

Psychometric properties of the 20-Item Toronto Alexithymia Scale in a Turkish adolescent sample

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ABSTRACT

Objective: Alexithymia have the similar negative consequences for mental health in adolescence as in adulthood. However, there is no alexithymia scale for clinical and research purposes in Turkish adolescents. This study aims to evaluate the psychometric properties of the Turkish version of 20-Item Toronto Alexithymia Scale (Turkish TAS-20) in a Turkish adolescent sample. **Methods:** Turkish TAS-20 was administered to 948 adolescents aged between 12 and 17 years (439 male, 509 female). The participants were grouped as total sample (range: 12-17 years), younger (range: 12-14 years) and older (range: 15 and 17 years) adolescents. Cronbach's α coefficients, mean inter-item correlations, intercorrelations of factors, confirmatory factor analysis, and measures of goodness-of-fit were determined. **Results:** The Cronbach's α coefficients were 0.78 for the total scale, 0.80, 0.68, 0.40 for the factor 1, factor 2, and factor 3, respectively. The Cronbach's α coefficient for full scale was favorable for total group. The Cronbach's α coefficient for factor 3 was reasonable in older (0.55 for 15-17 years old), however, it was low in younger adolescents (0.20 for 12-14 years old). All criteria of goodness-of-fit met the standards for adequacy-of-fit for all age groups. The mean inter-item correlation coefficients for the total sample, 12-14 year old group, and 15-17 year old group were 0.15, 0.11, and 0.21, respectively and were in the acceptable range from 0.10 to 0.50. **Conclusion:** The psychometric properties of Turkish TAS-20 for adolescents were comparable with the results of the reliability and validity study of Turkish TAS-20 in Turkish adults. However, caution should be taken when interpreting the results, because factor 3 appears to have weak psychometric properties. Considering factor 3, we suggest that the Turkish TAS-20 best fits for adolescents who are older than 14 years old. (*Anatolian Journal of Psychiatry* 2017; 18(4):362-368)

Keywords: alexithymia, scale, adolescent, psychometric properties

Yirmi maddelik Toronto Aleksitimi Ölçeğinin bir grup Türk ergen üzerinde psikometrik özelliklerinin değerlendirilmesi

ÖZ

Amaç: Aleksitiminin ergenlerin ruh sağlığı üzerinde erişkinlere benzer olumsuz sonuçları vardır. Bununla birlikte, Türk ergenlerde klinik uygulama veya araştırmalar için kullanılmak üzere bir aleksitimi ölçeği yoktur. Bu çalışmanın

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amacı 20-Maddelik Toronto Aleksitimi Ölçeği'nin (Türkçe TAS-20) psikometrik özelliklerinin bir grup Türk ergen üzerinde değerlendirmektir. **Yöntem:** Türkçe TAS-20, 12-17 yaşları arasındaki 948 ergene (439 erkek, 509 kız) uygulanmıştır. Olguların tümü (aralık: 12-17 yaş), erken dönemdeki (aralık: 12-14 yaş) ve geç dönemdeki (aralık: 15-17 yaş) ergenler olmak üzere gruplanmıştır. Cronbach α katsayıları, maddeler arası ortalama korelasyon, faktörler arası korelasyonlar, doğrulayıcı faktör analizi ve uyum indeksleri saptandı. **Bulgular:** Cronbach α katsayıları ölçeğin bütünü için 0.78, faktör 1, faktör 2 ve faktör 3 için sırasıyla 0.80, 0.68 ve 0.40'tı. Tüm grupta, ölçeğin tümü için Cronbach α katsayısı olumluydu. Faktör 3 için ise Cronbach α katsayıları 15-17 yaşları arasındaki ergenler için kabul edilebilir sınırlarda idi (0.55), ancak 12-14 yaşları arasındakiler için düşüktü (0.20). Uyum indekslerinin hepsi, tüm ergen yaş grupları için yeterli standartı sağladı. Maddeler arası ortalama korelasyon katsayıları tüm örneklem, 12-14 ve 15-17 yaşları arasındaki gruplar için sırasıyla 0.15, 0.11 ve 0.21 bulundu; katsayılar kabul edilebilir 0.10-0.50 değerleri arasındaydı. **Sonuç:** Türkçe TAS-20'nin ergenler üzerindeki psikometrik özellikleri, Türk erişkinlerde yapılan geçerlilik ve güvenilirlik çalışmasının sonuçları ile benzerdi. Bununla birlikte, faktör 3'ün zayıf psikometrik özellikler göstermesi nedeniyle sonuçları dikkatli yorumlamak gerekir. Faktör 3 göz önünde bulundurulduğunda, Türkçe TAS-20'nin 14 yaşından büyük ergenler için daha uygun olduğu düşünülmüştür. (*Anadolu Psikiyatri Derg* 2017; 18(4):362-368)

