# Validity and reliability of the Turkish version of the DSM-5 Generalized Anxiety Disorder Severity Scale for children aged 11–17 years

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**Background/aim:** This study aimed to assess the validity and reliability of the Turkish version of the DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form.

**Materials and methods:** The study sample consisted of 32 patients treated in a child psychiatry unit and diagnosed with generalized anxiety disorder and 98 healthy volunteers who were attending middle or high school during the study period. For the assessment, the Screen for Child Anxiety and Related Emotional Disorders (SCARED) was also used along with the DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form.

**Results:** Regarding reliability analyses, the Cronbach alpha internal consistency coefficient was calculated as 0.932. The test–retest correlation coefficient was calculated as r = 0.707. As for construct validity, one factor that could explain 62.6% of the variance was obtained and this was consistent with the original construct of the scale. As for concurrent validity, the scale showed a high correlation with SCARED.

**Conclusion:** It was concluded that Turkish version of the DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form could be utilized as a valid and reliable tool both in clinical practice and for research purposes.

**Key words:** DSM-5, Generalized Anxiety Disorder Severity Scale - Child Form, reliability, validity

## 1. Introduction

Anxiety disorders are among the most common psychiatric disorders seen in childhood. Reported rates vary from 8.3% to 27% related to a joint evaluation of lifetime prevalence with impairments in functioning. The second most commonly encountered anxiety disorder is generalized anxiety disorder (GAD), and its reported prevalence is 15% (1).

GAD is a condition where an individual has extreme anxiety and worries about multiple situations and activities most of the time during at least a 6-month period. The individual finds it hard to control worries. Distress, inability to focus, tiring easily, irritability, muscle tension, and sleep disruptions accompany the course of anxiety and worries (2).

GAD causes a decline in many functional domains (school, social skills, and family relationships), similar to other anxiety disorders (3). Adolescents with GAD tend

to engage in self-harm and self-report suicidal ideation more frequently, and they exhibit academic difficulties and intrafamilial conflicts and difficulties in peer relationships more often than their normal counterparts (4–6). The diagnosis of GAD is a reported risk factor for alcohol and nicotine abuse in adolescents (7). It has also been reported that although GAD has a high prevalence and is a cause of functional impairment, rates of diagnosis and treatment appear to be less than what would be expected (8).

GAD is assessed through a clinical interview. The onset of anxiety symptoms and their evolution during the course of the disorder, the severity of the anxiety symptoms, the effect of anxiety symptoms on functioning, and stress factors related to symptoms are among issues of interest in the clinical assessment (9). It is particularly important to ask about thoughts, behaviors, and physical symptoms related to anxiety (3). Although a clinical interview is the most common method used for assessment, some self-

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report forms such as the Multidimensional Anxiety Scale for Children (10), the Screen for Child Anxiety Related Emotional Disorders (11), the Spence Children's Anxiety Scale (12), and the Pediatric Anxiety Rating Scale (13) are also available for use during evaluation. These scales are not specific to GAD, but they evaluate the presence of anxiety disorders based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-4) (3). Although these scales have been shown to be effective for differentiating children with an anxiety disorder from those without, it has long been reported that specific scales based on diagnostic criteria for each anxiety disorder and appropriate for use in adolescents are warranted for the diagnostic and follow-up period (14,15). There is no instrument that specifically measures GAD in Turkey. The availability of a valid and easily administrable assessment tool is crucial in precisely identifying the primary problem, which is also necessary to guide treatment.

The DSM-5 was published in May 2013 (2). One of the major changes in the DSM-5 is the addition of a dimensional component to the traditional categorical approach of previous DSM editions. The categorical system, in which a diagnosis has only two values (the patient either has or does not have a disorder), has received considerable criticism. Psychopathology can vary along multiple dimensions, such as the number, intensity, and duration of symptoms experienced and the degree of interference caused by the symptoms. A dimensional assessment of psychopathology allows clinicians and researchers to assess the severity of a disorder, subclinical presentations of a disorder, and changes in symptoms over time by repeated assessments, none of which were captured by the categorical diagnostic system (16). Dimensionality was also strengthened in the DSM-5 by incorporating severity scales for all disorders (17). The addition of a severity score to each diagnosis allows the creation of patient-specific diagnostic profiles across disorders. Moreover, using a uniform quantitative score promotes consistency and improves comparability across studies, which is beneficial for both researchers and clinicians. Once a categorical anxiety diagnosis has been made, dimensional ratings allow for a summary of the severity of an individual's anxiety symptoms. From a clinical perspective, this is particularly important with regard to the choice of treatment type, and it works as well as observing changes in symptom levels over time does (16,18).

The DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form assesses the severity of generalized anxiety symptoms in children and adolescents aged 11–17 years. It was designed to be used from the first assessment through follow-up in individuals diagnosed with GAD who have clinically severe generalized anxiety (17). In a study with a community sample of children aged 8–13

years in the Netherlands, the scale was shown to be a valid and reliable tool (18).

The DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form is the first psychometric tool specific to the diagnosis of GAD that can be used in children. This study assessed the validity and reliability of the Turkish version of the DSM-5 Generalized Anxiety Severity Scale - Child Form.

## 2. Materials and methods

### 2.1. Translation process
To translate the DSM-5 Generalized Anxiety Severity Scale - Child Form into Turkish, written consent was obtained from HYB Yayıncılık and Boylam Psikiyatri Enstitüsü, the Turkish holders of the publication and translation rights for the DSM-5 Source Book and Handbook for scale studies. The translation process was performed by two experienced specialists in the field of child and adolescent psychiatry and an adult psychiatrist who knew the English language well, working independently of one another. Then, following a meeting among members of this team, the translation was checked and was turned into text. Language usage as well as cultural, conceptual, and writing appropriateness were evaluated with the intent of emphasizing conceptual rather than literal translations and the need to use natural and acceptable language for the broadest audience. Then the scale was translated back into English by another adult psychiatrist who knew the English language well and who was blinded to any information related to the scale. This final translation was compared to the original format of the scale by the whole team with regard to its ability to match the concepts addressed.

### 2.2. Participant groups
Healthy volunteers and patients who were being followed at the Celal Bayar University (CBÜ) Child Psychiatry Outpatient Unit were included. The clinical sample that represented the high-risk group regarding psychiatric symptoms consisted of 32 adolescents aged 11–17 years who had been followed up at the CBÜ Medical School's Child Psychiatry Outpatient Unit with the diagnosis of GAD according to the DSM-5 criteria. Diagnoses in the patient group were made through clinical interviews based on the DSM-5 diagnostic classification system. Inclusion criteria were age of 11–17 years, meeting the GAD criteria according to the DSM-5, and sufficient intellectual functioning to follow the study instructions. The exclusion criterion was having a physical or a neurological disorder that would require continuous treatment.

A community sample, which represented the low-risk group psychiatrically, was collected from schools in the catchment area. We were granted permission from the Ministry of Education to select the control group from secondary and high schools that were similar to the cases

in our unit, and we then administered the scale to students in randomly selected classrooms. Different criteria have been applied to conduct multivariate analyses such as factor analysis for assessing the psychometric properties of a scale. According to Tavşancıl (19), sample size needs to be at least 5- to 10-fold the number of question items in the scale. As this scale contained 10 items, we planned to include 100 controls; however, as there were missing data on two forms, we were only able to include 98 controls. Inclusion criteria for the community sample were age of 11–17 years, not meeting any of the criteria for a psychiatric or a physical disorder, and having sufficient intellectual capacity to follow the study instructions. Reports of families and the school were used as a measure of general intelligence. Ethical approval was given by the CBÜ Medical School Clinical Research and Evaluation Committee.

## 2.3. Assessment Tools

### 2.3.1. DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form

This form has 10 items that determine the severity of generalized anxiety in children and adolescents. The individual is asked to rate the severity of generalized anxiety for each item during the last 7 days. The first five items assess cognitive and physical symptoms related to the experience of fear and anxiety; these are assessed based on intensity and frequency. Each item is rated on a 5-point scale, ranging from 0 ("none" for intensity, "never" for frequency) to 4 ("extreme" for intensity, "all of the time" for frequency). The mean intensity and frequency ratings are used to create a single score for each item. The next set of five items assesses the frequency of escape and avoidance behaviors. The frequency of avoidance behavior is rated on a 5-point scale ranging from 0 (never) to 4 (all the time). Total scores vary from 0 to 40, with higher scores reflecting more severe generalized anxiety. Raw scores of the 10 items are summed to obtain the total raw score. In addition, the clinician was asked to calculate and use the average total score, which condenses the overall score to a 5-point scale, allowing the clinician to think of the child's GAD in terms of none (=0), mild (=1), moderate (=2), severe (=3), or extreme (=4) (17).

### 2.3.2. Screen for Child Anxiety and Related Disorders (SCARED)

This scale was developed by Birmaher et al. to screen anxiety disorders in children (11). SCARED has parent and child forms; a Turkish validity and reliability study was conducted by Çakmakçı in 2004 (20). SCARED comprises 41 items, each rated on a 3-point scale with responses of 0 = not true, 1 = sometimes true, and 2 = often true. The SCARED items are scored on five subscales with labels of panic/somatic, general anxiety, separation anxiety, social phobia, and school phobia. The total anxiety score is the simple sum of all items. A score of 9 for items 5, 7, 14, 21, 23, 28, 33, 35, and 37 suggests the presence of GAD (11).

