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RESEARCH ARTICLE

The Turkish validity and reliability of the Distress Tolerance Scale in youth in a clinical sample

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ABSTRACT

Objective: This study aims to examine the reliability and validity of the Turkish version of the Distress Tolerance Scale (DTS) in a clinical sample of children and adolescents.

Method: The study included a total of 198 children and adolescents between the ages of 10 and 17. To confirm the factor structure of the Turkish version of the DTS, confirmatory factor analysis was conducted. Convergent validity was assessed using a Spearman correlation matrix plot. Cronbach's alpha was calculated to evaluate internal consistency. The intraclass correlation coefficient, along with the Bland-Altman graphical method, was employed to examine test–retest reliability. All statistical analyses were evaluated at a significance level of $p<0.05$.

Results: The confirmatory factor analysis demonstrated model fit indices of $\chi^2/df=1.724$, Comparative Fit Index (CFI)=0.947, Goodness-of-Fit Index (GFI)=0.906, Normed Fit Index (NFI)=0.884, Tucker-Lewis Index (TLI)=0.934, Incremental Fit Index (IFI)=0.948, and Root Mean Square Error of Approximation (RMSEA)=0.061, indicating an acceptable fit. The Spearman correlation matrix plot revealed a negative relationship between the subscales of the DTS and the Revised Child Anxiety and Depression Scale – Child Version. Cronbach's alpha values for the DTS subscales ranged from 0.694 to 0.775, while the coefficient for the general distress tolerance factor was 0.884, indicating good internal consistency. The intraclass correlation coefficients assessing test–retest reliability ranged from 0.703 to 0.839. Bland-Altman plots demonstrated a reliable level of agreement between test and retest scores.

Conclusion: The Turkish version of the DTS is a valid and reliable tool for assessing distress tolerance in children and adolescents.

Keywords: Distress tolerance scale, psychometric properties, reliability, validity, youth

INTRODUCTION

The ability to endure and experience negative psychological states is referred to as distress tolerance. These states arise from cognitive or physical processes and manifest as emotions that often drive efforts to alleviate distress (1). The concept of distress tolerance consists of four factors. Tolerance refers to the individual's capacity to withstand distress and their perception of how unbearable the experience feels. Appraisal involves perceiving distress as unacceptable, feeling embarrassed about experiencing distress,

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and believing that one's coping abilities are weaker compared to those of others. Absorption indicates the extent to which negative emotions dominate the individual's attention and interfere with their functioning. Regulation describes the individual's extensive efforts to avoid negative emotions and the tendency to disengage from them as quickly as possible (1).

Emotional regulation and distress tolerance are closely related concepts (2). The association between distress tolerance and emotion regulation is characterized by the strategies developed by individuals to manage negative emotions (3). Research has shown an association between psychopathology and emotion regulation strategies during development (4). Therefore, it is important to understand the effects of distress tolerance on mental health. Distress tolerance, which has been the subject of increasing research, has been shown to be associated with various psychiatric disorders in young people. Problematic alcohol use, heavy drinking, delinquent behaviors, anxiety, depression, disordered eating attitudes, problematic internet use, and nonsuicidal self-injury are among the conditions associated with distress tolerance (5–10). Therefore, it is important to have reliable assessment methods for distress tolerance, which is linked to many psychiatric disorders in children and adolescents.

Experimental methods for measuring distress tolerance typically assess how long individuals persist in tasks involving physical or psychological stressors (11, 12). These methods provide an objective outcome independent of self-report. However, they have several limitations. First, persistence in these tasks may be influenced by factors other than distress tolerance, such as motivation or task persistence (1, 13). Additionally, physical stress paradigms, such as the cold-pressor task, primarily measure tolerance for physical discomfort rather than emotional distress. This limits their generalizability to affective experiences (14). These limitations of behavioral experiments have led to the need to measure the concept of distress tolerance by alternative means, such as self-report methods.

Simons and Gaher conducted the development and validation study of the Distress Tolerance Scale (DTS) among university students to measure the ability to tolerate distress. According to their study, the DTS consists of four first-order factors: tolerance, appraisal, absorption, and regulation, in accordance with the conceptual analysis of distress tolerance. Furthermore, the mean of these four first-order subscales yields a single second-order factor: the general distress tolerance (GDT) factor. While the internal consistency of the GDT factor was good, the subscales also showed adequate internal consistency. It was further demonstrated that the DTS maintains stability over time. Moreover, the DTS showed a negative relationship with affect dysregulation and a positive relationship with positive affectivity in validity analyses (1).

In the literature, there are only a few studies investigating the validity and reliability of the DTS in children and adolescents. In You and Leung's study, the factor structure and psychometric properties of the DTS were analyzed in a large general population of Chinese teenagers aged 12 to 19 years. In their study, they reported that a hierarchical model emerged from the exploratory factor analysis and was supported by the data. In addition, they found that the strength of the correlation between negative affectivity and distress tolerance was higher in female adolescents compared to males (15). In another study, the DTS was assessed for its factor structure and validity in both community and clinical samples. Researchers confirmed the four-factor hierarchical model in a clinical group of adolescents aged 10 to 18 years with primary emotional disorders. They also showed that the DTS regulation score increased with age in the community sample (16). In a study conducted with adolescents with chronic physical diseases in Taiwan, a nine-item, two-factor structure of the Chinese version of the DTS was identified (17).

As far as we know, no validity and reliability study has been conducted on the DTS among children and adolescents in our country. However, two separate studies have examined the validity and reliability of the Turkish version of the DTS in adult samples. Sargın et al. (18) identified a three-factor structure in the adult sample: tolerance, regulation, and self-efficacy. Nevertheless, in the study conducted by Akın et al. (19), it was shown that the model fit of the four-factor structure in the original scale was good.

To our knowledge, our study is the first to adapt and evaluate the reliability and validity of the DTS for Turkish teenagers. It appears that the initial factor structure proposed by Simon and Gaher may vary depending on age and sample characteristics. Thus, identifying the most suitable factor structure for young individuals in the Turkish sample is essential. This study aimed to translate the DTS into Turkish and examine its psychometric properties in a clinical

sample of children and adolescents. While distress tolerance has been extensively studied in adult populations, research focusing on children and adolescents remains limited. We expect that the adaptation of the DTS will contribute to the literature by enabling further studies on distress tolerance in Turkish youth.

