Validity and Reliability of the Turkish Version for DSM-5 Level 2 Anger Scale (Child Form for Children Aged 11-17 Years and Parent Form for Children Aged 6-17 Years)

DSM-5 Düzey 2 Öfke Ölçeği Türkçe Formunun Geçerlik ve Güvenirliği (11-17 Yaş Çocuk Formu ve 6-17 Yaş Çocuklar için Ebeveyn Formu)

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ABSTRACT

Introduction: This study aimed to assess the validity and reliability of the Turkish version of Diagnostic and Statistical Manual of Mental Disorders (DSM-5) Level 2 Anger Scale.

Methods: The scale was prepared by translation and back translation of DSM-5 Level 2 Anger Scale. Study groups consisted of a clinical sample of cases diagnosed with depressive disorder and treated in a child and adolescent psychiatry unit and a community sample. The study was continued with 218 children and 160 parents. In the assessment process, child and parent forms of DSM-5 Level 2 Anger Scale and Children's Depression Inventory and Strengths and Difficulties Questionnaire-Parent Form were used.

Results: In the reliability analyses, the Cronbach alpha internal consistency coefficient values were found very high regarding child and parent forms. Item-total score correlation coefficients were high and very high, respectively, for child and parent forms indicating a statistical significance. As for construct validity, one factor was maintained for each form and was found to be consistent with the original form of the scale. As for concurrent validity, the child form of the scale showed significant correlation with Children's Depression Inventory, while the parent form showed significant correlation with Strengths and Difficulties Questionnaire-Parent Form.

Conclusion: It was found that the Turkish version of DSM-5 Level 2 Anger Scale could be utilized as a valid and reliable tool both in clinical practice and for research purposes.

Keywords: DSM-5 Level 2 Anger Scale, reliability, validity

ÖZ

Amaç: Bu çalışmada DSM-5 Düzey 2 Öfke Ölçeği'nin Türkçe sürümünün geçerlik ve güvenirliğinin değerlendirilmesi amaçlanmıştır.

Yöntem: DSM-5 Düzey 2 Öfke Ölçeği'nin çevirisi ve geri çevirisi yapılıp ölçek hazırlanmıştır. Araştırma grupları çocuk psikiyatri kliniğinde tedavi gören ve depresif bozukluk tanısı alan klinik örneklem ile toplum örnekleminden oluşmuştur. 218 çocuk ve 160 ebeveyn ile çalışma yürütülmüştür. Değerlendirmede DSM-5 Düzey 2 Öfke Ölçeğinin çocuk ve ebeveyn ölçeklerinin yanı sıra Çocuklar İçin Depresyon Ölçeği ve Güçler ve Güçlükler Anketi Ebeveyn Formu kullanılmıştır.

Bulgular: Güvenilirlik analizlerinde Cronbach alfa iç tutarlılık katsayısı çocuk ve ebeveyn formları için çok yüksek düzeyde bulunmuştur. Mad- de - toplam puan bağıntı katsayıları yüksek ve çok yüksek düzeydedir ve istatistiksel olarak anlamlıdır. Yapı geçerliliğinde her iki formda da bir faktör elde edilmiştir ve ölçeğin orijinal yapısı ile uyumlu bulunmuştur. Birlikte geçerlilikte ölçeğin çocuk formunun Çocuklar İçin Depresyon Ölçeği ile ebeveyn formunun ise Güçler ve Güçlükler Anketi Ebeveyn Formu ile anlamlı korelasyon gösterdiği saptanmıştır.

Sonuç: DSM-5 Düzey 2 Öfke Ölçeği'nin Türkçe sürümünün hem klinik uygulamada hem araştırmalarda güvenilir ve geçerli biçimde kullanılabileceği gösterilmiştir.

