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Adaptation of Anxiety Scale for Children-Autism Spectrum Disorder-Parent Version (ASC-ASD-P-TR) to Turkish Culture and Examination of Psychometric Properties

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ABSTRACT

Objectives: Accurate assessment of anxiety symptoms in children diagnosed with Autism Spectrum Disorder (ASD) can be challenging due to the lack of appropriate assessment tools. This study aimed to adapt the Anxiety Scale for Children with Autism Spectrum Disorder-Parent Version into Turkish (referred to as ASC-ASD-P-TR) to enable parents to assess anxiety in children with ASD.

Methods: This methodological study was conducted between October 2023 and March 2024 with parents of children diagnosed with ASD aged 8-15 years. 371 parents participated in the study. Data were collected online. Content validity, construct validity, internal reliability and split-half reliability. were examined.

Results: The construct of the ASC-ASD-P-TR, which consists of four dimensions (Performance, Separation, Arousal, and Uncertainty) and 24 items, was validated in Turkish. The scale has a score range between 24 and 96, and an increase in score means an increase in anxiety. The total variance explained by the scale is 61%. Cronbach's alpha reliability coefficient for the overall scale is 0.94. In the sub-dimensions of the scale, Cronbach's alpha value was between 0.66 and 0.80.

Conclusion: The ASC-ASD-P-TR is a valid and reliable measurement tool for assessing anxiety in children with ASD in Turkiye.

Keywords: Anxiety, autism spectrum disorder, parent report, reliability, validity

INTRODUCTION

Autism spectrum disorder (ASD) is a common condition seen in 1-2% of children (Baio et al. 2018). ASD symptoms appear in early childhood and persist throughout life (Baghdadli et al. 2018). Clinically, it is characterised by differences in the quality of social communication and limited, repetitive behaviours (APA 2013). These symptoms are often accompanied by anxiety, depression, attention and behavioural problems (Goldin et al. 2014). Anxiety disorders, the most common psychiatric disorder that can be seen in all age groups, in which individuals experience constant anxiety at a level that they cannot ignore, are frequently reported in children with ASD (Dellapiazza et al. 2022). It is known that anxiety has an average prevalence rate between 20% and 50% in children with ASD due to the difficulties they experience in the process of adapting to the environment and in emotion regulation (Van et al. 2011, Lecavalier et al. 2014, Samadi et al. 2020). Anxiety causes far-reaching consequences that affect the activities of daily living, quality of life and school attendance of these children. This situation also negatively affects the caregivers of these children (Leyfer et al. 2006). Anxiety is also associated with sensory processing abnormalities, limited and repetitive behaviours and impairments in social functioning (Bellini 2004).

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Anxiety in children with ASD differs from traditional conceptualisations in important ways. There is a significant relationship between anxiety and sensory hypersensitivity and intolerance of uncertainty in ASD (Lidstone et al. 2014, Wigham et al. 2015). In addition, the clinical features of ASD may mimic the symptoms of separation anxiety, which is defined as "excessive anxiety about leaving home or the people to whom one is attached", resistance to routine changes and new environments in children (Gjevik et al. 2011). While social anxiety in typically developing children may be caused by the fear of being negatively evaluated by others, anxiety in social situations in ASD may be caused by violations of logic rules or concerns about the unpredictability of the social environment (Kerns et al. 2014, Zainal et al. 2014). White et al. (2015) examined, the metric and latent factor equivalence of the Multidimensional Anxiety Scale for Children (MASC-C) was in three groups. The groups were divided into three as young people with anxiety disorder, young people with ASD, and a healthy control group. As a result of the study, it was determined that the factor structure in the ASD group was different. This supports the idea that there are different anxiety symptoms in ASD (White et al. 2015). For this reason, the reliability and validity of measurements made with instruments designed for children with typical development may be limited (Rodgers et al. 2016). Rodgers et al. (2016) developed the ASC-ASD: the Anxiety Scale for Children with Autism Spectrum Disorder (ASC-ASD: the Anxiety Scale for Children with Autism Spectrum Disorder) in the UK in order to determine the level of anxiety in accordance with the characteristics of children diagnosed with ASD. The scale, which has Parent and Child versions, has promising psychometric properties such as good internal consistency, validity and 1-month test-retest reliability (Rodgers et al. 2016).

