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Original Article

Psychometric Characteristics of Persian Version of the Toronto Alexithymia Scale-20 in Clinical and Non-Clinical Samples

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Abstract

Background: Alexithymia as a cluster of cognitive and affective deficits has been studied for its ability to predict a variety of psychological disorders. Given its clinical importance, various self-report questionnaires have been developed to measure alexithymia. The aim of this study was to determine the psychometric characteristics of Persian version of the Toronto Alexithymia Scale-20 (FTAS-20) using confirmatory factor analysis.

Methods: 175 patients (102 women, 73 men) who met the DSM-IV-TR criteria for depressive, anxiety or obsessive-compulsive disorders, and 173 normal adults (99 women, 74 men) completed the FTAS-20.

Results: Findings supported the three-factor structure, internal consistency, test-retest reliability, and predictive validity of FTAS-20 in both clinical and non-clinical samples.

Conclusion: The three FTAS-20 subscales are useful to explore the distinct facets of the alexithymia construct.
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Keywords ● Alexithymia ● reliability ● validity ● factor analysis

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Introduction

A pattern of emotional deficits common in psychosomatic patients is termed "alexithymia" [1] Alexithymia is characterized by difficulty in identifying, describing, and expressing emotions; a paucity of fantasy life and a tendency to focus on the concrete details of external events.[2] Alexithymia was originally thought to be a characteristic of individuals experiencing psychosomatic problems,[3] but later its characteristics have come to be associated with a variety of psychiatric conditions,[4] as with the general population.[5]

Several studies have demonstrated relationships between alexithymia and various psychological disorders including post-traumatic stress disorder,[6,7] eating disorders,[8] somatization,[9] somatoform disorders,[10] panic disorder,[11] depression,[12,13] obsessive compulsive disorders (OCD),[14] and substance use disorders.[15]

Given its clinical importance, various self-report questionnaires have been developed to measure alexithymia.[15,16] The 20-item Toronto Alexithymia Scale (TAS-20),[16] as the most commonly-used and studied measure of alexithymia, has shown adequate reliability and validity, and its three-factor structure has been replicated in many languages and cultures.[15-25] However, there are several studies in which only a

two-factor structure was found.[15,26] Overall, the first two factors, "difficulty identifying feelings' (DIF) and "difficulty describing feelings" (DDF) show good psychometric properties, but the third factor, "externally-oriented thinking" (EOT) appears to be less reliable.[27]

The Persian version of the TAS-20 has recently been validated and used for a population of Iranian undergraduate students,[17] but its psychometric properties have not been examined for a clinical population. Therefore, the main objective of the present study was to investigate the reliability and factorial validity of the Persian version of the Toronto Alexithymia Scale-20 (FTAS-20) in a sample of psychiatric patients as well as a non-clinical sample. The present study sought to examine and compare the internal consistency, the homogeneity, and factor structure of the FTAS-20 in both samples. Our hypotheses were that alexithymia would be associated with mental disorders and that it is significantly different in the clinical and non-clinical samples.

Method

Participants and Procedure

The clinical sample consisted of 175 patients (102 women, 73 men) recruited to participate in the study from two outpatient clinics in Tehran, during one year. Patients were included in the study if 1) their age was between 18 and 60 years; 2) they were affected by depressive, anxiety disorders or OCD, according to the DSM-IV-TR criteria;[28] and they completed the diagnostic interview and the psychopathological evaluations after providing informed consent.

The non-clinical sample consisted of 173 normal adults (99 women, 74 men). They were recruited from the general population. The age of non-clinical participants ranged from 18 to 60 years. None of them had a history of psychiatric or psychosomatic disorders in need of hospitalization. Both clinical and non-clinical groups were homogenous as far as sociodemographic characteristics were concerned—gender, age, environmental factors and level of education. All participants were volunteers and completed the FTAS-20 individually following the diagnostic interview. All measures of FTAS-20 were scored so that higher scores represented higher levels of that variables. Therefore, higher scores on the alexithymia measures represented more alexithymic attitudes, and higher scores on psychological distress and psychological well-being were indicative of increased distress and well-being. Ten participants (six patients, four controls) were removed because of errors in responding.

