



Research article

Cross cultural adaptation and psychometric evaluation of the Indonesian version of the depression anxiety stress scales for youth (IDASS-Y)

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ABSTRACT

Depression and anxiety represent significant global health concerns, with a particularly high prevalence observed in economically disadvantaged developing countries. The availability of reliable and culturally relevant assessment instruments is crucial for the effective diagnosis and intervention of mental health issues, particularly among adolescents. The objective of this study was to adapt the Depression Anxiety Stress Scales for Youth (DASS-Y) into an Indonesian version (IDASS-Y) and to evaluate its psychometric properties among Indonesian adolescents. A multi-center cross-sectional study was conducted in West Sumatra Province and Yogyakarta Province, Indonesia. The study entailed a cross-cultural adaptation of the DASS-Y into the IDASS-Y through a five-step process and a psychometric evaluation. The study sample consisted of 255 adolescents between the ages of 16 and 18, recruited from two public senior high schools. The psychometric assessment comprised content validity testing, construct validity testing through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), and reliability testing. The IDASS-Y has demonstrated robust psychometric properties. The content validity was found to be high, with an overall S-CVI/Ave of 0.95. The EFA demonstrated a consistent three-factor structure corresponding to depression, anxiety, and stress, with no alterations to the item dimensions. The CFA results yielded a good model fit, as indicated by the following values: χ^2/df ratio = 2.553; RMSEA = 0.022; CFI = 1.000; SRMR = 0.083. The internal consistency of the scale was satisfactory, with Cronbach's alpha coefficients of 0.897 for depression, 0.893 for anxiety, and 0.884 for stress, and an overall alpha of 0.948. Additionally, McDonald's omega coefficients were notably high, at 0.897 for depression, 0.894 for anxiety, and 0.874 for stress, with an overall omega of 0.949. The Indonesian version of the Depression Anxiety Stress Scales for Youth (IDASS-Y) is a valid and reliable instrument for assessing depression, anxiety, and stress among Indonesian adolescents. It retains the original conceptual framework of the DASS-Y and demonstrates strong psychometric properties, making it suitable for both research and clinical use.

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1. Background

Depression and anxiety are significant global concerns, affecting millions of individuals worldwide across the globe, with the highest prevalence rates observed in economically impoverished developing countries [1,2]. These mental health conditions are associated with a range of social and physical difficulties, including dysfunctional family relationships, increased suicide rates, academic underachievement, and substance misuse [1,3–5]. Of particular concern is the prevalence of anxiety and mood disorders among children and adolescents, with these disorders often persisting into adulthood and increasing vulnerability to other mental health issues [6–8]. Therefore, valid and reliable assessment instruments are essential for tailoring treatment and effective prevention and intervention programs for childhood and adolescent depression and anxiety.

The extant measures are inadequate for distinguishing between depression and anxiety, as they assess a combination of symptoms pertaining to emotional states and general distress [9–11]. Lovibond and Lovibond (1995) [12] successfully expanded the list of symptoms associated with anxiety and depression. The research identified specific symptoms for anxiety, including subjective awareness, avoidance, and physiological hyperarousal. Similarly, the depression symptoms list was expanded to encompass anhedonia, hopelessness, devaluation of life, and self-deprecation. Additionally, the research identified an additional factor called “stress,” which is characterized by indicators like tension, impatience, and irritability. This “stress” factor represents a distinct emotional syndrome that is separate from general distress, anxiety, or depression [12–14].

Based on their research, Lovibond and Lovibond (1995) [12], developed the Depression Anxiety Stress Scales (DASS), a self-report questionnaire. The DASS is an effective instrument for assessing core symptoms of depression, anxiety, and stress while excluding non-discriminatory symptoms. A substantial body of evidence attests to the robust psychometric properties of the complete 42-item DASS and its abbreviated version comprising 21 items, the DASS-21, when employed with adult populations. The DASS demonstrates a stable factor structure across diverse samples, exhibits convergent validity with other measures, and is sensitive to interventions, rendering it suitable for routine clinical use [12].

The DASS-21 is a user-friendly assessment instrument that allows for the expeditious evaluation of depression, anxiety, and stress [15]. The assumption is that these emotional states contribute to a broader concept of general distress. The depression scale includes features such as loss of interest, anhedonia, and self-deprecation, while the stress scale emphasizes irritability, tension, and difficulty relaxing [12]. The DASS-21 has been translated into various languages, including Chinese [16], Persian [17], Dutch [18], Portuguese [19], Iranian [20], Malay [21], Serbian [22], Omani Arabic [23], Korean [24], Bengali [25], Italian [26], Indonesian [27], Greek [28], Turkish [29], Brazilian Portuguese, Hong Kong Cantonese, Romanian, Taiwanese Mandarin, Emirati Arabic, and American English [30].

Notwithstanding the extensive utilization and robust psychometric properties of the DASS-21 in research and clinical settings around the globe with adult populations, there is a notable absence of a comparable self-report questionnaire designed specifically for children and adolescents. The development of such an instrument would complement existing measures of affect in youth and provide a concise and comprehensive assessment of depression, anxiety, and stress [31–33]. In response to this need, Szabo & Lovibond developed a 21-item youth version of the DASS (DASS-Y), which has been validated for use with both children and adolescents [34]. To date, the DASS-Y has only been adapted into a Chinese version [16], which has demonstrated excellent validity and consistency in its psychometric properties.