Anahtar sözcükler: Aleksitimi, ölçek, ergen, psikometrik özellikler

INTRODUCTION

Alexithymia is defined as a personality construct that represents difficulty in identifying subjective emotional feelings and distinguishing between feelings and the bodily sensations of emotional arousal, difficulty in describing feelings to other people, a limited imagination, and externally oriented cognitive style.¹ The concept has been broadly explored among adults, because it is seen as a risk factor for a wide range of health related concerns.² Although it is assumed to be a personality trait that might be present during childhood, alexithymia in children and adolescents has not been adequately investigated.³

The prevalence of alexithymia indicated between 9% and 17% in men and 5% and 10% in women and approximately 10% in adult population.⁴⁻⁶ Prevalance of alexithymia in adolescents is reported as 7% to 10%,^{8,9} and considering prevalence rates, no gender differences have been reported in adolescents.¹⁰ Research with children and adolescent populations is relatively limited, however growing evidence reveals that alexithymia may have the similar negative consequences for mental health in adolescence to the extent that it does in adulthood. Higher levels of alexithymia in children and adolescents have been associated with somatic complaints,³ depressive mood,⁸ anxiety,¹⁰ addictive behaviors,¹¹ eating disorders,¹² and dissociation.¹³

The Toronto Alexithymia Scale (TAS),^{2,14} was the first validated measure for determining alexithymia, and its 20-item version (TAS-20),¹⁴ is an internationally used measure of alexithymia. TAS-20 is a three dimensional scale which consists of difficulty in identifying feelings (DIF, factor 1), difficulty in describing feelings (DDF, factor 2), and externally oriented thinking (EOT,

factor 3) factors.² It was reported that TAS-20 scale was the best psychological instrument for measuring alexithymia.¹⁵ Considering the literature about TAS-20, in general factor 1 and factor 2 showed good psychometric properties, but the third factor 'EOT' appeared to be weak.¹⁵

The validity and reliability of TAS-20 has been established in Turkish adults.¹⁶ Although the Turkish version of TAS-20 (Turkish TAS-20) has been previously used among Turkish adolescents,¹⁷⁻¹⁹ the psychometric properties of the scale have not been systematically evaluated in Turkish pre-adulthood population. Therefore, there is a necessity to explore the psychometric properties of TAS-20 among Turkish adolescents and present paper addresses this requirement.

METHODS

Study sample and ethical consideration

Nine hundred forty-eight adolescents (ranging in age from 12 to 17 years) from one secondary, and one high school were included in this study. Of these participants, 46% were male, 54% were female. Turkish TAS-20 was administered to 691 adolescents second time after 3 weeks to measure the test-retest reliability. All participants were informed about the study and written informed consents were provided by all participants. Approval to conduct the study was obtained from the local schools, regional ministry of education and the local research ethics committee.

