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Reliability and Factorial Validity of the Turkish Version of the 20-Item Toronto Alexithymia Scale (TAS-20)

Hüseyin Güleç¹, Samet Köse², Medine Y. Güleç¹, Serhat Çitak³,
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ÖZET:

Yirmi soruluk Toronto aleksimi ölçeğinin Türkçe uyarlamasının geçerlik ve güvenilirliğinin incelenmesi

Amaç: Bagby ve arkadaşları tarafından geliştirilmiş olan 20 soruluk Toronto Aleksimi Ölçeği (TAÖ)'nin Türkçe uyarlamasının; faktöriyel yapısı, geçerlik ve güvenilirliğinin incelenmesi bu çalışmanın amacını oluşturmaktadır.

Yöntem: Bu çalışma Karadeniz Teknik Üniversitesi ve Sağlık Eğitim Enstitüsü'nde eğitim gören lisans ve lisans üstü öğrencileri ile yürütüldü. Faktör yapısını incelemek amacıyla doğrulayıcı faktör analizi (confirmatory factor analysis) uygulandı. İç tutarlılığını incelemek için ölçeğin ve alt-ölçeklerin Cronbach's alfa katsayılarında ve her bir maddenin iç tutarlılığı etkisini görmek için düzeltilmiş madde-toplam korelasyonlarına bakıldı.

Bulgular: Sonuçlar TAÖ-20 Türkçe uyarlamasının, 3 faktör örüntüsünü sağladığını gösterdi. Ölçeğin ve alt-ölçeklerin iç tutarlık incelenmesinde toplam ölçek için alfa=0.78, 1. faktör için alfa=0.80, 2. faktör için alfa=0.57 ve 3. faktör için alfa=0.63 olarak saptandı. Faktörler arası korelasyonlarına bakıldığında; 1. ile 2. faktör arasında 0.53, 1. ile 3. faktör arasında 0.12 ve 2. ile 3. faktör arasında 0.36 olduğu görüldü. Düzeltilmiş madde-toplam korelasyonunun 0.22-0.48 arasında olduğu ve istatistiki olarak anlamlı olup, 18. ve 20. madde dışında yeterli korelasyon gösterdiği saptandı.

Sonuç: Çalışmanın bulguları TAÖ-20 Türkçe çevirisinin, orijinal çalışmada olduğu gibi 3 Faktör yapısını desteklediğini göstermektedir. Uyarlamının iç tutarlığı da yeterli olarak görülmektedir. TAS-20 Türkçe uyarlamasının Türk örneklemi için geçerli ve güvenilir olduğu bulunmuştur.

Anahtar sözcükler: Aleksitimi, yirmi-soruluk Toronto aleksimi ölçeği, doğrulayıcı faktör analizi, geçerlik, güvenilirlik

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ABSTRACT:

Reliability and factorial validity of the Turkish version of the 20-item Toronto alexithymia scale (TAS-20)

Aims: The aim of this study was to examine the factor structure and the validity of the Turkish version of the 20-item Toronto Alexithymia Scale (TAS-20) developed by Bagby et al. in a student sample.

Methods: Healthy undergraduates or post-college graduate students (n=390) from Karadeniz Technical University Medical School or the Institute of Health Education, respectively, were assessed using confirmatory factor analysis. Cronbach's alpha coefficient was determined to estimate internal reliability of the TAS-20 and subscales and correlations between each item and total score were also calculated.

Results: The Turkish TAS-20 showed a three-factor model. The Cronbach alpha for the total TAS-20 scale was 0.78, and for the three subscales (factors 1-3); 0.80, 0.57, and 0.63, respectively. Three of four criteria of goodness-of-fit met the standards for adequacy-of-fit. The parameter estimates for the items and correlation between the three factors of the TAS-20 were as follows: between factors 1 and 2, 0.53; between factors 1 and 3, 0.12; between factors 2 and 3, 0.36. All items (except 18 and 20) correlate significantly with the total score, the values range from 0.22 to 0.48.

Conclusions: The Turkish TAS-20 factor analysis yielded a three-factor structure consistent with the original scale and its translation had adequate internal consistency. Thus, the TAS-20 scale is a valid construct within the Turkish culture.