While the adult DASS-21 addresses complex emotional states with detailed and nuanced statements, the DASS-Y is developmentally appropriate for younger individuals, using simplified language and concepts relevant to children and adolescents. It is designed to capture the core symptoms of depression, anxiety, and stress, considering the fact that these symptoms manifest differently in younger populations. For instance, item number 5 of the DASS-Y states, “I hated my life,” whereas the DASS-21 for adults employs the phrase “I found it difficult to work up the initiative to do things.” This distinction highlights the differences between adolescent concerns and those of adults. The adaptation process ensured the items were understandable and relatable to youth, thereby rendering the DASS-Y a more suitable instrument for assessing negative affective states in children and adolescents [12,14,34,35].

In light of the high prevalence of depression, anxiety, and other mental disorders among Indonesian adolescents, the Indonesian version of the Depression Anxiety Stress Scales for Youth (IDASS-Y) has the potential to serve as a valuable instrument for mental health screening. This study had two primary objectives: (1) to adapt the DASS-Y for Indonesian adolescents by creating the IDASS-Y through cross-cultural adaptation; and (2) to thoroughly assess the psychometric properties of the IDASS-Y. In order to meet the aforementioned needs, the IDASS-Y is required to assess and evaluate depression, anxiety, and stress among Indonesian children and adolescents. This psychometric evaluation was conducted with the objective of assessing content validity, construct validity, and testing internal consistency of the IDASS-Y.

2. Methodology

2.1. Study design

A multicenter cross-sectional study was conducted in two major Indonesian provinces: West Sumatra and Yogyakarta. The study employed a two-phase design, comprising: (1) the cross-cultural adaptation of the DASS-Y into the IDASS-Y, conducted using a five-step process; and (2) psychometric testing of the IDASS-Y questionnaire.

2.2. Participants

The study focused on the adolescent population in tenth to twelfth grades or senior secondary school, as defined by the Indonesian educational system. The study was conducted at two public senior high schools (PSHS) located in West Sumatra Province and Yogyakarta Province. In order to be eligible for participation, individuals had to be between the ages of 16 and 18 years, possess the ability to comprehend and read Indonesian, and agree to participate in the study. Adolescents with any physical or mental health condition that may impede their ability to participate effectively or compromise the study's integrity (e.g., severe cognitive impairment, significant visual or hearing impairments) were excluded from the study. Therefore, prior to data collection, researchers did a basic physical and mental health screening, to make sure that the inclusion criteria met. Dimitrov [36] asserted that a minimum sample size of 150 participants is requisite for exploratory factor analysis (EFA). Kyriazos [37] proposed that for confirmatory factor analysis (CFA), the sample size calculation should adhere to a ratio of 5:1 between the number of participants and items. Accordingly, this study required a minimum of 105 participants. Consequently, a total of 255 participants was deemed the minimum sample size for this study, in order to conduct both CFA and EFA analyses. Additionally, 30 participants were included in the instrument pre-testing phase. Furthermore, five additional participants were involved in various study phases, including translation and content validity testing. These participants included two psychologists, two mental health nurse experts, and one pediatric nurse expert.

2.3. Data collection

A study was conducted between June and July 2023, in which participants were selected using both consecutive and purposive sampling methods. Data collection utilized an online questionnaire administered via Google Forms®, with each questionnaire typically requiring 10–15 min to complete. The collaboration with school instructors facilitated online meetings and aided in recruiting eligible participants who met the predefined inclusion criteria. Two research assistants, trained in research methods, data collection protocols, and ethical standards, assessed participant eligibility. Eligible adolescents were invited to participate in the study, received comprehensive study details, and were assured of their right to withdraw from the study. Written informed consent was obtained from all participants involved in the study. The data collection process is illustrated in Fig. 1.

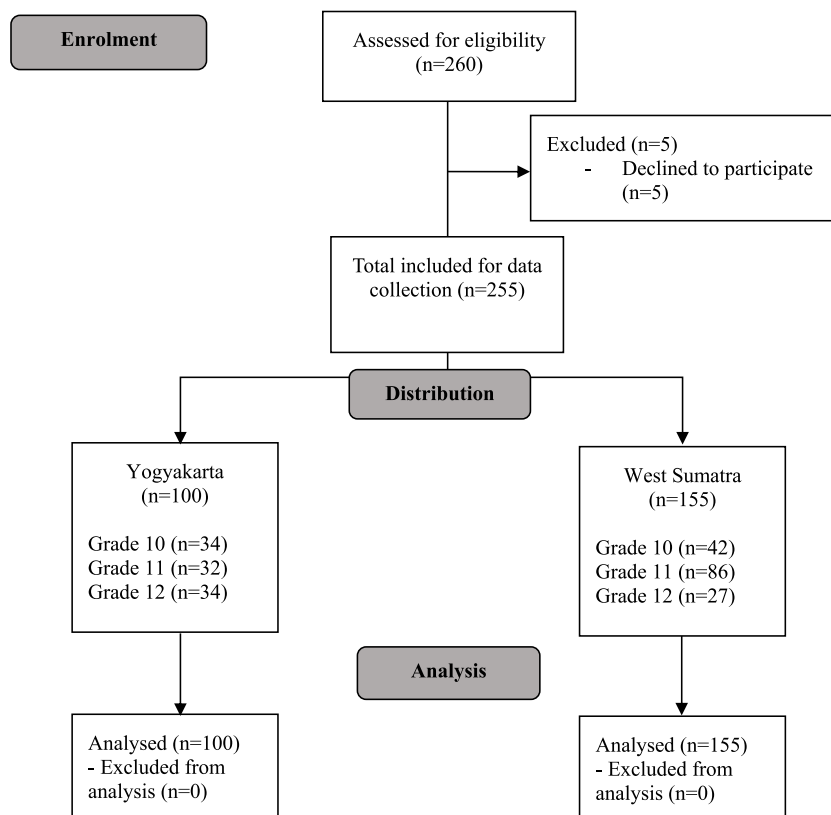


Fig. 1. STROBE flow diagram of the observational study.

