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ARAŞTIRMA

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Validity and Reliability of Child Symptom Assessment Inventory (CSAI)*Çocuk Semptom Tarama Envanterinin (CSTE) Geçerlik ve Güvenirliği***Elif Erol** **Authors Information****Elif Erol**

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ABSTRACT

While working with children in clinic, it is noteworthy that there is a limitation measurement tools of that measure behavior, symptoms, and pathology in the field despite the importance. The current measurement tools are used as an adaptation form in our country. Since the tests adapted from different cultures have difficulties in terms of language and cultural codes, it is important that each country has its own culture and language. So the aim of this study is to develop a tool that can measure mental symptoms of children and support the detection and treatment. 717 children (357 EFA, 128 criterion validity, 232 DFA) among 8-13 years old were included in the scale. Child Symptom Assessment Inventory draft form and Demographic Information Form, The Strength and Difficulties Questionnaire (SDQ) were used in the study. During the development phase of the scale, exploratory and confirmatory factor analyzes were performed. As a result of all analyzes, a structure consisting of 6 dimensions and 30 items was obtained. These factors are named Destructive Symptoms, Depressive Symptoms, Maladjustment to the Objective Reality, Cognitive Problems, Anxiety Symptoms, and Impulsivity Symptoms. It was seen that the scale has good validity and reliability so can be used in the field.

Article Information**Keywords**

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ÖZET

Çocuk kliniğinde çalışırken davranış, belirti, patolojik süreçleri ölçen ölçme araçlarının önemine karşın alandaki sınırlılığı dikkat çekmektedir. Ülkemizde kullanılan mevcut ölçme araçları genellikle uyarılma şeklindedir. Farklı kültürlerden uyarılan testlerin dil ve kültürel kodlar açısından zorlukları olduğu için, her ülkenin kendi kültürüne, diline uygun ölçme aracının olması önemlidir. Bu çalışmanın amacı, çocukların patolojik süreçlerine ilişkin öz-bildirimsel bir tarama aracı geliştirilmesidir. Ölçek geliştirme çalışması olan araştırmada 8-13 yaş arası 717 kişilik örnekleme (357 çocuk AFA, 128 ölçüt geçerliği, 232 DFA için), Çocuk Semptom Değerlendirme Envanteri (ÇOSDE), Demografik Bilgi Formu, Güç ve Güçlükler Anketi (GGA) uygulanmıştır. Dataya yapılan açımlayıcı ve doğrulayıcı faktör analizlerine göre 30 maddeli 6 faktörlü bir yapı elde edilmiştir. Faktörlere; Yıkıcılık Belirtileri, Depresif Belirtiler, Nesnel Gerçekliğe Uyumsuzluk, Bilişsel Sorunlar, Kaygı Belirtileri ve Dürtüsellik Belirtileri isimleri verilmiştir. Ölçeğin geçerlik ve güvenilirlik düzeyinin iyi olduğu bu yüzden alanda kullanılabileceği görülmüştür.

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INTRODUCTION

Considering the mental problems of childhood and adolescence, it is seen that the psychiatric rate is between 9-21% worldwide (Dursun, Güvenir, & Özbek, 2010). The rates are quite high. Because children may show behavioral problems or psychiatric symptoms as a way of coping with stressful events in their lives. When these problems are externalized, mostly aggression, and hyperactivity and when they are introjected, anxiety, fear, and attention problems it may appear (Halpern, 2004). According to the psychiatric evaluation study conducted in Turkey and involving children between the ages of 5-18, it was observed that 49% of those who applied to the clinic had at least one and of 85% of them had two psychiatric diagnoses. The most common diagnoses in these children are attention deficit and hyperactivity disorder (ADHD), specific phobia, depression, anxiety, tic disorder, social phobia, adjustment disorder, obsessive-compulsive disorder (Görmez, Örengül, Baljinnya, & Aliyeva 2017). On the other hand, learning disorders, behavioral disorders, enuresis, fear of school, phonological disorders, mental retardation, eating disorders, and autism are also common problems. (Görker, Korkmazlar, Durukan, & Aydoğdu 2004; Aras, Ünlü, & Taş, 2007). Aras, Ünlü, and Taş (2007), in their research with 822 children, state that families apply to psychiatry clinics with complaints such as unhappiness, pessimism, reluctance, anxiety, and anxiety about their children. These children, who are generally diagnosed with depression, experience problems in their relationships with their family and friends, shyness and lesson failure. Son and Kirchner (2000) state that depression prevalence is 2% worldwide and between 5% and 8% before adolescence Durukan et al. (2011) found that depression, which is seen with a rate of 5.7% in Turkey, is the most common diagnosis after ADHD, anxiety disorder, and mental retardation.