Instrument

The original TAS-20 was developed by Bagby et al.^{2,14} TAS-20 is a self-evaluation scale that consists of 20 items scored on a five-point Likert

scale; one (I never agree)- five (I always agree) which subscale consists of seven items (items: 1, 3, 6, 7, 9, 13, and 14), and is defined as difficulty in identifying feelings and distinguishing feelings from physical states accompanied by them. DDF subscale consists of five items (items: 2, 4, 11, 12, and 17) and is defined as difficulty in transferring feeling to others. EOT subscale consists of eight items (items: 5, 8, 10, 15, 16, 18, 19, and 20) and is defined as an extroverted cognitive structure, weakness of introverted thinking and imagination. The reliability, construct, and criterion validity of the Turkish TAS-20 have been established in adults. Internal reliability coefficients were 0.78 for the full scale, 0.80 for factor 1, 0.57 for factor 2 and 0.63 for factor 3.¹⁶

Statistical analysis

To evaluate the internal reliability and item-to-scale homogeneity of the Turkish TAS-20, Cronbach's α coefficients and mean inter-item correlations for the total scale and for each factor were calculated by SPSS 16 for Windows (SPSS Inc., Chicago, IL). Considering Cronbach's alpha coefficients, results of ≥ 0.70 accepted as satisfactory, which is the recommended standard for establishing internal reliability.²¹ Values of mean inter-item correlations accepted in the optimal range of between 0.20 to 0.40, and the standart should not be below 0.10 or above 0.50.²¹ Confirmatory factor analysis was performed via LISREL 8.7. Threshold of parameter estimates for Turkish TAS-20 items accepted as 0.35 according to Bagby et al.² The following criteria were used to indicate goodness-of-fit: $GFI \geq 0.85$, $AGFI \geq 0.80$, $RMSEA \leq 0.08$, $\chi^2/df < 5$, $NNFI \geq 0.90$, $CFI \geq 0.90$, and $SRMR \leq 0.08$.²²⁻²⁴ The test-retest reliability and intercorrelations between the factors were analyzed with the Pearson correlation

test.

RESULTS

The mean age of the sample was 14.54 ± 1.54 years. The mean TAS-20 scores of males and females were 50.01 ± 10.10 and 51.82 ± 11.38 , respectively ($p=0.057$). Scores of the adolescents between 12-14 year old and 15-17 year old groups were 50.86 ± 10.27 and 51.10 ± 11.30 , respectively. There was no statistically significant difference between 12-14 year old and 15-17 year old group in terms of the total scores ($p=0.73$).

Cronbach's α coefficients were 0.78 for the total scale, 0.80 for the DIF, and 0.68 for the DDF, indicating adequate internal consistency. Coefficient α of the EOT was 0.40 and below the recommended standart of 0.70. Cronbach's α coefficient of the EOT was 0.20 for the 12-14 year old group and significantly below the recommended standard. Cronbach's α coefficients were presented in Table 1.

The mean inter-item correlation coefficients were 0.15, 0.11, and 0.21 for the total sample, 12-14 year old group, and 15-17 year old group; respectively. Considering inter-item correlations, scores of Turkish TAS-20 were within the limits of 0.10 and 0.50. Inter-item correlations of DIF and DDF subscales were in the optimal range for all groups. Inter-item coefficients of EOT subscale were low for the total sample (0.08) and 12-14 year old group (0.03), but within the limits for 15-17 year old group (0.13) (Table 1).

All criteria of goodness-of-fit met the standards for adequacy-of-fit for all adolescent age groups (Table 2). Factor parameter estimate values were shown in Table 3. DIF and DDF items.

