Assessing Reliability and Validity of Farsi Version of the Toronto Alexithymia Scale-20 in a Sample of Opioid Substance Use Disordered Patients

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Objective: The aim of this study was to investigate the reliability and validity of the Farsi version of the Toronto Alexithymia Scale-20 in a sample of opioid substance use disordered patients.
Methods: 321 substance dependent patients (287 male, 34 female) participated in this study. All of the participants were asked to complete the Farsi version of the Toronto Alexithymia Scale-20 (FTAS-20), the Emotional Intelligence Scale (EIS-41), and The Mental Health Inventory (MHI). In order to examine the internal consistency of the FTAS-20, Cronbach's alpha coefficients were calculated for the entire sample. Pearson's correlation coefficient was used to estimate the test-retest reliability of the alexithymia dimensions. To examine the concurrent validity of the FTAS-20, a series of zero-order correlations were conducted between the FTAS-20 subscales, emotional intelligence and mental health variables. Confirmatory Factor Analysis (CFA) was utilized to test the three-factor structure of the FTAS-20.
Results: The internal consistency, test-retest reliability, concurrent validity, and the three-factor structure of the Farsi version of the TAS-20 for substance users were supported by findings.
Conclusions: The factors found in the Farsi version of the TAS-20, are similar to the three factors found in a study conducted by Bagby, Parker and Taylor; the factors were accordingly labeled as Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF) and Externally-Oriented Thinking (EOT). The results provide evidence for applicability of the TAS-20 and its cross-cultural validity.
Keywords:
Affective symptoms, Emotions, Iran, Measures, Reliability, Reproducibility of results, Substance–related disorders

Alexithymia, first introduced by Sifneos, is a multifaceted construct and is characterized by a set of affective and cognitive deficits (1). The authors description of Alexithymia, include disability to identify and describe feelings, in a concrete and reality-based cognitive style; and an impoverished inner emotion and a poor imagination (2-4). Several studies have demonstrated relationships between alexithymia and various psychological disorders; including: posttraumatic stress disorder (5, 6); eating disorders (7, 8); somatization (9), panic disorder (10); depression (11, 12); and substance use disorders (13-19).
In a large survey of middle-aged Finnish males, Kauhanen, Julkunen, and Salonen discovered that alexitymia is associated with alcoholism (16). Kokkonen et al. also reported a positive relationship between alexithymia and alcohol dependence in a younger population sample (17). Handelsman et al. (14) found that drug and alcohol abusers scored significantly higher on TAS-20 than normative samples in a study conducted by Bagby, Taylor and Parker (13). Similarly, Haviland et al. diagnosed alexithymia in 42% of the hospitalized substance use disordered patients (both males and females)(15); Ziolowski, Gruss and Rybakowski found alexithymia in 48% of the male alcohol dependent outpatients (19). It seems

that alexithymia is relatively common in individuals with substance use disorders. However, in a recent clinical trial of outpatient cognitive-behavioral therapy for a sample of substance users, Cleland and colleagues reported that scores of the substance use disordered patients on the TAS-20, were similar to scores of undergraduate students and were significantly compared to psychiatric patients (20).
Considering the clinical importance of alexithymia, various self-report questionnaires have been developed for its measurement (13, 21-24). The 20-item Toronto Alexithymia Scale (TAS-20), the most commonly used and studied measure of alexithymia, has demonstrated adequate reliability and validity (22); and its three-factor structure has been replicated in many languages and cultures (10, 13, 22, 25-39). Nevertheless, only a two-factor structure was uncovered by several studies (15, 40-42). In general, it is reported that the first two factors, "Difficulty Identifying Feelings' and "Difficulty Describing Feelings" indicate good psychometric properties. However, the third factor "Externally-Oriented Thinking" appears to be less reliable (43-45).
TAS-20,that was used for Italian undergraduate students, has been recently validated and utilized in Farsi. (27). Nevertheless, its psychometric properties have not been examined on the population of substance

users. Therefore, the chief purpose of this study is to investigate the reliability and validity of the FTAS-20 in a sample of substance users. This study tended to examine the homogeneity of the FTAS-20 and its subscales, its internal consistency, and its concurrent validity and factor structure in an Iranian sample of substance users. This study also predicted that alexithymia may be associated with substance use problems. Providing a valid scale for the Iranian researchers to measure alexithymia in the population of substance users was the most prominent reason for conducting the study.