In order to identify emotional or behavioral problems of childhood or adolescence moreover to define them as a disorder, it is necessary to define normal and abnormal first. This definition is very difficult as it often requires a subjective evaluation (Austin & Sciarra, 2013). Therefore, reliable and valid tools are needed to screen emotional and behavioral problems in clinics and field studies with children (Güvenir et. al., 2008).

The detection of child problems with a valid and reliable measurement tool allows early diagnosis and therefore intervention. Early diagnosis is important; because the source of mental illnesses seen in adulthood can manifest themselves in different appearances in childhood. For example, in a retrospective screening with 116 patients in major depression treatment, it was seen that 16% of the patients showed signs of attention deficit and hyperactivity in childhood (Alpert et. al., 1996).

In another study conducted with children between the ages of 4-6 who were diagnosed with ADHD, it was found that these children showed depression and suicidal tendencies between the ages of 9-18 (Chronis et. al., 2010). In order to prevent these difficulties, early diagnosis, and intervention are crucial in mental health diseases as in all medical fields.

Although there are many inventories to evaluate the development of children (Denver, AGTE, LATE, Portage, etc., measurement tools measuring behavior, symptoms, and pathology are very limited or adapted from different languages (Child and Youth Behavior Evaluation Scale, CBCL Age 4-18, Strength and Difficulties Questionnaire (SDQ) Age 4-16, Child Depression Scale Age 6-17, Anxiety and Depression Scale for children, Conners' Parent Rating Scale). Since tests adapted from different cultures have difficulties in terms of language and cultural codes, it is valuable to have a measurement tool suitable

for each country's own culture and language (Erol, 2018). Behaviours, conceptualizations, form, and language of the expressions that the test aim to measure has to belong to the culture for the practicality of the inventory (Öner, 2006).

In this study, in order to contribute to the deficiencies of the field, it was planned to develop a measurement tool that would allow the screening of the psychopathological processes of children (8 - 13) and validity and reliability analyzes were performed.

METHOD

Research Model

The research is an example of a scale development study.

Study Group

In the study, 14 experts were included for content validity, and a total of 717 children were included for all validity and reliability studies. The construct validity was tested with the first sample. 512 children from 6th-grade primary schools were included, but the 98 people who left more than 5% of the questions blank and who were found to be using psychiatric drugs were excluded. 57 people who did not match the age range were also excluded and 357 people remained in the sample. It was observed that 255 of this sample (62.7%) were girls and 133 (37.3%) were boys. Another sample was created to measure the effect of the scale on similar scales, and it was applied to 128 primary school students. Lastly, 301 people were included in order to perform the confirmatory factor analysis of the scale, but 69 people who left more than 5% of the questions blank and were found to be using psychiatric drugs were excluded from the sample, and 125 (53.9%) were girls and 107 (46.1%) were male. 232 people consisting of children were included in the sample.

Ethical Statement

The research was started with the permission of the ethics committee of Istanbul Arel University dated 17/05/2017 and numbered 69396709-300.00.00-994-1. The consent form was obtained from all participants indicating that they voluntarily participated in this study.