Table 1. Cronbach alpha and mean inter-item correlation coefficients for the 3-factor model of T-TAS-20

Cronbach's alpha	TAS-20	Factor 1 (DIF)	Factor 2 (DDF)	Factor 3 (EOT)
Total sample	0.78	0.80	0.68	0.40
12-14 year old group	0.70	0.73	0.57	0.20
15-17 year old group	0.85	0.85	0.75	0.55
Mean inter-item correlations				
Total sample	0.15	0.36	0.29	0.08
12-14 year old group	0.11	0.29	0.21	0.03
15-17 year old group	0.21	0.45	0.38	0.13

T-TAS-20: Turkish form of 20-item Toronto Alexithymia Scale; DIF: Difficulty in identifying feelings; DDF: Difficulty in describing feelings; EOT: Externally oriented thinking

Table 2. The goodness-of-fit indices obtained by confirmatory factor analysis

Age groups	(χ^2/df)	SRMR	NNFI	CFI	GFI	AGFI	RMSEA
Total sample	2.21	0.05	0.96	0.96	0.94	0.92	0.05
12-14 years	1.91	0.06	0.95	0.95	0.93	0.92	0.05
15-17 years	3.48	0.06	0.93	0.94	0.90	0.87	0.07

SRMR: Standardized Root Mean Square Residual; NNFI: Non-Normed Fit Index; CFI: Comparative Fit Index; GFI: Goodness-of-fit; AGFI: Adjusted Goodness-of-fit; RMSEA: Root Mean Square Error of Approximation

Table 3. Factor parameter estimates for the T-TAS-20 items

Factors and items	The age groups			
	12-17	12-14	15-17	
<i>Factor 1. Difficulty Identifying Feelings (DIF)</i>				
Item 1 (I am often confused about what I feel exactly)		0.67	0.62	0.72
Item 3 (I have sensations in my body that even doctors do not understand)		0.48	0.40	0.55
Item 6 (When I am upset, I do not know if I am sad, scared, or angry)		0.57	0.55	0.58
Item 7 (I am often confused by sensations in my body)		0.60	0.56	0.64
Item 9 (I have feelings that I am unable to define completely)		0.73	0.71	0.77
Item 13 (I do not know what is going on inside me)		0.75	0.69	0.80
Item 14 (I do not know most of the time why I am angry)		0.57	0.58	0.58
<i>Factor 2. Difficulty Describing Feelings (DDF)</i>				
Item 2 (It is difficult for me to find the appropriate words for my feelings)		0.73	0.68	0.82
Item 4 (I am able to describe my feelings easily)		0.69	0.62	0.76
Item 11 (I find it hard to describe how I feel about people)		0.54	0.51	0.56
Item 12 (People demand to talk about my feelings more)		0.23	0.13	0.32
Item 17 (I find it hard to disclose my innermost feelings, even to my close friends)		0.54	0.44	0.64
<i>Factor 3. Externally-Oriented Thinking (EOT)</i>				
Item 5 (I would rather solve problems than just describe them)		0.59	0.51	0.66
Item 8 (I would rather let things happen than to understand the reason why they happened that way)		0.39	0.24	0.48
Item 10 (It is essential for people to know about their feelings)		0.29	0.29	0.32
Item 15 (I would rather talk to people about their daily routines than their feelings)		0.06	-0.12	0.21
Item 16 (I would rather watch light entertainment shows than dramatic shows)		-0.07	-0.24	0.06
Item 18 (I can feel close to someone, even in moments of silence)		0.25	0.17	0.36
Item 19 (I find it useful to explore my feelings in solving my personal problems)		0.32	0.29	0.40
Item 20 (Seeking for hidden meanings in movies or plays kills their enjoyment)		0.12	0.03	0.20

T-TAS-20: Turkish form of 20-item Toronto Alexithymia Scale

showed acceptable results except the item 12 (0.23). The values of the EOT items were under 0.35, except the item 5 (0.59) and the item 8 (0.39).

All the inter-correlations between the three Turkish TAS-20 factors were statistically significant, for the total sample, 12-14 year old and 15-17 year old groups ($p < 0.001$). For the total sample, the DIF and DDF factors were significantly and strongly correlated with each other ($r = 0.68$), and the EOT factor exhibited a lesser degree of correlation with DIF ($r = 0.19$) and DDF

($r = 0.24$). Inter-correlation results were similar for both 12-14 year old and 15-17 year old groups with the total sample. Inter-correlation results of 12-14 year old group were 0.80 between DIF and DDF, 0.11 between DIF and EOT, and 0.12 between DDF and EOT. Considering 15-17 year old adolescents; inter-correlation results were 0.70 between DIF and DDF, 0.27 between DIF and EOT and 0.33 between DDF and EOT.