Material and Methods

Participants

Three hundred and Twenty one outpatients (287 male, 34 female) suffering from opioid substance dependence disorders, participated in this study. The study subjects were selected from a group of consecutive referrals to three addiction treatment centers in Tehran; including: Atieh (No.1) Addiction Treatment Center; Atieh (No.2) Addiction Treatment Center; and Baharan Addiction Treatment Center. The patients were evaluated using the DSM-IV-TR (49) criteria for substance dependence disorders. The mean age of the patients was 35.30 years (S.D.=9.19) raging from 18-60 years. In regards to educational level, 12.5% of the patients completed primary school, 31.7% completed secondary school, 37.5 had high school diploma, and 8.3% held higher degrees. In regards to marital status, 33.3% of the patients were single, 59.2% married, and 7.5% were divorced. In terms of economic status, 2.5% of the patients earned no income, 10.8% had low income, 73.3% had a moderate income, and 13.3% earned a high income.

Measures

The Toronto Alexithymia Scale

The Toronto Alexithymia Scale (TAS-20) is a 20-item self-report measure (22). Each item is rated on a five-point Likert scale ranging from 1 (strong disagreement) to 5 (strong agreement); these items are negatively keyed. Providing a total alexithymia score and three sub-scales, TAS20 evaluates the three factors of Difficulty Identifying Feelings, Difficulty Describing Feelings, and Externally Oriented Thinking. This scale has demonstrated excellent psychometric properties (34, 37, 46-50). Adequate psychometric properties of the scale have been reported for a sample of Iranian undergraduate students (FTAS-20).(27) It was found that alpha coefficients for the FTAS-20, Difficulty Identifying Feelings, Difficulty Describing Feelings and Externally-Oriented Thinking were 0.85, 0.82, 0.75 respectively and 0.72 for the total sample. The alpha coefficients were: 0.86,0.84,0.76 and 0.73 for females and 0.84,0.83,0.74 and 0.71 for males, respectively. The FTAS-20's total score was negatively correlated with Emotional Intelligence (r=-0.80, p<.001) and Psychological Well-being (r= -0.78, p<.001); however,

it was positively correlated with Psychological Distress (r=0.44, p<.001). All of the three FTAS-20 subscales were also significantly correlated with the Emotional Inteligence Scale-41 (EIS-41) and Mental Health Inventory (MHI) scores in the same directions. The results of the confirmatory factor analyses supported the three underlying factors: Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF), and Externally-Oriented Thinking (EOT) (27).

Emotional Intelligence Scale-41

The EIS-41 is a revised version of the 33-item emotional intelligence scale of Schutte et al. (51). which was devised by Austin et al (52). There have been reports of the scale's adequate psychometric properties and the three-factor structure including: Optimism/Mood Regulation, Utilisation of Emotions and Appraisal of Emotions (52). Besharat reported adequate psychometric properties of the scale for a sample of Iranian undergraduate students (53). Findings supported the internal consistency, test-retest reliability, concurrent validity, and factor structure of the Farsi version of the EIS-41. The alpha coefficient for the overall FEIS-41 was 0.89 and the internal reliabilities of scales derived for the three factors (Regulation of Emotions, Utilization of Emotions, Appraisal of Emotions) were 0.83, 0.78 and 0.81, respectively. Test-retest coefficient for the EIS-41 was 0.75; and test-retest coefficients for Regulation of Emotions, Utilization of Emotions and Appraisal of Emotions were 0.72, 0.69 and 0.71, respectively. The overall FEIS-41 score was negatively correlated with alexithymia (r=-0.57, P<0.001) and psychological distress (r=-0.47, P<0.001), and it was positively correlated with Psychological Well-being (r=0.79, P<0.001); the grade point average was (GPA; r=0.48, P<0.001). All of the three subscales of the FEIS-41 were also significantly correlated with the TAS-20, MHI, and GPA scores in the same directions. The results of exploratory factor analysis supported three underlying factors: Regulation of Emotions, Utilization of Emotions, and Appraisal of Emotions (53).