Data Collection Tools

In order to collect data from the participants, the Child Symptom Assessment Inventory (CSAI) draft form developed by the researcher, the Demographic Information Form, and the Strengths and Difficulties Questionnaire (SDQ) were used. SDQ was chosen because subscales and age range were similar to the scale that was tried to be developed.

Demographic Information Form. It is a form created to determine the demographic characteristics of the participants such as age, gender, socioeconomic level, number of siblings, parents' age, occupation, educational status, medical history, and drug use information.

Child Symptom Assessment Inventory (CSAI). It was developed by the researcher. It is a 5-point Likert type scale consisting of 6 subscales and 30 items. It is answered by the children. In the calculation, "never", "rarely", "occasionally", "often", and "always" options are given the value "1", "2", "3", "4", "5", respectively. The scale has 6 subscales and the total internal consistency coefficient is .92. The internal consistency coefficients in the subscales were .87 for Destructive Symptoms; .72 for Anxiety Symptoms;

.59 for Impulsivity Symptoms; .88 for Depressive Symptoms; .61 for Maladjustment to the Objective Reality; .68 for Cognitive Problems.

Strengths and Difficulties Questionnaire (SDQ). Strength and Difficulties Questionnaire - (SDQ) was developed by Robert Goodman in 1977 and adapted into Turkish by Güvenir et al. in 2008. It consists of 25 items and 5 factors. Factors have been named Attention Deficit and Excessive Mobility, Emotional Problems, Behavioral Problems, Peer Problems, and Prosocial Behavior. Each item is marked as 'not correct', 'partially correct', and 'absolutely correct' and scored as 0, 1 and 2 respectively. Items 7, 11, 14, 21, and 25 are scored in reverse. The internal consistency coefficient of the scale is .73 in the total difficulty score; The subscales were .70 in Attention Deficit and Hyperactivity, .70 in Emotional Problems, .50 in Behavioral Problems, .22 in Peer Relations, and .54 in Prosocial Behavior. Similar scales and clinical group comparisons were used for validity studies and the results were significant.

Process

Before starting the research, related literature reviewed and a draft scale with 102 items was created, then expert opinion was sought to test the content validity of this draft scale. Validity for a scale is that it measures what it claims to measure directly without mixing any other mixture (Otrar and Onat, 2010). As a result of the literature review, 102 items were given to 9 experts - 4 child-adolescent psychiatrists and 5 specialist psychologists- who are psychoanalytically oriented working in the Istanbul Child-Adolescent Psychoanalytic Psychotherapies Association to evaluate them in terms of theoretical background, language structure, and meaning for content validity. At the end of the evaluation, 4 items were removed from the scale and a total of 98 items remained. Then a pilot study was conducted. In this study, children were asked to answer the questions through the classroom teacher, and they were asked to mark items that they found difficult to understand or found meaningless. Reports were received from 41 children. Since there was no unclear item, the 98-item scale was prepared for use as a draft scale. The draft scale and Demographic Information Form were applied in 6th-grade primary schools after obtaining the necessary legal permissions. The time for children to fill out the form took approximately 15 minutes. After the exploratory factor analysis, it was seen that the scale consists of 6 factors and 30 items, and it was rearranged for validity and reliability studies, new numbers were given to the items and confirmatory factor analysis was performed. Finally, in order to measure the relations to on similar scales, another application was made with the SDQ scale. In this application, the response time of the scales took approximately 10 minutes.

RESULTS

For the research, an item pool consisting of 102 items was created and the expert group of 9 people were asked to give their opinions and score the items out of 100 in order to test the content validity. The draft scale remained 98 items by eliminating 4 items whose arithmetic mean was below 85. Subsequently, Bartlett's test results were examined to evaluate whether the sample was sufficient for factor analysis, KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) value was .76; Chi-square (Approx. Chi-Square) value was 10308.81; degrees of freedom (df) 4753; p-value was found .00.