METHODS

Participants

The present study was conducted using a cross-sectional research design. To ensure the applicability of the scale in clinical samples, the sample group consisted of young people who applied to a child and adolescent psychiatry outpatient clinic. The sample size was determined according to the Rule of Thumb, which indicates that for validity and reliability assessments, the number of participants should be at least 10 times the total number of items in the scale (20). Thus, the 15-item scale was administered to 198 young individuals aged 10 to 17 who volunteered to participate in the study. All participants were native Turkish children and adolescents who volunteered for the study and provided their consent. The study included children and adolescents who could adequately speak, read, and write Turkish to complete the scales. Exclusion criteria included the presence of psychiatric disorders that might prevent children and adolescents from engaging in the assessment process, such as intellectual disability and autism spectrum disorder, or being in the acute phase of a psychotic disorder or bipolar disorder. The study was conducted at a city hospital child and adolescent psychiatry outpatient clinic between December 2024 and April 2025. Ethical approval was obtained from the Ankara Bilkent City Hospital Ethics Committee on 27.11.2024 (approval number: TABED-2-24-443). Written consent was obtained from the participating children and adolescents, as well as from their parents. All study procedures adhered to the Declaration of Helsinki.

Procedure and Translation of DTS

To conduct validity and reliability analyses of the DTS among Turkish youth, permission was obtained from Jeffrey S. Simons, the developer of the scale. The English version of the DTS was translated into Turkish by a native bilingual Turkish speaker and a native Turkish-speaking English teacher. The authors and an English language specialist compared the two translated versions and produced a revised translation. A further translation of the Turkish text into English was then carried out by a different English teacher. Upon comparing the back-translation with the original English version of the DTS, the authors identified discrepancies and finalized the translation process by revising the Turkish version accordingly. Subsequently, fifteen adolescents completed the scale in a pilot study and provided feedback on the comprehensibility of the items. It was observed that children over the age of 10 were able to easily understand the scale items. The authors carefully analyzed each item to detect potential comprehension issues or changes in meaning related to language and terminology. Ultimately, the authors implemented modifications to the DTS, leading to the completion of the final translated version.

Instruments

Youth who participated in our study were evaluated using a sociodemographic form, the Turkish version of the Distress Tolerance Scale, the Revised Child Anxiety and Depression Scale – Child Version (RCADS-CV), and the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA). To assess the test-retest reliability of the scale, we administered the DTS to 39 volunteers two weeks after their initial completion.

Sociodemographic Form

This form was prepared by the authors to investigate participants' characteristics, including age, gender, and clinical features.

Distress Tolerance Scale (DTS)

Simons and Gaher created the DTS to measure individual differences in the capacity to tolerate distress. The scale is a 15-item, 5-point Likert-type self-report measure, with responses ranging from 1 (Strongly Agree) to 5 (Strongly Disagree). The DTS consists of four subscales: Tolerance, Regulation, Appraisal, and Absorption. In addition, the GDT factor is calculated as the mean score of the four DTS subscales, forming the higher-order structure of the scale. Higher scores on the DTS reflect greater distress tolerance (1).

Revised Child Anxiety and Depression Scale – Child Version (RCADS-CV)

This scale was designed to assess anxiety disorders and depression in children and adolescents. (21) The instrument comprises 47 items on a four-point Likert scale, with each item rated from 0 to 3. There

are two versions of the scale, one completed by the child and one by the parent. In our study, the child-completed form was used. Gormez et al. (22) conducted the Turkish adaptation, reliability, and validity study in children aged 8 to 17 years. We used the RCADS-Child Scoring Program version 3.2 in Excel to calculate the scores.

Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA)

Gullone and Taffe adapted this scale from the Emotion Regulation Questionnaire created by Gross and John for an adult population (23). The ERQ-CA is a self-report instrument designed to evaluate variations in the use of two emotion regulation strategies. The scale includes 10 items across two subdimensions: Expressive Suppression (ES) and Cognitive Reappraisal (CR), assessed using a 5-point Likert scale ranging from 1 to 5. Higher scores on the subscales indicate greater use of the corresponding emotion regulation strategy. The Turkish adaptation of the scale was carried out by Tetik and Cenkseven Önder, who demonstrated that the ERQ-CA is valid for children and adolescents aged 10 to 18 years (24).

Statistical Analysis

The analysis was carried out using the free and open-source software R (version 4.4.1, https://cran.r-project.org), SPSS for Windows Version 23.0 statistical package (Chicago, IL), and AMOS (version 23) by an academic biostatistician. The assumption of normal distribution for numerical variables was assessed using the Kolmogorov-Smirnov goodness-of-fit test and graphical approaches (Q-Q plot, histogram). Median (25^{th} percentile–75^{th} percentile) values were reported for numerical variables lacking normal distribution, and frequency and percentage values were reported for categorical variables.

In this study, validity (construct, convergent) and reliability (internal consistency, test-retest reliability) analyses of the DTS were conducted. Construct validity was examined using confirmatory factor analysis (CFA). The present research adhered to the four-factor hierarchical model established by Simons and Gaher (1). This decision was based on the theoretical coherence of the model, its strong empirical foundation in previous literature, and the need for comparability across studies. Moreover, the original structure aligns well with the conceptualization of distress tolerance as a multidimensional construct. Overall model fit was assessed using Chi-square Goodness of Fit (χ^2/df), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Incremental Fit Index (IFI). One method used to determine construct validity is calculating the correlation coefficient between the relevant scale and external measures (convergent validity). To assess convergent validity, Spearman's rank correlation coefficient was used to calculate the correlation between the DTS scores and the RCADS-CV and ERQ-CA scores. The correlation coefficient (r) is classified as very strong for values between 0.90 and 1.0, strong for 0.70–0.89, moderate for 0.40–0.69, poor for 0.20–0.39, and very poor when below 0.19 (20). The correlation matrix was plotted using the "metan" package (25).