2.4. Instruments

In the course of this study, two instruments were employed. The initial instrument encompassed a range of demographic variables, including gender, age, grade level, parents' marital status, residence status, and both paternal and maternal educational attainments and occupations. The second instrument utilized was the IDASS-Y questionnaire. The IDASS-Y is an assessment instrument utilized to quantify depression, anxiety, and stress levels in adolescents. The DASS-Y questionnaire was originally comprised of three components: depression, anxiety, and stress. Each component consisted of seven items, resulting in a total of 21 items. The questionnaire employed a four-point scale, with scores ranging from 0 to 3. The DASS-Y questionnaire scores were used to indicate the severity of depression, anxiety, and stress, with higher scores indicating greater severity. All the factor loadings were statistically significant, and the model fit indices indicated a good fit. Moreover, the questionnaire demonstrated high internal consistency, as evidenced by Cronbach's alpha coefficients of 0.89, 0.84 and 0.84, respectively, for the DASS-Y. The 21 items were distributed among the three dimensions as follows: depression (items 3, 5, 10, 13, 16, 17, and 21); anxiety (items 2, 4, 7, 9, 15, 19, and 20); and stress (items 1, 6, 8, 11, 12, 14, and 19) [34].

2.5. Cross-cultural adaptation

In this study, the translation and adaptation process of the instrument was conducted in accordance with the guidelines set forth by the World Health Organization [38]. The original author was contacted and granted permission to translate the questionnaire. Two qualified translators, proficient in both English and Indonesian, were responsible for the forward translation of the DASS-Y questionnaire from English to Indonesian. Subsequently, the translated versions were reviewed by the research team and assembled, resulting in the preliminary version of the IDASS-Y. Thereafter, two independent translators proficient in both English and Indonesian conducted a backward translation, whereby the initial version of IDASS-Y was translated back into English. This process was undertaken to ensure that the meaning of the translated items was aligned with the original version and to identify any potential discrepancies or issues with the initial translation. Following the translation process, a panel of experts in relevant fields, including two psychologists, two mental health nurses, and one pediatric nurse, conducted a review of the initial translated questionnaire along with the one resulting from the backward translation. The experts assessed the cultural appropriateness, clarity, and relevance of the items in the target language to the Indonesian context. Any discrepancies or concerns that arose during the review process were discussed and resolved. This resulted in the prefinal version of the IDASS-Y.

To further refine the translated questionnaire, a pre-testing or feasibility phase was conducted. This entailed the administration of the prefinal version of the IDASS-Y to a sample of 30 adolescents. The aim of the feasibility phase was to identify any potential issues with item comprehension, cultural sensitivity, or response options. The feedback obtained from the participants through interviews or surveys was used to assess the face validity and to guarantee the suitability of the questionnaire for the target population. Additionally, cognitive interviewing techniques, such as think-aloud interviews, were utilized during the feasibility phase. These techniques furnished insights into the participants' thought processes, comprehension, and interpretation of the questionnaire items. The cognitive interviewing process facilitated further refinement and validation of the translated instrument [38].

2.6. Data analysis

Descriptive statistics, including frequencies, percentages, means, medians, minimum-maximum (min-max) values, and standard deviations (SD), were utilized to present the data in a manner that allows for their interpretation. Furthermore, a psychometric evaluation was conducted to assess the content validity, construct validity, and reliability of the instrument. The collected data were analyzed using SPSS (including the Hayes' Process Macro) and AMOS software, version 22 (IBM Corp., Armonk, N.Y., USA).

2.7. Content validity

The content validity index (CVI) for all items of the IDASS-Y was assessed in accordance with the model proposed by Polit et al. (2007). An item CVI (I-CVI) exceeding 0.78 and a scale-level content validity index/averaging calculation method (S-CVI/Ave) exceeding 0.90 were deemed to be excellent indicators of content validity. In instances where item scores fell below 0.85, revisions were made in accordance with expert recommendations and suggested modifications [39–41]. The content validity testing was conducted with the involvement of five experts, who had previously participated in the translation stage as panelists and were comprised of psychologists, mental health nurses, and pediatric nurse.

2.8. Construct validity

The construct validity of the IDASS-Y questionnaire was assessed through the application of both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). These analyses were employed for the purpose of evaluating the extent to which the questionnaire effectively measured the intended constructs or dimensions. In the course of the EFA, the data yielded by the questionnaire responses were examined to identify the underlying factor structure. The EFA facilitated the determination of the number of factors and the relationships between the items and the constructs. By examining the patterns of responses, factor loadings, and eigenvalues, the EFA provided insights into the construct validity of the IDASS-Y. The EFA employed principal component analysis (PCA) with varimax rotation to identify the underlying factor structure. The determination of extracted factors was guided by the scree plot,

eigenvalues, total variance, Kaiser-Meyer-Olkin measure, Bartlett's test of sphericity, and conceptual considerations. Items with loading factor scores exceeding 0.40 were considered influential in contributing to additional factors [42].

Following the EFA, a CFA was conducted to validate the factor structure identified in the EFA. The CFA was conducted to confirm the hypothesis that the factor structure derived from the theoretical framework of the questionnaire would have a good fit with the observed data. The CFA provided statistical evidence for the construct validity of the IDASS-Y by assessing fit indices such as chi-square/df, comparative fit index (CFI), goodness of fit index (GFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The CFA was conducted using maximum likelihood estimation [43]. The model fit was evaluated based on specific criteria, including: (a) a χ^2/df ratio of ≤ 3.00 , indicating an acceptable fit, (b) an RMSEA of ≤ 0.06 , indicating an acceptable fit; (c) a SRMR of ≤ 0.05 , indicating a good fit; and (d) a GFI and CFI of ≥ 0.90 indicating a good fit [43].