Anahtar kelimeler: DSM-5 Düzey 2 Öfke Ölçeği, geçerlik ve güvenirlik

INTRODUCTION

Anger is one of the basic emotions in human life, which everyone experiences from time to time. When the definition of anger is analyzed, it is observed that the concept might be defined as a wide array of emotional experiences that alter from moderate distress or frustration to severe fury and rage (1). Although seen as an unwanted emotional situation, sometimes it might be regarded as a healthy emotional condition that helps to adapt, since it motivates the individual to move forward toward the goals or get over obstacles (2). However, when this emotion is intense or is expressed in hostile, aggressive, or non-functional patterns, it might cause many problems. When studies on children

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and adolescents who had applied to a child and adolescent psychiatry unit were reviewed, it was seen that the most commonly encountered feature in these subjects were feelings of frustration and difficulties in managing anger. In a study by Çelik et al. (3), it was reported that one of the most common reasons for referral in adolescents diagnosed with anxiety disorder was angry outbursts, while problems in anger management were more prominent as a symptom in depressed adolescents. In another study conducted on adolescents who had applied to a psychiatry outpatient unit, one of the main reasons for application was reported as feeling frustrated. Particularly, in individuals with attention deficit hyperactivity disorder and depression, feeling frustrated is among the main symptoms encountered (4). Similar results were maintained in a study by Görker et al. (5), wherein the main subjects were adolescents who had applied to a psychiatric outpatient unit (5).

Anger accompanies the course of many psychiatric disorders (3,4,5). Therefore, the clinical utility of the scale carries much importance. Many tools are present in the assessment of anger. In our country, the scales that have the validity and reliability for children and adolescents are Adolescent Anger Rating Scale, the State-Trait Anger Expression Inventory (STAXI-2), and Novaco Anger Inventory-Short Form (6,7). For the assessment of psychiatric disorders in children, it has been reported that to gather data from many sources of information, such as the child himself/herself and his/her parents and teachers, whenever necessary increased the quality and validity of the evaluation (8). The three above mentioned scales have only self-report forms, and their psychometric features have only been studied within a community sample. This might be a disadvantage for these tools to be used in child psychiatry facilities.

Diagnostic and Statistical Manual of Mental Disorders (DSM), which is the most commonly used system for classification of disorders and illnesses in psychiatry and has been renewed within certain intervals, was published with its fifth edition (9). With the DSM-5 Diagnostic Criteria handbook released in 2013, novel scales have been warranted to determine the severity and monitor the follow-up of the disorders both in psychiatric practice and for field researches. For this reason, American Psychiatry Association has recommended novel assessment tools that have been adapted to DSM-5 criteria for many psychiatric disorders (10). DSM-5 Level 2 Anger Scale was designed for the use in the first assessment and the course of treatment of children and adolescents with anger symptoms (10). This study aimed to assess the validity and reliability of the Turkish version of DSM-5 Level 2 Anger Scale.

METHODS

Translation Process
To carry out the adaptation of DSM-5 Level 2 Anger Scale into Turkish, firstly, a written consent was obtained from HYB Yayıncılık and Boylam Psikiyatri Enstitüsü who held the publication and translation rights of DSM-5 Source Book and Handbook for scale studies. The translation was carried out by three child and adolescent psychiatry specialists. When the text was controlled and agreed upon, it was translated into English. The translated text was compared to the original and verified if it met the warranted criteria for the inclusion of expected concepts. When the necessary approval was maintained, the scale text was finalized.

Sample Group
For the sample group of the study, patients who have been followed up in Manisa Celal Bayar University (CBU) Child Psychiatry Unit, their parents, and healthy volunteers were included. When studies on children and adolescents who have applied to a child and adolescent psychiatry unit

were reviewed, it was seen that most common feature in adolescents with a psychiatric disorder was frustration and difficulties in anger management, and these features were also commonly seen in adolescents with a diagnosis of depression (3,4,5). Therefore, the sample that would represent the psychiatrically high-risk group consisted of 45 children aged 11-17 years and their parents who were diagnosed with depressive disorder according to the DSM-5 criteria. The diagnoses of the patient group were determined by conducting a clinical interview based on the DSM-5 criteria. Inclusion criteria for the study were age between 11 and 17 years, fulfillment of the criteria for depressive disorder according to the DSM-5 criteria, and sufficient intellectual functioning to follow study instructions. Exclusion criteria were a physical or a neurological disorder that would require constant medical attention and treatment. The community sample that represented the psychiatrically low risk group was derived from schools in the catchment area. Inclusion in the control group were age between 11 and 17 years of age, no psychiatric or physical illness diagnosis, and sufficient intellectual functioning to follow study instructions.

The ethical approval of the study was obtained from CBU Medical School Clinical Researches Evaluation Committee.