In the reliability analysis of the Turkish version of the DTS, test-retest reliability was evaluated with the Spearman correlation coefficient and the Intraclass Correlation Coefficient (ICC), while Bland-Altman plots were employed to determine measurement agreement over time. The ICC ranges from 0.00 to 1.00, where values between 0.50 and 0.75 indicate moderate reliability, values between 0.75 and 0.90 indicate good reliability, and values above 0.90 represent excellent reliability (26). The "blandr" package in R software was used to generate Bland-Altman graphs (27). The reliability of the DTS was assessed using Cronbach's alpha coefficient calculated across the 15 items. If Cronbach's alpha ranges from 0.60 to 0.79, the scale can be considered quite reliable; if it ranges from 0.80 to 1.00, it can be considered highly reliable (20). The statistical significance level was set at $p<0.05$.

RESULTS

The scale was administered to 198 participants aged 10-17 years (median=15.0, 25^{th}–75^{th} percentile=13.0-16.2). Among the participants, 62.1% (n=123) were female and 37.9% (n=75) were male. The study found that among the adolescents, the rates of psychiatric disorders were as follows: major depressive disorder 35.4% (n=70), attention-deficit/hyperactivity disorder 29.8% (n=59), generalized anxiety disorder 13.6% (n=27), social anxiety disorder 7.6% (n=15), conduct disorder 6.1% (n=12), obsessive-compulsive disorder 4.0% (n=8), specific learning disorder 4.0% (n=8), and oppositional defiant disorder 3.5% (n=7).

Results of Validity Analysis

In our study, the construct validity of the DTS was evaluated, and CFA was applied to validate the

Table 1: Confirmatory factor analysis results

Parameter	Abbreviation	Acceptable range	Initial model	Final model
Chi-Square Fit Test	CMIN/df	CMIN/df≤3	2.882	1.724
Comparative Fit Index	CFI	0.95≤CFI≤0.97	0.852	0.947
Goodness of Fit Index	GFI	0.85≤GFI≤0.90	0.840	0.906
Normed Fit Index	NFI	0.90≤NFI≤0.95	0.793	0.884
Tucker-Lewis Index	TLI	TLI≥0.95	0.828	0.934
Incremental Fit Index	IFI	0.90≤IFI≤0.95	0.854	0.948
Root Mean Square Error of Approximation	RMSEA	0.05≤RMSEA≤0.08	0.098	0.061

Table 2: Findings on reliability

	ICC (95% CI)	Cronbach's alpha	r_s	p
F1	0.703 (0.501–0.833)	0.775	0.704	<0.001
F2	0.807 (0.662–0.894)	0.769	0.831	<0.001
F3	0.823 (0.688–0.903)	0.757	0.813	<0.001
F4	0.779 (0.618–0.878)	0.694	0.764	<0.001
GDT	0.839 (0.714–0.912)	0.884	0.850	<0.001

F1: Tolerance; F2: Appraisal; F3: Absorption; F4: Regulation; GDT: General distress tolerance; ICC: Intraclass Correlation Coefficient; CI: Confidence interval; rs: Spearman correlation coefficient.

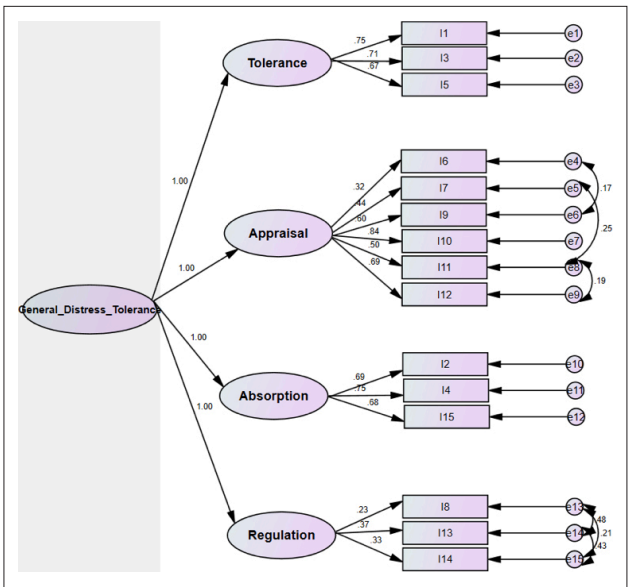

Figure 1. Diagram of confirmatory factor analysis (adjusted model).

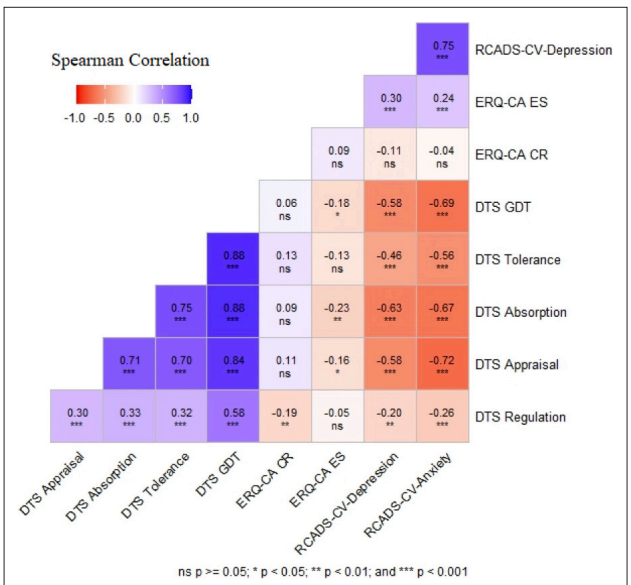

Figure 2. Correlation matrix plot showing the relationships between the subdimensions of the DTS and the scales of the ERQ-CA and RCADS-CV.