The Mental Health Inventory

The Mental Health Inventory (MHI) is a 38-item scale that provides two sub-scales of Psychological Well-Being and Psychological Distress (54). Psychological Well-Being is divided into two factors: General Positive Affect and Emotional Ties. Psychological Distress is divided into three factors: Anxiety, Depression, and Loss of Behavioral and Emotional Control. Satisfactory psychometric properties of the MHI have been reported (54,55). Adequate psychometric properties of the scale have been reported for both the patients and the Iranian normal samples (56). Test-retest reliability and internal consistency of the MHI were examined and were illustrated to be at satisfactory levels.

Table 1. Means, standard deviations, internal reliability coefficients (IRC), and mean interitem correlations (MIC) for the FTAS-20 for substance use disordered patients

Patients	Factor 1	Factor 2	Factor 3	FTAS-20
Men (n= 287)				
Mean	20.33	13.44	19.14	52.92
S.D.	7.49	4.13	6.71	18.18
IRC	0.79	0.74	0.72	0.84
MIC	0.38	0.36	0.22	0.24
Women (n= 34)				
Mean		18.91	12.70	17.93
S.D.		7.38	3.99	7.43
IRC		0.81	0.72	0.70
MIC		0.34	0.34	0.20
Total (n= 321)				
Mean		19.74	13.13	18.68
S.D.		7.46	4.08	6.61
IRC		0.80	0.73	0.71
MIC		0.36	0.35	0.21

FTAS-20= 20-item Farsi version of the Toronto Alexithymia Scale; Factor 1= Difficulty Identifying Feelings; Factor 2= Difficulty Describing Feelings; Factor 3= Externally-Oriented Thinking.

Table 2. Test-retest reliability of the FTAS-20 and its subscales for substance use disordered patients

N= 63	Mean (S.D.) at test 1	Mean (S.D.) at test 2	r*
DIF	19.09 (7.33)	19.20 (7.19)	.68
DDF	13.44 (4.54	12.60 (4.24)	.69
EOT	19.01 (6.29)	17.96 (6.25)	.62
FTAS-20	50.36 (16.87)	50.39 (17.00)	.79

* Pearson's Product-Moment Correlation Coefficient, all of the P values <.001; DIF= Difficulty Identifying Feelings; DDF= Difficulty Describing Feelings; EOT= Externally-Oriented Thinking; FTAS-20= 20-item Farsi version of the Toronto Alexithymia.

Test-retest coefficients for psychological well-being and psychological distress were 0.77 and 0.82 for the patient group, and 0.89 and 0.87 for the normal group respectively. The alpha coefficients for psychological well-being and psychological distress were 0.85 and 0.89 for patients and 0.91 and 0.89 for the normal group, respectively.

Concurrent validity of the MHI was calculated according to correlation coefficients between the scores on the MHI and the total score of the General Health Questionnaire (GHQ) (57,58). Psychological well-being was negatively correlated with GHQ (r=-0.85,P<0.001); psychological distress was positively correlated with GHQ (r= 0.86, P< 0.001) for the entire patient group and the normal group. The results also supported discriminant validity of the MHI (56).

Procedure

Subjects were selected from three outpatient clinics in Tehran. All of the participants were volunteers and completed the FTAS-20, EIS and the MHI individually. All of the measures were scored in a manner that higher scores represented higher levels of the variables. Therefore, higher scores on the alexithymia measures represented more alexithymic attitudes; and higher scores on psychological distress and psychological well-being indicated increased distress and well-being. Due to inaccurate responses, sixteen participants were excluded from the study. In terms of demographic and clinical characteristics, no significant difference was observed between the sub sample and the rest of the patients.

Results
Reliability
Table 1, separately, demonstrates the means, standard deviations, internal reliability coefficients, and the mean inter-item correlations of the FTAS-20 for males, females and the entire sample.