Assessment Tools
Diagnostic and Statistical Manual of Mental Disorders Level 2 Anger Scale Self-Report Form consists of six items. For each item, the individual was asked to rate the severity of symptoms related with anger for the past 7 days. The scale involves a five-point Likert-type assessment (1= never, 2= almost never, 3= sometimes, 4= most of the time, and 5= almost all the time). Total scores alter between 6 and 30, and a higher score indicates a higher severity of the problem.

Diagnostic and Statistical Manual of Mental Disorders Level 2 Anger Scale-Parent Form consists of five items. For each item, the parent/legal guardian of the child with the symptoms was asked to rate the severity of symptoms related with anger for the past 7 days. The scale brings a five-point Likert-type assessment (1= never, 2= almost never, 3= sometimes, 4= most of the time, and 5= almost all the time). The total score varies between 5 and 25, and higher scores indicate a higher severity of the anger problem.

Children's Depression Inventory (CDI) is a 27-item self-report scale for children aged 6-17 years developed by Kovacs (1981). The Turkish validity and reliability study was performed by Oy (1991), and the pathological cut-off point was determined as 19 (11).

Strengths and Difficulties Questionnaire (SDQ) is used to screen psychiatric problems in children and adolescents. This survey has a parent and school form for individuals of 4-16 years of age and a self-report form for teens aged 11-16 years. The survey contains 25 questions for positive and negative behavioral features. These questions have been summed up under five subheadlines that each contain five questions according to both appropriate diagnostic criteria and the results of factor analysis; Attention Deficiency and Hyperactivity, Behavior Problems, Emotional Problems, Peer Problems, and Social Behavior. Each subheadline can be assessed within itself and separate scores could be derived and a ''Total Difficulty Score'' might also be calculated through the summation of the first four headlines. Emotional problems subscale consists of depressive symptoms and anxiety symptoms (12).

Statistical Analysis
For statistical analysis, initially, to show that study groups did not differ regarding sociodemographic and clinical features, analysis of variance

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to numeric variables and Chi-square test to categorical variables were applied.

For reliability analyses, the Cronbach alpha internal consistency analysis of the scale was carried out. Besides, the reliability of the scale was maintained with item-total score correlation coefficients. Within the application, DSM-5-Level 2 Anger Scale was reapplied to 40 healthy parents and their children 2 weeks after the initial application, the and test-retest reliability was measured by calculating the correlation coefficient between the two applications. The inter-rater reliability was also assessed.

An explanatory factor analysis was applied by using the data from all study groups, for the construct validity of the scale. Firstly, to control if the sample was appropriate for explanatory factor, Kaiser-Meier-Olkin Test and Bartlett Test were used. The explanatory factor analysis was carried out by using varimax rotation according to the main compounds method, and the factors that were ≥1 were taken into assessment. Among factor constructs, factor loads e≥0.4 were taken into assessment. The explanatory factor construct was compared to the original dimensional structure of the scale. Besides, regarding concurrent validity, correlation between Level 2 Anger Scale-Child Form and CDI as well as the correlation between Level 2 Anger Scale-Parent Form and SDQ-Parent Form Emotional Symptoms Subscale were measured.

RESULTS

A total of 160 parents and 218 children were included in this study. Thirty cases had both parent and child forms. Sociodemographic and clinical features of study groups (both child sample and parent sample) are shown in Table 1, 2.

Reliability Analyses

In reliability analyses of DSM-5 Level 2 Anger Scale, the Cronbach alpha internal consistency coefficient was 0.920 for the child form and 0.906 for the parent form. Cronbach alpha coefficients for each item are shown in Table 3, 4. Item-total score correlation coefficients were between 0.627 and 0.852 for the self-report forms, while it was between 0.697 and 0.823 for the parent form (Table 3, 4). In the test-retest application, data for 33 children and 40 parents who had healthy children aged 6-17 years were appropriate for the analysis, and the correlation coefficient between 2-week apart applications were $r=0.158$ ($p=0.379$) for the self-report form and $r=0.441$ ($p=0.004$) for the parent form.

The correlation coefficient between DSM-5 Level 2 Anger Scale-child and parent forms was $r=0.564$ ($p<0.0001$).

Validity Analyses

To maintain the construct validity, explanatory factor analysis was applied to DSM-5 Level 2 Anger Scale. The Kaiser-Meyer-Olkin analysis and Bartlett Test were applied prior to an explanatory factor analysis, to test whether the sample was in congruity or not.