RCADS-CV: Revised Child Anxiety and Depression Scale – Child Version; ERQ-CA: Emotion Regulation Questionnaire for Children and Adolescents; ES: Expressive Suppression; CR: Cognitive Reappraisal; DTS: Distress Tolerance Scale; GDT: General Distress Tolerance.

factor structure. The original hierarchical model (1), consisting of four first-order factors and one second-order factor, was fitted to the modeling data (n=198), and the fit measures were reported (Final model in Table 1, Fig. 1). Some fit indices were acceptable (GFI=0.906, IFI=0.948, and RMSEA=0.061), whereas others indicated a poor fit (TLI=0.934 and NFI=0.884). Considering the modification indices shown in Table 1, it was concluded that the values were at an acceptable level in terms of the model fit. Consequently, a valid scale structure consisting of 15 items, four first-order factors, and one second-order factor was confirmed.

According to the Spearman correlation matrix plot (Fig. 2), used to determine convergent validity, a significant negative moderate correlation was identified between the GDT factor and the tolerance and absorption subscale scores of the DTS and the RCADS-CV anxiety score (r=-0.689, r=-0.558, r=-0.674, respectively; p<0.001 for all). The appraisal subscale score of the DTS demonstrated a significant negative strong correlation with the RCADS-CV anxiety score (r=-0.722, p<0.001), whereas the regulation subscale score showed a significant negative weak correlation

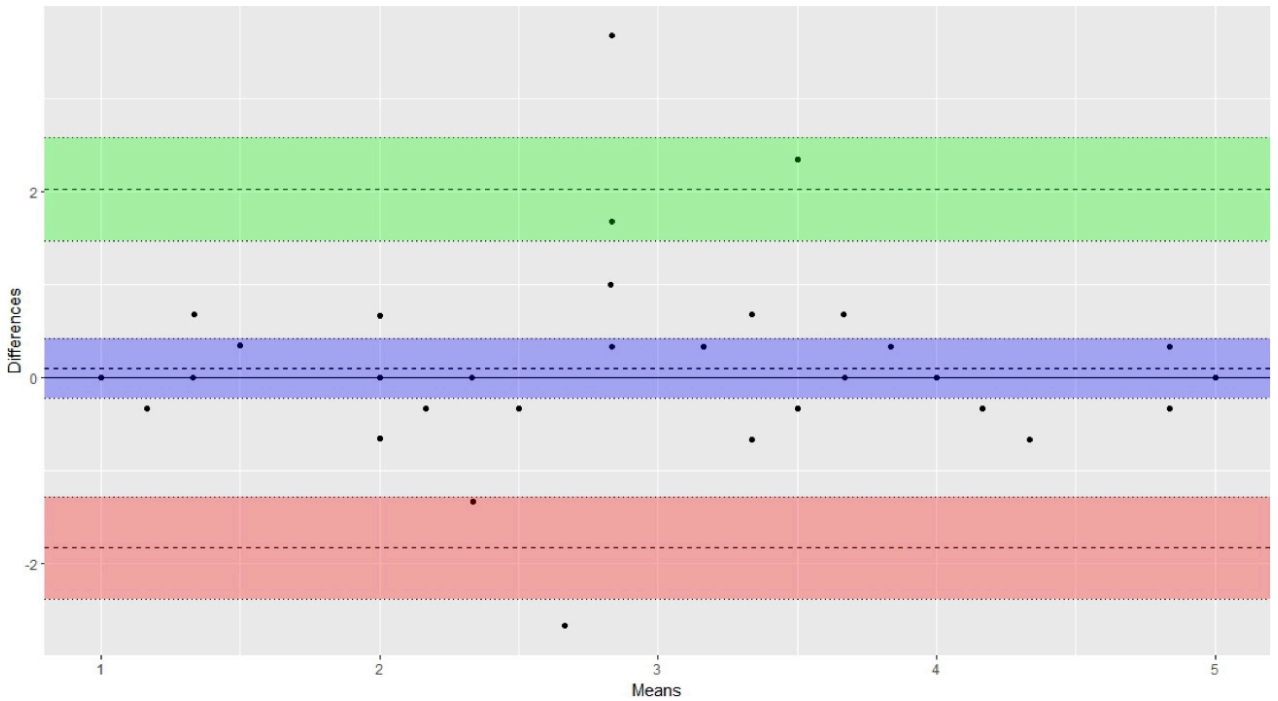

Figure 3. Bland-Altman plot illustrating the agreement between the two measurement time points for the tolerance subscale. The blue shaded area represents the mean difference and its 95% confidence interval. In the plot, green highlights the upper limit of agreement and red highlights the lower limit (mean±1.96 SD). Each dot corresponds to a participant's average measurement versus the difference between the two methods.

with the RCADS-CV anxiety score (r=-0.260, p<0.001). A significant negative moderate correlation was found between the GDT factor and the tolerance, absorption, and appraisal subscale scores of the DTS and the RCADS-CV depression score (r=-0.582, r=-0.459, r=-0.632, r=-0.576, respectively; p<0.001 for all). The regulation subscale score of the DTS showed a significant negative weak correlation with the RCADS-CV depression score (r=-0.203, p=0.004). In addition, a significant negative very weak correlation was observed between the GDT factor and the appraisal subscale score of the DTS and the ECQ-CA ES score (r=-0.183, p=0.010; r=-0.164, p=0.021, respectively), while the absorption subscale score showed a significant negative weak correlation with the ERQ-CA ES score (r=-0.231, p=0.001). Finally, the ERQ-CA CR score showed a significant negative very weak correlation with the regulation subscale score of the DTS (r=-0.193, p=0.007).

Results of Reliability Analysis

In our study, the internal consistency of the DTS was assessed using Cronbach's alpha. The alpha coefficients obtained from the analysis were 0.775 for the tolerance subscale, 0.769 for the appraisal subscale, 0.757 for the absorption subscale, and 0.694 for the regulation subscale (Table 2). Cronbach's alpha coefficient for the GDT factor was found to be 0.884. According to Cronbach's alpha coefficients, the subdimensions of the scale can be considered reliable. The total of 15 items of the scale also demonstrated high reliability based on Cronbach's alpha coefficient (20).