Table 1
Participant characteristics.

Variable	Entire sample (N = 255)		EFA sample (n = 150)		CFA sample (n = 105)	
	f	%	f	%	f	%
Gender						
Female	203	79.6	117	78.0	86	81.9
Male	52	20.4	33	22.0	19	18.1
Age						
14 Years	1	0.4	N/A	N/A	1	1.0
15 Years	10	3.9	4	2.7	6	5.7
16 Years	86	33.7	57	38.0	29	27.6
17 Years	125	49.0	73	48.7	52	49.5
18 Years	25	9.8	13	8.7	12	11.4
19 Years	7	2.7	3	2.0	4	3.8
20 Years	1	0.4	N/A	N/A	1	1.0
Class level						
1st year	76	29.8	49	32.7	27	25.7
2nd year	118	46.3	79	52.7	39	37.1
3rd year	61	23.9	22	14.7	39	37.1
Parent's marital status						
Married	224	87.8	131	87.3	88.6	88.6
Divorced	31	12.2	19	12.7	11.4	11.4
Residence status						
With parents	235	92.2	139	92.7	96	91.4
Other families	11	4.3	8	5.3	3	2.9
Alone	9	3.5	3	2.0	6	5.7
Father's education						
Elementary	48	18.8	18	12.0	30	28.6
Junior high school	41	16.1	21	14.0	20	19.0
Senior high school	110	43.1	76	50.7	34	32.4
Diploma	56	22.0	35	23.3	21	20.0
Mother's education						
Elementary	53	20.8	22	14.7	31	29.5
Junior high school	38	14.9	23	15.3	15	14.3
Senior high school	108	42.4	71	47.3	37	35.2
Diploma	56	22.0	34	22.7	22	21.0
Father's occupation						
Civil servant	22	8.6	15	10.0	7	6.7
Private employee	27	10.6	22	14.7	5	4.8
State employee	3	1.2	2	1.3	1	1.0
Self-employee	59	23.1	35	23.3	24	22.9
Unemployed	13	5.1	5	3.3	8	7.6
Retired	10	3.9	7	4.7	3	2.9
Others	121	47.5	64	42.7	57	54.3
Mother's occupation						
Civil servant	30	11.8	12	8.0	18	17.1
Private employee	4	1.6	3	2.0	1	1.0
State employee	5	2.0	3	2.0	2	1.9
Self-employee	16	6.3	10	6.7	6	5.7
Unemployed	110	43.1	73	48.7	37	35.2
Retired	1	0.4	1	0.7	N/A	N/A
Others	89	34.9	48	32.0	41	39.0

2.9. Reliability

The reliability of the instrument was evaluated through the application of internal consistency and stability measures. Cronbach's alpha and McDonald's omega coefficients were used to assess the internal consistency of both the domain and the overall scale of the IDASS-Y questionnaire. A Cronbach's alpha value between 0.7 and 0.9 was deemed sufficient to achieve an adequate level of internal consistency [44]. McDonald's omega is reliability estimator that considers the factor loadings of the items. It has been demonstrated in various studies to be an effective alternative for estimating reliability [45,46]. Homogeneity was assessed through an examination of item-total and interitem correlations. Item-total correlations exceeding 0.30 and interitem correlations within the range of 0.30–0.70 were deemed to be acceptable coefficients, indicating the coherence of the questionnaire items [47–49]. Moreover, the test-retest approach was employed to substantiate the stability of the scale. A random sample of 100 participants was selected to complete the IDASS-Y questionnaire twice, with the second administration occurring two weeks later. This sample size was deemed sufficient to ensure robust statistical power for assessing stability. The stability of the scale was evaluated by computing the intra-class correlation (ICC), with an ICC value greater than 0.8 indicating stability [50].

2.10. Ethical considerations

The informed consent of all adult human participants and the parents or legal guardians was obtained. Additionally, informed assent was obtained from the adolescents, ensuring their understanding and agreement to participate. On May 30, 2023, the study received approval from the health research ethics committee of Universitas Andalas, with the ethics review board granting approval under the reference number 087.laiketik/KEPKFKEPUNAND.

3. Results

3.1. Characteristics of the participants

The majority of the 255 participants (82.7 %) were within the age range of 16–17 years old. A smaller proportions of participants were aged 19 years old (2.7 %) or 20 years old (0.4 %). With regard to the distribution of participants according to gender, 20.4 % identified as male, while the majority (79.6 %) identified as female. The largest proportion of participants in this study (46.3 %) were in the twelfth grade. An examination of the participants' living arrangements revealed that a significant majority (92.2 %) reported residing with their parents. Furthermore, the data revealed that 87.8 % of the participants' parents were married. With regard to parental educational attainment, it is noteworthy that a notable proportion of the fathers (43.1 %) and mothers (42.4 %) of the participants had completed their secondary education. Moreover, it was observed that the majority of the participants' fathers (47.5 %) had career choices that are still frequently regarded as unconventional by many in society, such as being a farmer or a freelance worker. Conversely, a significant proportion of the participants' mothers (43.1 %) were reported to be unemployed (Table 1).

Table 2
Content validity index I-CVI, and S-CVI of the expert panel of each IDASS-Y item.