The Kaiser-Meyer-Olkin analysis for DSM-5 Level 2 Anger Scale-Child Form was measured as 0.900. The Chi-square value in Bartlett Test was calculated as 817.967 ($p<0.0001$), and it was shown that the sample group was appropriate for factor analysis. With factor analysis, one factor, whose eigenvalue was 4.348 and that explained 72.5% of total variance, was obtained (Table 3).

The Kaiser-Meyer-Olkin analysis coefficient for DSM-5 Level 2 Anger Scale-Parent Form was 0.857. The Chi-square in Bartlett Test was calculated as 488.954 ($p<0.0001$), and it was shown that the sample

Table 1. Sociodemographic features of the child sample

		Depressive disorder group N: 45	Control group N: 173
Age*, years		15.6±1.4	15.1±1.7
Gender*	Female	35 (77.8%)	90 (52%)
	Male	10 (22.2%)	83 (48%)
School attendance*	Attending	40 (88.9%)	173 (100%)
	Not attending	5 (11.1%)	0
Mother's educational status*	Primary and secondary school	34 (75.5%)	57 (33%)
	High school	8 (15.5%)	44 (25.4%)
	College	3 (6.6%)	72 (41.6%)
Father's educational status*	Primary and secondary school	26 (57.7%)	40 (19.2%)
	High school	15 (33.3%)	49 (27.8%)
	College	4 (9.0%)	84 (53.0%)
Scores of the scales applied	DSM-5 Level 2 Anger Scale-Child Form*	24.7±4.9	14.3±5.9
	CDI*	29.5±8.6	13.6±7.8

*p<0.05; DSM-5: Diagnostic and Statistical Manual of Mental Disorders; CDI: children's depression inventory

Table 2. Sociodemographic features of the parent sample

		Depressive disorder group N: 45	Control group N: 115
Age*, years		15.5±1.4	14.0±1.9
Gender*	Female	34 (75.6%)	61 (53.0%)
	Male	11 (24.4%)	54 (47.0%)
School attendance*	Attending	40 (88.9%)	115 (100%)
	Not attending	5 (11.1%)	0
Mother's educational status*	Primary and secondary school	35 (77.7%)	20 (17.4%)
	High school	7 (15.5%)	29 (25.2%)
	College	3 (6.6%)	66 (57.4%)
Father's educational status*	Primary and secondary school	27 (60.0%)	22 (19.2%)
	High school	14 (31.1%)	32 (27.8%)
	College	4 (8.9%)	61 (53.0%)
Scores of the scales applied	DSM-5 Level 2 Anger Scale-Parent Form*	16.0±5.5	9.7±3.7
	SDQ Emotional Problems Subscale*	5.6±2.6	1.9±1.7

*p<0.05; DSM-5: Diagnostic and Statistical Manual of Mental Disorders; SDQ: strengths and difficulties questionnaire

group was in congruity for factor analysis. Because of the factor analysis, one factor whose eigenvalue is 3.633 and that explained 72.6% of the variance was obtained (Table 4).

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Table 3. Item-total score correlation coefficients, Cronbach alpha coefficients, and factor loads of DSM-5 Level 2 Anger Scale-Child Form

	Item-total score correlation coefficient	Cronbach alpha coefficient	Factor loads
Anger-C1	0.813	0.901	0.883
Anger-C2	0.798	0.902	0.876
Anger-C3	0.852	0.894	0.909
Anger-C4	0.850	0.896	0.904
Anger-C5	0.720	0.913	0.799
Anger-C6	0.627	0.927	0.720

Table 4. Item-total score correlation coefficients, Cronbach alpha coefficients, factor loads of DSM-5 Level 2 Anger Scale-Parent Form

	Item-total score correlation coefficient	Cronbach alpha coefficient	Factor loads
Anger-P1	0.799	0.877	0.878
Anger-P2	0.823	0.872	0.896
Anger-P3	0.697	0.898	0.802
Anger-P4	0.756	0.887	0.847
Anger-P5	0.743	0.889	0.837

The correlation coefficient as a result of concurrent validity analysis of DSM-5 Level 2 Anger Scale-Child Form with CDI was r=0.814 (p<0.0001).

The correlation coefficient as a result of concurrent validity analysis of DSM-5 Level 2 Anger Scale-Parent Form with SDQ Emotional Problems subscale was r=0.701 p<0.0001.