## 2.4. Statistical analysis

The independent-sample t-test was applied to numerical variables and the chi-square test was used for categorical variables related to sociodemographic and clinical features. Correlation analyses were conducted with Pearson's correlation analysis. The level of significance was $P \leq 0.05$. The normality of the distributions was tested with Levene's test, and all means were found to be normally distributed. Cronbach's alpha internal reliability analysis was performed for the reliability analysis of the DSM-5 GAD severity scale. The reliability of the scale was determined by measuring item–total score correlation coefficients. The scale was readministered to 38 healthy volunteers at 2 weeks after the initial application, and test–retest reliability was determined by calculating the correlation coefficient between the consecutive scores.

Explanatory factor analysis was used to assess the scale's construct validity using data derived from the study groups. First, the Kaiser–Meier–Olkin and Bartlett tests were used to control for sample congruity for the explanatory factor analysis. The explanatory factor analysis was carried out by applying varimax rotation according to the main compounds method, and factors with eigenvalues of ≥1 were included in the analysis. Among the factor constructs, items with factor loadings of ≥0.4 were included in the analysis. The explanatory factor constructs were compared to the original dimension structure of the scale. The correlation between the DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form and SCARED was measured to assess concurrent validity.

## 3. Results

This study was conducted with 32 patients who presented to the CBÜ Child Psychiatry Unit and were diagnosed with GAD and 98 healthy children who formed the community sample. The sociodemographic and clinical features of the study groups are shown in Table 1. Table 2 presents mean total scores on study measures by sex.

All 32 patients (100%) who formed the clinical sample were in ongoing treatment. Among these, 68.8% (n = 21) had a comorbid diagnosis, 31.3% (n = 10) had a specific phobia, 21.9% (n = 7) had social anxiety disorder, 9.4% (n = 3) had agoraphobia and panic disorder, 12.5% (n = 4) had a depressive disorder, and 6.3% (n = 2) had attention-deficit hyperactivity disorder and separation anxiety disorder.

### 3.1. Reliability analyses

Cronbach's alpha internal consistency coefficient was 0.932. Cronbach's alpha coefficient for each item is shown in Table 3. The item–total score correlation coefficients ranged from 0.566 to 0.810 (Table 3). Data of the 38

**Table 1.** Sociodemographic data of the groups.

| | | Generalized anxiety disorder, N = 32 | Community sample, N = 98 | P |
|---|---|---|---|---|
| Age | | 15.1 ± 1.99 | 15.7 ± 1.01 | 0.152 |
| Sex | Female | 19 (59.4%) | 42 (42.9%) | 0.104 |
| | Male | 13 (40.6%) | 56 (57.1%) | |
| Scores of the scales applied | DSM-5 Generalized Anxiety Disorder Severity Scale | 19.0 ± 9.8 | 6.3 ± 8.5 | 0.001 |
| | SCARED total score | 41.7 ± 15.3 | 22.5 ± 14.3 | 0.001 |
| | SCARED generalized anxiety subscale | 10.9 ± 5.3 | 6.6 ± 4.9 | 0.001 |

**Table 2.** Mean total scores of applied scales by sex.

| | Total sample, N = 130, mean ± SD | Females, N = 61, mean ± SD | Males, N = 69, mean ± SD |
|---|---|---|---|
| DSM-5 Generalized Anxiety Disorder Scale - Child Form* | 9.4 ± 10.4 | 13.0 ± 11.4 | 6.3 ± 8.3 |
| Generalized anxiety subscale of SCARED* | 7.6 ± 5.4 | 9.4 ± 5.4 | 6.0 ± 4.9 |
| SCARED total score* | 27.0 ± 16.6 | 33.3 ± 17.0 | 21.7 ± 14.3 |

*P < 0.001.

volunteers who completed the scale a second time were evaluated to assess test–retest reliability; the correlation coefficient between the two scale administrations was r = 0.707 (P < 0.001).

### 3.2. Validity analyses
Before performing explanatory factor analysis, Kaiser–Meyer–Olkin analysis was applied to assess sample congruity, resulting in a coefficient of 0.870. The chi-square value by the Bartlett test was 995.763 (P < 0.001). Thus, explanatory factor analysis was applied to the DSM-5 Generalized Anxiety Disorder Severity Scale - Child form to determine construct validity. In the factor analysis, one factor had an eigenvalue of >1; that eigenvalue of 6.258 explained 62.6% of the total variance (Table 3).