To determine the test-retest reliability of the DTS, 39 participants completed the scale again two weeks after their initial assessment. Spearman's correlation coefficients were calculated to determine the relationship between the two measurements. The findings demonstrated a significant, strong positive correlation between the initial and follow-up assessments (p<0.001 for all). ICC coefficients were also calculated to assess test-retest reliability. The ICC coefficient for the tolerance subscale was found to be 0.703, indicating moderate reliability. For the appraisal, absorption, regulation, and GDT factors, ICC coefficients ranged between 0.779 and 0.839, indicating good reliability (Table 2). Finally, the data points in the Bland-Altman graphs being very close to the zero line indicate that the agreement between the test-retest results was at a reliable level (Fig. 3–6).

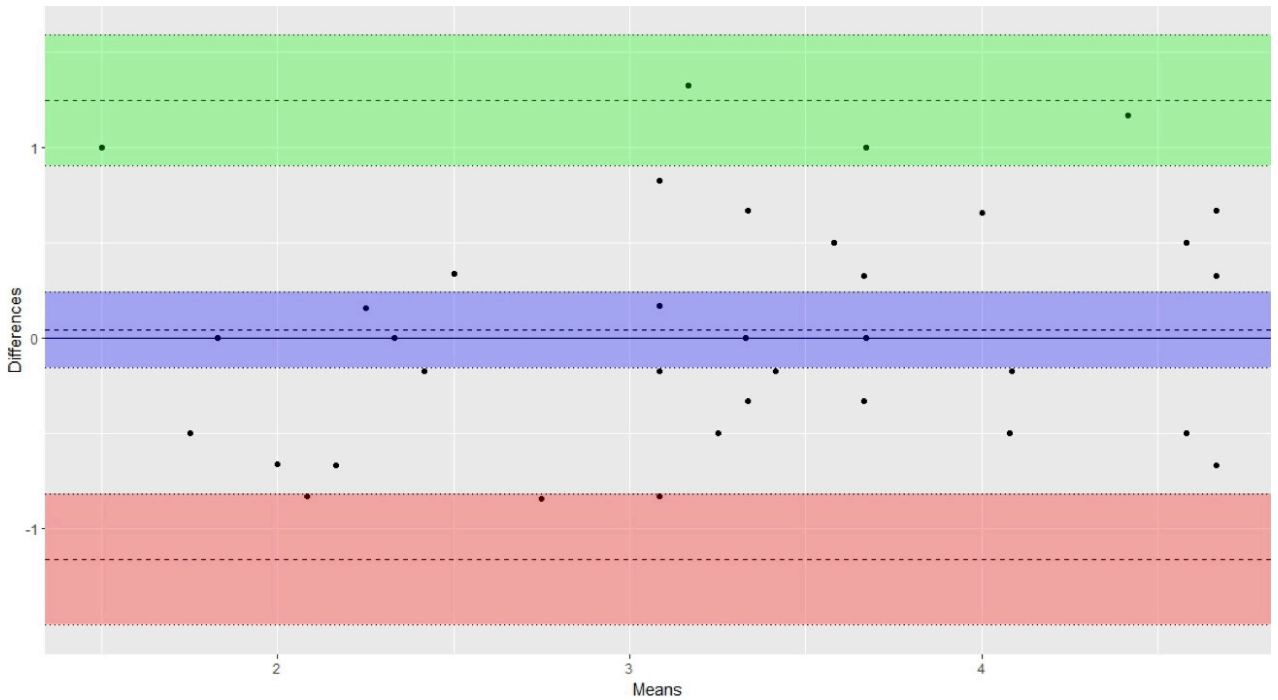

Figure 4. Bland-Altman plot illustrating the agreement between the two measurement time points for the appraisal subscale. The blue shaded area represents the mean difference and its 95% confidence interval. In the plot, green highlights the upper limit of agreement and red highlights the lower limit (mean±1.96 SD). Each dot corresponds to a participant's average measurement versus the difference between the two methods.

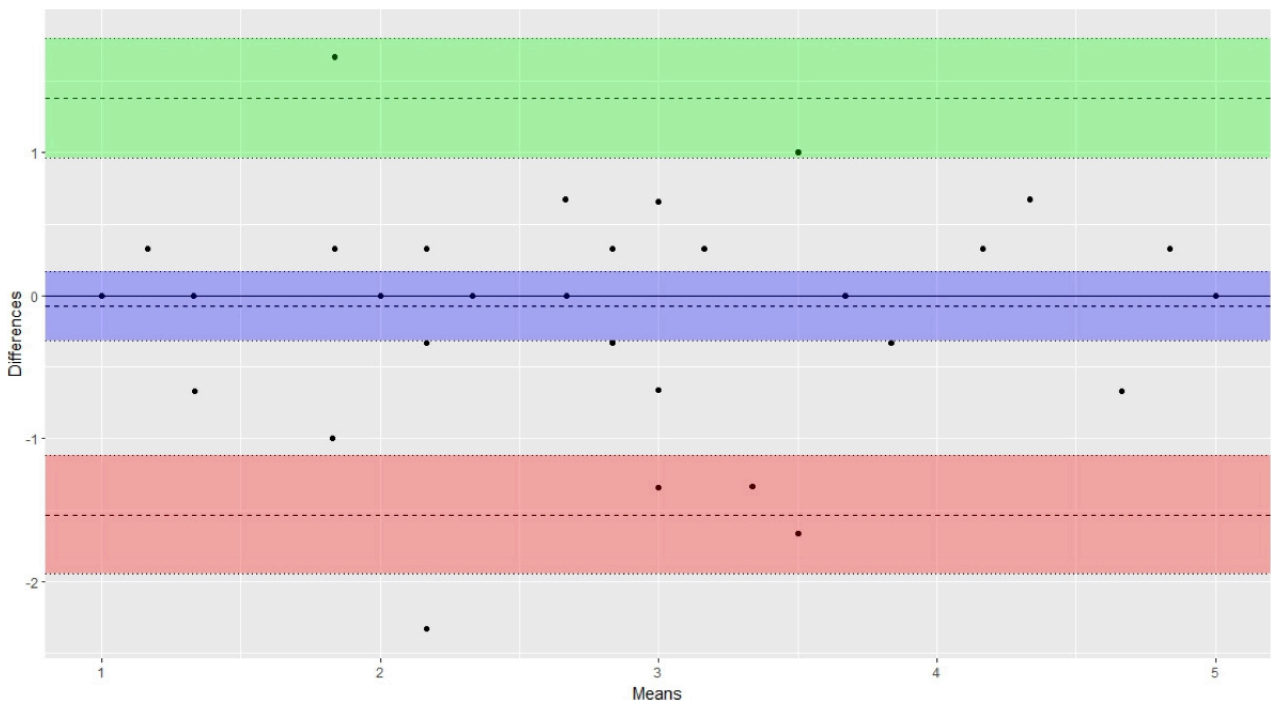

Figure 5. Bland-Altman plot illustrating the agreement between the two measurement time points for the absorption subscale. The blue shaded area represents the mean difference and its 95% confidence interval. In the plot, green highlights the upper limit of agreement and red highlights the lower limit (mean±1.96 SD). Each dot corresponds to a participant's average measurement versus the difference between the two methods.