Considering the high prevalence of anxiety in children diagnosed with ASD, it is vital that professionals can accurately recognise and assess anxiety symptoms in this group (Den Houting et al. 2018). Despite the increasing number of ASD screening tools in Turkey, the number of accessible valid scales is still limited for both clinical use and general population screening (Köse et al. 2017), and there is no measurement tool that can determine the level of anxiety appropriate to the characteristics of children diagnosed with ASD. The planned study aims to fulfil this need. Therefore, the aim of the study is to determine the psychometric properties of the parent version of the ASC-ASD measurement tool and to carry out a Turkish validity and reliability study. Unlike other anxiety scales, the "Anxiety Scale for Children with Autism Spectrum Disorder-Parent Version" measurement tool is based on symptoms that a parent can easily observe rather than the child's verbal expression of anxiety.

Research Hypothesis

H1: "Anxiety Scale for Children with Autism Spectrum Disorder-Parent Version" is a valid and reliable measurement tool that can be used in Turkish language.

METHOD

This methodological study was planned with the aim of introducing a measurement tool to the Turkish culture to enable the evaluation of anxiety in children aged 8-15 years with autism spectrum disorder by their parents.

Determining the Appropriate Scale to Meet the Needs: When the literature was examined, it was seen that there is a measurement tool with the original name "The Anxiety Scale for Children with autism spectrum disorder-Parent (ASC-ASD-P)" developed by Rodgers et al. (2016). The scale was translated into Turkish by Deniz et al. (2020), but its psychometric properties could not be analysed. However, the Turkish translation form was used by researchers in clinical studies. In the Turkish translation made by Deniz et al. (2020), the name of the scale was determined as Anxiety Scale for Children with Autism Spectrum Disorder-Parent Version (ASC-ASD-P-TR) (Newcastle University 2015). Since the copyrights of the scale belong to Newcastle University and also upon the request of the authors who developed the scale, the translations made by Deniz et al. (2020) were adhered to. Permission to use the scale was obtained from Newcastle University and Deniz et al. (2020) (Newcastle University 2015).

ASC-ASD-P scale consists of 24 items and 4 subscales (Performance: 2nd, 4th, 7th, 15th and 17th items, Arousal: 1st, 3rd, 8th, 12th, 13th and 22nd item, Separation: 11th, 18th, 19th, 20th and 24th item and Uncertainty: 5th, 6th, 9th, 9th, 10th, 14th, 16th, 21st and 23rd items). There are no reverse scored statements in the scale. The scale is scored as "Never"=1, "Sometimes"=2, "Often"=3 and "Always"=4. It has a score range of 24 to 96, and an increase in the score means an increase in anxiety. The Cronbach's alpha reliability coefficient calculated for the overall original scale is 0.94. The values calculated for the sub-dimensions are; Performance (0.89), Separation (0.87), Arousal (0.87) and Uncertainty (0.91). The one-month test-retest value of the scale was calculated as 0.84.

Ethical Principles: In order to adapt "The Anxiety Scale for Children with Autism Spectrum Disorder" to Turkish culture, permission was first obtained from the authors who developed the measurement tool via e-mail. After the author's permission, ethics committee permission was obtained from Üsküdar University Non-Interventional Scientific Research Ethics Committee (Date: 31/08/2023 and Number: 61351342) to conduct the study. In the study, data were

collected online from parents via "Google Forms". Written informed consent was obtained from the parents.

Content validity: For the cultural validity of the scale, content validity was conducted based on expert opinion. Experts expressed their opinions on each item with a Likert-type rating as "Necessary", "Useful but not necessary" and "Not necessary" (Yurdugül 2019). Content Validity Ratio (CVR) and Content Validity Index (CVI) were calculated based on the opinions of at least 5 and at most 40 experts (Esin 2014, Yurdugül 2019). In this study, the opinions of 8 experts were requested for content validity.

Reliability: In the adaptation study, a parallel form measuring the anxiety level of children was not used. One of the reasons for this is that there is no autism-specific measurement tool that measures the anxiety level of children with autism. In addition, there are measurement tools that measure anxiety and depression levels in children, but it was thought that these measurement tools would affect the validity of the adapted measurement tool due to the high number of items. Therefore, it was not used. For the reliability of the scale, Cronbach α reliability coefficient and split-half test consistency were used.

Pilot Implementation: On whom the pilot study will be conducted depends on the variable to be measured and the target group. Many characteristics such as age range, education level, gender of the group in the sample of the pilot study should be the same with the target group of the original scale (Erkuş 2007). For pilot studies, a sample of 30-50 people is considered sufficient by the literature (Şeker and Gençdoğan 2006). For this reason, in order to determine whether the trial form, which had language and content validity, was correctly understood by the sample, it was applied to a sample of 30 people who had similar characteristics with the study population. After the pilot application, it was determined that the items in the scale could be evaluated correctly by the sample.