Domain	Item code	Item number	I-CVI	CVI/Ave	CVI-UA	Interpretation
Depression	D1	Q3	1.0	0.97	0.85	Accepted
	D2	Q5	1.0			Accepted
	D3	Q10	1.0			Accepted
	D4	Q13	0.8			Accepted
	D5	Q16	1.0			Accepted
	D6	Q17	1.0			Accepted
	D7	Q21	1.0			Accepted
Anxiety	A1	Q2	0.8	0.94	0.71	Accepted
	A2	Q4	1.0			Accepted
	A3	Q7	1.0			Accepted
	A4	Q9	1.0			Accepted
	A5	Q15	1.0			Accepted
	A6	Q19	1.0			Accepted
	A7	Q20	0.8			Accepted
Stress	S1	Q1	1.0	0.93	0.85	Accepted
	S2	Q6	1.0			Accepted
	S3	Q8	1.0			Accepted
	S4	Q11	0.8			Accepted
	S5	Q12	1.0			Accepted
	S6	Q14	1.0			Accepted
	S7	Q18	0.8			Accepted
Overall (20/21)						Accepted
S-CVI/Ave = 0.95						Strong
S-CVI-UA = 0.76						Accepted

3.2. Content validity

Table 2 presents the content validity index for items related to depression, anxiety, and stress as evaluated by a panel of five experts. With regard to the domain of depression, items D1 (Q3), D2 (Q5), D3 (Q10), D5 (Q16), D6 (Q17), and D7 (Q21) all yielded an I-CVI of 1.0, signifying unanimous agreement among the experts. The CVI/Ave was 0.97, while the CVI-UA was 0.85. Item D4 (Q13) obtained an I-CVI of 0.8. All items in this domain were deemed acceptable.

In the domain of anxiety, item A1 (Q2) demonstrated an I-CVI of 0.8, with a CVI/Ave of 0.94 and a CVI-UA of 0.71. Each of the items, A2 (Q4), A3 (Q7), A4 (Q9), A5 (Q15), and A6 (Q19), demonstrated an I-CVI of 1.0, while item A7 (Q20) exhibited an I-CVI of 0.8. All of the aforementioned items were also deemed to be acceptable. In the domain of stress, items S1 (Q1), S2 (Q6), S3 (Q8), S5 (Q12), and S6 (Q14) each obtained an I-CVI of 1.0, with S1 having a CVI/Ave of 0.93 and a CVI-UA of 0.85. Items S4 (Q11) and S7 (Q18) were assigned an I-CVI of 0.8. All items within this domain were deemed acceptable.

The S-CVI/Ave was found to be 0.95, indicating a high level of agreement among the experts, while the S-CVI-UA was 0.76, signifying a strong content validity for the instrument. Based on these evaluations, it was concluded that 20 out of 21 items were accepted.

3.3. Construct validity

3.3.1. Exploratory factor analysis (EFA)

To ascertain the viability of the data for factor analysis, the Kaiser-Meyer-Olkin (KMO) coefficient was employed, along with Bartlett's test of sphericity. The KMO coefficient of 0.908, in conjunction with the significant results of Bartlett's test, indicated that the data was suitable for factor analysis. The extraction of factors was determined through the application of principal component analysis. To determine the number of factors, eigenvalues and the scree plot were examined. The findings revealed three factors with eigenvalues greater than one (10.435, 1.736, and 1.266), accounting for a cumulative variance of 63.98 %. The first factor explained 49.69 % of the variance, the second factor accounted for 8.26 %, and the third factor explained 6.03 % (Table 3).

Subsequently, a varimax rotation was employed to categorize the 21 items into three factors. As illustrated in Table 4, the factor loadings for each item demonstrated that those items representing a specific domain were clustered together, thereby providing support for the construct validity of the original DASS-Y questionnaire. For example, the first seven items, which represent the depression dimension, were grouped together under one factor, displaying loadings ranging from 0.562 to 0.765. Similarly, the seven items representing the anxiety dimension formed a cohesive group, with loadings ranging from 0.540 to 0.787. Likewise, the seven items reflecting the stress domain clustered together with loadings ranging from 0.525 to 0.884. It is noteworthy that none of the items exhibited loadings of 0.300 or higher on a different domain, thereby providing further evidence for the construct validity of the IDASS-Y questionnaire.

3.4. Confirmatory factor analysis (CFA)

The confirmatory factor analysis (CFA) yielded substantial insights into the proposed three-factor structure of the IDASS-Y

Table 3

Description of eigenvalues, extraction and rotation loadings of the three factors derived from the IDASS-Y.

Component	Initial eigenvalues			ESS Loadings			RSS Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	10.435	49.691	49.691	10.435	49.691	49.691	5.012	23.865	23.865
2	1.736	8.265	57.956	1.736	8.265	57.956	4.376	20.840	44.705
3	1.266	6.030	63.987	1.266	6.030	63.987	4.049	19.282	63.987
4	0.965	4.595	68.581						
5	0.794	3.779	72.360						
6	0.652	3.104	75.465						
7	0.649	3.091	78.556						
8	0.575	2.737	81.293						
9	0.498	2.373	83.665						
10	0.474	2.256	85.922						
11	0.438	2.088	88.009						
12	0.404	1.922	89.932						
13	0.384	1.830	91.762						
14	0.313	1.490	93.252						
15	0.287	1.366	94.618						
16	0.272	1.297	95.915						
17	0.265	1.263	97.178						
18	0.224	1.067	98.245						
19	0.159	0.755	99.000						
20	0.125	0.593	99.593						
21	0.085	0.407	100.000						

Note: Principal Component Analysis was performed.

Table 4
EFA item loadings of IDASS-Y.

