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Cross-cultural validation and psychometric properties of the DASS-21 scale in Yorùbá language

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Abstract

Purpose The main objective of this study was to translate and validate the DASS-21 for Yorùbá-speaking participants in Nigeria.

Methods The DASS-21 was translated into the Yorùbá language, involving independent translations (forward and backward) by multilingual professionals. Four hundred three Nigerian participants voluntarily participated in the study and responded to the set of questionnaires.

Results A confirmatory factor analysis showed acceptable fit for both the single-factor and three-factor models, with comparable fit indices across models. The three-factor model demonstrated good internal consistency and showed expected associations, being positively related to generalized anxiety disorder, patient health questionnaire, and negative affect, and negatively related to positive affect and flourishing.

Conclusions The findings show that the DASS-21 Yorùbá is reliable and valid for assessing both the three-factor model and overall psychological distress, and can be effectively used among Yorùbá-speaking populations. It is recommended that researchers working with Yorùbá-speaking Nigerians use this translated version of the scale to enhance understanding of the items in the local language and to obtain more accurate results.

Keywords Translation, Yorùbá language, Validation, DASS-21, Nigeria

1 Introduction

Depression, anxiety, and stress are major mental health disorders worldwide; this has been a major concern contributing to global health diseases [1]. Different studies collectively affirmed the joint contributions of depression, anxiety, and stress to mental health disorderliness, higher health care costs, as well as lower quality of life [2–4]. However, in multilingual and multicultural settings like Nigeria, linguistic and cultural barriers often hinder accurate mental health assessment, particularly among populations that do not speak English fluently [5]. This necessitates the urgent need for validated psychological assessment tools in Indigenous languages.



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The Yoruba language, spoken by over forty million people primarily in southwestern Nigeria and in diaspora communities, is one of the major languages in West Africa [6]. Although it is not an official language in any country, it is one of the three major national languages alongside Igbo and Hausa in Nigeria. Despite the vast number of speakers, there is a notable scarcity of validated psychological instruments in Yoruba. This gap impedes clinical assessments, mental health screenings, and epidemiological studies within Yoruba-speaking communities.

The majority of research on depression, anxiety, and stress in Nigeria has been done on urban or reasonably educated populations, with little focus on rural groups, according to a review of the literature. For example, Ibigbami [6] studied school-age adolescents, whereas Emmanuel [7] studied university science students. In a similar vein, Adegoke [8] gathered data from patients at the General Outpatient Department of Bowen University Teaching Hospital, Ogbomoso, where the majority belonged to the Yoruba ethnic group, and Onvishi [9] conducted their study among staff. Furthermore, healthcare professionals participated in Oyedele's study. Interestingly, the majority of participants in each of these studies spoke English in the contexts in which they were conducted.

However, mental health disorders remain underdiagnosed and undertreated, particularly in low- and middle-income countries (LMICs) like Nigeria. A major contributor to this gap is the lack of culturally and linguistically appropriate assessment tools, such as validated psychological instruments in the Yoruba language. This deficiency poses significant challenges for effective mental health screening, diagnosis, and intervention in both clinical and community settings. The Depression, Anxiety and Stress Scale (DASS), developed by Lovibond [10], is a widely used self-report instrument designed to measure negative emotional states. It is available in both a 42-item full version and a shorter 21-item format. The DASS has established psychometric robustness across countless populations and languages. To make the tool relevant and practical for Yoruba-speaking populations, it is fundamental to translate, culturally adapt, and assess its validity and reliability in this context.

The purpose of this study is to translate and validate the DASS-21 into Yoruba, offering a reliable, culturally sensitive tool for assessing depression, anxiety, and stress among Yoruba-speaking individuals in Nigeria. Culturally appropriate assessment tools are critical in diverse linguistic and cultural settings, as they enhance accurate measurement, diagnosis, and access to mental health care while facilitating cross-cultural research [11]. The DASS has been effectively translated and validated in many languages, including Spanish, Arabic, Mandarin, Swahili, Turkish, and Chinese, with studies reporting strong psychometric properties such as internal consistency and construct validity [12–15]. Nevertheless, cultural differences can modify how psychological symptoms are perceived and reported, stressing the need for thorough adaptation processes beyond literal translation.