Measures

The FTAS-20 is a 20-item self-report measure. Each item is rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree); five items are negatively keyed; it provides a total alexithymia score. Furthermore, three sub-scales rate DIF, DDF, and EOT. The TAS-20 has demonstrated excellent psychometric properties.[4,21,22,25,29] The FTAS-20 has recently been validated and used for a population of Iranian undergraduate students.[17]

Statistical Analysis

To examine the three-factor structure of the FTAS-20 in the two studied samples, confirmatory factor analysis (CFA) was performed. CFA offers a variety of statistical tests and indices designed to assess the "goodness-of-fit" of the identified models.[30] For the purposes of the present study, the goodness-of-fit was evaluated using the following statistics: The goodness-of-fit index (GFI >0.85), the adjusted goodness-of-fit index (AGFI >0.80), the non-normed fit index (NNFI >0.90), the comparative fit index (CFI >0.90), the root mean square residual (RMSR <0.10), and the root mean square error of approximation (RMSEA <0.08).[30,31]

To examine the internal consistency for FTAS-20, Cronbach's alpha coefficients were calculated for the entire sample of 338 participants. The internal reliability coefficients and the mean interitem correlation coefficients were calculated for each sample for FTAS-20 and each of the factors. To examine the predictive validity of FTAS-20 and its factors, the scores on each of these were compared between the clinical and non-clincial samples. Between-group differences were assessed by *Student's t* test. To evaluate the test-retest reliability of FTAS-20, the Pearson's correlation coefficient was calculated at two time points over two weeks in a sample of 43 patients and 50 normal subjects for the total scale and for each of the three factor scales.

Results

The mean±SD age of patients was 33.4±8.3 (range: 18–60) years. The clinical sample consisted of 53 depressed, 67 anxious, and 49 OCD patients. The mean±SD age of normal subjects (non-clinical) was 34.3±9.1 (range: 18–60) years.

Confirmatory factor analysis

Using CFA, the three-factor structure of FTAS-20 was tested for both clinical and non-clinical samples (table 1).

Table 1: Parameter estimates from the confirmatory factor analysis in the non-clinical (n= 169) and clinical (n= 169) samples.

Item Number	Parameter estimates	
	Non-clinical sample	Clinical sample
Factor 1		
1	0.63	0.65
3	0.44	0.57
6	0.67	0.66
7	0.69	0.67
9	0.77	0.78
13	0.71	0.73
14	0.66	0.60
Factor 2		
2	0.77	0.78
4	0.63	0.43
11	0.61	0.55
12	0.47	0.41
17	0.62	0.65
Factor 3		
5	0.31	0.29
8	0.43	0.61
10	0.66	0.44
15	0.79	0.42
16	0.49	0.28
18	0.30	0.47
19	0.42	0.50
20	0.44	0.27

All parameter estimates are significant (P<0.05). Factor 1= Difficulty identifying feelings; Factor 2= Difficulty describing feelings; Factor 3= Externally-oriented thinking.

The goodness-of-fit indices,[30] are presented in table 2. The three-factor structure of FTAS-20 was found to meet the standards for adequacy of fit. All parameter estimates were found significant (P<0.05). The parameter estimates between factor 1 and 2 was 0.77 (P<0.05) for non-clinical sample and 0.72 (P<0.05) for clinical group; between factor 1 and 3, it was 0.45 (P<0.05) for non-clinical and 0.47 (P<0.05) for clinical group; and between factor 2 and 3, the parameter was 0.58 (P<0.05) for non-clinical and 0.62 (P<0.05) for clinical sample.

Table 2: Goodness-of-fit indices for the confirmatory factor analysis of FTAS-20

Index	Non-clinical sample	Clinical sample
GFI	0.94	0.95
AGFI	0.91	0.93
NNFI	0.95	0.92
CFI	0.95	0.92
RMS	0.08	0.06

FTAS-20= 20-item Persian version of the Toronto Alexithymia, GFI= goodness-of-fit index, AGFI= adjusted goodness-of-fit index, NNFI= non-normed fit index, CFI= comparative fit index, RMS= root mean square residual.

