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Validity and Reliability Test of Child Anxiety Instrument (SCARED) on Students of Sekolah Dasar Kedungsari 5 Magelang

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ABSTRACT

Anxiety disorders rank the 9th cause of DALYs, which can have long-term effects. The COVID-19 pandemic can trigger anxiety disorders in children related to changes in learning, habituation of new behaviors, COVID-19 disease itself, and other factors. Detection of anxiety disorders in children needs to be done early so that it can avoid its long-term effects. Screen for Children Anxiety Related Emotion Disorder (SCARED) is a multi-informant instrument that is considered good for screening anxiety disorders in children, so it is necessary to assess its validity and reliability so that it can be used in Indonesia. This study aimed to test the validity and reliability SCARED instrument in Indonesian to measure the tendency of children's Anxiety Disorders. This study was an observational study with a crosssectional design. Subjects were students of Sekolah Dasar Negeri Kedungsari 5 Magelang (n=220). Content validity test using Pearson product-moment and construct validity test using CFA. Concurrent test with RCMAS using Pearson correlation. Reliability test by calculating the value of Cronbach alpha. The result content validity test showed that all children's versions of SCARED items and parents' versions of SCARED had r counts above r tables. There was concern with the RCMAS and the SCARED children version concurrent with the parent version. Cronbach's alpha value of SCARED child version 0.901 and parent version 0.891. The Indonesian version of SCARED is a valid and reliable instrument to assess the tendency of children's anxiety disorders in elementary school students.

1. Introduction

Mental disorders are serious problems that cause disability and have long-term impacts, where almost 50% of mental disorders occur before the age of 14 years⁽¹⁾. The overall global prevalence of mental disorders aged 5-17 years is 6.7%, with anxiety disorders of 3.2% -6.5%, but not all countries have data on the prevalence of mental disorders in children. 2,3,4

Anxiety disorders in children can have negative effects on their development so that they affect their quality of life, which results in poor academic performance and poor social roles. Where in the future can cause suffering, the development of comorbid diseases, and high medical costs. This large effect indicates a critical need for identification and intervention in the early stages of this condition. 5,6,7

The COVID-19 pandemic is increasing the psychopathology of depression and anxiety, especially in children.⁸ Where there is a relationship between anxiety and depression during lockdown with anxious mood, depression, suicidal thoughts, quarrels with parents, insomnia, and learning difficulties during online learning.⁹

Anxiety disorders in children are the beginning of the psychopathology of mental disorders, so detection and therapy are needed as early as possible.¹⁰ Screen for children Anxiety Related Emotion Disorder (SCARED) is a multi-informant screening instrument for children aged 8-18 years old developed by Birmaher et al. 1997.11 The SCARED instrument was developed as an overall anxiety screening tool and 5 anxiety disorder subscales according to the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV. The SCARED instrument was tested valid and reliable in various settings and tested by several countries as a screening tool, used by clinicians as a diagnostic procedure. and therapeutic effectiveness. 3,12,13,14,15,16 The importance of screening for anxiety disorders makes it necessary to assess the validity and reliability of the SCARED instrument that can be used in Indonesia.

2. Methods

This study is a non-experimental study with a cross-sectional design. That was carried out at Sekolah Dasar Negeri Kedungsari 5 Magelang after obtaining approval from the ethics committee of FKKMK UGM in December 2021. The sample was active students of SDN Kedungsari 5 Magelang grades 2-6, who can read and understand Indonesian, willing to participate as research respondents. While the exclusion criteria did not complete filling out the questionnaire completely. The data collection technique is non-probability sampling by means of the whole sampling. The minimum sample is 205 students.

The instruments used were the general respondent data questionnaire, the child and parent version of the Screen children Anxiety-Related Disorder (SCARED), and the Revised Children's Manifest Anxiety Scale (RCMAS). This study conducted a face validity test, content validity test with Pearson's Product moment Correlation test, construct validity test using confirmatory factor analysis (CFA), alignment validity test by comparing the child version of SCARED with the parent version of SCARED, and also comparing the child version of SCARED with RCMAS using Pearson correlation. This study also tested the reliability of the child and parent versions of SCARED based on Cronbach's alpha values.