The population and sample: The population of this study consisted of parents of children diagnosed with autism spectrum disorder between the ages of 8-15. The participants were recruited via social media groups (e.g. Facebook and Instagram) and WhatsApp messaging groups. The snowball sampling method was utilised.

Since this study is a scale adaptation study, factor analysis techniques should be used. In the literature, it is stated that a sample of 300 people is a good value for factor analysis (Çokluk et al. 2021). In this study, 371 parents were reached. The sample consisted of 86.8% mothers, 32.4% of whom were graduates of higher education and the average age was 41.4 ± 6.2 years. On the other hand, 82.7% of the children were male and the mean age of the sample was 11.3 ± 2.6 years.

The children were diagnosed with ASD by paediatric mental health specialists and paediatric neurologists. The researchers conducted telephone interviews with the parents. Through telephone interviews, it was confirmed by whom and when the medical diagnosis of the children was made. Copies of the diagnosis reports were requested to be uploaded to the system together with the data collection form.

Inclusion criteria

- 18 years of age or older
- Having a child aged 8-15 years with a diagnosis of ASD
- Being one of the primary caring parents of a child diagnosed with ASD
- Being literate
- Volunteering to participate in the research
- Not having a medical diagnosis of psychiatric disorder

Exclusion criteria

- Being the parent of a child diagnosed with autism spectrum disorder under the age of 8 and over the age of 15
- Not being the primary caring parent of a child with ASD
- The child has another diagnosis accompanying the diagnosis of autism spectrum disorder
- Not being literate
- Having a medical diagnosis of a psychiatric disorder

Data Collection

In the study, data were collected between October 2023 and March 2024 via Google forms. The online survey was directed to 400 parents. 29 parents refused to participate in the study. 371 parents participated in the online survey. The online survey was opened only once per account. In this way, repeated entries from the same account were prevented. Before starting to answer the questions in the data collection forms in the online form, parents were asked questions about the inclusion criteria. If the characteristics of the parent did not meet the inclusion criteria, the system did not allow the parent to fill out the form. The questionnaire was completed by the participants at times and in settings of their own choosing. This situation brings advantages such as the elimination of the observer effect (Roberts, 2007). At the same time, a mandatory response button was prepared for each question in order to complete the questionnaire. When the parent skipped a question without answering, the system gave a warning. After all questions were answered, the questionnaire could be completed and the save button could be pressed. In this way, it was ensured that the questionnaires were 100%

filled. Parents who did not want to continue the study could withdraw from the study by saying end the survey. However, no parent wanted to withdraw from the study. The flow chart of the study is shown in Figure 1.

Data Analysis: In the data analysis phase, SPSS 26 package programme was used for descriptive statistics and AMOS 23 package programme was used to examine the model fit. Number, mean and percentage values were preferred for descriptive statistics. While correlation analysis was used in the search for relationships, the construct validity of the scale was carried out with confirmatory factor analysis (CFA).

RESULTS

In this study, the content validity of the ASC-ASD-P-TR scale, which is planned to be adapted in this study, was tested by means of the data obtained from the experts for content validity, determination of content validity rates and calculation of the content validity index.

While CVR is used in the acceptance or rejection of certain items, CVI is calculated for the whole test. In this case, the average of the CVR values of the items decided to be included in the scale is calculated and the CVI value is obtained (Lawshe 1975). In this study, the opinions of 8 experts were obtained. For 8 experts, the CVR ratio is 0.75 (Ayre and Scally 2014).

In line with the expert opinions, CVR was calculated for each statement of the trial form, and it was seen that there were no items with zero or negative values. When the CSV values of the items were analysed, it was seen that all the statements in the trial form were suitable for calculating the content validity index. Thus, it was decided to calculate the content validity index of 24 items in the scale. As a result of the necessary calculation, it was calculated that the content validity index of the 24-item trial form was 0.95. In order for the form to be valid as a whole, the CVI value obtained must be greater than the CVR value (CVI>CVR). As seen in Table 1, it was concluded that the values obtained from this study were CVI (0.95) > CVR (0.75) and the content validity of the ASC-ASD-P-TR scale was achieved.

Construct validity: In the study, confirmatory factor analysis was conducted to examine construct validity. As a result of the analysis performed to test the suitability of the data for factor analysis, Barlett's normal distribution test result was significant (x^2: 2810.40; p< 0.000) and the Kaiser-Mayer-Olkin (KMO) value was 0.871. These findings indicated that the data set was suitable for factor analysis and gave clues about the possibility of factorisation in the scale.