Table 1. KMO and Bartlett's test value

Kaiser-Meyer-Olkin Measure Sampling Adequacy		.757
Bartlett's Test of Sphericity	Approx. Chi-Square	10308.808
	Degree of freedom	4753
	p	.000

After testing the fit of the sample, exploratory factor analysis was performed to determine the factor structure of the scale. Items numbered 94-82-35-47-49-66-29-68-26-15-5-16-17-86-78-63-41-39-87-79-81-80-74-23-7-56-13-31-85-88-55-11-62-75-27-84-58-12-20-95-6-30-50-22-64-59-92-51-97-3-25-32-28-46-83-52-76-37-53-96-8-60-36-9-10-77-83-38-48 with a load of less than .30 and a load higher than .20 on another factor were excluded from the analysis one by one respectively.

Table 2. Explanatory factor analysis KMO and Bartlett's test value

Kaiser-Meyer-Olkin Measure Sampling Adequacy		.89
Bartlett's Test of Sphericity	Approx. Chi-Square	3154.48
	Degree of freedom	435
	p	.00

As seen in Table 2, KMO adequacy value is .89; Bartlett's test result was found to be 3154.48 (435, $p < 0.01$).

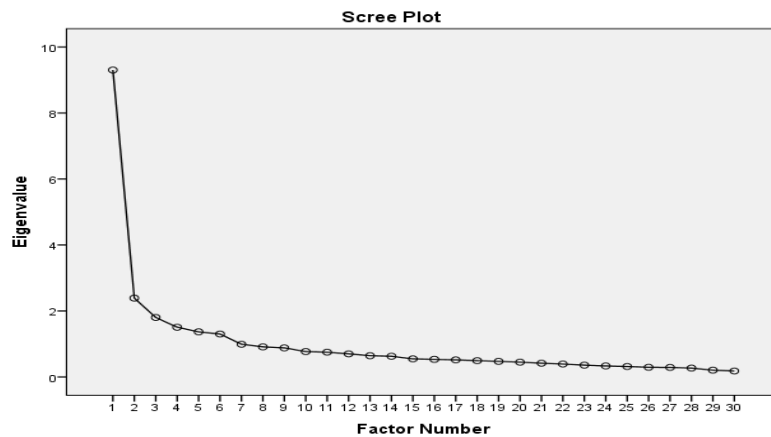


Figure 2. Explanatory Factor Analysis

Table 3. Explained total variance

Component	Total	Variance%	Total%
1	9,30	31,01	31,01
2	2,39	7,96	38,98
3	1,80	6,01	44,99
4	1,51	5,02	50,01
5	1,37	4,56	54,57
6	1,30	4,34	58,91

As seen in Table 3, a 6-factor structure that explains 58.91% of the total variance was explained. The variance amounts explained by the factors are 31.01% for the first factor, 7.86% for the second factor, 6.01% for the third factor, 5.02% for the fourth factor, 4.56% for the fifth factor, and 4.34% for the sixth factor, respectively.

Table 4. Factor loadings and internal consistency coefficients

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
89	.72					
71	.68					
19	.67					
72	.62					
57	.61					
24	.60					
40	.60					
33	.60					
65	.56					
98	.56					
45	.50					
44	.44					
18			.76			
53			.58			
61			.51			
4				.71		
14				.60		
2				.56		
21				.40		
54					.73	
70					.71	
93					.66	
1					.66	
69					.59	
91					.58	
90					.48	
42						.63
67						.48
73						.35
34						.31
Cronbach's Alpha	.87	.72	.59	.88	.61	.68

Values below .30 were not included. n = 357

Table 5. Subscales and related items after factor analysis

Factor	# of Items	Item Numbers	Cronbach's Alpha
Destructive S.	8	72-89-71-19-24-40-33-57	.87
Anxiety S.	4	98-44-45-65	.72
Impulsivity S.	3	18-43-61	.59
Depressive S.	7	70-93-54-69-91-1-90	.88
MOR*	4	42-67-73-34	.61
Cognitive P.	4	21-14-2-4	.68

*Maladjustment to the Objective Reality

Table 5 shows the distribution of the items according to the factors. The total Cronbach's alpha coefficient of the 6-factor structure in the exploratory factor analysis performed with the Varimax method is .92.