A structured literature search was conducted across Scopus, Web of Science, PubMed, and Google Scholar using combinations of keywords ('DASS', 'Depression Anxiety Stress Scale', 'translation', 'validation', 'Yorùbá'). The search did not yield any published studies reporting a validated Yorùbá version of the DASS scale. Despite the scale's use in several studies involving English-speaking participants in Nigeria [16] Indigenous languages such as Yoruba - spoken by a significant portion of the population - remain underrepresented. While some psychological tools have been adapted for Hausa and Igbo speakers,

few efforts have focused on Yoruba, limiting access to diagnostic tools for this population. The translation and validation process entails linguistic conversion and cultural adaptation to ensure the tool's relevance, acceptability, and clarity within the target culture. Guidelines from organizations such as the World Health Organization (2016) and the International Test Commission (2017) outline steps including forward translation, back-translation, expert review, pilot testing, and psychometric evaluation. These measures ensure semantic and conceptual equivalence while safeguarding the instrument's reliability, validity, and factor structure.

By following these established protocols, this study seeks to develop a validated Yoruba version of the DASS-21, contributing to the growing demand for culturally responsive mental health assessment tools in Nigeria. The validated scale will serve as a vital resource for clinicians, researchers, and policymakers striving to improve mental health outcomes in Yoruba-speaking communities.

2 Method

2.1 Translation process of the DASS-21 Yorùbá language

We used the World Health Organization (WHO) approach to translate the Depression, Anxiety, and Stress Scale (DASS) into Yorùbá. Initially, permission was obtained from the developers of the scale to translate it into Yorùbá. We invited four interpreters to translate the DASS-21 into Yorùbá using the forward - backward translation method.

Two English-speaking interpreters independently translated the scale into Yorùbá. Then, two other interpreters, who did not see the original English version, independently translated it back into English. The original and back-translated versions were compared, and any differences and revisions were resolved through discussion (see Table 1). All translators had 5–8 years of professional experience, had a background in psychology, and held Ph.D. degrees.

2.1.1 Content validity

To determine content validity, 8 carefully selected experts in the fields of literature, language specialists, and psychometrics were asked to analyze the items. Each reviewer separately graded the clarity of each item on the bliss scale to the conceptual framework on a 4-point Likert scale (1 = not clear, 2 = somewhat clear, 3 = clear, 4 = very clear). The item-level content validity index (I-CVI) was calculated based on ratings from eight experts. Following established guidelines, items with an I-CVI of ≥ 0.78 (i.e., agreement among at least six experts) were considered acceptable [17, 18] (see Table 2).

2.2 Validation of the Yorùbá translation

2.2.1 Sample and setting

This study was conducted on Yorùbá-speaking adults from Nigeria from November 2024 to February 2025 through an online survey. The data was collected through a purposive sampling technique. During the data collection period, an invitation in the Yorùbá language discussing the purpose of the study was circulated to a total of 403 Yorùbá-speaking adult participants.

This sample size was adequate for CFA, exceeding the recommended minimum of 200 and acceptable sample-to-item ratios for stable estimates [19, 20].

Table 1 Original and the Yorùbá translated version of the DASS-21

Items	DASS – Original	DASS- Yorùbá Translation
01 (s)	I found it hard to wind down.	Ó sòro fún mi láti wó lulẹ.
02 (a)	I was aware of dryness of my mouth.	Mo mò nípa ẹnu gbígbe mi
03 (d)	I couldn't seem to experience any positive feeling at all.	Kò jọ pé mo ní ìrírí ìmọlára rere kankan rárá.
04 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	Mo ní ìrírí ìsòro àìlẹmí dádádára (fún àpẹẹrẹ mí mí gúlegúle lápọjù, àìlẹmí nígbà tí kò bá sí ìṣẹ àsekára)
05 (d)	I found it difficult to work up the initiative to do things	Ó nira fún mi láti ronú láti ṣe àwọn nìkan.
06 (s)	I tended to over-react to situations	Mo máa ń ṣe àṣejù sí àwọn ìṣẹlẹ.
07 (a)	I experienced trembling (e.g. in the hands)	Mo ní ìrírí ẹgbọn rírì (fún àpẹẹrẹ ní ọwọ)
08 (s)	I felt that I was using a lot of nervous energy	Mo rò pé mò ń lo ọpọlọpọ agbára ẹrù.
09 (a)	I was worried about situations in which I might panic and make a fool of myself	Mo ní ìdààmú ọkàn nípa àwọn ìṣẹlẹ tí ó le mú mi jáyà, kí ó sì sọ mí di ọdẹ
10 (d)	I felt that I had nothing to look forward to	Mo rò pé mi ò ní nkankan láti fojú sọ̀nà fún
11 (s)	I found myself getting agitated	Mo rí ara mí pé mò n bá ọkàn jẹ/banújẹ.
12 (s)	I found it difficult to relax	Ó nira fún mi láti sinmi
13 (d)	I felt down-hearted and blue	Mo ní ìmọlára ibànújẹ àti ipòruru ọkàn.
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	Mi ò fara mọ ohunkóhun tí kò jẹ kí n tẹ̀síwájú pẹ̀lú ohun tí mò ń ṣe.
15 (a)	I felt I was close to panic	Mo ní ìmọlára pé mo sún mọ́ ijayà.
16 (d)	I was unable to become enthusiastic about anything	Mi ò kí ní ìtara nípa ohunkóhun.
17 (d)	I felt I wasn't worth much as a person	Mo rò pé mi ò niye lórí púpọ́ gégẹ́ bí èniyàn.
18 (s)	I felt that I was rather touchy	Mo ní ìmọlára pé mò ní ìkanra.
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	Mo mò nípa ìṣesí ọkàn mí nígbà tí kò sí ìṣẹ àsekára (fún àpẹẹrẹ, ìmọlára ìlọsókè èémí ọkàn, ọkàn pàdánù ilù ọkàn kan tàbí isọ ọkàn kan)
20 (a)	I felt scared without any good reason	Ẹrù bà mí láísí ìdí kankan tò dára.
21 (d)	I felt that life was meaningless	Mo ní èrò pé ìgbésí ayé kò ní ìtumọ.

