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Original Article

The Indonesian version of the Early Childhood Screening Assessment (ECSA_INA) to screen for social, emotional, and behavioral disorders in children

Elvira Rosana[1,2,3], Alifah Anggraini[1], Mei Neni Sitaresmi[1]

Abstract

Background The incidence of emotional, social, and behavioral disorders in children is quite high in the world, including in Indonesia. Therefore, earlier screening is necessary for effective treatment. Currently there is no screening tool for emotional, social, and behavioral disorders in children, especially toddlers, that has been validated in Indonesia. *The Early Childhood Screening Assessment* (ECSA) is a widely used and recommended instrument for children aged 1.5-5 years.

Objective To carry out a cross-cultural adaptation of ECSA in Indonesian (ECSA_INA) and assess its internal validity and reliability.

Methods The study consisted of 2 phases: transcultural adaptation and internal validity and reliability testing on parents of children aged 1.5-5 years The first phase consists of the forward translation of original instruments into Indonesian, synthesis from experts and backward translation to the original language and then discussion by experts. Furthermore, pre-testing was carried out in 6 parents of children aged 1.5-5 years. We conducted the second phase of the internal validity and reliability test on 70 parents of children aged 1.5 - 5 years. Each respondent filled in ECSA_INA 2 times, with an interval of 14 days. Furthermore, the data were analyzed statistically with the correlation test of Cronbach's α, Intraclass Correlation Coefficient (ICC) and Pearson correlation.

Results The internal consistency was good (Cronbach's $\alpha=0.831$). Test- retest reliability was good with intraclass correlation coefficient (ICC) of 0.867 ($P<0.000$). Overall internal validity is good.

Conclusion The ECSA_INA is a reliable and valid instrument for screening social, emotional and behavior in Indonesian children.

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Keywords: *social; emotional and behavior disorder; instrument; Indonesian cross-cultural adaptation; reliability; validity*

The Indonesian government is committed to achieving the *Sustainable Development Goals* (SDGs) by 2030, particularly in child development. Human resource quality begins in early childhood, supported by health development from the prenatal stage.[1,2] Children given proper attention are expected to grow and develop well. In 2018, one-third of Indonesians were children, with 10% under five years old. This young population is vital, as they represent the nation's future.[3,4]

Healthy children continuously grow and develop. As stated in Regulation No. 66 of 2014, development includes improvements in motor skills, language, socialization, and independence.[5] Social-emotional development involves a child's ability to manage emotions, build relationships, and engage with their environment. It plays a vital role in overall well-being and brain development, preparing children

From Department of Child Health[1] and Master Program[2], Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada/Dr Sardjito General Hospital, Yogyakarta, Faculty of Medicine and Health Sciences, University of Bengkulu, Bengkulu[3], Indonesia.

Corresponding author: Mei Neni Sitaresmi. Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada. Jl Farmako, Sekip Utara, Kecamatan Depok, Kabupaten Sleman, Daerah Istimewa Yogyakarta, 55281. Phone/Fax: +62-274-560300. Email: msitaresmi@ugm.ac.id.

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for school, life, and adulthood.[6]

The children 12-59 months are critical for child development, as emotional and social skills rapidly emerge. This stage also sees significant growth in speech, creativity, social awareness, and intelligence, forming the foundation for future development. Moral and personality development also begins during this time, and undetected or untreated issues may affect the quality of future human resources.[7]

Around 10% of preschoolers face serious mental health issues in primary care, affecting their interactions with family and peers.[8,9] In low- and middle-income countries, 26.2% of children score low on social-emotional measures. Data from Sleman and Yogyakarta (2011-2013) show that 46.37% of 1,902 pediatric patients at community health center (*pusat kesehatan masyarakat/puskesmas*) had emotional or behavioral disorders.[10] Early social-emotional problems can persist into school age and adolescence, leading to long-term mental and behavioral issues, including antisocial behavior and crime.[11,12]

Since the COVID-19 pandemic began in late 2019, emotional and social issues in children have increased due to lockdowns and home confinement.[13] Quarantine, while beneficial for public health, can negatively affect children, especially those separated from parents.14 A study in Shaanxi, China found psychological issues - such as distraction, irritability, and fear - in 320 children aged 3-18 years.[15] Similarly, Spanish children reported boredom, anger, loneliness, and anxiety.[16] Early detection is crucial to support child development and prevent worsening mental disorders, yet many cases remain undetected and untreated.[17,18]