Considering the test-retest reliability, the difference between the mean scores of the adolescents who completed the Turkish TAS-20 for the

second time was not statistically significant from the scores of the first evaluation. Pearson's Product-Moment correlation coefficients (r) for the total scale; DIF, DDF and EOT subscales were 0.79; 0.74, 0.65, 0.64; respectively ($p < 0.001$).

DISCUSSION

The current study findings revealed the psychometric properties of Turkish TAS-20 in adolescents for the first time. The results provided evidence to replicate the originally created three-factor model for the TAS-20.^{2,16} All criteria of goodness-of-fit reached the standards for adequacy-of-fit for all adolescent age groups. The estimates of internal reliability of the full scale for Turkish adolescents are comparable with the results of reliability and validity study of TAS-20 which had been conducted on Turkish adults.¹⁵ The test-retest reliability coefficient for the Turkish TAS-20 was 0.79 and indicated the stability of the scores.

The Cronbach's α coefficients for the total scale, DIF, and DDF subscales indicated adequate internal consistency. The authors of the original scale (TAS-20) suggested that the Cronbach's α coefficient above 0.60 demonstrate an acceptable reliability for DDF.¹⁵ Therefore in this study, Cronbach's α coefficient of DDF (0.68) was reasonable. In the present study, Cronbach's α coefficient for EOT was founded as 0.40. The Cronbach's α coefficients for EOT subscale was not favorable for most of the TAS-20 versions in different languages as ranged between 0.27 to 0.68.¹⁵

Regarding the mean inter-item correlations, results of the 15-17 year old group were in the optimal range. However, considering the factor 3, inter-item correlations of younger adolescents (12-14 years old) were below the recommended limit.²¹ Results of the parameter estimates were favorable for DIF and DDF subscales, except item 12. However, the values of the EOT items were under 0.35, except the item 5 and the item 8. In accordance with several studies,^{3,25-27} our results indicated that the two factors of the Turkish TAS-20 (DIF and DDF) had satisfactory psychometric properties for adolescents. How-

ever, it is important to interpret the results cautiously, because of the weak psychometric properties of EOT. Many other translations of the TAS-20 have often found less than optimal reliability coefficients for EOT.^{3,15} There may be a response bias to negatively keyed items on this factor and that some of the items do not adequately assess the EOT part of the alexithymia.^{3,28} Besides that, altering meaning in the translation process or cultural differences might both contribute to this. It is proved that to revise the item 5 in light of cultural differences provides more reliable and valid results for factor 3.²⁹ Craparo et al.³⁰ suggested that the EOT subscale is hard to understand for an adolescent and reported that DIF and DDF factors seem to represent the core of alexithymia in younger adolescents.

These results should be considered in the context of certain limitations. First, we did not measure the depression, which has been shown to be associated with alexithymia among adults.^{5,31} Second, this study included only self-reported data, which may be subject to bias. Finally, the cross-sectional nature of our study prevent the ability to detect a direct causal relationship between the variables. Despite these limitations, the strength of this study is its large sample size and the findings could help to extend our understanding alexithymia in adolescence.

CONCLUSION

The psychometric properties of the full scale in Turkish adolescents are comparable with the reliability and validity study of TAS-20 which had been conducted on Turkish adults. Caution should be taken when interpreting the outcomes, because the factor 3 appears to have weak psychometric properties. This study indicates that, for younger adolescents (12-14 years old) EOT subscale has some issues about factor parameters and internal reliability. Considering the EOT subscale, we suggest that the Turkish TAS-20 better fits for adolescents who are older than 14 years old. A new alexithymia scale specifically designed for younger adolescents that includes items which are more compatible with their social, emotional, and cognitive development can be the targets for future studies.

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