There were 198 (49.1%) males and 205 (50.9%) females. Of the total participants, 318 identified as Christians, while the remaining participants identified as Muslims. In terms of education, 13 (3.2%) participants had secondary-level education (SS1–SS3), 29 (7.2%) held an NCE, 229 (56.8%) had a degree, 79 (19.6%) had a master's degree, and 53 (13.2%) had a Ph.D. The average age and standard deviation were calculated as 38.21 years and 13.26, respectively. Informed consent was obtained from all participants before data collection, and confidentiality and anonymity of responses were ensured.

2.3 Instruments

A self-administered questionnaire comprising five sections, including DASS-Yorùbá, PHQ-9, GAD-7, SPANE, and Flourishing Scale, was used for data collection.

2.3.1 Depression, anxiety and stress scale – Yorùbá (DASS-21)

The DASS-21 Yorùbá is a translation of the original scale developed to evaluate emotional distress in three dimensions [10]: depression, anxiety, and stress, with seven items in each.

Participants were asked to self-report whether each item on the scale, which described a symptom, had applied to them in the preceding week, on a scale of 0 (did not apply to me at all) to 3.

Table 2 The relevance ratings on the item scale by eight experts

	E1	E2	E3	E4	E5	E6	E7	E8	Agree	I-CVI	UA	pc	k*
01	4	4	3	4	4	3	4	1	7	0.88	0	0.03	0.87
02	4	4	4	4	4	4	4	4	8	1.00	1	0.00	1.00
03	4	4	4	4	3	3	4	4	8	1.00	1	0.00	1.00
04	4	4	4	4	3	3	4	3	8	1.00	1	0.00	1.00
05	4	4	3	4	4	3	4	4	8	1.00	1	0.00	1.00
06	4	4	4	4	3	4	4	1	7	0.88	0	0.03	0.87
07	4	4	4	3	4	4	4	4	8	1.00	1	0.00	1.00
08	4	4	4	3	3	4	4	3	8	1.00	1	0.00	1.00
09	4	4	4	4	4	3	4	4	8	1.00	1	0.00	1.00
10	4	2	4	4	4	4	3	4	7	0.88	0	0.03	0.87
11	4	4	4	3	4	4	3	1	7	0.88	0	0.03	0.87
12	4	4	4	4	4	4	4	4	8	1.00	1	0.00	1.00
13	4	4	4	4	3	4	3	4	8	1.00	1	0.00	1.00
14	4	4	4	4	4	4	3	4	8	1.00	1	0.00	1.00
15	4	4	4	3	3	4	4	4	8	1.00	1	0.00	1.00
16	4	4	4	4	4	3	4	4	8	1.00	1	0.00	1.00
17	4	4	4	4	4	4	4	3	8	1.00	1	0.00	1.00
18	4	4	4	4	2	3	4	4	7	0.88	0	0.03	0.87
19	4	4	4	4	4	3	4	3	8	1.00	1	0.00	1.00
20	4	4	4	3	3	3	4	4	8	1.00	1	0.00	1.00
21	4	4	4	4	4	4	4	4	8	1.00	1	0.00	1.00

Avg Average, I-CVI Item-Content Validity Index, UA Universal Agreement, pc Chance Agreement, k* Modified Kappa.