Key words: Alexithymia, TAS-20, confirmatory factor analysis, reliability, factorial validity

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INTRODUCTION

The construct of alexithymia refers to personality style that shows deficits in the subjective awareness and cognitive processing of affect regulation (1). The construct was formulated to encompass the following features: (1) difficulty identifying and describing feelings; (2) difficulty distinguishing between feelings and the bodily sensations of emotional arousal; (3) constricted imaginal processes, as evidenced by a paucity of fantasies; and (4) a cognitive style that is concrete and externally orientated (2). The first two dimensions

correspond to affective disturbances, and the second ones correspond to restricted imaginative and cognitive style (3).

Several techniques are available for assessing alexithymia, but most early tools (self-report scales, projective techniques, and observed rating scale) were not valid (1). The Toronto Alexithymia Scale (TAS) was the first alexithymia measure validated in accordance with modern psychometric research, and its 20-item version (TAS-20), especially, is an internationally used measures of alexithymia (4-5). Alexithymia has been studied widely recently and measurement methods before 1985 were

shown to be limited (1). Taylor and colleagues developed a new scale in 1985. The 26-item TAS (TAS-26) was developed with a four-factorial basis theoretically consistent with a four-dimensional structure: (1) definite inability in expression and verbal communication of feelings; (2) weak imagination and markedly abstract thoughts; (3) weak and concrete intrusive thoughts; and (4) inability to describe feelings. The investigators then realized that the third factor was negatively related to the first factor and weakly correlated with the total scale. Thus, 17 new items were added and all 53 items were reviewed and further developed into a 23-item TAS-R (TAS-Revised). The TAS-R had two factorial structures despite the four factorial structure of the TAS-26. Confirmatory factor analysis of the TAS-R revealed that data representation was not sufficient in two-factorial structures. In 1994, the authors refined a 20-item, three dimensional, new version of the scale with (1) difficulty in identifying feelings, (2) difficulty in describing feelings, and (3) externally oriented thinking (4). Bagby and colleagues reported that the 20-item scale was the best for measuring alexithymia (5).

In Turkey, alexithymia validity and reliability of scales have been previously evaluated. Dereboy (6) translated four self-report alexithymia scales into Turkish and investigated their scale-dependent validity and reliability and showed that the Turkish translation of the TAS-26 was reliable (internal consistency coefficient $r=0.65$; test-retest reliability coefficient $r=0.71$) and valid (TAS scores of patients were correlated with alexithymia scores, $r=0.51$, $p<0.05$; and significantly higher than the normal population, $z=-2.17$, $p<0.005$). Then, a reliability and validity study of the Turkish translation of the TAS-20 was performed by Bestepe with 300 individuals, and the overall internal consistency coefficient of the scale was measured ($r=0.81$). Bestepe only reported the Cronbach's alpha of the total scale and provided no factor analysis (unpublished data) (7). In our previous study (8), we evaluated the reliability and validity of the Turkish translation of the TAS-20, and found internal consistency (coefficient $r=0.76$) and test-retest reliability (coefficients between $r=0.34$ and 0.55). Also, using exploratory factor analysis, we showed that the scale did not replicate the factor structure of the original TAS-20 and we obtained two-factorial structures. These findings were likely due to inadequate translation of the items, cross-cultural

differences, homogenous sampling, or differences in statistical methods (8). Confirmatory and exploratory factor analyses after revision of those items with inadequate loads revealed that the original scale provided a three factorial structure, but internal consistency coefficients of factors 2 and 3 were low (Cronbach's alpha coefficient: total scale, $r=0.74$; 1st factor, $r=0.80$; 2nd factor, $r=0.64$; and 3rd factor $r=0.22$) (9).

In our previous studies with the TAS-20, we only administered the scale to college students, but in this present study we included post-college graduate students in the sample. Participants from an additional city were included who had higher educational and socioeconomical status, thereby increasing our sample heterogeneity and more accurately representing the Turkish population at large. The aim of this study was to investigate the reliability and factorial validity of the Turkish TAS-20 in a larger and more heterogeneous sample than used in our previous studies.