The construct validity of the ASC-ASD-P-TR scale was tested by confirmatory factor analysis (CFA). For this purpose, goodness of fit values and significance levels of the items were analysed. It was determined that the expressions belonging to the sub-dimensions showed a significant relationship with the structure they were in. The goodness of fit values of the ASC-ASD-P-TR were found to be above the minimum values recommended by the literature (Schermelleh-Engel and Moosbrugger 2003, Meydan and Şeşen 2011, Wang and Wang 2020). Based on these findings, it was concluded that the 4-factor structure was confirmed (Table 2).

The model fit of the ASC-ASD-P-TR, which consists of four dimensions and 24 items, was tested with second level multifactor CFA. Since the data were normally distributed, maximum likelihood calculation method was used. When the goodness of fit values of the structure was examined, it was seen that the goodness of fit values was not at the desired level, so the correction indices were examined. High covariance was observed between the error terms of I9-I10, I19-I24 and I12-I13 items and the error terms of these items were combined. When the goodness of fit values of the scale was examined after the procedure, it was seen that $\chi 2$ /df= 2.162, AGFI= 0.91, CFI = 0.90, GFI = 0.90, RMSEA= 0.056, NFI= 0.92. In line with these findings, it was understood that the fit values were at an acceptable level (Sümer 2000, Meydan and Şeşen 2011, Gürbüz and Şahin 2015, Polatçı and Ünüvar 2021) (Figure 1).

When the significance of the latent variables of the ASC-ASD-P-TR was analysed, it was seen that all variables were significant at p<0.001 level. When the goodness-of-fit values

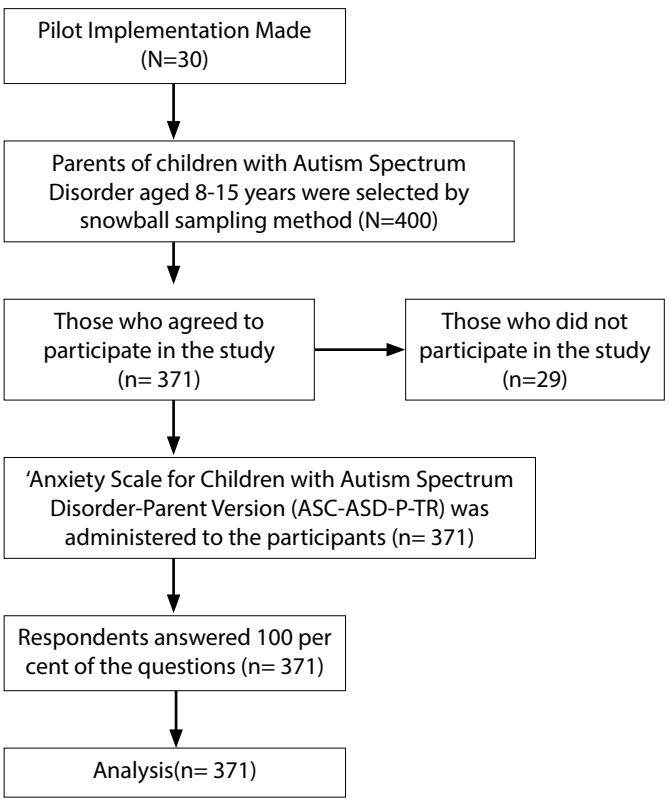

Figure 1. Flow Chart

Table 1. Content validity information of the ASC-ASD-P-TR scale

Item Number	Not appropriate	Correct	Appropriate	CVR	Item Number	Not appropriate	Correct	Appropriate	CVR
I1	0	0	8	1	I13	0	1	7	0.75
I2	0	0	8	1	I14	0	0	8	1
I3	0	0	8	1	I15	0	1	7	0.75
I4	0	0	8	1	I16	0	0	8	1
I5	0	0	8	1	I17	0	0	8	1
I6	0	0	8	1	I18	0	0	8	1
I7	0	0	8	1	I19	0	0	8	1
I8	0	0	8	1	I20	0	0	8	1
I9	0	0	8	1	I21	0	0	8	1
I10	0	0	8	1	I22	0	0	8	1
I11	0	1	7	0.75	I23	0	0	8	1
I12	0	1	7	0.75	I24	0	1	7	0.75

Number of Experts: 8
Content Validity Ratio (CVR): 0.75
Content Validity İndex (CVI): 0.95

Table 2. Goodness of fit values for the measurement tools and the recommended in the literature