2.3.2 Patient health questionnaire (PHQ-9)

The participant's health was assessed using a nine-item patient health questionnaire (PHQ-9). This questionnaire, designed by Kroenke [21], is a self-administered questionnaire that rates the criteria for depressive disorders on a range of 0 (not at all) to 3 (nearly every day). In this study, the Cronbach's α for patient health was 0.85.

2.3.3 Generalized Anxiety Disorder 7-item Scale (GAD-7).

The participants' general anxiety was measured using the Generalized Anxiety Disorder 7-item Scale, which was created by Spitzer [22]. The scale consists of seven items. The response is scored on a four-point scale that goes from 0 (not at all) to 3 (nearly every day). In this study, the Cronbach's α for GAD-7 was 0.84.

2.3.4 Scale of positive and negative experience (SPANE)

The scale of positive and negative experiences (SPANE), developed by Diner [23], was used to assess the participants' positive and negative experiences. The scale has 12 items; six items are related to positive experiences, and six are related to negative experiences. The response is scored on a five-point scale, from 1 (very rarely or never) to 5 (very often or always). In this study, the Cronbach's α for SPANE-P and SPANE-N was 0.88 and 0.75, respectively.

2.3.5 Flourishing scale (FS)

Diner [23], developed the flourishing scale (FS), which was used to quantify a single psychological well-being score that measured achievement in important areas such as relationships, self-esteem, optimism, and purpose. The scale consists of eight items. The

response is rated on a seven-point scale, from 1 (strongly disagree) to 7 (strongly agree). The lowest and highest scores vary from 8 to 56. A higher score indicates a more favorable perception of oneself in many areas of functioning, and vice versa. In this study, the Cronbach's α for FS was calculated as 0.94.

2.4 Statistical analysis

Categorical variable – Gender- was summarized using frequencies and percentages. Arithmetic means and standard deviation were used for the continuous variable - age- of the participants. The association between the variables was established through Pearson's correlational analysis. To test the reliability of the tools used, Cronbach's α was used to analyse the data. To assess the structural validity of the tool, confirmatory factor analysis was used.

3 Results

3.1 Assessing the structural validity of the DASS-21-Yorùbá language

The analyses were conducted using SPSS AMOS (Version 23). Confirmatory factor analysis was performed using the maximum likelihood estimation method. The assumption of multivariate normality was assessed using skewness and kurtosis values, which were within acceptable limits. We hypothesize that the three-factor model presented by Lovibond [10] will better reflect the data than the one-factor model (Figs. 1 and 2). Both models were compared using model fit indices such as the Comparative Fit Index (CFI > 0.90) [24], Tucker-Lewis Index (TLI > 0.90) [25], Root Mean Square of Approximation (RMSEA < 0.08) [26], and Chi-square statistics ($\chi^2/df < 5.0$) [27] (see Tables 3 and 4).

To further evaluate the underlying structure, a three-factor model comprising depression, anxiety, and stress was tested. The three-factor model demonstrated improved fit compared to the single-factor model, as indicated by higher incremental fit indices and lower error indices. Additionally, model comparison indices such as AIC and ECVI were lower for the three-factor model, suggesting better model parsimony and generalizability (see Table 4).

The one-factor model ($\chi^2 = 419.846$, $df = 189$) and the three-factor model ($\chi^2 = 419.227$, $df = 186$) were compared using a chi-square difference test. The difference was not statistically significant ($\Delta\chi^2 = 0.62$, $\Delta df = 3$, $p > .05$). Additionally, both models showed very similar fit indices (CFI: 0.925 vs. 0.924; TLI: 0.917 vs. 0.915; RFI: 0.859 vs. 0.856; SRMR: 0.039 vs. 0.039; RMSEA: 0.055 vs. 0.056; NFI: 0.115 vs. 0.087; RFI: 0.859 vs. 0.856; AIC: 0.039 vs. 0.039 & ECVI: 0.055 vs. 0.056), indicating negligible differences in model fit. These results suggest that both models provide a comparable fit to the data.