In the concurrent validity analysis, the correlation between the DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form and SCARED was r = 0.731 (P < 0.001) for the scale total score and r = 0.655 (P < 0.001) for the generalized anxiety subscale.

### 4. Discussion
This study explored the validity and reliability of the DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form and showed that the Turkish version is valid and reliable.

Assessing a scale's internal consistency indicates whether the characteristic meant to be measured was indeed measured. Higher internal consistency values are important, as they indicate that items used for the measure actually measure a homogeneous construct. It is commonly established for psychometric assessments that the closer a Cronbach's alpha coefficient value is to 1, the higher the reliability of the scale is (21). In a reliability analysis for a children's group during the original development of the scale, Cronbach's alpha coefficient was 0.87 (18). Cronbach's alpha coefficient for our scale's internal consistency was 0.932, indicating that the scale as a whole appropriately represented the intended construct. The item–total score correlation coefficients were also high, demonstrating construct reliability. The test–retest correlation coefficient between the two scale administrations was r = 0.707. This value was also significant, supporting the scale's reliability. Together, these results indicate that this scale can be used as a reliable and valid tool.

The concurrent validity analysis evaluated the correlation between the GAD severity scale and SCARED. In the first study conducted with children, the correlation with the generalized anxiety subscale was 0.55 (18). In our study, the correlation coefficient with the SCARED generalized anxiety subscale was r = 0.655, indicating

**Table 3.** Item–total score correlation coefficients, Cronbach's alpha coefficients, and factor loads for items of Generalized Anxiety Disorder Severity Scale - Child Form.

| Items | Item–total score correlation coefficients | Cronbach's alpha coefficients | Factor load |
|---|---|---|---|
| Felt moments of sudden terror, fear, or fright | 0.763 | 0.924 | 0.817 |
| Felt anxious, worried, or nervous | 0.810 | 0.921 | 0.857 |
| Had thoughts of bad things happening, such as family tragedy, ill health, loss of a job, or accidents | 0.730 | 0.926 | 0.787 |
| Felt a racing heart, sweaty, trouble breathing, faint, or shaking | 0.714 | 0.927 | 0.773 |
| Felt tense muscles, felt on edge or restless, or had trouble relaxing or trouble sleeping | 0.763 | 0.924 | 0.819 |
| Avoided, or did not approach or enter, situations about which they worried | 0.752 | 0.924 | 0.805 |
| Left situations early or participated only minimally due to worries | 0.772 | 0.923 | 0.821 |
| Spent lots of time making decisions, putting off making decisions, or preparing for situations, due to worries | 0.774 | 0.923 | 0.819 |
| Sought reassurance from others due to worries | 0.701 | 0.928 | 0.760 |
| Needed help to cope with anxiety (e.g., alcohol or medication, superstitious objects, or other people) | 0.566 | 0.933 | 0.631 |

a medium-level correlation, and that with the total SCARED score was high, at r = 0.731. A comparison of the two scales revealed that avoidance behavior and somatic symptoms were not addressed in the SCARED generalized anxiety subscale. This might explain the relatively low correlation coefficient with the SCARED generalized anxiety subscale, and it may have caused an increase in the correlation coefficient with the total SCARED score due to the presence of somatic symptoms in other subscales of the SCARED. The concurrent validity of the scale supports the scale as a valid assessment tool.

An explanatory factor analysis used to assess the DSM-5 GAD severity scale identified a single factor congruent with the original scale construct (18). The conceptualization of GAD symptoms in a single construct indicates high specificity of the scale to the cluster of GAD symptoms. Thus, the scale would provide clinicians with clear and unconfounded data, allowing them to monitor GAD severity.

The presence of both construct validity and concurrent validity supports the notion that the scale is a valid tool.

Sex differences were in accordance with the literature. That is, all anxiety disorders were more prevalent in girls than boys (22,23). In the present study, girls had higher scores on the SCARED overall scale, the SCARED generalized anxiety subscale, and the DSM-5 GAD severity scale.

A limitation of this study was the relatively low number of subjects in the patient sample, where the patients would have to consist of individuals within the symptomatic phase. Another limitation was the lack of a structured clinical interview for the community sample to determine diagnoses. All statistical analyses were carried out without any loss of subjects. A strength of this study might be the sample size being representative for patients. The scale score was significantly different in the community and clinical samples, indicating that the scale can distinguish a clinical from a normal sample. In this way, the clinical utility of the scale was proven.

According to these results, we suggest that the DSM-5 Generalized Anxiety Disorder Severity Scale - Child Form scale can be used effectively in future GAD studies.

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