Variable	χ2/df	RMSEA	CFI	GFI	AGFI	NFI	Validity
ASC-ASD-P-TR	2.162	0.056	0.90	0.90	0.91	0.92	+
*Goodness-of-fit	χ2<2	0<RMSEA<0.05	0.95≤CFI≤1	0.95≤GFI≤1	AGFI>0.95	0.95≤GFI≤1	
*Acceptable compliance	χ2<5	0.05<RMSEA<0.10	0.90≤CFI≤0.95	0.90≤CFI≤0.95	AGFI>0.90	0.90≤CFI≤.95	

ASC-ASD-P-TR: Anxiety Scale for Children with Autism Spectrum Disorder-Parent Version; RMSEA: Root Mean Square Error of Approximation; CFI: Comparative Fit Indices; GFI: Goodness-of-Fit Index; AGFI: Adjusted Goodness of Fit Index; NFI: Normed Fit Index

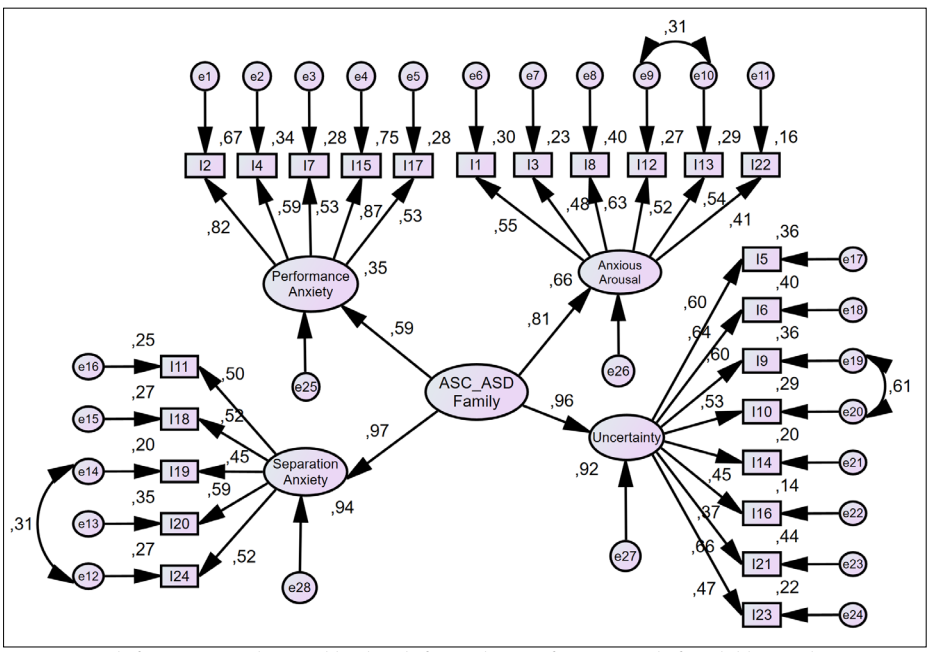

Figure 2. Multifactor CFA with second level multifactorial CFA of Anxiety Scale for Children with Autism Spectrum Disorder-Parent Version (ASC-ASD-P-TR)

Table 3. Factor loadings and significance levels of the statements of ASC-ASD-P-TR

No	x̄	SD	Factor Loading	t	P	No	x̄	SD	Factor Loading	t	P
I1	1.93	0.68	0.55	6.844	0.000	I13	1.35	0.62	0.54	7.180	0.000
I2	1.82	0.89	0.82	11.151	0.000	I14	2.22	0.90	0.45	7.046	0.000
I3	2.22	0.86	0.47	6.844	0.000	I15	1.85	0.94	0.87	18.090	0.000
I4	1.75	0.94	0.59	11.151	0.000	I16	2.03	1.07	0.37	6.108	0.000
I5	2.13	0.92	0.60	9.752	0.000	I17	1.42	0.79	0.53	9.965	0.000
I6	2.43	0.93	0.64	9.752	0.000	I18	2.88	0.88	0.52	7.001	0.000
I7	1.48	0.80	0.53	9.905	0.000	I19	1.69	0.87	0.45	7.968	0.000
I8	1.46	0.70	0.63	8.034	0.000	I20	2.11	1.04	0.59	7.431	0.000
I9	2.48	0.85	0.60	9.241	0.000	I21	2.59	0.94	0.66	9.803	0.000
I10	2.47	0.94	0.54	8.472	0.000	I22	1.53	0.78	0.41	6.155	0.000
I11	2.45	1.07	0.50	6.768	0.000	I23	2.04	0.93	0.47	7.481	0.000
I12	1.57	0.76	0.52	7.119	0.000	I24	1.81	0.87	0.52	6.768	0.000