Item number	IDASS-Y statement	Factor 1 (Depression)	Factor 2 (Anxiety)	Factor 3 (Stress)
3	<i>Saya tidak bisa menikmati apapun</i> "I did not enjoy anything"	0.605		
5	<i>Saya membenci hidup saya</i> "I hated my life"	0.765		
10	<i>Tidak ada hal menyenangkan yang bisa saya harapkan</i> "There was nothing nice I could look forward to"	0.589		
13	<i>Saya merasa sedih berkepanjangan</i> "I could not stop feeling sad"	0.562		
16	<i>Saya membenci diri sendiri</i> "I hated myself"	0.844		
17	<i>Saya merasa bahwa diri saya tidak berguna</i> "I felt like I was no good"	0.816		
21	<i>Saya merasa bahwa hidup itu mengerikan</i> "I felt that life was terrible"	0.583		
2	<i>Saya merasa pusing, seakan-akan saya akan pingsan</i> "I felt dizzy, like I was about to faint"		0.728	
4	<i>Saya mengalami kesulitan bernapas (misalnya: sesak napas), meskipun saya tidak sedang berolahraga dan tidak sakit</i> "I had trouble breathing (e.g. fast breathing), even though I wasn't exercising and I was not sick"		0.787	
7	<i>Tangan saya terasa gemetar</i> "My hands felt shaky"		0.752	
9	<i>Saya merasa ketakutan</i> "I felt terrified"		0.540	
15	<i>Saya merasa seperti akan panik</i> "I felt like I was about to panic"		0.615	
19	<i>Saya dapat merasakan jantung saya berdetak sangat cepat, meskipun saya tidak sedang melakukan olahraga berat</i> "I could feel my heart beating really fast, even though I hadn't done any hard exercise"		0.712	
20	<i>Saya merasa takut tanpa alasan yang jelas</i> "I felt scared for no good reason"		0.580	
1	<i>Saya mudah kesal karena hal-hal kecil</i> "I got upset about little things"			0.637
6	<i>Saya merasa diri saya bereaksi berlebihan terhadap situasi-situasi yang terjadi</i> "I found myself over-reacting to situations"			0.562
8	<i>Saya merasa stres karena banyak hal</i> "I was stressing about lots of things"			0.528
11	<i>Saya mudah tersinggung</i> "I was easily irritated"			0.884
12	<i>Saya merasa sulit untuk rileks</i> "I found it difficult to relax"			0.524
14	<i>Saya merasa kesal ketika orang menginterupsi saya</i> "I got annoyed when people interrupted me"			0.577
18	<i>Saya mudah terganggu</i> "I was easily annoyed"			0.882

Note: Varimax rotation was applied.

questionnaire. Fig. 2 depicts the standardized factor loadings for depression, anxiety, and stress, with all loadings exceeding the 0.5 threshold. The loadings for depression ranged from 1.00 to 2.84, for anxiety from 0.84 to 2.13, and for stress from 1.00 to 1.75. The inter-factor correlations were 0.11 between depression and anxiety, 0.15 between depression and stress, and 0.28 between anxiety and stress. These loadings indicated strong relationships between the observed variables and their respective constructs, confirming that each item significantly loads on its intended factor and demonstrating that the model was well-fitting.

Moreover, Table 5 presents the model fit indices, which provide further evidence supporting the appropriateness of the proposed model for the IDASS-Y questionnaire. The ratio of χ^2/df was calculated at 2.553, indicating an acceptable fit between the model and the observed data. Furthermore, the Comparative Fit Index (CFI) yielded a perfect score of 1.000, indicating a high level of congruence between the model and the data. Similarly, the Goodness of Fit Index (GFI) yielded a perfect score of 1.000, thereby affirming the overall fit of the model. The Root Mean Square Error of Approximation (RMSEA) yielded a value of 0.022, indicating a reasonable approximation of the population covariance matrix. Values below 0.08 are indicative of an acceptable fit. Additionally, the Standardized Root Mean Square Residual (SRMR) obtained a value of 0.083, falling within the acceptable range. This suggests a reasonable level of discrepancy between the model and the observed data.

3.5. Reliability

In the final phase of the study, the reliability of the questionnaire was evaluated through measures of internal consistency and