In order to examine the internal consistency of the Farsi version of the TAS-20, Cronbach's alpha coefficients were calculated for the entire sample. The alpha coefficients for TAS-20, DIF, DDF, and EOT were 0.83, 0.80, 0.73 and 0.71 for the total sample; 0.84, 0.79, 0.74 and 0.72 for males; and 0.82, 0.81, psychological well-being and psychological distress were 0.77 and 0.82 for the patient group, and 0.89 and 0.72 and 0.70 for females, respectively. These findings suggest that the Farsi version of the TAS-20 is internally consistent.

To examine the test-retest reliability of the Farsi version of the TAS-20, 63 patients (46 male, 17 female) completed the FTAS-20 two weeks after the first survey. Pearson correlation coefficients between the scale scores at time 1 and time 2 were calculated for the total participants, males and females separately. In this study, table 2 presents the test-retest reliability of the DIF, DDF, EOT, and the FTAS-20 total score. As shown in Table 2, test-retest coefficient for the FTAS-20 was 0.79; test-retest coefficients for the three subscales ranged from 0.62 to 0.69.

Validity
Correlations between FTAS-20, EIS and MHI Scores

To examine the relationship between the FTAS-20 (and its subscales) EIS and MHI variables, a series of zero-order correlations were conducted. Table 3 demonstrates the correlations of FTAS-20, EIS and MHI scores. The overall FTAS-20 score was significantly and negatively correlated with emotional intelligence (r= -0.79, P< .001) and psychological well-being (r= -0.73, P< .001); and it was significantly and positively correlated with psychological distress (r=0.55, P<.001). All of the three FTAS-20 subscales were also significantly correlated with the EIS and MHI scores in the same directions (see Table 3).

Factor Analysis of the FTAS-20

To test the construct validity of the Farsi version of the TAS-20, a principal components factor analysis was performed on the item responses from the total sample of 321 participants. Subsequently, an oblique rotation indicated that the three factors, accounting for 38.4% of the variance, should be retained. Table 4 lists the items with large pattern matrix elements. The factors found

n the Farsi version of the FTAS-20 are similar to the three factors found in previous studies (13,22,27,29, 30,37,38,47) and were accordingly labeled as Difficulty Identifying Feelings (DFI) with seven items; Difficulty Describing Feelings (DDF) covering five items; and Externally - Oriented Thinking (EOT) consisting of eight items. However, the subscales indicated five items (2,4,13,15,17) with factor loadings lower than 0.40, ranging from 0.30 to 0.38.

Discussion

This research attempted to explore the psychometric properties of the Farsi version of the TAS-20 in a sample of substance use disordered patients. The results of this study provide support for the reliability and validity of the Farsi version of the TAS-20 as a measure of alexithymia for substance use disordered patients. With respect to reliability, the results indicated that the full FTAS-20 and its three factors have adequate reliability and internal consistency for substance users. These findings were in line with previously reported research that utilized substance users (20). The overall alpha value of 0.83 obtained for FTAS-20 for this sample was also similar to those reported for clinical (13,16,19,20) and non-clinical populations (13,37,41) including an Iranian sample of undergraduate students (27).

The homogeneity of the full FTAS-20 and its factors was confirmed by the mean inter-item correlations, which tended to fall within the optimal range of 0.20 to 0.40 (47). The parameter estimating the relationships among the three factors, confirm that the factors reflected three separate, yet empirically related, facets of the alexithymia construct (59). The results also revealed that test-retest reliability was satisfactory for the FTAS-20 total score and the DIF, DDF and EOT subscales in this sample.

The concurrent validity of the FTAS-20 was investigated by the correlations between the FTAS-20 total score, and DIF, DDF and EOT scores with emotional intelligence, psychological well-being and psychological distress. Findings confirmed that the scores of the full FTAS-20 and its three factors were significantly related to increased report of emotional intelligence and mental health problems in a sample of

substance use disordered patients. Higher alexithymic measures were related to higher scores on psychological distress, and lower scores onpsychological well-being and emotional intelligence. The pattern of correlations is consistent with the results from previous studies (10-12,27,48,51)and it suggests that alexithymia, emotional intelligence and mental health measures should be regarded as distinct but related constructs. These results indicate that difficulty identifying, describing, and communicating feelings may increase the risk of substance use disorders.