1st Factor consists of items numbered 72-89-71-19-24-40-33-57. Items are like “I fight when I can't get along”, “Sometimes I behave verbally and behaviourally aggressive”. It is named as Destructive Symptoms and Cronbach's alpha coefficient for internal reliability is .87.

2nd Factor consists of items numbered 72-89-71-19-24-40-33-57. Items are like “It suddenly feels like something bad will happen”, “I'm afraid some people will hurt me”. It is named as Anxiety Symptoms and Cronbach's alpha coefficient for internal reliability is.72.

3rd Factor consists of items numbered 18-43-61. Items are like “My hands and feet wiggle, I move where I sit” and “I'm active, I can't stand still”. It is named as Impulsivity Symptoms and Cronbach's alpha coefficient for internal reliability is .59.

4th Factor consists of items numbered 70-93-54-69-91-1-90. Items are like “I feel like crying” and “There are times when I want to hurt myself”. It is named as Depressive Symptoms and Cronbach's alpha coefficient for internal reliability is .88.

5th Factor consists of items numbered 42-67-73-34. Items are like “I have friends that nobody knows or sees”, “I have special powers like talking to animals, reading people's thoughts, moving objects with brainpower”. It is named as Maladjustment to the Objective Reality and Cronbach's alpha coefficient for internal reliability is.61.

6th Factor consists of items numbered 21-14-2-4. “While I am telling a subject, I cannot keep it in my mind, I explain it scattered”; “I have difficulty understanding a topic”. It is named as Cognitive Problems and Cronbach's alpha coefficient for internal reliability is .68.

For the research, an item pool consisting of 102 items was created and the expert group of 9 people were asked to give their opinions and score the items out of 100 in order to test the content validity.

Table 6. Correlation between subscales

	Destructive S.	Anxiety S.	Impulsivity S.	Depressive S.	MOR.	Cognitive P.
Destructive S.	1	.42**	.28**	.64**	.65**	.44**
Anxiety S.		1	.23*	.68**	.41**	.45**
Impulsivity S.			1	.16*	.25*	.21*
Depressive S.				1	.67**	.74*
Maladjustment					1	.77*
Cognitive P.						1

**p<0.01, *p<0.05

When the correlation between subscales was examined, the lowest correlation was .16 with Impulsivity Symptoms and Depressive Symptoms; The highest correlation was observed between .77 with Maladjustment to the Objective Reality and Cognitive Problems.

Confirmatory factor analysis was also conducted to test the construct validity of the scale. Because of the high number of items, parcels were created and analyzes were carried out with the assumption that these parcels are the main indicators of the factors in question. A plot is the distribution of the items of a factor

or dimension in a balanced way to the artificially determined factors according to their correlation with the total score (Şimşek, 2007).

Table 7. Factor loadings and t-values

Latent Variables / Observed Variables	Factor Loadings	t-values
Destructive Symptoms		
Plot 1	80	17.65
Plot 2	94	22.52
Anxiety Symptoms		
Plot 1	65	11.92
Plot 2	91	16.25
Depressive Symptoms		
Plot 1	84	18.18
Plot 2	87	19.19
Maladjustment to Obj. Reality		
Plot 1	82	13.14
Plot 2	53	9.22
Cognitive Problems		
Plot 1	71	12.75
Plot 2	47	8.72
Impulsivity Symptoms		
Plot 1	87	7.61
Plot 2	59	6.80

n = 232

As seen in the table, the lowest t-value is 6.80 and the highest t-value is 22.52. All values are meaningful because all values are higher than 1.96. As it's shown in the standardized Solution tab, it is seen that the highest factor loading is .94 and the lowest is .47. In confirmatory factor analysis Chi-Square = 157.66, df = 39, P-value = .00000, RMSEA = .09 values were obtained. Degree of freedom value of Chi-Square is 4,02. As this value is lower than 5, it's indicated that data and the model are fit. It's found that Root Mean Square Residual (RMR) = .07, Standardized RMR = .06. It is acceptable to have these values less than .08. If these are lower than .05, it indicates a good fit. Looking at other goodness of fit values, Goodness of Fit Index (GFI) = .96, Normed Fit Index (NFI) .95, Non-Normed Fit Index (NNFI) .94, Comparative Fit Index (CFI) .96, Incremental Fit Index (IFI) .96. It is acceptable for all these values to be higher than .90. If it is bigger than .95, it shows that it is a very good fit.