Table 4. Item-total correlations of ASC-ASD-P-TR and Cronbach's alpha values obtained when the item was deleted

No	Item Total Correlations	Alpha if item deleted	No	Item Total Correlations	Alpha if item deleted
I1	0.440	0.881	I13	0.428	0.882
I2	0.518	0.879	I14	0.473	0.880
I3	0.418	0.881	I15	0.569	0.877
I4	0.486	0.880	I16	0.348	0.884
I5	0.518	0.879	I17	0.443	0.881
I6	0.551	0.878	I18	0.445	0.881
I7	0.441	0.882	I19	0.457	0.880
I8	0.522	0.879	I20	0.462	0.881
I9	0.528	0.879	I21	0.552	0.878
I10	0.470	0.880	I22	0.315	0.884
I11	0.423	0.882	I23	0.417	0.882
I12	0.461	0.880	I24	0.522	0.879

of the structure of the scale and the significance of the items were evaluated together, it was concluded that the four-factor structure of the scale was confirmed and the structural validity was provided for this study (Table 3). The variance explained by the four-dimensional structure of the scale was found to be 61%.

When the correlation of the items of the ASC-ASD-P-TR with the scale total score was analysed, it was observed that all items had a medium-sized relationship with the scale (Table 4).

Reliability: Reliability can be defined as the ability of the test or scale results to accurately reveal the phenomenon related to the conceptual structure and to give similar results when the measurement tool is applied in different places, at different times and in different masses selected from the same main mass (Şencan 2005).

In this study, Cronbach α reliability coefficient and split-half test consistency were used to test the reliability of the obtained structure. Although the reliability coefficient, which can be considered sufficient in a Likert-type scale, is desired to be above 0.70, it should be as close to 1 as possible (Tezbaşaran 2008, DeVellis 2014). In the split-half test consistency, the correlation between the two halves is expected to be as high and significant as possible.

According to the findings, there was a high, positive and significant relationship between the two halves in all dimensions of the scale (Performance anxiety: r:0.798; p<0.001, Arousal anxiety: r:0.684; p<0.001; Separation anxiety: r:.678; p<0.001; Uncertainty: r: 0.673; p<0.001). In addition, the Spearman Brown correlation coefficient between the two halves of the scale total was determined as 0.872. These values showed that both the sub-dimensions and the total scale provided split-half test consistency.

Tablo 5. Split-half test consistency and Cronbach's α values for the sub-dimensions of the ASC-ASD-P-TR

Factor	Half	Value	Spearman Brown	Guttman	Cronbach
Performance anxiety	first half second half	0.708 0.632	0.798	0.769	0.80
Arousal anxiety	first half second half	0.542 0.533	0.684	0.684	0.70
Separation anxiety	first half second half	0.509 0.422	0.678	0.660	0.70
Uncertainty	first half second half	0.771 0.565	0.673	0.671	0.77
ASC-ASD-P-TR	first half second half	0.809 0.705	0.872	0.872	0.89

Tablo 6. External validity findings

Behaviours	Performance anxiety	Arousal anxiety	Separation anxiety	Uncertainty	Total
body shaking	0.040	0.190**	0.148**	0.122*	0.152**
eye/ear closing	0.160**	0.166**	0.130*	0.184**	0.183**
mumbling	0.005	0.151**	0.017	0.142**	0.102*
hitting/biting/shouting	0.081	0.309**	0.219**	0.301**	0.289**

*p<0.05; **p<0.01

Cronbach's α values obtained in all sub-dimensions of the scale are satisfactory (Performance Anxiety: 0.80; Arousal Anxiety: 0.70; Separation Anxiety: 0.70; Uncertainty: 0.77). The Cronbach α value calculated for the overall scale was 0.89, which indicates a high level of reliability. When the split-half test consistency and Cronbach α reliability coefficient of the scale were evaluated together, it was evaluated that the reliability of the four-factor structure obtained was at a sufficient level.

Families were asked about the presence of repetitive behaviours that occur as a result of anxiety in children with autism spectrum disorder. According to the findings, it was seen that behaviours such as body shaking, eye/ear closing, mumbling and hitting/biting/shouting shown by children diagnosed with autism spectrum disorder were related to the sub-dimensions of the scale and the total score of the scale. As anxiety increases in children, the scores of these behaviours increase.