Child growth and development and disorders of such can be monitored with the following screens in Indonesian: *Stimulasi Deteksi Intervensi Dini Tumbuh Kembang*/SDIDTK (Stimulation, Detection, Early Intervention of Growth and Development) program. The SDIDTK program uses the *Kuesioner Pra Skrining Perkembangan*/KPSP (Developmental Pre-Screening Questionnaire), *Tes Daya Lihat*/TDL (visual test), *Tes Daya Dengar*/TDD (hearing test), *Modified Checklist for Autism in Toddlers* (MCHAT), and *Gangguan Pemusatan Perhatian Hiperaktivitas*/GPPH (Disorders of Concentration and Attention/Hyperactivity) instruments. Monitoring of mental, emotional, and behavioral disorders can be detected with KPSP, MCHAT, *Kuesioner Masalah Perilaku Emosional*/KMPE (Emotional Behavior Problems Questionnaire), *Conners Comprehensive Behavior Rating Scales* (CBRS), *Denver Developmental Screening Test* (DDST) or Denver II, and *Strengths and Difficulties Questionnaire* (SDQ) instruments. The KMPE is a screening instrument for emotional problems in children aged 36-72 months.[7]

Early Childhood Screening Assessment (ECSA) has not been validated in its development. In Indonesia, only the SDQ and *Pediatric Symptom Checklist-17* (PSC-17) are validated for screening mental-emotional disorders. The SDQ, freely available online, identifies two-thirds of psychiatric disorders in children aged 4-16 years through 25 items assessing both positive and negative behaviors.[10] The PSC-17 is used to monitor behavioral issues in children aged 4-17 years old.[19]

Currently, no screening tool exists in Indonesia for detecting emotional, social, and behavioral disorders in children aged 1.5-5 years and their parents. To support early detection, we identified the ECSA, developed by Gleason *et al.*[20] in the U.S., and widely used in primary care. The ECSA is a user-friendly 40-item questionnaire - 36 for children and 4 for parents - with an additional checklist for parental issues. It demonstrates high sensitivity (85%), specificity (83%), and internal consistency (0.91).20 As it had not been validated in Indonesian, we translated, culturally adapted, and content-validated it, resulting in the ECSA_INA, intended for screening use in Indonesia.

Methods

This study was conducted to test the internal validity and reliability of the Indonesian translation of the ECSA instrument in children aged 1.5-5 years from California using a cross-sectional design conducted on children and parents using the *Health and Demography Surveillance System* (HDSS) framework in Sleman District, Yogyakarta Special Region. The first we permitted translation from the developer of instrument. The instrument consisted of two part. First, part of child question consisted of 36 questions, with maximal score is 40 and cut-off point that suggest the child may be need further investigation is 18.

Second, part of parent, consist of 4 questions, that suggest the parent may be have depression if there are minimal ones question the answer is yes. In the end of instrument, there is general conclusion or overall impression of mother concerned about child's emotional or behavioral development.[20] Our study consisted of 2 stages: 1) transcultural adaptation of the instrument and 2) internal validity and reliability testing on parents of children aged 1.5-5 years.

By random sampling, children and parents living in the Sleman district area, included in the HDSS framework, and met the inclusion criteria were included as participants. Inclusion criteria were parents of children aged 1.5-5 years who lived in Sleman Regency, children not currently suffering from illness or being treated for chronic diseases, and who provided written informed consent at the time of sampling. Exclusion criteria were parents who were not fluent in Indonesian in their daily activities, parents who could not read, parents who were sick and/or on medication for chronic diseases. The required sample size was calculated with the PASS 2021 (ncss.com/software/pass, 2021) sample calculation application, using a Cronbach's α target of at least 0.8, power of 1, and 20% drop out rate, resulting in a minimum sample size of 70.