METHODS

Subjects and Procedure

Study participants 390 university students (233 females) with a mean age of 23.39 ± 4.72 years (range=18-42 years). Undergraduates were recruited from Karadeniz Technical University Medical School (low-middle socioeconomic status, younger, from the northeast of Turkey) and postgraduate students were included from Ankara Institute of Health Education (middle-high socioeconomic status, older, from the central region of Turkey). The subjects were given written instructions to respond on a 5-point Likert scale in agreement/disagreement with each statement on the TAS-20. The subjects also answered questions that screened for current medical and/or psychiatric problems. All subjects recruited were eligible for the study, but seven students with missing data were eliminated from this study (final $n=383$).

Measures

Twenty-item Toronto Alexithymia Scale (TAS-20)

TAS-20 was developed by Bagby, Parker and Taylor (4-5). Each item is evaluated in a Likert type scale with five intervals (1= strongly disagree, 5=strongly agree).

Bagby and colleagues found internal consistency of the scale ($r=0.81$) in their development studies. They also showed that test-retest reliability ($r=0.77$) within three weeks. Factor analytic studies yielded a three-factor solution which accounted for 31.0% of the total variance. The first factor explained 12.6% of the total variance (internal consistency, $r=0.78$); the second factor explained 10.0% of the total variance (internal consistency, $r=0.75$); and the third factor explained 8.80% of the total variance (internal consistency, $r=0.66$).

The Turkish Version of the 20-Item Toronto Alexithymia Scale (TAS-20)

The TAS-20 was translated into Turkish by a Turkish psychiatric researcher (Sayar K). The blind back-translation was done by another Turkish psychiatric researcher (Kose S) who had not seen the original items. This back-translation was then compared with the original version to detect any discrepancies. Discrepant items were re-translated until full consensus was achieved. Scrutiny of phrases used in the original inventory version was performed by an expert committee fluent in Turkish and English and no difficulties were found in using the inventories within the context of current Turkish culture.

Statistical Analysis

First, we assessed the Kaiser-Meyer-Olkin measure of sampling adequacy and the Barlett test of sphericity (10), to ensure sampling adequacy. The correlation matrix of the sample was analyzed with the SPSS 9.0. An exploratory factor analysis (principles component analysis, with varimax rotation and with unlimited numbers of factor [eigenvalues >1 as a criterion]) and a confirmatory factor analysis (maximum likelihood estimation, with an oblique method) were performed for the TAS-20 via LISREL VIII (11). Using the model developed by Bagby et al. (4), each of the TAS-20 items was considered to be a measure of only a single latent factor. Given the hypothesized associations among the three facets of the alexithymia construct, an oblique model was tested for each sample. Following the recommendation of Cole (12), the goodness-of-fit was evaluated using four criteria: chi-square goodness-of-fit, the goodness-of-fit index (GFI; Jöreskog and Sörbom (13)), which varies from 0 (no fit) to 1 (perfect fit); the adjusted goodness-of-fit index (AGFI; Jöreskog and

Sörbom (13)); Steiger's (14) root-mean-square error of approximation (RMSEA); and the ratio of the chi-square to its degrees of freedom (χ^2/df ; Bollen (15)). We used multiple criteria since each index has different strengths in assessing the goodness-of-fit between the hypothetical model and the actual data (Cole (12), Marsh et al. (16), Steiger (14)). The following criteria were used to indicate goodness-of-fit: $GFI \geq 0.85$; $AGFI \geq 0.80$; $RMSEA \geq 0.08$ (Anderson and Gerbing (17); Cole (12); Browne and Cudeck (18)); $\chi^2/df < 5$ and preferable < 2 (Watkins (19); Briggs and Cheek (20)). Browne and Cudeck (18) suggest that an RMSEA value of 0.05 indicates a close fit and that values up to 0.08 represent reasonable errors of approximation, while they would not advise employing a model with an $RMSEA > 0.1$. The Cronbach coefficient alpha was also used for testing the internal consistency of the whole TAS-20 scale and the three subscales.