3.2 Reliability analysis of the DASS-21-Yorùbá subscales

The scale's reliability was evaluated using internal consistency and McDonald's Omega (ω). All subscales showed strong internal consistency: DASS-depression, $\alpha = 0.79$, for DASS anxiety, $\alpha = 0.83$, and for DASS-stress, $\alpha = 0.72$. whereas the McDonald's Omega (ω) calculated for these subscales is calculated as DASS-Depression, $\omega = 0.80$, for DASS Anxiety, $\omega = 0.83$, and for DASS-Stress, $\omega = 0.73$. The overall internal consistency and McDonald's Omega were calculated as $\omega = 0.916$, and $\omega = 0.92$.

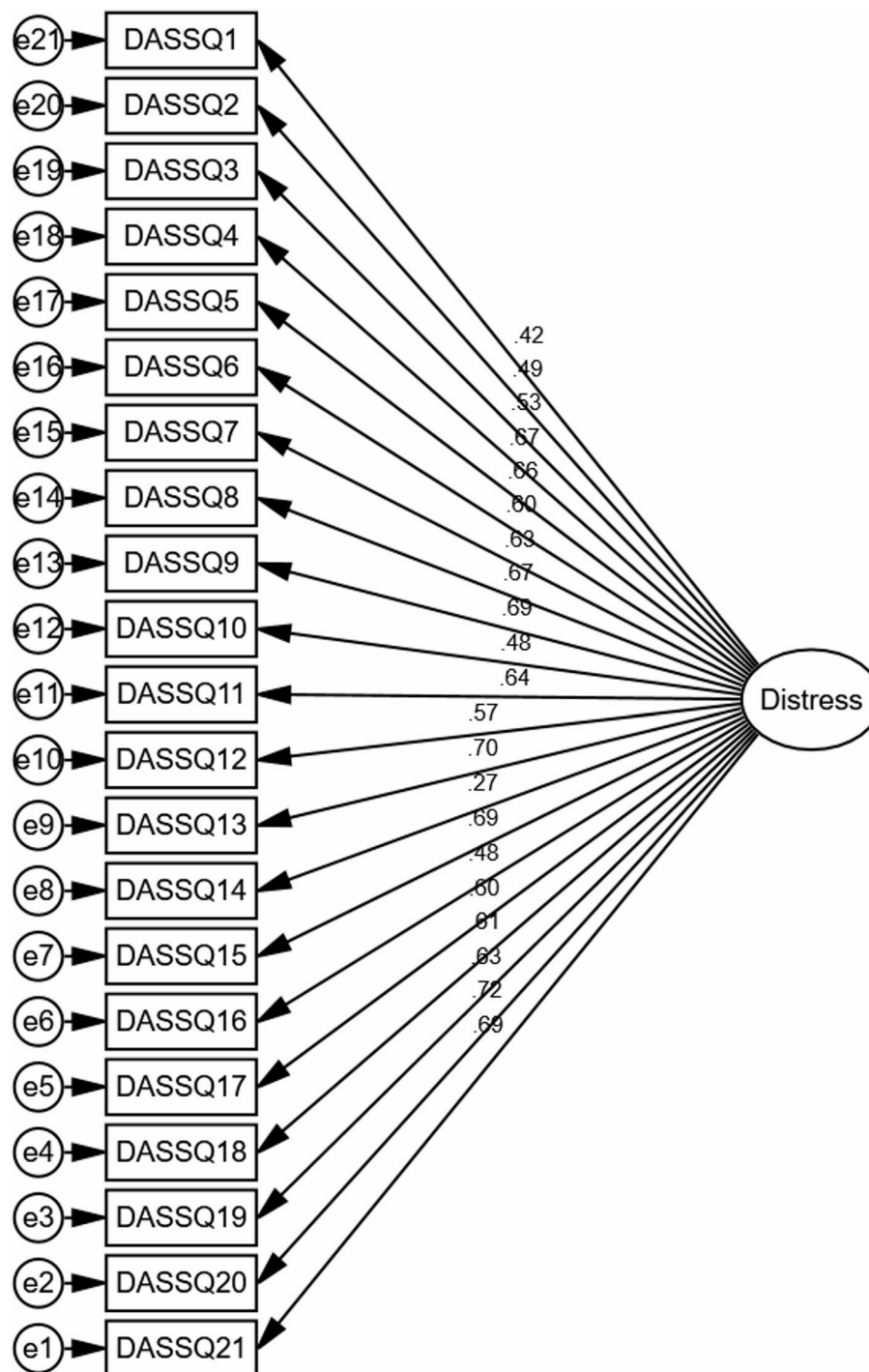


Fig. 1 Schematic representation of the one-factor model of DASS – 21 Yorùbá

3.3 Validity of the DASS-21-Yorùbá subscales

Convergent and discriminant validities were assessed by examining the associations of the DASS subscales with the Flourishing Scale, SPANE-P, SPANE-N, PHQ-9, and GAD-7. As shown in Table 5, DASS-depression demonstrated moderate positive correlations with GAD-7, PHQ-9, and SPANE-N, and weak negative correlations with SPANE-P and the Flourishing Scale.