As it's shown in Table 8; there are positive and significant correlation between CSAI Depressive Symptom sub-scale and SDQ Emotional Problems ($r = .64, p < .00$); CSAI Depressive Symptom sub-scale and SDQ Behavioral Problems ($r = .36, p < .00$). There are positive and significant correlation between CSAI Anxiety Symptom sub-scale and SDQ Emotional Problems ($r = .54, p < .00$); CSAI Anxiety Symptom sub-scale and SDQ Behavioral Problems ($r = .19, p < .03$). There are positive and significant correlation between CSAI Maladjustment to Objective Reality sub-scale and SDQ Emotional Problems ($r = .44, p < .00$); CSAI Maladjustment to Objective Reality sub-scale and SDQ Behavioral Problems ($r = .43, p < .00$). There are positive and significant correlation between CSAI Cognitive Problems sub-scale and SDQ Emotional Problems ($r = .43, p < .00$); CSAI Cognitive Problems sub-scale and SDQ Behavioral Problems ($r = .32, p < .00$). There are positive and significant correlation between CSAI Destructive Symptoms sub-scale and SDQ Emotional Problems ($r = .34, p < .00$); There are positive and significant correlation between CSAI Destructive Symptoms sub-scale and SDQ Behavioral Problems ($r = .43, p < .00$); CSAI Destructive Symptoms sub-scale and SDQ Peer Relations

($r = .21, p < .02$). There are positive and significant correlation between CSAI Impulsivity Symptoms and SDQ Attention Deficit and Excessive Mobility ($r = .31, p < .00$); CSAI Impulsivity Symptoms, and SDQ Peer Relations ($r = .24, p < .01$).

Table 8. Pearson correlation analysis between CSAI and SDQ

SCALES		Depressive S.	Anxiety S.	MOR	Cognitive Problems	Destructive S.	Impulsivity S.
SDQ Emo.	r	.64**	.54**	.44**	.43**	.34**	.02
	p	.00	.00	.00	.00	.00	.80
SDQ Behv.	r	.36**	.19*	.43**	.32**	.43**	.05
	p	.00	.03	.00	.00	.00	.55
SDQ ADH.	r	.14	.03	.15	.16	.13	.31**
	p	.16	.72	.09	.09	.15	.00
SDQ Peer R.	r	.10	.08	.03	.05	.21*	.24**
	p	.31	.37	.78	.60	.02	.01
SDQ Prosocial	r	-.23	.01	-.05	.11	-.07	.16
	p	.87	.92	.62	.25	.42	.08

** $p < 0.01$, * $p < 0.05$ MOR: Maladjustment to Objective Reality, SDQ Emo.: Strengths & Difficulties Questionnaire Emotional Problems, SDQ Behv.: Strengths & Difficulties Questionnaire Behavioral Problems, G SDQ ADH.: Strengths & Difficulties Questionnaire Attention Deficit and Excessive Mobility, SDQ Peer R.: Strengths & Difficulties Questionnaire Peer Relations, SDQ Prosocial.: Strengths & Difficulties Questionnaire Prosocial Behaviors

Table 9. Descriptive statistics on average scores obtained from the scale

Sub-scales	Min.	Max.	\bar{X}	m	SD	$\bar{X} - SD$	$\bar{X} + SD$
Destructive Symptoms	8	38	17.35	16	6.94	10.41	24.29
Anxiety Symptoms	4	20	9.33	9	3.92	5.41	13.26
Impulsivity Symptoms	3	15	8.34	8	3.15	5.20	11.49
Depressive Symptoms	7	33	15.16	14	6.61	8.55	21.77
Maladjustment to Obj.Reality	4	18	5.99	5	2.55	3.44	8.54
Cognitive Problems	4	18	7.46	7	2.79	4.66	10.25
Total Scale	31	123	63.64	62	18.72	44.91	82.36

m= Median, SD= Standard Deviation, n=232.