3. Results and Discussion

Characteristics of research subjects

The total number of research subjects was 220 students and parents. The average age of the student was 9.77±1.44 years, with most of the students being female, 58.2%. Respondents are generally Javanese, which is 94.1%. The questionnaires for parents were mostly filled by mothers, with 71.8%, where the education level of the parent questionnaire is 79.1%, equal to or more than the high school grade.

An overview of the risk factors for anxiety during the COVID-19 pandemic. Respondents who have been infected with Covid are 5.9%. Where respondents whose parents have been infected with COVID are 11.4%, and families have been infected with Covid, namely 14.1%. 60.9% of respondents have screen time every day a week, and 65% of respondents use screen time of more than 2 hours every day.

Face validity test

The SCARED instrument was translated from English to Indonesian by a certified linguist from the Translation Service at the English Literature Study Program, Faculty of Cultural Sciences, Universitas Gadjah Mada (UGM), Yogyakarta. The results of the translation were then discussed and agreed upon by a team of experts (adolescent and children psychiatrist, psychiatrist, psychologist) and researchers and involved the consideration of the original instrument developer. The final version of the instrument was carried out on 15 parents who had children who were in elementary school and 20 elementary school students for pretesting and cognitive interviewing, where they said they understood the questions given.

Content validity test Pearson product-moment test

Pearson Product Moment correlation test is done by correlating the score of each item with the total score. Items will be declared valid if the r count is greater than the r table.

No	Uji Pearson's Product Moment SCARED child version (n=220)		No	Uji Pearson's Product Moment SCARED child version (n=220)		No	Uji Pearson's Product Moment SCARED child version (n=220)	
	r	р		r	р		r	р
1	.506**	.000	15	.609**	.000	29	.348**	.000
2	.273**	.000	16	.434**	.000	30	.563**	.000
3	.375**	.000	17	.511**	.000	31	.455**	.000
4	.326**	.000	18	.533**	.000	32	.494**	.000
5	.324**	.000	19	.590**	.000	33	.543**	.000
6	.452**	.000	20	.459**	.000	34	.362**	.000
7	.475**	.000	21	.497**	.000	35	.549**	.000
8	.219**	.001	22	.505**	.000	36	.418**	.000
9	.434**	.000	23	.565**	.000	37	.564**	.000
10	.505**	.000	24	.554**	.000	38	.513**	.000
11	.325**	.000	25	.377**	.000	39	.477**	.000
12	.406**	.000	26	.526**	.000	40	.460**	.000
13	.335**	.000	27	.251**	.000	41	.445**	.000
14	.329**	.000	28	.422**	.000			

Table 1. Results for Pearson's Product Moment of SCARED child version (n=220)

The value of the r table is obtained from the value of degrees of freedom (df) = n-2 (n = sample size). The sample in this study is 220, so the value of the r table is obtained at the value of df (218) with a significance level of 0.05, which is 0.132. The lowest calculated rvalue for the SCARED child version is 0.219 on item 8, and the highest is 0.69 on item 15. All items of the SCARED child version have a calculated r-value of > 0.132 and p < 0.005, so it can be concluded that based on the Pearson product Moment 41 test, the SCARED child version instrument item is valid as a measuring tool. The range of r values is 0.219-0.609 (p<0.005)

The Pearson's Product Moment test of 41 items of the Parents' version of the SCARED instrument showed that all items had an r-value of > 0.132 and p < 0.005, with the lowest r of 0.200 on item 36 and the highest of 0.615 on item 10 (table 8). So it can be concluded that based on the Pearson Product Moment test, 41 items of the SCARED parental version are valid as a measuring instrument with an r-value of 0.200 - 0.615 (p <0.005).

No	Uji Pearson's Product Moment SCARED parents version (n=220)		No	Uji Pearson's Product Moment SCARED parents version (n=220)		No	Uji Pearson's Product Moment SCARED parents version (n=220)	
	r	р		r	р		r	р
1	.279**	0,000	15	.459**	0,000	29	.502**	0,000
2	.260**	0,000	16	.450**	0,000	30	.517**	0,000
3	.528**	0,000	17	.311**	0,000	31	.555**	0,000
4	.513**	0,000	18	.581**	0,000	32	.518**	0,000
5	.306**	0,000	19	.457**	0,000	33	.478**	0,000
6	.299**	0,000	20	.450**	0,000	34	.284**	0,000
7	.384**	0,000	21	.470**	0,000	35	.470**	0,000
8	.421**	0,000	22	.573**	0,000	36	.200**	0,003
9	.335**	0,000	23	.430**	0,000	37	.473**	0,000
10	.615**	0,000	24	.287**	0,000	38	.465**	0,000
11	.335**	0,000	25	.520**	0,000	39	.519**	0,000
12	.272**	0,000	26	.602**	0,000	40	.607**	0,000
13	.465**	0,000	27	.251**	0,000	41	.548**	0,000
14	.243**	0,000	28	.345**	0,000			