DISCUSSION

The Turkish adaptation, validity, and reliability of DSM-5 Level 2 Anger Scale-child and parent forms were assessed through this study, and the results showed that the Turkish version could be used in practice.

Although anger is a common and natural emotion, problems associated with inappropriate expression of anger remain among the most serious concerns of parents, educators, and the mental health community. Childhood aggression is associated with a host of personal, social, and academic adjustment difficulties, including depression and anxiety, peer rejection, loneliness, and school dropout (13,14). It is also associated with physical conditions, such as hypertension and coronary heart disease (15,16). Children who display aggression early in life are also at a risk for continued aggression throughout adolescence and adulthood (14). The stability of aggression and the severity of the associated adjustment difficulties underline the importance of detecting aggression early-on.

In our study, the Cronbach alpha coefficient for internal consistency was very high for both child and parent forms (0.920/0.906, respectively). Regarding psychometric assessments, as the Cronbach alpha coefficient value gets closer to 1, the scale is considered more reliable (17). The STAXI-2 Cronbach alpha value was found to be 0.82 for the trait anger subscale (7). The internal consistency value for Novaco Anger Inventory-Short Form was 0.93 (7). The Cronbach alpha value for Adolescent Anger Assessment Scale was 0.74 (6). Our study was also consistent with literature, indicating that the construct of the scale appropriately

represented the whole. The item-total score correlation coefficients were found to be high and very high, respectively, for child and parent forms, and this proves that the construct of the scale was reliable. When these results were considered, it might be thought that the scale could be used as a reliable tool. Correlation coefficients between two applications within the healthy group were 0.158/0.441 for child and parent forms, respectively, in the test-retest application of the scale. This was in a moderate level and statistically insignificant for the parent form. However, it was very low and statistically insignificant for the child form. As for reliability calculations, high values of correlation coefficients (p<0.5 at least) indicate that there was not much alterations for the consistency of measurements derived from the test and between two applications, regarding the time in between the applications for the feature that was measured. However, one reason behind the low level of correlation coefficient might be the irregularities in measuring and alterations in the measured variable or both (18). Although anger is generally regarded as an unwanted emotional situation, sometimes it might also be seen as a healthy emotional condition that motivates the individual to protect himself/herself, reach out for goals, and maintain balance (2). As anger is not always seen as a symptom of a psychiatric disorder and it might be experienced as part of a healthy emotional situation might be the cause of the low level of correlation between the two applications.

During the assessment of psychiatric disorders in children and adolescents, it has been reported that gathering information from different sources, such as the child him/herself and his/her family and teachers, whenever necessary might increase the validity of the information obtained and achieve a much clearer picture of the child (8). The fact that DSM-5 Level 2 Anger Scale has both child and parent forms indicates superiority within this context. Studies conducted to date have reported a low level of correlation between the data obtained from children and their parents (19). Considering this information, in a meta-analysis study, the rate was confirmed as 0.25 (20). In our study, correlation coefficient as a result of child and parent form was at a high level with statistical significance (0.564, p<0.0001) and supported the reliability of the scale.

As for concurrent validity, correlations were measured between the child form and CDI as well as between the parent form and Strengths and Difficulties Questionnaire-Parent Form Emotional Problems subscale, and the values were calculated as 0.814/0.701, respectively, which reflected a very high and high level of statistically significant correlation. The concurrent validity of the study supports that the tool could be used in a valid manner.

The explanatory factor analysis was applied to DSM-5 Level 2 Anger Scale. In our study, one factor with an eigenfactor value above 1 in the factor analysis of both forms was obtained and was congruent with the original construct of the scale. The conceptualization of anger symptoms within a single factor construct causes the scale to be specific to the symptom cluster. This enabled the clinician to gather clear data about the severity of anger symptoms without any confounding factors.

Limitations and Advantages of the Study

The first limitation to this study was the relatively low number of patients within the symptomatic phase that formed the sample group. Another limitation was that no structured interview was used to determine the differential diagnoses for the control group. Meanwhile, the presence of differences between the patients and control group regarding age, gender, school attendance, and parental education levels need to be considered when assessing the differences in comparative analyses regarding scale items. All statistical analyses were performed with the original size of the

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sample group. The advantage/superiority of the study is that the sample group was able to represent patients, thereby maintaining the clinical availability of the scale.

The Turkish version of DSM-5 Level 2 Anger Scale was proven to be a valid and reliable tool both in clinical practice and for research purposes.

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