This research was conducted in stages consisting of:

1. Stage one.

This period lasted for 2 months and included the translation and transcultural adaptation of the instrument. A certified translation agency employed a methodology of translating the instrument from English to Indonesian, then translating it back to English using the following multi-step guide:

a. Preliminary translation to Indonesian by the first 2 linguists, labeled T1 and T2.
b. Translation synthesis I and expert committee review, labeled T1 - T2.
c. Back-translation to English by 2 different linguists, labeled B1 and B2.
d. Translation synthesis II and review by expert committee.
e. Testing the draft instrument that has been validated transculturally on a limited sample (6 people) to assess whether the instrument is easy to understand, in both commands and statements, the layout, and how long it took participants to fill it in.
f. Discussion of the trial results by the expert team until the final draft of ECSA_INA is ready to be tested in the community.

2. Stage two

This stage lasted for 2 months and consisted of several steps in 70 sample:

a. We explained the purpose of the study and the benefits and risks of participating to parents. Those willing to participate provided written informed consent.
b. Parents were asked to complete the instrument, with the help of an assistant if needed.
c. The test results were reviewed and analyzed for internal validity and reliability, with a minimum Cronbach's α target of 0.6.21
d. This was followed by an additional reliability testing phase. Fourteen days after completing the instrument, parents were asked to complete it again, to assess for consistency. The reliability test was considered good for an overall ICC score of at least 0.5.

We also collect the characteristic data of participant include the child data (age, gender, low birth weight $<$ 2500 grams, normal birth weight $\geq$ 2500 grams, gestation age: aterm vs premature) and parent data (depression based on parental score, education, gender, address area). The last analysis data also include score of the respondent.

This study was approved by the Ethics Committee of the Faculty of Medicine, Universitas Gadjah Mada. Subjects were identified by their initials to ensure confidentiality. Descriptive statistical methods and Mann-Whitney bivariate analysis results of socio-demographic characteristics are presented in tabular form. The ECSA_INA instrument was analyzed for validity and internal consistency test using Cronbach's α coefficient and Pearson's correlation tests. The reliability test was continued by test-retest after an interval of 14 days, then analyzed for an intraclass correlation coefficient (ICC).

Results

Cross-cultural adaptation in this study was carried out through steps: (1) forward translation, (2) synthesis, (3) backward translation, (4) review, (5) pre-testing

in six samples, (6) review and fixed the formulation of instrument. During this stage, translation synthesis was carried out 3 times by a committee consisting of 7 experts from various fields: 1 pediatrician, 1 pediatric psychiatrist, 1 child psychologist, 1 pediatric nurse specialist, 1 community medicine expert, 1 general practitioner at the community health center, and 1 Indonesian linguist. They finalized the ECSA_INA to be used in the validity and reliability tests in the target population in the second stage (**Figure 1**).

The initial translation of the ECSA English instrument into Indonesian was carried out within 1 week by two ceritified professional medical translators from accredited institutions, one a native Indonesian speaker and the other a native English speaker. Subsequently, the translation was synthesized by a team of experts in 2 meetings held over a 2-week period. Back translation of the ECSA instrument from Indonesian to English was done by two medical translators one was a native English speaker and the other was a native Indonesian speaker that is different from the forward translator. The second translation process took another 1 week. Translation evaluation II was conducted by a seven-person expert committee over 1 week. Next, a limited trial was conducted on 6 respondents over a 2-week period. The results of the limited trial were reviewed by the expert committee for 1 week.

At the stage of translating ECSA from the original form to Indonesian, there was not much difference between the works of the two translators. Some minor differences were found in items 4, 8, 19,