Table 2. Pearson's Product Moment test's results of SCARED parents version (n=220)

Construct validity test

Construct validity test is validity that tests how far the statement items of an instrument are able to measure and have conformity with the construct or conceptual definition that has been determined by confirmatory factor analysis (CFA). The determinant of the correlation matrix test shows a value of 0.000, meaning that the items in the instrument are interrelated. The analysis result of the Kaiser-Meyer-Olkin value of the SCARED children version is 0.819 (> 0.6), indicating that the sample taken is quite adequate. The Bartlett test of Sphericity of SCARED child version showed a significance level with a value of 0.000 (Chi-square = 3246.311; df = 820; p < 0.05), so the data could be predicted and analyzed further.

Table 3. Analysis results of KMO and	Bartlett's Test SCARED child version
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Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.819
Approx. Chi-Square	3246.311
df	820
Sig.	.000

The next step is the Measure of sampling adequacy (MSA), which is indicated by the anti-image correlation value above 0.500. Based on the results of the analysis, the MSA value for all items of the SCARED

child version is above 0.500 with a range of values from 0.660-0.904, which is shown in table 10, so that it can be analyzed further.

No	MSA	No	MSA	No	MSA	No	MSA
1	0,897	13	0,754	25	0,723	37	0,837
2	0,700	14	0,741	26	0,801	38	0,822
3	0,726	15	0,893	27	0,837	39	0,778
4	0,697	16	0,766	28	0,762	40	0,804
5	0,746	17	0,817	29	0,704	41	0,832
6	0,849	18	0,904	30	0,853		
7	0,854	19	0,857	31	0,747		
8	0,660	20	0,775	32	0,826		
9	0,866	21	0,878	33	0,808		
10	0,803	22	0,898	34	0,811		
11	0,783	23	0,835	35	0,836		
12	0,875	24	0,886	36	0,794		

Table 4. Analysis results of the MSA SCARED child version

Eigenvalues obtained > 1 indicate the number of components formed from a number of items being analyzed. Based on the results of the factor analysis test, 10 components were obtained, but because this is to test 5 existing factors where each item of the SCARED child version has a weight or loading factor > 0.4, which shows that it is valid as a measuring tool. The cumulative variance of 42.71 means that all components contribute to the influence of the variable by 42.7%.

No	Component					No	Component				
	1	2	3	4	5		1	2	3	4	5
1	.579	.284	.087	044	.085	22	.452	.279	.068	.163	.025
2	.167	079	.114	.031	.679	23	.267	.301	.116	.573	069
3	.073	.611	.087	117	082	24	.631	.071	.102	.360	016
4	.001	.171	.516	054	.071	25	.134	018	.660	.153	095
5	.036	.489	034	040	.379	26	.167	.601	.123	.126	035
6	.562	.148	.049	095	.356	27	.665	.085	.042	.018	.008
7	.183	.491	.162	.069	.272	28	.163	.198	006	.621	108
8	108	.024	.555	.040	004	29	100	.100	.690	.149	015
9	.509	.249	.022	035	.101	30	.480	.120	.196	.387	.051
10	.088	.643	.119	.078	.003	31	.084	.258	.497	.105	.109
11	.185	.006	.093	.054	.675	32	.119	.530	.205	.097	010
12	.640	.004	105	.127	.229	33	011	.431	.127	.493	.238
13	.060	.025	.686	072	.133	34	.540	157	030	.463	042
14	072	.171	035	.487	.351	35	.137	.368	.137	.412	.217
15	.483	.414	.067	.150	.138	36	.363	159	.102	.431	.470
16	.144	.130	.582	.012	.192	37	.158	.484	.101	.462	049
17	.411	087	.174	.462	.417	38	.616	.211	055	.172	.072
18	.364	.468	.036	.127	.022	39	.162	.507	.019	.223	001
19	.596	.221	.144	.144	.168	40	.073	.497	.136	.144	.069
20	.263	.261	.506	037	062	41	.138	.487	.073	.146	015
21	.142	.363	070	.412	.305						