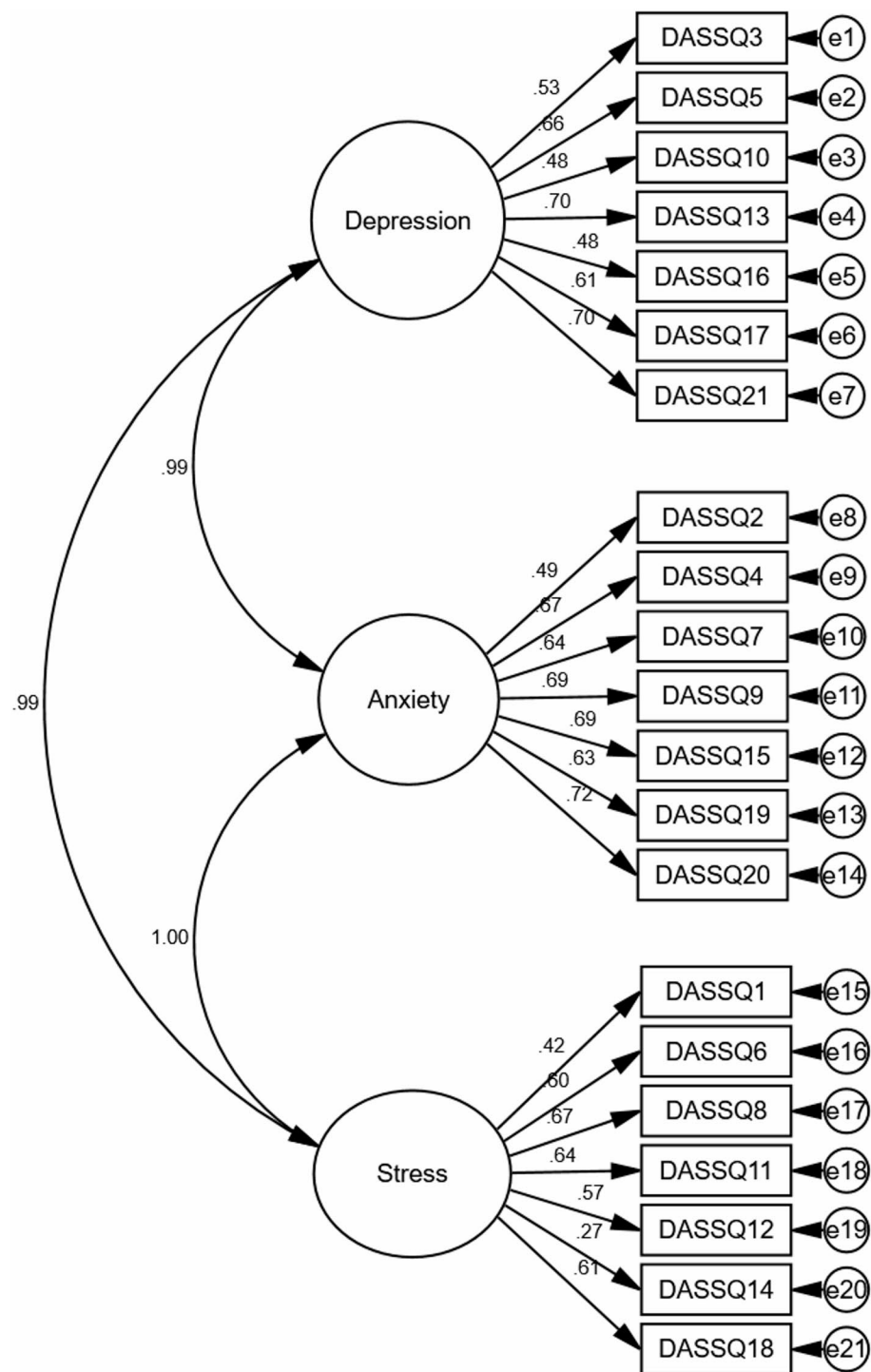


Fig. 2 A schematic view of the three-factor model of DASS – 21 Yorùbá

Similarly, DASS-anxiety showed moderate positive associations with GAD-7, PHQ-9, and SPANE-N, and moderate negative associations with SPANE-P and the Flourishing Scale.

