean square error of approximation

Table 4. Descriptive statistics of the two questionnaires

Questionnaire	Mean±SD	Median	Mid-Quartile Range	Min	Max	95% CI	
						Lower Bound	Upper Bound
DAST-16 (0-20)	11.04±3.41	12.00	(8.5,14.0)	2.00	16.00	10.56	11.51
DAST-8 (0-10)	5.27±1.86	6.00	(4.0,7.0)	0.00	8.00	5.01	5.52

Abbreviation: DAST, drug abuse screening test

The Mean±SD score of DAST-8 (from 0 to 8) was 5.27±1.86 (95% CI; 5.01-5.52). This score had a median of 6 and a mid-quartile range of 4-7. The score ranged from 0 to 8 (Table 4). Based on the Spearman correlation test results, a significant positive relationship was observed between the scores of DAST-16 and DAST-8 (r=0.851, P<0.001).

Discussion

In this study, according to the CFA results, the highest factor load in the DAST-16 Persian version was related to items 14 (Have you gotten into fights when under the influence of drugs?) and 16 (Have you been arrested for

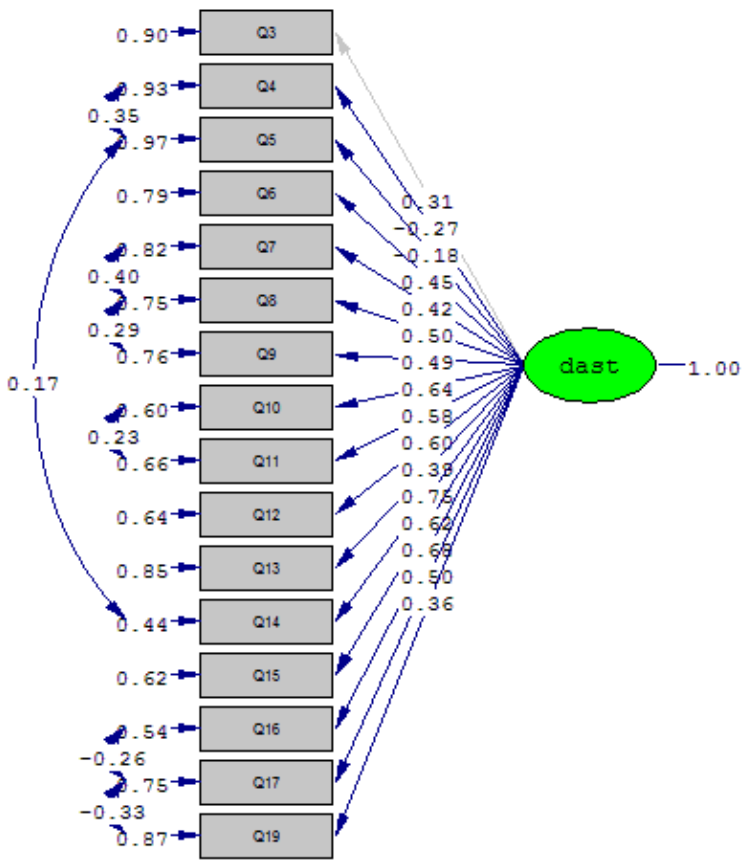

Figure 1. Confirmatory factor analysis model of the Persian DAST-16

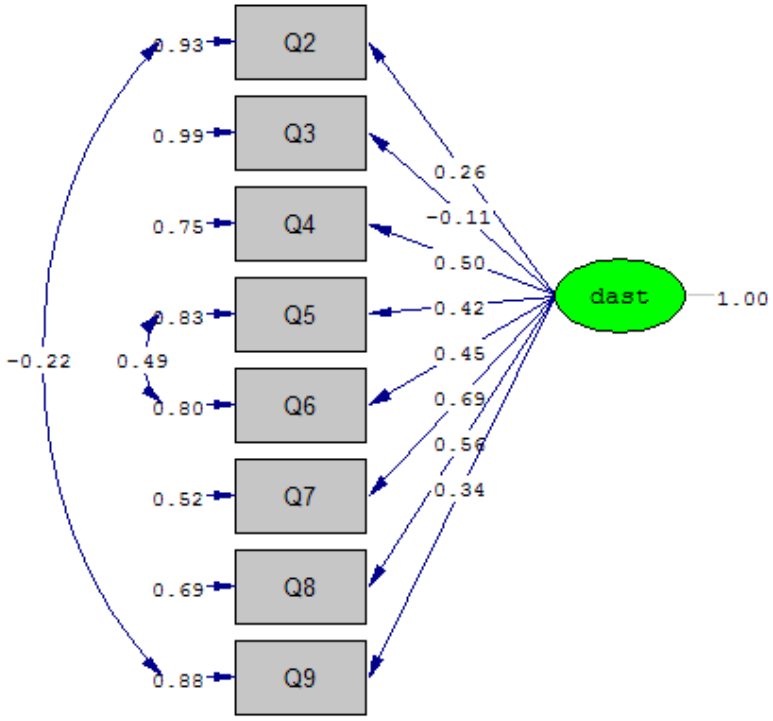

Figure 2. Confirmatory factor analysis model of the Persian DAST-8

possession of illegal drugs?). This factor indicates the role of SUD on interpersonal dysfunction. These findings are consistent with similar studies conducted in Korea, Turkey, and Spain [10, 11, 18]. The highest factor load in the DAST-8 Persian version was related to items 7 (Have you neglected your family because of your use of drugs?) and 8 (Have you engaged in illegal activities to obtain drugs?). This finding is consistent with the results of Shirinbayan et al. [9] with the difference that in their study, item 9 also had the highest factor load. In another similar study conducted in Turkey, item 7 had the highest factor loading, followed by items 9, 1, and 6 [11]. The difference in the highest factor loading of other items can be due to cultural differences.