Descriptive statistics (minimum-maximum scores, average, median and standard deviation) are given in Table 9. In addition, as an indicator to determine the cut-off score for the scale, suggestive score ranges for the lower and upper groups were calculated based on the mean and standard deviation scores. The cut-off scores for the scale were calculated as one standard deviation above the mean score (mean + standard deviation) and one standard deviation below (mean - standard deviation).

In normal distributions, the area from one standard deviation below the mean to one standard deviation above the mean is specified as the middle area (Tabachnick and Fidell, 2013). Accordingly, one standard deviation above the mean can be considered as the upper group and one standard deviation from the mean as a lower group.

Cut-off scores for the upper groups were calculated as 24.29 for the Destructive Symptoms sub-scale, 13.26 for the Anxiety Symptoms sub-scale, 11.49 for the Impulsive Symptoms sub-scale, 21.77 for the Depressive Symptoms sub-scale, 8.54 for the Objective Reality sub-scale, 10.25 for the Cognitive Problems sub-scale and 82.36 for the overall scale. These cut-off scores were calculated in the current sample. Further work is needed to establish a standard cut-off score. The distributions to be calculated in future studies can be handled comparatively.

Finally, independent group t test was conducted to determine the discrimination of the scale's lower-upper dimensions and total scores. As a result of the analysis, a significant difference in favor of the upper group was observed in all sub-scales and throughout the overall scale ($p < .00$).

DISCUSSION, CONCLUSION & SUGGESTIONS

Measurement tools such as test, inventory, questionnaire or scale are needed for both research and clinical studies worldwide, including in our country. The quality and psychometric properties of the scales used in scientific studies or practice appear as the main factor determining the content and quality of scientific studies and psychological practices based on these studies. Therefore, scale development and adaptation studies are very valuable. Unfortunately, in our country, the number of specially developed measurement tools is in a minority. Approximately two out of three of the tests used to consist of adaptations. Unless psychological tests are proven to be culturally independent, they should be developed individually for each country (Tezbaşaran, 1996). When we look at the subscales of the Strengths and Difficulties Questionnaire, which is one of the global tests used in the field and in this research, internal consistency coefficients .50 in Behavioral Problems and .22 in Peer Relations stand out, and these rates are quite low. Similar difficulties can be observed in the Conners' Parent Rating Scale, which is another widely used scale. It is seen that this scale, which has been adapted in many countries, has different structural features across countries (Kaner, Büyüköztürk, İşeri, Ak, & Özyaydın, 2011). For all these reasons, it was planned to develop a scale in this study in order to measure the thoughts, behaviors, affect and symptoms of Turkish children, and as a result of the analysis, a 6-factor 30-item structure emerged. The developed measuring tool is named as Child Symptom Assessment Inventory (CSAI) and the sub-scales are named as Destructive Symptoms, Depressive Symptoms, Maladjustment to the Objective Reality, Cognitive Problems, Anxiety Symptoms and Impulsivity Symptoms.

It is examined content validity, construct validity, criterion validity with a similar scale to test the validity of the scale, internal consistency coefficient to test its reliability and finally 27% lower-upper group comparisons to determine the discrimination of the items. After the scope validity, the basic components analysis was performed to evaluate whether the sample was sufficient for factor analysis. Bartlett's test results were examined and the KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) value was .76 and the Bartlett Sphericity test result was 10308.81 (4753, $p < 0.01$). According to Büyüköztürk (2005), the KMO value as .80 is "excellent". In this context, it was seen that the scale provided "perfect" compliance with factor analysis with .83 KMO value and factor analysis was started.