RESULTS

Of the 383 participants, 60.8% were women. Data were missing in 7 cases (0.02%). The measure of psychometric adequacy suggested that the TAS-20 correlation matrix was suitable for factor analysis for the sample. The Barlett test of sphericity indicated that the TAS-20 items were interdependent: $\chi^2=1,832$, $p < 0.0001$. The Kaiser-Meyer-Olkin measure of sample adequacy (MSA) was greater than minimally accepted level of 0.5 (MSA=0.82).

Exploratory factor analysis gave a two-factor model, which accounted for 34.9% of the total variance. Of the three factors from the original study, items from factors 1 and 2 formed in one factor, whereas items from factor 3 formed their own factor.

The parameter estimates for the items and correlation among the three factors of the TAS-20 are presented in Tables 1 and 2. The parameter estimates for the relationships among the three TAS-20 factors were significantly associated with each other. For all subjects the χ^2 goodness-of-fit, the GFI, the AGFI, and the RMSEA were significant. These results and Cronbach alphas are presented Table 3. The Cronbach alpha for the total TAS-20 scale was 0.78, and for the three subscales (factors 1, 2, and 3); 0.80, 0.57, and 0.63, respectively. None of the alphas of the three factors improved when an item was deleted.

Table 1: Factor parameter estimates for the TAS-20 items

Factor 1 Difficulty Identifying Feelings		n=383
Item 1 (I am often confused about what I feel exactly)		0.37
Item 3 (I have sensations in my body that even doctors do not understand)		0.81
Item 6 (When I am upset, I do not know if i am sad, scared, or angry)		0.66
Item 7 (I am often confused by sensations in my body)		0.53
Item 9 (I have feelings that I am unable to define completely)		0.62
Item 13 (I do not know what is going on inside me)		0.77
Item 14 (I do not know most of the time why I am angry)		0.59
Factor 2 Difficulty Describing Feelings		
Item 2 (It is difficult for me to find the appropriate words for my feelings)		0.51
Item 4 (I am able to describe my feelings easily)		-0.29
Item 11 (I find it hard to describe how I feel about people)		0.64
Item 12 (People demand to talk about my feelings more)		0.22
Item 17 (I find it hard to disclose my innermost feelings, even to my close friends)		0.50
Factor 3 Externally-Oriented Thinking		
Item 5 (I would rather solve problems than just describe them)		0.74
Item 8 (I would rather let things happen than to understand the reason why they happened that way)		-0.16
Item 10 (It is essential for people to know about their feelings)		2.08
Item 15 (I would rather talk to people about their daily routines than their feelings)		-0.29
Item 16 (I would rather watch light entertainment shows than dramatic shows)		-0.35
Item 18 (I can feel close to someone, even in moments of silence)		-0.09*
Item 19 (I find it useful to explore my feelings in solving my personal problems)		0.67
Item 20 (Seeking for hidden meanings in movies or plays kills their enjoyment)		-0.15*

* p > 0.05, TAS: Toronto Alexithymia Scale.

Table 2: Parameter estimates for the relationship among the three factors of the TAS-20

	Factor 1	Factor 2	Factor 3
Factor 1 (Difficulty Identifying Feelings)			
Factor 2 (Difficulty Describing Feelings)	0.53**		
Factor 3 (Externally-Oriented Thinking)	0.12*	0.36**	
Coefficients ≥ 0.30 are shown in bold,			

*p < 0.05, **p < 0.01

Table 3: Cronbach alphas and the goodness-of-fit indices for the 3-factor model of TAS-20

Cronbach's alpha TAS-total	0.78
Cronbach's alpha (Factor 1)	0.80
Cronbach's alpha (Factor 2)	0.57
Cronbach's alpha (Factor 3)	0.63
Measures of fit	
Chi-square test (df=167)	564.09
Goodness-of-fit (GFI)	0.87
Adjusted goodness-of-fit (AGFI)	0.84
Root-mean-square error of approximation (RMSEA)	0.079

TAS: Toronto Alexithymia Scale

DISCUSSION

Recently, many studies have appeared in the literature about alexithymia. Here, a Turkish translation of a tool to measure alexithymia was administered to medical school

and postgraduate students from both genders to obtain psychometric properties of the scale in a Turkish sample. Our findings indicated that the previously established three-factor structure that was determined in the study of Bagby and colleagues was replicated in a student sample with the Turkish version of the scale. All criteria of goodness-of-fit met the standards for adequacy-of-fit. Only the χ^2 goodness-of-fit score was not favorable.