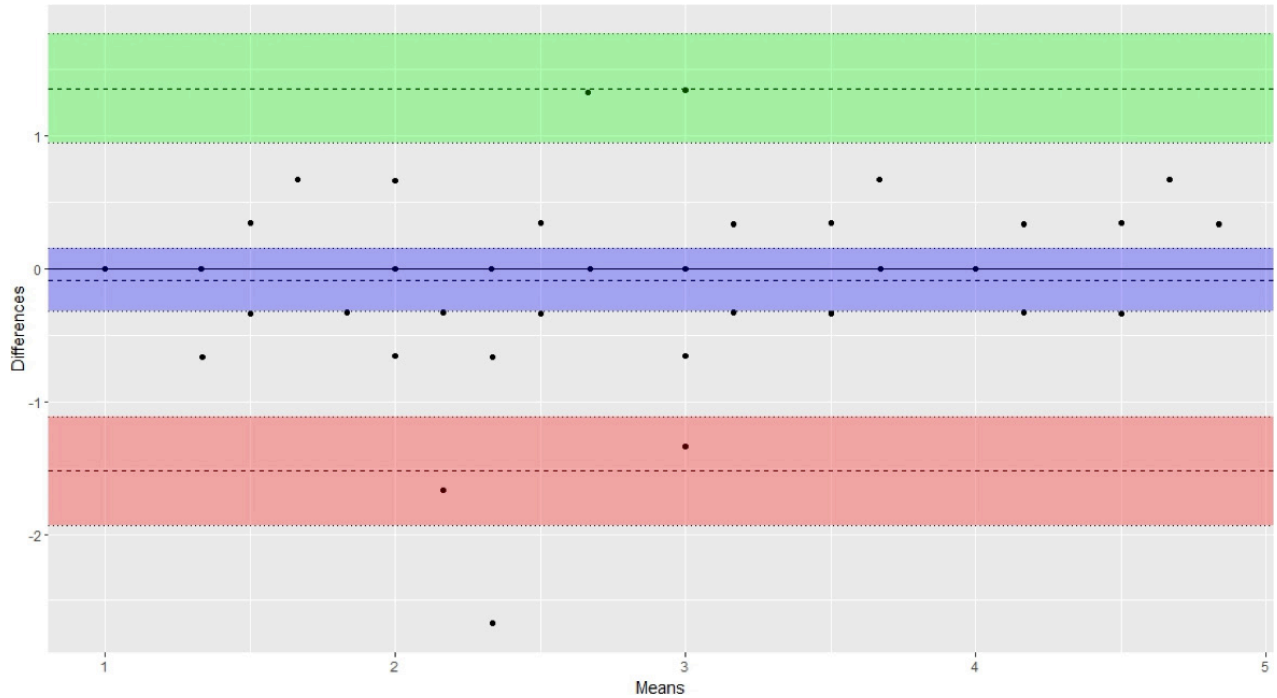

Figure 6. Bland-Altman plot illustrating the agreement between the two measurement time points for the regulation subscale. The blue shaded area represents the mean difference and its 95% confidence interval. In the plot, green highlights the upper limit of agreement and red highlights the lower limit (mean±1.96 SD). Each dot corresponds to a participant's average measurement versus the difference between the two methods.

DISCUSSION

Our study demonstrated that convergent validity, CFA, test-retest reliability, and internal consistency analyses confirmed the DTS as a valid and reliable instrument for assessing distress tolerance in a Turkish youth sample. The outcomes of the validity and reliability analyses are examined below in accordance with the literature.

In our study, CFA indicated that the original hierarchical model of the DTS, consisting of 15 items, four first-order factors, and one second-order factor, showed an acceptable model fit. Simons and Gaher conducted two separate studies in which they developed the DTS and found that the single-factor model consisting of 15 items did not fit well. Consequently, a hypothesized hierarchical model comprising four first-order factors indicative of a single second-order GDT factor was shown to have a significantly better fit (1). However, various studies in the literature have proposed different factor structures for the DTS. In You and Leung's study, it was shown that the Chinese version of the DTS consists of four first-order factors: tolerance, absorption, appraisal, and regulation. It also has a second-order factor of general distress intolerance comprising the first three of these factors. Notably, item 6 of the DTS was placed under the regulation factor instead of appraisal (15). In Tonarely and Ehrenreich-May's study, the four-factor hierarchical structure showed the best model fit in young people aged 10-18 years in a clinical sample. This structure was comparable to the one validated by You and Leung. However, item 6 was categorized under the appraisal factor, as in the original version (16). In a Portuguese study conducted with children aged 6-13 years who had emotional disorders, five different factor structures of the DTS proposed in the literature were evaluated. As a result, it was suggested that Tonarely and Ehrenreich-May's model was the most appropriate for the clinical sample (28). According to these studies, regulation is not considered part of the GDT factor. However, from a conceptual standpoint, as noted in the original development study of the DTS, distress tolerance and distress regulation are closely interrelated (1). Since the factor structure in Simons and Gaher's study showed an acceptable fit in our sample, we believe that the original hierarchical model can be applied to the Turkish youth sample.