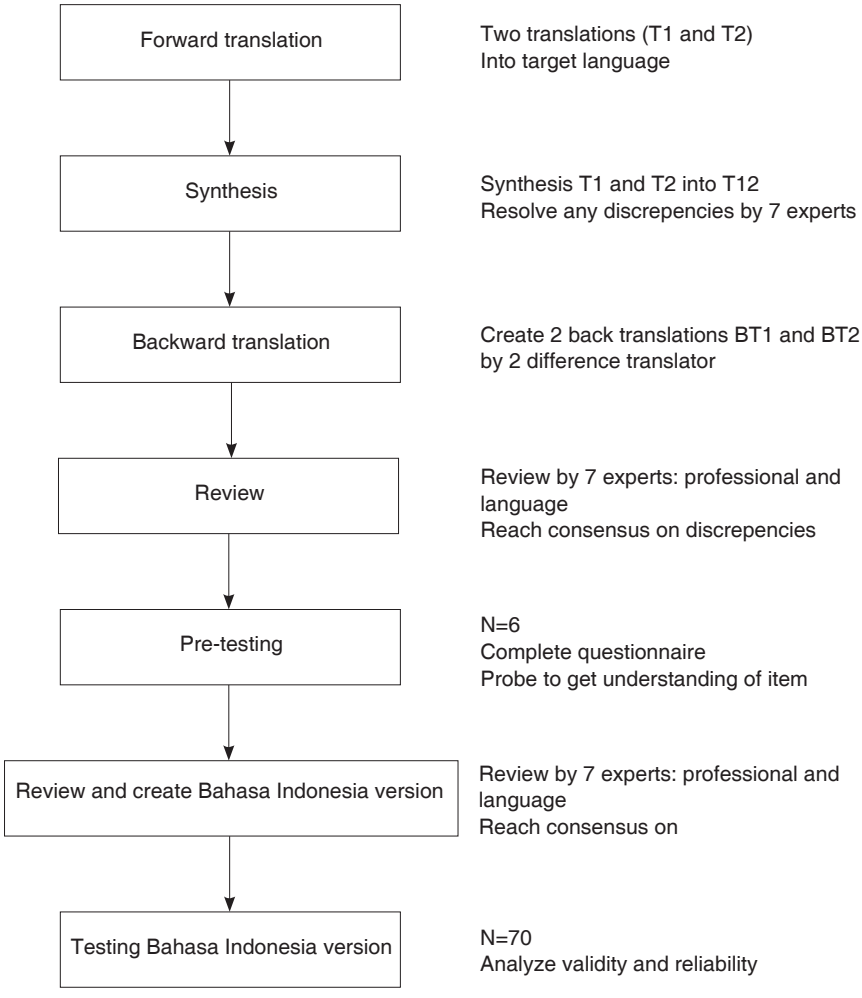

Figure 1. Flow chart of translation procedure

21, 26, 33, 39, and 40. Through discussion, the team of experts synthesized the two translations into one document. The products of back translation from Indonesian to English were also generally not very different. Items 32 and 40 as well as a slightly different form of context were adjusted to Indonesian language and culture through expert team discussion. In the limited trial with 6 subjects who met the inclusion criteria, we found that some items were quite difficult for respondents to understand.

Table 1 presents the demographic characteristics of six participants involved in the limited trial. The median age of parents was 32 years, ranging from 27 to 40 years, while the median age of their children was 3 years, with a range of 2 to 5 years. In terms of educational background, one parent had completed elementary school (SD), one had a high school diploma, one held a D3 (diploma), two had completed a bachelor's degree (S1), and one had a master's degree (S2). The median time required to complete the instrument was 10 minutes, with a range of 5 to 20 minutes.

Figure 2 illustrates the clarity assessment of the ECSA_INA items based on the results of the pre-testing phase involving six participants. Each of the 40 items, along with the instructions, was evaluated for clarity. Most of the items were rated as "Clear" (represented in blue) by all participants. However, a number of item - specifically items 1, 4, 6, 13, 16, 22, 27, 30, 32, 33, 34, and 3 - were marked as "Not Clear" (represented in orange) by one or more participants. Items 33 and 36 received the highest number of "Not Clear" ratings (two each), indicating that these items may need further revision or clarification. Overall, the majority of the items were well understood by the participants, suggesting that the translation and adaptation of ECSA into Indonesian (ECSA_INA) may be was largely successful.

The expert committee made the following changes to the ECSA_INA after reviewing the limited trial results:

a. Item 13: the caption "(irritate) others" was added to the statement "crying to annoy".
b. Item 23: "Running around in circumstances that

Table 1. Characteristics of subjects of the limited trial

Characteristics	(N=6)
Median parental age (range), years	32 (27- 40)
Median child age (range), years	3 (2-5)
Education level	
Elementary school	1
High school	1
Diploma	1
S1	2
S2	1
Median duration of fulfillment is 10 min (range)	10 (5-20)