Although it is possible that inhibition of emotions may increase the risk for substance use disorders, it is

Table 3. Pearson correlations of the FTAS-20 and its subscales scores with EI, PWB, and PD

	EI	PWB	PD
DIF	-0.65	-0.69	0.44
DDF	-0.73	-0.71	0.41
EOT	-0.60	-0.61	0.37
FTAS-20	-0.79	-0.73	0.55

* all P values <.001; DIF= Difficulty Identifying Feelings; DDF= Difficulty Describing Feelings; EOT= Externally-Oriented Thinking; FTAS-20= 20-item Farsi version of the Toronto Alexithymia; EIS= Emotional Intelligence Scale; PWB= Psychological Well-Being; PD= Psychological Distress.

Table 4. Factor loadings from exploratory analysis by item of the Farsi version of the TAS-20[a]

Factor 1		Factor 2		Factor 3	
Item	PME	Item	PME	Item	PME
6	0.71	4	0.67	15	0.60
9	0.67	2	0.62	8	0.57
3	0.63	17	0.60	10	0.44
1	0.60	11	0.53	19	0.41
13	0.55	12	0.42	5	0.35
14	0.43			20	0.33
7	0.38			18	0.31
				16	0.30

PME= pattern matrix element; Factor 1= Difficulty Identifying Feelings; Factor 2= Difficulty Describing Feelings; Factor 3= Externally-Oriented Thinking
a= The three factors explained 38.4% of the variance.
Items 4, 5, 10, 18, and 19 are negatively keyed.

equally plausible that people with more severe substance use disorders may simply restrict their emotional responses as a coping mechanism to prevent social problems. As suggested by Hendryx, Haviland, and Shaw, alexithymia could be considered as an attempt to blockade negative emotions which are associated with stress (60). Due to the study's correlational design, a large- prospective study should be carried out to determine whether alexithymic features contribute a unique variance to the prediction of substance dependence symptoms.

The results of the factor analyses provided support for the three underlying factors: Difficulty Identifying Feelings, Difficulty Describing Feelings, and Externally-Oriented Thinking. This is in accordance with a recent review of results from various cross-cultural studies (37). Nevertheless, in this study, several items in the FTAS-20 appeared to function in less than an optimal manner. For instance, items 5, 7, 16, 18, and 20 had nontrivial loading on the DIF and EOT factors. This may be related to methodological and cultural issues. Different models of factor analysis might yield different results as indicated by several studies (33, 42, 59). Cultural differences in the meanings given to certain TAS-20 items might be the reason for nontrivial loading of the five items. It may be feasible to refine or replace some of these items to provide an improved measure of alexithymia for the Iranian population.

The overall results of the current study provide support for the reliability, validity and the three-factor structure of the FTAS-20, utilizing the sample of substance use

disordered patients. Moreover, the study provides evidence for applicability of the TAS-20 and its cross-cultural validity. By finding a relationship between alexithymia and emotional intelligence; and between psychological well-being and psychological distress, this study raise the possibility that high alexithymia might be a predictive factor for substance use disorders.

Limitations such as sample size, sample type and measures call for further studies to examine more psychometric properties of the FTAS-20. The results need to be replicated in further studies., mainly due to the fact that the sample used in this study was restricted to substance dependent patients. It was also not possible to test the participants against the possible co morbid disorders. This puts more limits on generalizability of the present data. Psychometric properties of the FTAS-20 and its factor structure in different clinical and non-clinical populations have yet to be determined.

Despite a good agreement reported between TAS-20 scores and the observer ratings of alexithymia (13,61,62), a question could be raised about the adequacy of the FTAS-20 in assessing alexithymia as long as its criterion validity has not been firmly established. Valid judgment on the ability to identify, monitor and report emotional status may not be possible particularly for highly alexithymic patients (42,49).

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