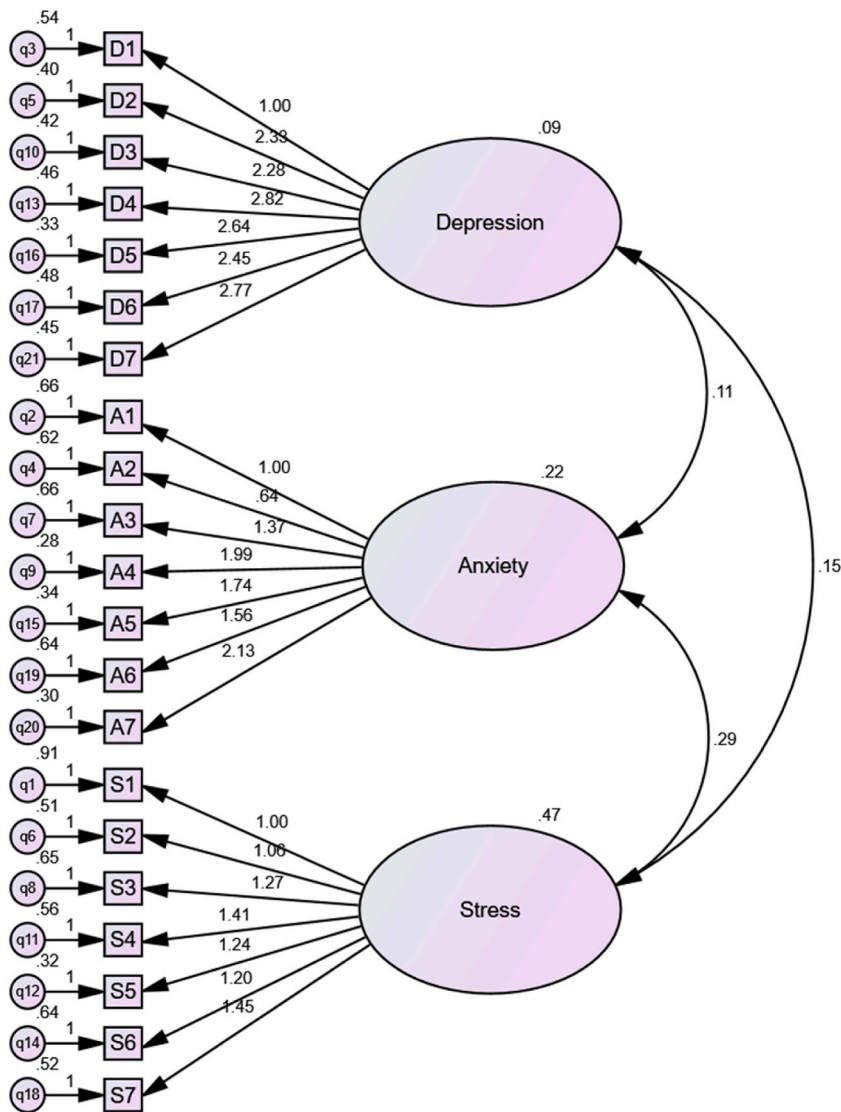


Fig. 2. Confirmatory factor analysis graphical presentation.

Table 5
Model fit of the IDASS-Y.

Indicator	Value
χ^2/df	2.553
CFI	1.000
GFI	1.000
RMSEA	0.022
SRMR	0.083

stability. The internal consistency reliability of the various factors of the IDASS-Y was assessed using Cronbach’s alpha and McDonald’s omega coefficients.

For the domain of depression, Cronbach’s alpha and McDonald’s omega were both 0.897, indicating strong internal consistency. This was evidenced by inter-item correlations ranging from 0.434 to 0.789 and item-total correlations from 0.622 to 0.775. Furthermore, anxiety exhibited reliability with Cronbach’s alpha of 0.893 and McDonald’s omega of 0.894, inter-item correlations ranged from 0.414 to 0.651, while item-total correlations spanned from 0.660 to 0.729. The Cronbach’s alpha for stress was 0.884, while the McDonald’s omega was 0.874. The inter-item correlations ranged from 0.387 to 0.869, while the item-total correlations spanned from 0.566 to 0.741. The total score of the IDASS-Y demonstrated a higher Cronbach’s alpha of 0.948 and McDonald’s omega

of 0.949, suggesting robust reliability across the entire scale (Table 6). These metrics collectively indicate strong internal consistency within each factor and the overall scale of the IDASS-Y, thereby affirming its reliability in measuring depression, anxiety, and stress symptoms in youth populations.

To evaluate the stability of the questionnaire, a random sample of 100 adolescents was selected and asked to complete the IDASS-Y questionnaire on two separate occasions, with a two-week interval between the administrations. The data obtained from these administrations were then utilized in the calculation of the intraclass correlation coefficient (ICC) for each factor and for the overall instrument. The ICC test results demonstrated a statistically significant agreement between the scores obtained from the first and second administrations ($p < 0.001$). This finding indicates a high level of stability for the questionnaire, suggesting that the responses remained consistent over time. Table 7 presents a detailed overview of the ICC results, substantiating the assertion that the IDASS-Y questionnaire exhibits robust stability in measuring depression, anxiety, and stress among adolescents.

4. Discussion

This study had two main objectives. The initial objective was to conduct a cross-cultural adaptation of the DASS-Y questionnaire in order to develop the Indonesian version of the DASS-Y (IDASS-Y), which was specifically tailored for Indonesian adolescents. The second objective was to conduct comprehensive evaluation of the psychometric properties of the IDASS-Y. The findings of this study have provided substantial evidence supporting the validity and reliability of the Indonesian version of the DASS-Y questionnaire. These findings demonstrate the efficacy of the IDASS-Y in accurately assessing depression, anxiety, and stress among adolescents in the Indonesian context. It is of particular importance to note that this study represents inaugural investigation to translate, culturally adapt, and validate the DASS-Y in Indonesia.

The overall Cronbach's alpha and McDonald's omega coefficients demonstrated robust internal consistency across the entire scale. The results of the exploratory factor analysis (EFA) in this study revealed that the grouping of items in the Indonesian version of the DASS-Y is consistent with that of the original version, with no alterations to the dimensions of any items. The EFA identified three factors corresponding to depression, anxiety, and stress, which aligned with the original structure of the DASS-Y [34]. Each item loaded significantly onto its respective factor, with no cross-loadings above 0.300 on any other factor, thus maintaining the integrity of the original dimensions. This consistency serves to reinforce the robustness of the DASS-Y's factor structure, thereby confirming that the Indonesian version retains the conceptual framework established by the original instrument. The consistent grouping of items underscores the reliability of the DASS-Y across different cultural contexts, ensuring that the instrument accurately measures the intended constructs of depression, anxiety, and stress among Indonesian adolescents.

Furthermore, the results of confirmatory factor analysis (CFA) indicated that the construct validity of the IDASS-Y was satisfactory, as evidenced by the acceptable fit of the model with all fit indices. This finding lends support to the notion that the multi-item scale accurately reflects the expected dimensionality of the construct being measured. The CFA results align with those of previous validation research conducted by Szabo & Lovibond (2022) [34], thereby confirming the suitability of the IDASS-Y for future studies involving Indonesian adolescents. The calculated Root Mean Square Error of Approximation (RMSEA) and the p -value for the χ^2/df ratio in this study satisfied the criteria for a good fit of the model to the original construct. Moreover, the Comparative Fit Index (CFI) in the present study exceeded the cutoff point, indicating a satisfactory model fit. These findings underscore the robustness of the IDASS-Y and its suitability for research purposes among the Indonesian adolescent population, supported by its satisfactory construct validity and adherence to established goodness-of-fit criteria.