In the present study, a significant negative correlation was found between the GDT factor and all subscales of the DTS and the RCADS anxiety and depression scores. Caiado et al. (28) reported that the DTS subscale scores were negatively correlated with the RCADS anxiety and depression scores. In addition, You and Leung found a significant correlation between distress intolerance and levels of anxiety and depression as assessed by the Depression Anxiety Stress Scale (15). Similar to our study, the DTS regulation subscale score was found to be relatively weakly associated with anxiety and depression levels in both studies (15, 28). These findings indicate that adolescents may experience negative emotions without a corresponding urge to immediately suppress or eliminate them. Contrary to our expectations, our study showed only a poor correlation between distress tolerance and emotion regulation strategies. In a recent study, it was shown that low distress tolerance significantly predicted increased utilization of rumination, avoidance, and suppression, but not reappraisal, as emotion regulation strategies (29). It is thought that the use of various tools to measure emotion regulation may explain the differing results. In addition, Milam and Judah's study suggests that emotion regulation may be more effective in facilitating distress tolerance among individuals with higher levels of cognitive control (30). This suggests that there are many factors that may mediate the association between distress tolerance and emotion regulation, and further studies should be conducted to identify these factors. Based on these findings, it was concluded that the DTS is related to anxiety, depression, and emotion regulation, but measures a different construct.

The internal consistency of the DTS was assessed using Cronbach's alpha coefficients, which ranged from 0.69 to 0.88, indicating that the scale's internal consistency is reliable. Simons and Gaher evaluated the internal consistency of the DTS at two different time points. In the initial assessment, alpha coefficients ranged from 0.70 to 0.82. Six months later, a follow-up evaluation yielded alpha coefficients ranging from 0.73 to 0.85, further supporting the scale's reliability over time (1). Similarly, You and Leung (15) found that the scale was internally consistent, with alpha coefficients ranging from 0.75 to 0.91. Caiado et al. (28) also determined that the scale exhibits good internal consistency, as evidenced by alpha values of 0.70 or higher. In Tonarely and Ehrenreich-May's study, the internal consistency of the DTS in a clinical sample was found to range from questionable to good, with Cronbach's alpha coefficients between 0.58 and 0.86 (16). Overall, while minor variations exist depending on sample characteristics and study design, the DTS has generally demonstrated acceptable internal consistency.

In our study, the test-retest reliability of the DTS was assessed using various statistical and graphical approaches, including Spearman's correlation coefficients, ICC values, and Bland-Altman plots. The ICC values for the subscales and the GDT factor of the DTS ranged from 0.703 to 0.839, indicating moderate to good test-retest reliability. Simons and Gaher reported good test-retest reliability for the second-order scale of the DTS over a six-month period, with an ICC value of 0.61 (1). In our study, Spearman correlation coefficient values between the two evaluations conducted at two-week intervals ranged from 0.70 to 0.85. Leu and Yeung, on the other hand, found the stability of the scale to be moderate at follow-up over a six-month interval (r=0.31-0.48) (15). This difference may be related to the variation in the time intervals used in studies assessing test-retest reliability. Consequently, based on the Spearman correlation coefficients, ICC values, and Bland-Altman plots for each subdimension, we can assert that the DTS is both reproducible and consistent over time.

This study has some limitations. First, the sample was limited to children and adolescents from a psychiatry outpatient clinic, which may affect the generalizability of the findings to non-clinical populations. Additionally, since the scales used to examine convergent validity were only validated for ages 10–17, DTS could not be evaluated in younger children. Future studies should address this age group. The cross-sectional design also prevents causal inferences. Test-retest reliability was evaluated in a limited portion of the sample (n=39), restricting conclusions regarding temporal stability. Finally, the diagnostic heterogeneity of the sample may have influenced DTS scores, as varying levels of internalizing and externalizing symptoms could contribute to differences in distress tolerance. Prior longitudinal research indicates that distress tolerance shows distinct associations with anxiety, attention-deficit/hyperactivity disorder, and oppositional defiant disorder symptoms (31). This diversity should be taken into account when interpreting the current findings.

CONCLUSION

The findings of this research suggest that the Turkish version of the DTS is a valid and reliable tool for evaluating distress tolerance in clinically referred Turkish children and adolescents aged 10 to 17 years. The scale demonstrated acceptable psychometric properties and may serve as a valuable instrument for both clinical assessment and research in child and adolescent mental health settings. Future studies are encouraged to replicate these findings in community samples and younger age groups, as well as to investigate the predictive value of distress tolerance in various psychological outcomes.

Ethical Approval: The Ankara Bilkent City Hospital Ethics Committee granted approval for this study (date: 27.11.2024, number: TABED-2-24-443).

Informed Consent: Informed consent was obtained from all participants.

Conflict of Interest: The authors declare that they have no conflict of interest.

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Contribution Categories		Author Initials
Category 1	Concept/Design	M.O., K.A.B., G.S.D., E.C.
	Data acquisition	B.N.T.K., M.O.
	Data analysis/Interpretation	M.O., H.A.
Category 2	Drafting manuscript	M.O., B.N.T.K., H.A., K.A.B.
	Critical revision of manuscript	G.S.D., E.C.
Category 3	Final approval and accountability	M.O., B.N.T.K., H.A., K.A.B., G.S.D., E.C.
Other	Technical or material support	H.A.
	Supervision	G.S.D., E.C.