Factor analysis is done to determine the factor structure, and the factors emerge as a result of grouping the variables used according to the responses of the evaluators and their common characteristics (Tabachnick and Fidell, 2013). Varimax rotation technique was used in the exploratory factor analysis of the scale, since it was a suitable method to be preferred when multifactorial structures are concerned (Büyüköztürk, 2005), the distribution of items according to factors and factor loadings were evaluated; whether the items in the scale measure the properties they need to measure has been examined. As a result of the analysis, a structure with 6 factors and 30 items with an eigen value above 1, which explains 58.88% of the variance, was obtained. The scales are considered as "poor" if they explain 10% of the total variance, "mediocre" if they explain 20%, "good" if they explain 30%, "very good" if they explain 40%, "excellent" if they explain 50% (Çokluk, Şekercioğlu, & Büyüköztürk, 2010).

According to the analysis, it can be said that the factor structure of CSAI is "perfect" since it can explain 59% of the total variance. On the other hand, KMO adequacy value is .89; Bartlett's test result was found to be 3154.48 (435, $p < 0.01$), which is described as "perfect" (Büyüköztürk, 2005).

Each variable has a certain effect on the factor it depends on, this is called factor load. The higher the factor load, the better the item factor measures (Tabachnick and Fidell, 2013). The factor load of the scale is between .31 and .72 and its arithmetic mean is .58. The factor loadings of 0.60 and above are high; Between 0.30-0.59 can be defined as medium sizes (Büyüköztürk, 2005). In this case, CSAI's factor loads are from medium to high.

For the criterion validity of the scale, its correlations with the Strengths and Difficulties Questionnaire (SDQ), which is another scale used in the field and measures similar symptoms, were examined. Criterion validity is comparisons made with different scales that are thought to measure similar properties (Tekin, 1993). The reason for choosing this scale is the similarity of the sub-scales. For example, CSAI Depressive Symptoms sub-scale and SDQ Emotional Problems sub-scale; CSAI Maladjustment to Objective Reality sub-scale and SDQ Behavioral Problems sub-scale and CSAI Impulsivity sub-scale and SDQ Attention Deficit and Excessive Mobility sub-scale are similar. As a matter of fact, the relationships between these sub-scales were analyzed using the Pearson Correlation test and statistically significant results were obtained.

Considering the internal consistency for the reliability analysis of the scale, the total Cronbach's alpha coefficient was found to be .92. According to Kayış (2005), if Cronbach's Alpha Coefficient is $.60 \leq \alpha < .80$, it is "quite reliable"; If it is $.80 \leq \alpha < 1.00$, it is a "highly reliable" scale. Cronbach's alpha values for CSAI's sub-scales are between .59 and .87 and .92 for overall. On the other hand, in the comparison of the two groups with the highest and lowest scores of 27%, significant results in favor of the upper group showed the distinctiveness of the items.

Considering the validity and reliability analysis of the scale as a result of all these processes, it is seen that it has good values and can be used in the field. The scale also has some limitations. Being based on self-report allows the child to evaluate herself/himself is positive on one hand, but also negative because it can be difficult for 8/9-year old children. Therefore, developing family and / or teacher forms of the scale may strengthen screening. Another limitation standardization and pathological group comparison was not performed. It will be useful to do it in another study.

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Author Contributions

EE structured the research, created a draft form of the scale, collected the data, analyzed it, wrote the manuscript and sent it to the journal.

Conflict of Interest

It has been reported by the author that there is no conflict of interest.

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Ethical Statement

This research was completed in line with the Helsinki Declaration. In line with this, the study was investigated and permitted by İstanbul Arel University Scientific Research and Ethical Review Board. Additionally, data tools in the study were only distributed to volunteer participants. All participants provided informed consent. Additionally, participants were informed that they could withdraw from the study at any time during data collection.

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