DISCUSSION

In this study, the name of the ASC-ASD-P (The Anxiety Scale for Children with Autism Spectrum Disorder-Parents) scale developed by Rodgers et al. (2016) was translated into Turkish as "Anxiety Scale for Children-Autism Spectrum Disorder-Parent Version (ASC-ASD-P-TR)". The findings obtained from this adaptation study conducted with a sample of parents with children diagnosed with ASD between the ages of 8-15 years showed that the scale has validity and reliability in determining the anxiety levels of children diagnosed with ASD.

As a result of the calculation of the content validity index of the 24 items in the scale, it was determined that the content validity index of the 24-item trial form was 0.95. In order for the form to be valid as a whole, the CVI value obtained must be greater than the CVR value (CVI> CVR). It was concluded that the values obtained from this study were CVI (0.95) > CVR (0.75) and that the content validity of the ASC-ASD-P-TR scale was achieved (Lawshe 1975, Ayre and Scally 2014).

When the goodness of fit values of the construct was examined, it was seen that $\chi 2$ /df= 2.162, AGFI= 0.91, CFI = 0.90, GFI = 0.90, RMSEA= 0.056, NFI= 0.92. The obtained goodness of fit values was within the limits recommended in the literature (Sümer 2000, Meydan and Şeşen 2011, Gürbüz and Şahin 2015, Polatçı and Ünüvar 2021). Since exploratory factor analysis was used for construct validity in the ASC-ASD main version of the scale developed by Rodgers et al. (2016) and in the Spanish version developed by Beneytez-Barroso et al. (2020), goodness of fit values was not examined. However, the four-factor structure revealed in the main version and the Spanish version was maintained in this study.

The ASC-ASD-P-TR has four sub-dimensions: Performance Anxiety, Uncertainty, Arousal Anxiety and Separation Anxiety. These subscales include items that are particularly appropriate for the specific anxiety phenomenology in ASD. The existence of sub-dimensions is very important. The subscales are very useful for treatment and research as they provide more detailed information about anxiety profiles that

cannot be obtained with the total scale score. Therefore, this additional information can be used to guide formulation and treatment planning or hypothesis development. The unique relationships between the subscales and the relationship between the subscales and an overall construct of anxiety for autism spectrum disorder may be best examined empirically in future studies through the use of bifactor models in which each item loads on a specific factor and an overall factor.

In the study, Cronbach's alpha value of the scale was found to be 0.89. This value shows a high level of reliability. Cronbach α values obtained in all sub-dimensions of the scale are at satisfactory level (Performance Anxiety: 0.80; Arousal Anxiety: 0.70; Separation Anxiety: 0.66; Uncertainty: 0.77). A Cronbach's alpha value of 0.94 was determined for the main version of the ASC-ASD developed by Rodgers et al. (2016). The Cronbach's α values are obtained in its sub-dimensions; Performance (0.89), Separation (0.87), Arousal (0.87) and Uncertainty (0.91) (Rodgers et al. 2016). In the study conducted by Den Houting et al. (2018) in Australia, the scale Cronbach's alpha value was found to be 0.93. In the Spanish version developed by Beneytez-Barroso et al. (2020), the scale Cronbach's alpha value was determined as 0.92. Performance anxiety sub-dimension Cronbach's alpha was 0.88, uncertainty sub-dimension Cronbach's alpha was 0.87, separation anxiety sub-dimension Cronbach's alpha was 0.72, and arousal anxiety sub-dimension Cronbach's alpha was 0.83. In a study conducted in Metropolitan Lima with families of children aged 6-18 years with ASD, the scale uncertainty sub-dimension Cronbach's alpha value was 0.85, the performance anxiety sub-dimension Cronbach's alpha value was 0.81, and the arousal anxiety sub-dimension Cronbach's alpha value was 0.8. Separation anxiety sub-dimension was excluded from the analysis due to its low factor value (Castañeda Mikrukova and Rúa 2023). Similarly, in the study conducted by Samadi et al. (2020) to evaluate the anxiety levels of children diagnosed with ASD in Iran, the analysis of parents' responses identified three factors reflecting different forms of anxiety: Performance anxiety, Uncertainty and Arousal anxiety. The fourth sub-dimension of the original English version (Separation anxiety) was not replicated; three of these items were not loaded to any sub-dimension and the remaining 1 was loaded to the Uncertainty sub-dimension (Samadi et al. 2020).

In the study, when the item correlations of the sub-dimensions of the ASC-ASD-P-TR were analysed, it was seen that the inter-item correlations in all sub-dimensions were of appropriate magnitude and significant level. Based on these findings, it was concluded that each of the items in the sub-dimensions of the scale contributes significantly to the dimension in which it is located and the items are related to each other. Similarly, in the study conducted by Den Houting et al. (2018), it was found that the ASC-ASD sub-dimensions were moderately correlated with each other and had a strong correlation with the ASC-ASD total score (Den Houting et al. 2018).