DASS-stress also showed moderate positive correlations with GAD-7, PHQ-9, and SPANE-N, and moderate negative correlations with SPANE-P and the Flourishing Scale.

Table 3 Item-level standardized coefficient in two models of the DASS-21-Yorùbá Language

Items	One-factor model	Three-factor model
DASSQ21	0.69***	0.53***
DASSQ20	0.72***	0.66***
DASSQ19	0.63***	0.49***
DASSQ18	0.61***	0.70***
DASSQ17	0.60***	0.48***
DASSQ16	0.48***	0.61***
DASSQ15	0.69***	0.70***
DASSQ14	0.27***	0.49***
DASSQ13	0.70***	0.67***
DASSQ12	0.57***	0.64***
DASSQ11	0.64***	0.69***
DASSQ10	0.48***	0.69***
DASSQ9	0.69***	0.63***
DASSQ8	0.67***	0.72***
DASSQ7	0.63***	0.42***
DASSQ6	0.60***	0.60***
DASSQ5	0.66***	0.67***
DASSQ4	0.67***	0.64***
DASSQ3	0.53***	0.57***
DASSQ2	0.49***	0.27***
DASSQ1	0.42***	0.61***

*** $p < .001$ **Table 4** Model fit comparison in confirmatory factor analysis of the DASS-21 Yorùbá

Model	χ^2/df	p	CFI	TLI	RFI	SRMR	RMSEA	NFI	AIC	ECVI
One-factor model	2.22	< 0.001	0.925	0.917	0.859	0.039	0.055	0.115	0.039	0.055
Three-factor model	2.25	< 0.001	0.924	0.915	0.856	0.039	0.056	0.087	0.039	0.056

CFI Comparative Fit Index, TLI Tucker-Lewis Index, RFI Relative Fit Index, SRMR Standardized Root Mean Square Residual, RMSEA Root Mean Square of Approximation, NFI Normed Fit Index, AIC Akaike Information Criterion, ECVI Expected Cross-Validation Index.

Table 5 Correlation of DASS-21-Yorùbá subscales with criterion variables

Criterion variables	DASS - depression	DASS - anxiety	DASS - stress
Generalized anxiety disorder	0.482**	0.522**	0.507**
Patient Health Questionnaire	0.526**	0.581**	0.513**
Scale of positive and negative emotion-positive	-0.312**	-0.322**	-0.219**
Scale of positive and negative emotions-negative	0.435**	0.410**	0.447**
Flourishing scale	-0.284**	-0.310**	-0.266**
DASS-depression	1	0.79	0.75
DASS-anxiety		1	0.78
DASS-stress			1

These patterns support the convergent validity of the DASS subscales with related constructs (e.g., anxiety and depression symptoms) and their discriminant validity with positive psychological measures (flourishing, & positive affect).

Further, the inter-factorial validity of the scale was calculated to confirm whether the factors are correlated with one another and are measuring the same construct. The results thus obtained indicated that the factors are positively and significantly correlated with each other and that they measure the same construct (see Table 5). To further validate the findings, Average Variance Extracted (AVE) was examined. According to Fornell and Larcker, AVE values should exceed 0.5 to indicate adequate convergent validity [28].

Table 6 Convergent validity and reliability estimates

Factor	No of Items	Cronbach's Alpha	CR	AVE
Depression	7	0.79	0.76	0.61
Anxiety	7	0.83	0.84	0.73
Stress	7	0.72	0.71	0.68

CR Composite Reliability, AVE Average Variance Extracted

In this study, all AVE values were above 0.5, confirming adequate convergent validity (see Table 6).

To confirm the factor structure of the DASS-21, translated into the Yorùbá language, a confirmatory factor analysis was performed. The model fit indices suggest acceptable fit with $\chi^2 = 419.227$, $p = .001$; CMIN/DF = 2.25; GFI = 0.90; CFI = 0.92; NFA = 0.87. Additionally, the RMSEA = 0.05 and PCLOSE = 0.08, suggesting that the model fits well. Overall, these absolute and incremental fit indices are within acceptable ranges and support the validity of the models.