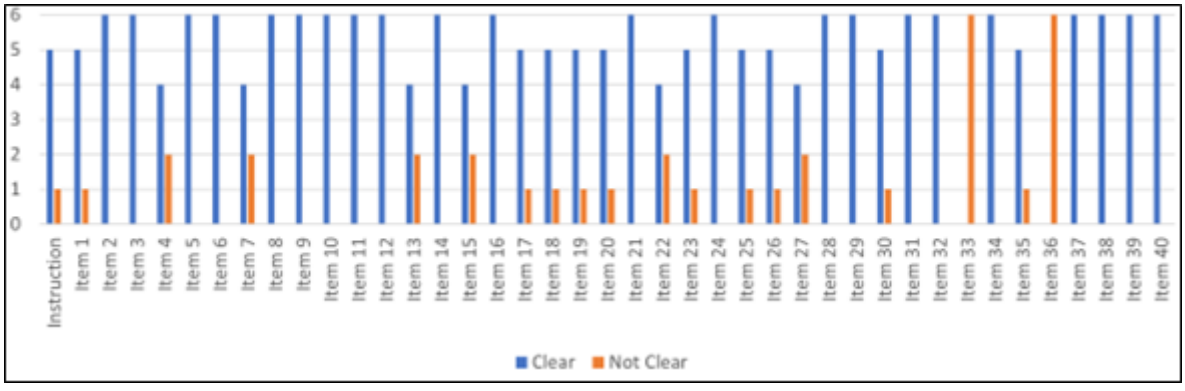

Figure 2. ECSA_INA pre-testing results

require sitting still (e.g. at school, during worship)" was shortened to "running around or when children need to be quiet (e.g., at school, during worship)."

c. Item 30: "Has unusual repetitive behaviors (body spinning, hands swinging repeatedly)" was clarified to "Has unusual repetitive behaviors (e.g., body spinning, hands swinging repeatedly, etc.)".
d. Item 33: "Doesn't seem to have much joy" was replaced with "doesn't seem cheerful".
e. Item 36: To "Learning or development is slower than other children" we added the word process in front to read "Process learning or development is slower than other children.

The results of the validity and internal consistency tests in this study were generally good, with a Cronbach's α value of 0.831, and most r >0.23 or P<0.05 (**Table 2**). The test and re-test consistency analysis revealed an ICC value of 0.867, which indicated that the ECSA_INA instrument had good reliability (**Table 3**).

The characteristics of the respondents are presented in **Table 4**. The normality test revealed that the data were not normally distributed. Bivariate analysis was continued with the Mann-Whitney test, which revealed that significant relationship between residential location and total child score (P=0.03) that show the subject who lived in urban area had high emotional, social and behavior problem. There were no significant relationships between child age, gender, birth weight, gestational age, caregiver depression, caregiver education, or caregiver gender and median score (range 15-17) (**Table 4**).

In the analysis of general parent perception and children's scores, there was a significant association in both test, the first test and the test-retest (P=0.02 and P=0.04, respectively) (**Table 5**). We can conclude that high of child score is correlate with general perception of parent that the child suggest more investigation.

Table 2. Internal validity and reliability analysis of ECSA_INA

Item no.	Analysis			Item no.	Analysis		
	r	Cronbach's α	P value		r	Cronbach's α	P value
1	0.390	0.835	0.001	21	0.380	0.833	0.001
2	0.487	0.832	0.000	22	-0.094	0.836	0.440
3	0.633	0.828	0.000	23	0.300	0.840	0.011
4	0.288	0.839	0.016	24	0.209	0.837	0.083
5	0.320	0.838	0.007	25	0.286	0.839	0.016
6	0.442	0.834	0.000	26	0.225	0.838	0.061
7	0.335	0.836	0.005	27	0.523	0.840	0.000
8	0.462	0.833	0.000	28	0.408	0.831	0.000
9	0.477	0.833	0.000	29	0.537	0.835	0.000
10	0.592	0.829	0.000	30	0.313	0.831	0.008
11	0.576	0.830	0.000	31	0.309	0.837	0.009
12	0.570	0.830	0.000	32	0.434	0.839	0.000
13	0.418	0.830	0.000	33	0.334	0.834	0.005
14	0.344	0.834	0.004	34	0.154	0.836	0.203
15	0.624	0.836	0.000	35	0.055	0.842	0.776
16	0.450	0.828	0.000	36	0.276	0.842	0.021
17	0.326	0.834	0.006	37	0.267	0.838	0.026
18	0.451	0.838	0.000	38	0.320	0.838	0.007
19	0.170	0.834	0.160	39	0.162	0.837	0.181
20	0.460	0.840	0.000	40	0.217	0.840	0.072
Total							0.831

The instrument is declared valid if the r value is at least 0.23 (sample 70, α 0.05) or the P value <0.05. The instrument is considered to have good reliability if Cronbach's > 0.6.