Different results were found when FTAS-20 scores were compared between clinical and non-clinical samples. The clinical group scored significantly higher than the non-clinical sample on the DIF factor (P< 0.001), DDF (P<0.001), EOT (P<0.001), and the total FTAS-20 (P<0.001).

There were significant differences in mean FTAS-20, DIF, DDF and EOT scores between depressed and anxious people. The depressed subjects scored significantly higher than the anxious people on DIF factor (P=0.014), DDF (P=0.026), EOT (P=0.025), and the total FTAS-20 (P=0.019).

There were no significant differences in mean FTAS-20, DIF, DDF and EOT scores between depressed and OCD groups, as well as between those with OCD and anxiety.

Table 3 shows some important statistics for FTAS-20.

To examine the internal consistency for FTAS-20, Cronbach's alpha coefficients were calculated for the entire sample of 338 participants. The alpha coefficients for FTAS-20, DIF, DDF,

Table 3: Mean, standard deviation (SD), internal reliability coefficient (IRC), and mean interitem correlation (MIC) for FTAS-20 for clinical and non-clinical samples.

Participants	Factor 1	Factor 2	Factor 3	FTAS-20
Depressive disorders (n= 53)				
Mean	22.52	14.37	20.64	57.54
SD	6.21	3.54	5.93	15.53
IRC	0.76	0.69	0.65	0.78
MIC	0.27	0.22	0.16	0.17
Anxiety disorders (n= 67)				
Mean	19.47	12.88	18.14	50.50
SD	6.96	3.67	5.98	16.46
IRC	0.79	0.73	0.68	0.80
MIC	0.28	0.25	0.20	0.18
Obsessive-compulsive disorders (n= 49)				
Mean	20.44	13.28	18.79	52.53
SD	6.32	3.39	5.75	15.34
IRC	0.80	0.76	0.69	0.81
MIC	0.29	0.23	0.18	0.19
Normal subjects (n= 169)				
Mean	16.54	11.44	15.88	43.88
SD	6.55	3.36	5.27	15.06
IRC	0.75	0.71	0.66	0.79
MIC	0.33	0.29	0.23	0.24

FTAS-20= 20-item Persian version of the Toronto Alexithymia Scale; Factor 1= Difficulty identifying feelings; Factor 2= Difficulty describing feelings; Factor 3= Externally-oriented thinking.

Table 4: Test-retest reliability of FTAS-20 and its subscales for the non-clinical and clinical samples

Scale	Non-clinical Sample		
	Mean (SD) at test 1	Mean (SD) at test 2	r*
DIF	16.48 (6.68)	15.66 (6.21)	0.71
DDF	11.54 (3.57)	10.62 (3.34)	0.63
EOT	15.10 (5.62)	16.42 (4.76)	0.58
FTAS-20	43.08 (16.60)	42.18 (14.96)	0.75
	Clinical Sample		
DIF	20.74 (6.88)	20.09 (6.91)	0.73
DDF	13.53 (3.75)	13.39 (4.12)	0.69
EOT	18.95 (6.07)	19.76 (6.32)	0.65
FTAS-20	53.23 (16.41)	51.93 (15.62)	0.77

*Pearson's product-moment correlation coefficient, all Ps<0.001; DIF= Difficulty identifying feelings; DDF= Difficulty describing feelings; EOT= Externally-oriented thinking; FTAS-20= 20-item Persian version of the Toronto Alexithymia.

and EOT were respectively, 0.79, 0.75, 0.71 and 0.66 for non-clinical sample; 0.78, 0.76, 0.69 and 0.65 for depressed patients; 0.80, 0.79, 0.73, and 0.68 for anxious patients; and 0.81, 0.80, 0.76, and 0.69 for those with OCD. All these reflected that FTAS-20 is internally consistent.