Table 5. factor extraction and rotation analysis results of the SCARED child version

The determinant of the correlation matrix test for the parental version of SCARED also shows a value of 0.000, meaning that the items in the instrument are interrelated. The Kaiser-Meyer-Olkin value of 0.827 (> 0.6) indicates that the sample taken is quite adequate. The Bartlett test of Sphericity showed a significance level with a value of 0.000 (Chi-square = 3707.880; df = 820; p < 0.05), so the data could be predicted and analyzed further.

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KMO and Bartlett's Test								
Kaiser-Meyer-Olkin Measure of S	.827							
Bartlett's Test of Sphericity	Approx. Chi-Square	3707.880						
	df	820						
	Sig.	.000						

The results of the analysis, for the parental version of SCARED, the MSA values for all items are above

0.500 with a value range of 0.694-0.900, which is shown in table 13, so that it can be analyzed further.

No item	MSA	No item	MSA	No item	MSA	No item	MSA
1	0,739	13	0,775	25	0,804	37	0,864
2	0,812	14	0,624	26	0,900	38	0,833
3	0,855	15	0,806	27	0,885	39	0,870
4	0,830	16	0,812	28	0,781	40	0,854
5	0,694	17	0,790	29	0,790	41	0,839
6	0,797	18	0,854	30	0,853		
7	0,736	19	0,885	31	0,876		
8	0,851	20	0,770	32	0,806		
9	0,833	21	0,823	33	0,845		
10	0,859	22	0,859	34	0,809		
11	0,751	23	0,813	35	0,868		
12	0,851	24	0,838	36	0,829		

Table 7. Results of MSA of SCARED parents version

Eigenvalues obtained > 1. Based on the results of the factor analysis test, it was found that the parent version of SCARED got 10 components, but because this was to test 5 existing factors, 5 components were tested. each item has a weight/ loading factor >0.4, so it is valid as a measuring tool. The cumulative variance of 46.64 means that all components of the SCARED parent version contribute to the influence of the variable by 46.64%.

The results of the 5-component analysis show that

	Rotated Component Matrix												
			Componen	t			Component						
	1	2	3	4	5		1	2	3	4	5		
1	.453	.145	142	.022	.323	22	.282	.441	.049	.311	.349		
2	.198	060	.262	.011	.489	23	.211	.130	.507	.111	040		
3	079	.762	.068	001	.102	24	.610	051	.061	.046	.315		
4	.003	.531	002	.343	023	25	.160	.391	.080	.484	212		
5	112	.282	.430	033	028	26	.004	.586	.265	.201	.120		
6	.724	022	.048	.009	.179	27	.739	.012	029	031	.103		
7	.168	.225	.500	095	056	28	.258	024	.517	.100	026		
8	014	.294	029	.505	002	29	017	.541	103	.438	068		
9	.726	.058	.120	025	.060	30	.402	.152	.372	.319	054		
10	.039	.705	.078	.168	.129	31	.015	.282	.242	.535	.041		
11	.201	.221	.019	037	.618	32	.037	.664	.168	.030	030		
12	.778	053	091	.144	.121	33	023	.051	.693	.259	.068		
13	.119	.332	010	.512	158	34	.756	.011	.025	008	.087		
14	013	045	.451	024	.272	35	.034	.207	.660	.037	.008		
15	.409	.030	.176	.359	.280	36	.281	.038	117	008	.639		
16	.075	006	.167	.722	.141	37	024	.073	.641	.235	.162		
17	.153	.010	.174	.061	.691	38	.735	.110	.198	.147	001		
18	.269	.450	.152	.139	.294	39	.042	.417	.342	.157	.139		
19	.559	.044	.240	.120	.376	40	.045	.497	.415	.237	019		
20	.049	022	.188	.732	.162	41	.080	.678	.186	.005	.035		
21	111	.276	.615	012	.204								

Table 8. Factor extraction and rotation analysis results of SCARED parent's version

Alignment validity test

The parent and child version of the SCARED instrument was compared with the Pearson correlation. It was found that there was a correlation (r = 0.29) with p < 0.001. The children's version of the SCARED instrument was also compared with the RCMAS, which also assessed the tendency of anxiety in children, which had been validated in Indonesia. There was a correlation (r = 0.640) with p < 0.001. Based on the ROC analysis, the cut-off value of the SCARED child version was obtained at a total score of 34.5, sensitivity of 74.1% & specificity of 88.6%.