The results of this study are in alignment with those of the only other published study on the psychometric testing of the DASS-Y, which was conducted with the Chinese version of the instrument [16]. As with the Indonesian version, the Chinese version of the DASS-Y exhibited robust psychometric properties. The results of the confirmatory factor analysis (CFA) of the Chinese version demonstrated good model fit, as indicated by the following values: χ^2 , RMSEA, CFI, NNFI, and SRMR. Moreover, the Chinese version of DASS-Y exhibited robust convergent validity, with composite reliability (CR) values and average variance extracted (AVE) values exceeding the established cut-off point [16]. These findings corroborate the robust psychometric properties observed in the Indonesian version, as evidenced by the satisfactory fit indices and high internal consistency. The results of both studies indicate that the DASS-Y is an effective instrument for assessing depression, anxiety, and stress in diverse cultural contexts, thereby underscoring its robustness and reliability as an instrument for adolescent mental health assessment.

The results of the factor analysis demonstrate that the factor structure of the Indonesian version of the Depression Anxiety Stress Scales for Youth (IDASS-Y) is consistent with the original conceptualization of the scale. The exploratory factor analysis (EFA) yielded three clearly delineated factors, each corresponding to a distinct construct: depression, anxiety, and stress. This finding aligns with the original conceptualization of the DASS-Y framework. This consistency was further corroborated by the confirmatory factor analysis (CFA), which demonstrated an excellent model fit with indices such as the χ^2/df ratio, RMSEA, CFI, and SRMR, all of which indicated a

Table 6
Internal consistency for each factor of IDASS-Y.

Domain	Number of items	Cronbach's alpha	McDonald's omega	Inter-item correlation	Item-total correlation
Domain 1. Depression	7	0.897	0.897	0.434–0.789	0.622–0.775
Domain 2. Anxiety	7	0.893	0.894	0.414–0.651	0.660–0.729
Domain 3. Stress	7	0.884	0.874	0.387–0.869	0.566–0.741
Overall IDASS-Y	21	0.948	0.949	0.203–0.869	0.525–0.745

Table 7
Stability for each factor of IDASS-Y.

Domain	M (SD) test	M (SD) retest	ICC coefficient
Domain 1. Depression	6.09 (5.59)	6.26 (5.50)	0.993 ^a
Domain 2. Anxiety	5.84 (5.34)	6.02 (5.30)	0.995 ^a
Domain 3. Stress	9.33 (5.40)	9.46 (5.27)	0.992 ^a
Overall IDASS-Y	21.26 (14.76)	21.74 (14.45)	0.995 ^a

Note.

^a significance level at $p < 0.001$.

robust fit. Each item loaded appropriately onto its intended factor, with no significant cross-loadings, thereby affirming the integrity of the original three-factor model. These results validate that the IDASS-Y accurately captures the constructs of depression, anxiety, and stress as originally conceptualized by Szabo & Lovibond [34], thus making it a reliable instrument for assessing these dimensions in the adolescent population in Indonesia.

4.1. Study limitation

The present study has several limitations that warrant acknowledgment. The first limitation of this study is that the participants were drawn from the general population rather than a clinical population. This may limit the generalizability of the findings to clinical settings. Additionally, the sample was predominantly female participants, which could introduce a gender bias and affect the applicability of the results to a sample with a more balanced gender distribution. It is recommended that future studies include a more diverse sample, encompassing both clinical and general populations, and strive for a more balanced gender representation. The second limitation is that the absence of external outcome measures constrained the assessment of convergent and discriminant validity, which were assessed exclusively through CFA. It would be beneficial for future studies to incorporate additional external measures in order to enhance the validity assessment of the IDASS-Y. The final limitation is the relatively modest sample size, which, while meeting the minimum requirements, may have constrained the robustness of advanced psychometric testing, such as CFA. Larger sample sizes would facilitate more precise and reliable results. Future studies may also investigate measurement invariance across diverse ethnic groups in Indonesia. Acknowledging these limitations will guide future research to enhance the validity and generalizability of the IDASS-Y.

4.2. Study Implications

The present study validated the Indonesian version of the DASS-Y questionnaire for the assessment of depression, anxiety, and stress in Indonesian adolescents. The instrument can be utilized by clinicians for the evaluation of adolescents' mental health, with the objective of identifying potential intervention areas. The dimensions of depression, anxiety, and stress provide a framework for clinicians to develop targeted interventions. By addressing these dimensions, clinicians can facilitate enhanced mental health outcomes among Indonesian adolescents. The IDASS-Y questionnaire is a reliable instrument for measuring negative emotional states associated with depression, anxiety, and stress. Clinicians can utilize this scale to assess the impact of interventions. Future research using structural equation modelling may contribute to a comprehensive understanding of mental health among Indonesian adolescents.

5. Conclusion

The Indonesian version of the DASS-Y questionnaire has demonstrated favorable psychometric properties, indicating its validity and reliability in assessing depression, anxiety, and stress among the adolescent population in Indonesia. However, additional validation studies of this instrument are necessary to ensure its generalizability and applicability across various populations in Indonesia, particularly among diverse ethnic groups.

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CRedit authorship contribution statement

Rika Sarfika: Writing – review & editing, Writing – original draft, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Hema Malini:** Writing – review & editing, Validation, Resources, Investigation, Data curation. **Anggi Lukman Wicaksana:** Writing – review & editing, Validation, Resources, Investigation, Data curation. **Bunga Permata Wenny:** Writing – review & editing. **I Made Moh Yanuar Saifudin:** Writing – review & editing, Writing – original draft, Validation, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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