To examine the test-retest reliability of FTAS-20, 93 participants (50 normal subjects, 43 patients) completed the FTAS-20 two weeks after the first time. Pearson's correlation coefficients between the scale scores at the first and second time were calculated separately for the clinical and non-clinical groups. Test-retest reliability of DIF, DDF, EOT, and FTAS-20 total score in this study are presented in table 4. Test-retest coefficients for FTAS-20 and its subscales ranged from 0.58 to 0.75 for non-clinical sample and from 0.65 to 0.77 for patients (table 4).

Discussion

In this study, we examined the reliability and factorial validity of the Persian version of TAS-20 in clinical and non-clinical groups. The results of the present study provided strong support for the three-factor model of FTAS-20 in both clinical and non-clinical samples. In addition, the parameter estimates for the relationships among the three factors provided evidence that the factors reflect the three separate facets of the alexithymia construct. These results are consistent with previously-reported research that used CFA to evaluate the factor structure of TAS-20 in different cultures for clinical and general populations.[16,18-22,24,32]

All parameter item estimates were found significant. However, items 5, 16 and 20 had values lower than the desirable value only in clinical sample. These items were exactly the same as those found by Parker, et al,[33] in two samples of community-based and forensic people, and were also similar to those reported by Kroner and Forth,[34] in a forensic sample and to that reported by Cleland, et al,[35] in a sample of substance users. Cultural differences in the meanings given to certain TAS-20 items might be partly responsible for low values of the three items. It may be possible to refine or replace some of these items to provide an improved measure of alexithymia for Iranian populations. However, the fact that all of the EOT factors measured in this study had scores lower than the desirable values only in clinical sample, does not allow us to rely completely on cultural explanations. The nature of the psychopathology might pretty well influence patients' responses to items. It is possible that low values of these items may be accounted for by the cognitive component of the EOT factor rather than the emotional component of the DIF and DDF factors. As pointed out by Cleland, et al,[35] different cutoffs are also needed to be established for clinical samples.

Considering the reliability, the results indicated that the full FTAS-20 and its three factors have adequate reliability and internal consistency for both clinical and non-clinical samples. These findings were in line with previously-reported research that utilized different populations.[11,16,18-22,24,32] The overall alpha value of 0.80 and 0.79 obtained for FTAS-20 for the clinical and non-clinical samples, respectively, is also similar to those reported for clinical,[15,35] and non-clinical populations,[15,25,26] including an Iranian sample of undergraduate students.[17]

The homogeneity of the full and the factor scales was confirmed by the mean inter-item correlations, which tended to fall within the optimal range of 0.20–0.40,[23] for the two samples. The parameter estimates for the relationships among the three factors provided evidence that the factors reflected three separate, yet empirically-related, facets of the alexithymia construct.[33] The results also revealed that test-retest reliability was satisfactory for FTAS-20 total score and DIF, DDF and EOT subscales for the clinical and non-clinical samples.

The finding that the clinical sample was more alexithymic than the nonclinical group gives support to the predictive validity of FTAS-20. The

mean full and factors scores of the clinical samples were significantly higher than those of the normal subjects. This indicated that alexithymia is related to psychopathology. Several studies on psychiatric patients have found higher TAS-20 scores than those of general populations (e.g., 4 *vs* 20).

The overall results of the present study provided support for the reliability, validity and three-factor structure of FTAS-20 using clinical and non-clinical samples. Moreover, the study provided evidence for applicability of TAS-20 and its cross-cultural validity.

Although the results of current study supported the use of FTAS-20 in Iranian populations, future research should examine alternative methods of validation. Psychometric properties of FTAS-20 and its factor structure in different clinical and non-clinical populations have still to be determined. Differences found between depressed and anxious patients call for further studies to examine more psychometric properties of FTAS-20, as well as clinical and theoretical implications of the construct.

Despite a good agreement reported between TAS-20 scores and observer ratings of alexithymia,[15,36] a question could be raised about the adequacy of FTAS-20 to assess alexithymia as long as its criterion validity has not been firmly established. Valid judgment about the ability to identify, monitor and report emotional status may not be possible especially for highly alexithymic individuals.[4,37]

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