Factor 1 and 2 were strongly correlated, as expected. This finding was consistent with previous confirmatory factor analyses of the TAS-20 in multiple languages (21-23) Factor 3 correlated moderately with factor 2, and weakly with factor 1. The weaker correlation between factors 1 and 3 was also consistent with results of previous studies with non-clinical samples (4,21,22,24,25). A stronger correlation between these factors was obtained in

clinical samples (4,25), so perhaps there is a higher prevalence of alexithymia in clinical samples.

When we performed an initial confirmatory factor analysis (CFA) on the TAS-20 using our previous dataset, while there was adequate support for the 3-factor model (based on the goodness of fit indicators), 5 items were failing to load significantly on their hypothesized factor (items 12, 8, 15, 16 and 20) (8). We checked these items for possible translation problems and could not detect any such problems. Since the other items conformed quite well to the model, we came to a conclusion that the 5 poor items might have also been an artefact of some unknown aspect of our very homogeneous sample. Therefore, we collected the current (more heterogeneous) sample (n=383) to use to test the factor structure using CFA.

The internal reliability coefficients of the Turkish TAS-20 were satisfactory, with a lower Cronbach's alpha for factor 2, which has been reported in some studies

(23,26,27). The internal reliability coefficient for factor 3 dramatically increased in this study from that in a previous study in which we included psychiatry outpatients (9). The discrepancy between the two values might be due to sampling, and the current study includes a more heterogeneous sample of a normal population (with the inclusion of post-graduate students).

The examination of the parameter-item estimates revealed that all estimates were significant, except for items 18 and 20 on factor 3. These results are likely to be due to common problems of translation. This is consistent with data obtained in non-clinical samples in Sweden (28), Italy (25), Lithuania (26), and India (22) for item 18. Possibly, item 18 has different meanings in clinical and non-clinical samples or across different cultures. Psychometric properties of the TAS-20 in numerous languages and cultures are summarized in Table 4.

In conclusion, the Turkish TAS-20 had sound

Table 4: psychometric properties of the TAS-20 for different languages

Language	Country	Sample	n	Mean	SD	α			
						TAS-20	F1	F2	F3
Danish	Denmark	Primary care patients	577	42.32	11.55	0.83	0.81	0.78	0.66
Dutch	Netherlands	Normal adults	702	39.40	8.69	0.80	0.84	0.72	0.54
Dutch	Netherlands	Students	414	43.93	9.12	0.79	0.79	0.78	0.60
Farsi	Iran	Students	587	43.41	11.92	0.85	0.82	0.75	0.72
Finnish	Finland	Normal adults	5034	44.5	10.4	0.83	0.81	0.77	0.66
Finnish	Finland	Students	516	38.9	8.2	0.76	0.77	0.72	0.61
French	France	Normal adults	769	46.23	10.51	0.78	0.74	0.71	0.56
French	France	Students	263	45.8	9.7	0.73	—	—	—
French	Belgium	Students	380	—	—	0.79	0.71	0.79	0.65
French	Canada	Medical patients	1443	54.2	10.7	0.79	0.80	0.64	0.34
German	Germany	Male Students	104	47.19	10.24	0.80	0.79	0.76	0.61
German	Germany	Female Students	199	43.45	9.88	0.79	0.80	0.76	0.60
German	Austria	Normal adults	306	39.88	8.43	0.70	0.72	0.66	0.55
Greek	Greece	Normal adults	104	47.85	12.34	0.80	0.78	0.53	0.63
Hebrew	Israel	Female students	142	37.54	9.09	0.84	0.80	0.79	0.68
Italian	Italy	Psychiatric and medical patients	642	53.6	14.8	0.82	0.79	0.68	0.54
Italian	Italy	Normal adults	206	44.7	11.3	0.75	0.77	0.67	0.52
Japanese	Japan	Psychiatric and medical patients	939	55.21	10.48	0.77	0.84	0.66	0.48
Japanese	Japan	Students	473	53.2	12.1	0.70	0.79	0.72	0.49
Korean	South Korea	Students	388	51.20	8.56	0.76	0.79	0.65	0.49
Lithuanian	Lithuania	Normal adults	200	49.80	9.53	0.78	0.77	0.54	0.59
Mandarine	Taiwan	Students	299	52.0	10.41	0.84	0.82	0.70	0.47
Norwegian	Norway	Students	229	40.10	8.96	0.79	0.77	0.79	0.65
Polish	Poland	Students	286	53.71	9.23	0.68	0.72	0.52	0.47
Portuguese	Portugal	Normal adults	133	46.80	11.79	0.79	0.80	0.64	0.44
Portuguese	Portugal	Students	298	47.17	10.81	0.79	0.83	0.65	0.60
Spanish	Spain	Students	370	50.58	11.34	0.78	0.79	0.73	0.61
Swedish	Sweden	Students	157	41.59	9.18	0.83	0.79	0.77	0.67
Turkish	Turkey	Students	383	49.42	9.37	0.78	0.80	0.57	0.63