Table 3. ECSA_INA test and re-test consistency analysis

Score	ICC	95%CI	P value
Children	0.860	0.771 to 0.914	0.000
Mothers	0.871	0.792 to 0.920	0.000
Total	0.867	0.787 to 0.917	0.000

Description: ICC <0.5 indicates poor reliability; ICC 0.5-0.75 indicates moderate reliability; ICC >0.75-0.9 indicates good reliability; ICC >0.90 indicates very good reliability

Discussion

We conducted a cross-cultural adaptation of ECSA English version from California into Indonesian (ECSA_INA). The ECSA was chosen because it is free to access and easy to carry out, as no special tools are needed. Currently, there is no instrument that can be used to screen for emotional, social and behavioral disorders in children aged 1-5 years in the Indonesian language.

Table 4. Bivariate analysis of respondent characteristics (N=70)

Characteristics	n (%)	Bivariate analysis	
		Median of score (range)	P value
Children's factors			
Child's age			0.19
1.5-3 years	16 (22.8)	15.00 (8.00-50.00)	
>3-5 years	54 (77.1)	18.00 (8.00-39.00)	
Gender			0.56
Male	39 (55.7)	18.00 (8.00-39.00)	
Female	31 (44.3)	18.00 (9.00- 39.00)	
Birth weight			0.80
Normal	58 (82.9)	17.00 (8.00- 50.00)	
Low	12 (17.1)	18.00 (8.00- 36.00)	
Gestational age			0.97
Full term	55 (78.6)	17.00 (8.00- 50.00)	
Preterm	15 (21.4)	18.00 (9.00- 39.00)	
Caregiver's factors			
Depression			0. 91
Yes	5 (7.1)	17.00 (14.00-29.00)	
No	65 (92.9)	17.00 (8.00-50.00)	
Educational level			0.39
Low	46 (65.7)	17.00 (8.00- 50.00)	
High	24 (34.3)	17.00 (8.00-30.00)	
Gender			0.50
Female	61 (87.1)	17.00 (8.00- 50.00)	
Male	9 (12.9)	17.00 (10.00- 23.00)	
Location of residence			0.03
Urban	32 (45.7)	20.00 (8.00- 50.00)	
Rural	38 (54.3)	15.00 (8.00- 36.00)	

Table 5. Analysis of child score and general perception of child performance (N=70)

Group (general perception)	n(%)	Median score (range)	P value
Test			0.02*
No	45 (64.3)	17.00 (8.00-36.00)	
Yes/somewhat	25 (35.7)	21.00 (9.00-50.00)	
Re-test			0.04*
No	46 (65.7)	17.00 (8.00-36.00)	
Yes/somewhat	24 (34.3)	20.00 (9.00-50.00)	

*14 days after the 1st test, P value <0.05 (significant)

During cross-cultural adaptation of ECSA_INA, some items were adjusted in terms of language at each stage through expert discussion. We then ran a pilot test of the ECSA_INA on 6 parent respondents in the community. It took them 5-20 minutes to complete the instrument (average 10 minutes). Thus, the ECSA_INA instrument was relatively easy to understand and quickly completed. These results also support a previous study which found that 98.8% of respondents/caregivers completed the ECSA instrument in full, compared to the PSC instrument, in which many forms had less than 5 of 35 items not filled.[22] The same study also found that this instrument can be used in first-level services and is preferred by primary care providers for screening cases of child emotional, social and behavioral disorders compared to regular history taking.[23] Our internal consistency (reliability) results for all ECSA_INA items were satisfactory, with total of Cronbach's α is 0.831 and all items had a value > 0.6. This finding was in agreement with the reliability test conducted for the first time on the ECSA instrument (Cronbach's α 0.9).[20] The results of ECSA translations into various languages also showed satisfactory reliability, such as into Arabic with Cronbach's α 0.8623 and into Spanish, with sensitivity of 86%, specificity of 82%, and a cut-off point of 24.[24]