Reliability test

The results of the reliability test of the child version of SCARED and the parent version obtained Cronbach's alpha values, respectively 0.901 and 0.891. Both Cronbach's alpha values are above the value of 0.7, which indicates that the child and parent versions of the SCARED questionnaire are reliable as a means of measuring children's anxiety tendencies.

Advance validation is obtained through the process of translating the instrument and adapting it into a relevant form so that it can be understood in Indonesian culture. The SCARED instrument was carried out through a readability test, discussion, and agreement by the researcher with a team of experts (child consultant psychiatrist, psychiatrist, and psychologist) as well as the considerations of the instrument maker so that the Indonesian version of the SCARED instrument was obtained which is equivalent to the original version of SCARED. Readability test to 15 parents of elementary school students and to elementary school students as many as 20 children where they said they understood the questions given. This was in accordance with the statement submitted by Saousa and Rojjassirat that the recommendations of respondents for a good readability test or content validity were as many as 10-40 respondents.¹⁷

Proses of Filling out the questionnaire by students, especially in grade 2, are assisted by the researcher and the homeroom teacher who is in front of the class if there are things that are not understood. This is in accordance with what was suggested by the questionnaire maker that children aged 8-11 years still need to be accompanied if there are things that are not understood.¹⁸

The Pearson Product Moment correlation test on the child version of SCARE and the parent version is said to be valid as a measuring tool according to what Azwar (2019) said, namely, good content validity on an instrument stating that the criteria in the instrument reflect what is being measured and measure relevant aspects.¹⁹

In the construct validity test, factor analysis was obtained after fulfilling the requirements, namely: 1 large sample 220 where the minimum sample was 205; 2. the Kaiser-Meyer-Olkin score in the children's version of SCARED was 0.819 (> 0.6), and the parents' version of SCARED was 0.827, both of which passed the value of 0.6 which indicated that the 220 samples taken were adequate; 3) The Bartlett test of Sphericity SCARED for children and the version for SCARED for parents showed a level of significance with a value of 0.000 (p < 0.05) so that the data could be predicted and analyzed further, namely the Measure of sampling adequacy (MSA) with all items above 0.500. . The range of SCARED values for the children's version is 0.660-0.904 and the parents' version of SCARED values are 0.694-0.900 so that it can be analyzed further and the research sample is considered worthy of representing the general population.

The results of the total variance explained test showed that Eigenvalues Eigenvalues > 1 were obtained for more than 5 components, but because this was to test 5 existing factors. The results of the 5component analysis show that each item has a weight or loading factor >0.4, which indicates that it is valid as a measuring tool.

The validity test found that there was a correlation between the total child version of SCARED and the RCMAS total value, where p < 0.001 and r = 0.640. The parent-child version of SCARED has a correlation with r 0.290 with p <0.001, which can be caused by various things such as the perception of parents and children on the symptoms in question, lack of openness between children and parents, and other factors.

The reliability test showed that all items in the SCARED questionnaire of children and parents version were reliable, with Cronbach's alpha 0.901 for children and 0.891 for parents (both >0.7). This difference in Cronbach's alpha value may be caused by several things, such as differences in the characteristics of children and parents and the absence of mental disorders in parents. Although it was said in the study by Macleod et al. in De Los Reyes and Kazdin that the use of one parent or teacher informant or a combination of both, the prevalence of anxiety disorders was 10.3%-36.2%, this is also the basis as stated by De Los Reyes and Kazdin. that clinicians need to investigate further the factors that could be behind this difference and indirectly give the perception that information from one of the informants is the gold standard of the child's behavior.²⁰

4. Conclusion

Screen for Children Anxiety Emotion Related (SCARED) of parents and children version in Indonesian is a valid and reliable instrument to assess the tendency of children's anxiety disorders.

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