*Adapted from Taylor et al. (2003)

psychometric properties in our sample of Turkish healthy volunteers, including its internal consistency, test-retest reliability, concurrent validity, and factorial structure. Thus, the Turkish TAS-20 will be useful for future studies in Turkey to help better understand alexithymia, especially in clinical populations.

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Türkçe TAÖ-20 Türkçe Toronto Aleksitimi Ölçeği

Lütfen aşağıdaki maddelerin sizi ne ölçüde tanımladığını işaretleyiniz.

Hiçbir zaman (1),....., Her zaman (5) olacak şekilde bu maddelere puan veriniz.

	Hiçbir zaman	Nadiren	Bazen	Sık sık	Her zaman
1. Ne hissettiğimi çoğu kez tam olarak bilemem.	1	2	3	4	5
2. Duyularım için uygun kelimeleri bulmak benim için zordur.	1	2	3	4	5
3. Bedenimde doktorların bile anlamadığı duygular oluyor.	1	2	3	4	5
4. Duyularımı kolayca tanımlayabilirim.	1	2	3	4	5
5. Sorunları yalnızca tanımlamaktansa onları çözümlmeyi yeğlerim.	1	2	3	4	5
6. Keyfim kaçtığımda, üzgün mü, korkmuş mu yoksa kızgın mı olduğumu bilemem.	1	2	3	4	5
7. Bedenimdeki duygular çoğu kez kafamı karıştırır.	1	2	3	4	5
8. Neden öyle sonuçlandığını anlamaya çalışmaksızın, işleri oluruna bırakmayı yeğlerim	1	2	3	4	5
9. Tam olarak tanımlayamadığım duygularım var.	1	2	3	4	5
10. İnsanların duygularını tanıması zorunludur.	1	2	3	4	5
11. İnsanlar hakkında ne hissettiğimi tanımlamak benim için zordur.	1	2	3	4	5
12. İnsanlar duygularım hakkında daha çok konuşmamı isterler.	1	2	3	4	5
13. İçimde ne olup bittiğini bilmiyorum.	1	2	3	4	5
14. Çoğu zaman neden öfkeli olduğumu bilmem.	1	2	3	4	5
15. İnsanlarla, duygularından çok günlük uğraşları hakkında konuşmayı yeğlerim.	1	2	3	4	5
16. Psikolojik dramalar yerine eğlence programları izlemeyi yeğlerim.	1	2	3	4	5
17. İçimdeki duyguları yakın arkadaşlarıma bile açıklamak bana zor gelir.	1	2	3	4	5
18. Sessizlik anlarında bile kendimi birisine yakın hissedebilirim.	1	2	3	4	5
19. Kişisel sorunlarımı çözerken duygularımı incelemeyi yararlı bulurum.	1	2	3	4	5
20. Film ya da tiyatro oyunlarında gizli anlamlar aramak, onlardan alınacak hazzı azaltır.	1	2	3	4	5

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