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REFERENCES

1. Simons JS, Gaher RM. The Distress Tolerance Scale: Development and validation of a self-report measure. Motiv Emot 2005;29:83-102. [Crossref]
2. Conway CC, Naragon-Gainey K, Harris MT. The Structure of Distress Tolerance and Neighboring Emotion Regulation Abilities. Assessment 2021; 28:1050-1064. [Crossref]
3. Naragon-Gainey K, McMahon TP, Chacko TP. The structure of common emotion regulation strategies: A meta-analytic examination. Psychol Bull 2017; 143:384-427. [Crossref]
4. Cavicchioli M, Tobia V, Ogliari A. Emotion Regulation Strategies as Risk Factors for Developmental Psychopathology: A meta-analytic review of longitudinal studies based on cross-lagged correlations and panel models. Res Child Adolesc Psychopathol 2023; 51:295-315. [Crossref]
5. Heleniak C, Bolden CR, McCabe CJ, Lambert HK, Rosen ML, King KM, et al. Distress tolerance as a mechanism linking violence exposure to problematic alcohol use in adolescence. Res Child Adolesc Psychopathol 2021; 49:1211-1225. [Crossref]
6. Daughters SB, Reynolds EK, MacPherson L, Kahler CW, Danielson CK, Zvolensky M, et al. Distress tolerance and early adolescent externalizing and internalizing symptoms: the moderating role of gender and ethnicity. Behav Res Ther 2009; 47:198-205. [Crossref]
7. Juarascio AS, Felton JW, Borges AM, Manasse SM, Murray HB, Lejuez CW. An investigation of negative affect, reactivity, and distress tolerance as predictors of disordered eating attitudes across adolescence. J Adolesc 2016; 49:91-88. [Crossref]
8. Lin MP. Avoidance/emotion-focused coping mediates the relationship between distress tolerance and problematic Internet use in a representative sample of adolescents in Taiwan: One-year follow-up. J Adolesc 2022; 94:600-610. [Crossref]
9. Winward JL, Bekman NM, Hanson KL, Lejuez CW, Brown SA. Changes in emotional reactivity and distress tolerance among heavy drinking adolescents during sustained abstinence. Alcohol Clin Exp Res 2014; 38:1761-1769. [Crossref]
10. Lin MP, You J, Wu YW, Jiang Y. Depression mediates the relationship between distress tolerance and nonsuicidal self-injury among adolescents: One-year follow-up. Suicide Life Threat Behav 2018; 48:589-600. [Crossref]
11. Brown RA, Lejuez C, Kahler CW, Strong DR. Distress tolerance and duration of past smoking cessation attempts. J Abnorm Psychol 2002; 111:180. [Crossref]
12. Zvolensky MJ, Vujanovic AA, Bernstein A, Leyro T. Distress tolerance: Theory, measurement, and relations to psychopathology. Curr Dir Psychol Sci 2010; 19:406-410. [Crossref]
13. Brandon TH, Herzog TA, Juliano LM, Irvin JE, Lazev AB, Simmons VN. Pretreatment task persistence predicts smoking cessation outcome. J Abnorm Psychol 2003; 112:448-456. [Crossref]
14. Geisser ME, Robinson ME, Pickren WE. Differences in cognitive coping strategies among pain-sensitive and pain-tolerant individuals on the cold-pressor test. Behav Ther 1992; 23:31-41. [Crossref]
15. You J, Leung F. A Chinese adaptation of the Distress Tolerance Scale among adolescents: Factor structure and psychometric properties. J Psychopathol Behav Assess 2012; 34:136-144. [Crossref]
16. Tonarely NA, Ehrenreich-May J. Confirming the factor structure and validity of the Distress Tolerance Scale (DTS) in youth. Child Psychiatry Hum Dev 2020; 51:514-526. [Crossref]
17. Lee SL, Wu LM, Lin SY, Chen TH, Lin WT. Cross-cultural translation and validation of the Chinese version Distress Tolerance Scale for adolescents with chronic physical disease. Child Care Health Dev 2024; 50:e13270. [Crossref]

18. Sargin AE, Özdel K, Utku Ç, Kuru E, Yalçınkaya Alkar Ö, Türkçapar MH. Distress tolerance scale: A study of reliability and validity. J Cogn Behav Psychother Res 2012; 1:152. [Article in Turkish]

19. Akın A, Akça MŞ, Gülşen M. Turkish version of the Distress Tolerance Scale: A study of validity and reliability. Kastamonu Educ J 2015; 23:619-630. [Article in Turkish]

20. Alpar R. Uygulamalı İstatistik ve Geçerlik-Güvenirlik. Seventh ed. Ankara: Detay Yayincilik; 2022. [Book in Turkish]

21. Chorpita BF, Yim L, Moffitt C, Umemoto LA, Francis SE. Assessment of symptoms of DSM-IV anxiety and depression in children: A revised child anxiety and depression scale. Behav Res Ther 2000; 38:835-855. [Crossref]

22. Gormez V, Kilincaslan A, Ebesutani C, Orengul AC, Kaya I, Ceri V, et al. Psychometric Properties of the Parent Version of the Revised Child Anxiety and Depression Scale in a Clinical Sample of Turkish Children and Adolescents. Child Psychiatry Hum Dev 2017; 48:922-933. [Crossref]

23. Gullone E, Taffe J. The emotion regulation questionnaire for children and adolescents (ERQ-CA): A psychometric evaluation. Psychol Assess 2012; 24:409. [Crossref]

24. Tetik S, Önder FC. Çocuk ve Ergenlerde Duygu Düzenleme Ölçeği'nin Türkçeye Uyarlanması. Çukurova Univ J Soc Sci Inst 2021; 30:87-100. [Article in Turkish] [Crossref]

25. Olivoto T, Lúcio ADC. metan: An R package for multi-environment trial analysis. Methods Ecol Evol 2020; 11:783-789. [Crossref]

26. Koo TK, Li MY. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. J Chiropr Med 2016; 15:155-163. [Crossref]

27. Datta D. blandr: A Bland-Altman Method Comparison package for R, version 0.6.0. Available at: https://zenodo.org/records/11583535. Accessed Nov 27, 2025.

28. Caiado B, Santos D, Pereira B, Góis AC, Canavarro MC, Moreira H. The factorial structure, psychometric properties and sensitivity to change of the Distress Tolerance Scale for children with emotional disorders. Children (Basel) 2024; 11:115. [Crossref]

29. Jeffries ER, McLeish AC, Kraemer KM, Avallone KM, Fleming JB. The role of distress tolerance in the use of specific emotion regulation strategies. Behav Modif. 2016; 40:439-451. [Crossref]

30. Milam AL, Judah MR. The association of emotion regulation with distress tolerance depends on a neural correlate of cognitive control. Biol Psychol 2023; 180:108571. [Crossref]

31. Cummings JR, Bornovalova MA, Ojanen T, Hunt E, MacPherson L, Lejuez C. Time doesn't change everything: the longitudinal course of distress tolerance and its relationship with externalizing and internalizing symptoms during early adolescence. J Abnorm Child Psychol 2013; 41:735-748. [Crossref]