Limitations

The limitations of the study are that the sample is limited to individuals who use the internet, the possibility of excluding participants at relatively older ages due to internet use, and the inability to reach illiterate parents.

CONCLUSIONS AND RECOMMENDATIONS

It can be stated that the Turkish form of the ASC-ASD-P-TR is a valid and reliable scale in determining the anxiety level of children diagnosed with ASD between the ages of 8 and 15. The existence of a reliable assessment tool will help practitioners to determine and evaluate intervention strategies to alleviate anxiety in children with ASD.

The scale is based on symptoms that a parent can easily observe rather than the child's verbal expression of anxiety. The fact that it is easy to use and score, practical and can be applied in a short time can be considered as an advantage.

In the study, data were collected from literate parents through an online form. It is recommended to determine the needs of this sample group by applying face-to-face data collection tools to the illiterate sample.

In the original version of the scale, it is recommended to investigate whether the measurement tool would be appropriate for use in children with intellectual/learning disabilities. In addition, anxiety is an important issue throughout the lives of individuals diagnosed with ASD. Therefore, it is important to investigate whether the scale will also be effective in measuring the anxiety of adults with ASD.

In this study, no assessment was made regarding the severity of the disease. All parents of children diagnosed with ASD between the ages of 8-15 were included in the sample. It is recommended that children diagnosed with ASD should be grouped according to the severity of the disorder and comparative studies should be conducted.

Anxiety Scale for Children-Autism Spectrum Disorder-Parent Version (ASC-ASD-P-TR) Directive

This measure developed by Rodgers et al. (2016) is a measurement tool developed for parents to measure anxiety level in children with autism spectrum disorder. It was adapted to Turkish culture as the Anxiety Scale for Children-Autism Spectrum Disorder-Parent Version (ASC-ASD-P-TR).

ASC-ASD-P-TR is a scale consisting of 24 items and four dimensions (performance, separation, arousal and

uncertainty). There are no reverse-scored statements in the scale. The scale is a four-point Likert-type scale and is scored as "Never"=1, "Sometimes"=2, "Frequently"=3 and "Always"=4. It has a score range between 24 and 96, and an increase in score means that anxiety increases. The construct validity of the scale was established by CFA and the total variance explained by the four-factor structure was 61%. The Cronbach α value calculated for reliability was 0.89 for the overall scale, 0.80 for the performance dimension, 0.70 for the separation dimension, 0.70 for the arousal dimension and 0.77 for the uncertainty dimension.

The sub-dimensions of the scale, the items it contains and the conceptual framework of the dimensions are as follows.

Performance Anxiety: This sub-dimension consists of 2nd, 4th, 7th, 15th and 17th items. It includes items related to performance anxiety. Performance anxiety reflects the concerns of individuals with autism spectrum disorder about violating rules and making mistakes rather than broader social evaluation issues. The items in this sub-dimension reflect the worries experienced by individuals with autism spectrum disorder, similar to the fear arising from the negative evaluation of others in social phobia.

Arousal: This subscale consists of items 1, 3, 8, 12, 13 and 22. This sub-dimension is usually used to express a state of increased physiological arousal due to intense anxiety or worry. The central feature of separation anxiety is "excessive anxiety about leaving home or a dependent person". Among the features of autism spectrum disorder, resistance to changes in routine and new environments can mimic the symptoms of separation anxiety. This has led the authors to suggest that the anxiety exhibited in these situations is not necessarily related to attachment, but may be more related to core features of autism spectrum disorder.

Separation Anxiety: This dimension consists of items 11, 18, 19, 20 and 24. It refers to excessive anxiety about leaving home or people to whom he/she is attached. Characteristics of autism spectrum disorder include resistance to routine changes and new environments, and this may mimic the symptoms of separation anxiety. This has led the authors to suggest that the anxiety exhibited in these conditions is not necessarily related to attachment, but may be more related to core features of autism spectrum disorder. However, the items that make up the separation subscale appear to be particularly related to separation from caregivers and related anxieties. This suggests that perhaps some form of anxiety about separation in the parent's role in mediating the child's interaction with the world is a real phenomenon in ASD.

Uncertainty Anxiety: This section consists of items 5, 6, 9, 10, 14, 16, 21 and 23. This subscale indicates the presence of anxiety related to uncertainty. This supports the established relationship between sensory hypersensitivity and anxiety in autism spectrum disorder and emerging evidence that intolerance of uncertainty may play an important role in anxiety in autism spectrum disorder.

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