Internal validity for this instrument was generally good, with $r>0.23$, $P<0.05$, which is supported by good internal consistency results. However, on items number 19, 22, 24, 34, 35, 39. This might have been influenced by other factors, such as from the instrument itself or external factors. Instrument factors include instructions, wording, construction, item difficulty and number of items. External factors include parent's psychology, residence, gender and age. In a study in China on relationships among residence, knowledge, behavior, and mental health during the pandemic, found that people living in urban areas experienced more mental disorders with better behavior and knowledge than rural areas related to COVID 19.[25] The division of urban and rural areas in Indonesia according to *Biro Pusat Statistik* (BPS/*Statistics Indonesia*) 2020 is very dependent on population density and availability of facilities, namely, schools, markets, health services, and other facilities, urban and rural differences also include the stress factors faced in each area.[26] This finding was in agreement with the bivariate analysis which revealed a significant association between urban place of residence and higher child score.

A systematic review found an association between parent or child psychological factors and parent reports of child symptoms. The main factors associated were parental anxiety, child temperament, and parental expectations and beliefs. These three factors can cause parents to pay more attention to their children, interpret their children's behavior as symptoms, and remember symptoms in children.[27] Several studies found an association between prematurity and birth weight and the incidence of future developmental disorders. In the last two decades, the survival rate of infants born prematurely has increased as intensive newborn care has improved. Many studies found that in long-term follow-up, many infants born prematurely had a high prevalence of emotional and behavioral disorders, such as ASD, anxiety, and depression.[28] A reviews of preterm infants, found that they were at 3-4 times higher risk of developing mental health disorders in childhood compared to full-term infants.[29] Another study found that the social and emotional development of preterm infants lagged behind that of full-term infants.[30] However, we did not find a significant relationship, possibly because the proportions between the two groups compared were quite different. Moreover, other factors analyzed in our study were not related.

In addition, factors from the instrument itself can also influence parental form-filling, such as the number of items. In 2017, a study tested a shorter form of the ECSA, with 22 items that were retained from 22 child items.[31] The authors discarded items 5, 13, 17, 20, 21, 22, 25, 26, 29, 31, 32, 34, 35, and 36. We also noted that items 22, 34, and 35 had low validity values. This short form of ECSA had quite high sensitivity (89%) and specificity (85%) values, as related to the number of items that affect validity. These results are also noted for further research in the development of ECSA instruments in Indonesia.[31]

The cultural adaptation process can also affect the validity of an instrument. Items 22 and 34 had the statements "too interested in games with sexual connotations or certain body parts" and "too friendly with new people." In Indonesian culture, these statements are considered as taboo. Talking about sex to toddlers is socially unacceptable in the culture.

Furthermore, being friendly to new people is common in Indonesia, because it is a cultural value. These items received feedback from respondents in the form of not wanting to answer because the statements were culturally inappropriate.

The results of test-retest reliability after 2 weeks obtained a good ICC of 0.867 (95%CI 0.787 to 0.917), revealing good reliability between respondents' answers with an interval of 2 weeks. Similarly, a previous study had a correlation value of 0.810,20 and an Arabic version had ICC 0.954 (95%CI 0.937 to 0.967).[23]

The analysis of parent's perception towards children's ECSA score, there was a significant difference in both the first test and the test-retest, indicating there is relationship between the parent's perception/caregiver and child's score. Therefore, the ECSA_INA instrument can be used as a screening test for children's emotional, social and behavioral disorders.

This study is the first in Indonesia to receive approval from ECSA developers to conduct cross-cultural adaptation into Indonesian and evaluate internal validity and reliability. Limitations of this study including not comparing psychometrics, sensitivity, and specificity of other instruments that have been used for screening emotional and social disorders in children, and also the psychological factors of the respondents. The ECSA_INA instrument is filled out based on the parent's assessment of the child's emotional and social disorders and their own feelings. This assessment can be subjective, depending on how the parent assesses the child compared to the behavior of their peers.

In conclusion, the results of the internal validity and reliability tests show that the ECSA_INA instrument is valid and reliable in Indonesian. In the future, further research is expected on internal validity and reliability tests with item modifications, such as reducing the number of items with low validity. To be accepted as a good screening instrument in Indonesia, the ECSA_INA will have to be compared to other instruments previously used to assess children and psychometrics.

Conflict of interest

None declared.

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