The single-factor models of the DAST-16 and DAS-8 Persian versions had an acceptable fit to the data, which confirms the theoretical model. These findings are consistent with similar studies conducted in Mexico, the USA, Korea, Turkey, and Spain [10, 18, 20, 21] but are against the results of a study conducted in India [22]. The Cronbach α coefficients of DAST-16 and DAST-8 were above 0.7, indicating their good internal consistency. The Cronbach α coefficient of DAST-10 in the studies conducted in India (α=0.94), the USA (α=0.86), and Spain (α=0.94) and the coefficient of DAST-20 in a study in Turkey (α=0.87) also indicated their good internal consistency [10, 11, 21, 22]. Furthermore, the results showed high test-retest reliability and ICC values for two questionnaires. This finding is consistent with the results of a study conducted by Koko et al. on 40 participants. They reported a good ICC value for the DAST-10 and an excellent ICC value for the DAST-20 [21]. Our results reported that a significant positive relationship was observed between the scores of DAST-16 and DAST-8. This finding is consistent with a study conducted in Mexico [20]. The result indicates that the Persian DAST-8 can be an alternative to the Persian DAST-16, which takes less time to be completed due to having a lower number of questions.

The DAST-16 and DAST-8 Persian versions have acceptable validity and reliability and can be used for screening the possible involvement of drugs in Iranian samples. This study had some limitations, including different moods of participants while completing the questionnaires and a low number of female samples.

Ethical Considerations

Compliance with ethical guidelines

This study obtained ethical approval from the Ethics Committee of Guilan University of Medical Sciences (Code: IR.GUMS.1399.144). Informed written consent was obtained from all participants after describing the study objectives. They were free toleave the study at any time.

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Authors' contributions

Conceptualization, data analysis, and interpretation of data: SagharFatemi, RobabehSoleimani, and Mohammad Ali Yazdanipour; Writing original draft and sampling: SagharFatemi, RobabehSoleimani, Mohammad Hassan Novin, and ElaheAbdollahi; Reviewand final approval: All authors.

Conflict of interest

The authors declared no conflict of interest.

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