4 Discussion

In the present study, we aim to translate and validate the DASS-21 into the Yorùbá language-speaking population. Different psychometric properties were used to verify the reliability, validity, and confirm the factor structure of the scale. This study was completed in multiple phases, including the forward and backward translation methods. Through a multistage process, this scale was successfully translated and back-translated by bilingual and multilingual professionals who know both English and the Yorùbá language. In general, the results of the study support the applicability, reliability, as well as the validities of the translated DASS-21 scale. The results of the confirmatory factor analysis revealed that all the indices are acceptable, hence supporting the good fit. The three-factor model was supported with all indices within the range. The Cronbach's alpha coefficients range between 0.72 and 0.83, indicating good internal consistency.

We verified the three-factor model proposed by Lovibond [10] for the DASS-21, and confirmatory factor analysis demonstrated good match indices between the data from the Yorùbá version and the predicted three-factor model as compared to a one-factor model. The three subscales reflecting the three components also had high internal consistency.

The first factor in this study is “DASS-depression” with seven items that address various symptoms of depression, such as dysphoria, despair, devaluation of life, self-deprecation, loss of interest, anhedonia, and lethargy.

The second factor is “DASS-anxiety,” which has seven items that address diverse anxiety symptoms such as situational anxiety and the subjective experience of anxious affect.

The third factor is called “DASS-stress,” which has seven items that address different stress-related symptoms such as relaxation, anxious arousal, being easily disturbed, agitated, irritability, and impatience.

Confirmatory factor analysis revealed the three-factor structure, which supported the previously suggested factorial model. The scale's reliability was evaluated using Cronbach's α and McDonald's Omega, with an acceptable threshold of > 0.70 . Furthermore, the factor loadings of all 21 items are greater than 0.5. These results support the internal consistency and the structural validity of the DASS-21 Yorùbá version.

It is noteworthy to report that to confirm the convergent and discriminant validities of the DASS-21 translated scale. The data was also collected on flourishing Scale, SPANE-P, SPANE-N, PHQ-9, and GAD-7. The analysis of the convergent validity revealed a statistically significant moderate positive association of DASS-21Yorùbá-depression, DASS-21Yorùbá-anxiety, and DASS-21Yorùbá-stress with GAD-7, PHQ-9, and SPANE-N. Whereas, to establish the discriminant validity, a statistically significant moderate negative association was found between the DASS-21Yorùbá-depression, DASS-21Yorùbá-anxiety, and DASS-21Yorùbá-stress with SPANE-P, and the flourishing scale. The results support the convergent and discriminant validity of the scale.

5 Conclusion

This study translated and validated a widely used scale for depression, anxiety, and stress into the Yorùbá language. The results showed that the scale has acceptable reliability and validity and can be used with Yorùbá-speaking populations. The analysis showed that both the one-factor and three-factor models fit the data well and were very similar. The difference between the two models was not statistically significant. This means the scale can be understood either as a single measure of psychological distress or as three related factors - depression, anxiety, and stress.

Although both models performed similarly, the three-factor model was kept because it follows the original structure of the scale. Overall, the Yorùbá version of the scale is a useful tool for research and practice.

Future research should focus on cross-validation using independent samples, test-retest reliability, and measurement invariance across demographic groups. In addition, validation in clinical populations and diverse settings will further strengthen the utility and generalisability of the scale.

6 Limitations

The present study has several limitations. First, the use of non-probability sampling may limit the generalisability of the findings. Second, the cross-sectional design precludes causal interpretations. Additionally, test–retest reliability was not assessed, limiting conclusions about temporal stability. Fourth, the scale was not validated in a clinical sample, which may restrict its applicability in diagnostic settings. Finally, the use of online data collection may have excluded individuals with lower literacy levels in Yorùbá, potentially limiting representativeness.

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Permission for translation of DASS-21

Permission was obtained from Prof. Peter Lovibond, the author of the DASS, to translate and adapt the scale into the Yorùbá language.

Author contributions

MG: Writing – Conceptualization, Methodology, Formal analysis, Investigation, Writing – Original Draft, Writing – Review & Editing, Supervision, Software LOO: Writing, data collection, and translation SEB: Methodology and Investigation.

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Data availability

The data supporting the findings of this study are accessible from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The research protocol was approved by the Institutional Review Board (IRB) of GITAM in accordance with the 1964 Declaration of Helsinki and its later amendments and relevant ethical guidelines. Informed consent was obtained from all participants prior to their participation in the study. Participant confidentiality was strictly maintained, and the data were used solely for research purposes. Informed consent was obtained from all individual participants included in the study.

Consent for publication

The authors affirm that participants provided informed consent for publication of the results for research purposes.

Competing interests

The authors declare no competing interests.

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