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Development and Validation Analysis of Redeemer's University Alexithymia Scale (RUNAS)

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Abstract

Background: In Nigeria, alexithymia, "no words for feelings" is understudied and under-assessed despite its significance in physical and psychological health outcomes. This study attempts the development of a standardised alexithymia scale. **Methodology:** The development of this scale is in two phases: the first phase is the development and refinement of screening tool items and the second phase establishes the scale's psychometric properties. **Results:** The observed KMO measure of sampling adequacy is .59 with a significant Bartlett's test of sphericity (X^2 = 1022.608, df = 561, p = .000). The test of the principal components indicated twelve components extracted. Based on Principal Component Analysis, only 12 items in one component were found significant and retained as part of the final scale. The item-total statistics and Cronbach coefficient (α) of .79, a Spearman-Brown coefficient of .80, and Guttman Split-Half coefficient of .79 of the tool indicate that all items have good discrimination and should be retained. The internal consistency of RUN-PDST among the Nigerian sample revealed that the screening tool is reliable. Paired with TAS-20, RUNAS has good concurrent validity. **Conclusion:** RUNAS has appropriate psychometric properties for assessing alexithymia in Nigeria and similar cultural contexts.

Keywords

Development, Validation, Alexithymia, Screening Tool

1. Introduction

Alexithymia, a state of being "without a word for feelings" causes an individual

to experience affective and cognitive functioning and a deficit in emotional regulation (Sifneos, 1973). Alexithymia is a deficiency in emotional identification and expression (Zou et al., 2016; Paivio & McCulloch, 2004; Marty & de M'Uzan, 1963), and difficulty in distinguishing between feelings and physical sensations (Sifneos, 2000, 1996, 1973; Nemiah et al., 1976; Nemiah & Sifneos, 1970).

However, the first reports of patients who experienced difficulties describing feelings, distinguishing between feelings and bodily sensations and have a concrete and experienced-based cognitive style (Parker et al., 2003), as well as lack of empathy (Di Tella & Castelli, 2016; Swart et al., 2009), emerged at the end of the 1940s.

Alexithymia was first researched in the context of traditional psychosomatic or somatic diseases, but it is now recognised as a personality trait normally distributed in the general population; a high degree of alexithymia is a risk factor for several mental diseases and medical conditions (Luminet et al., 1999; Taylor et al., 1997).

Alexithymia is significantly correlated with depression (Afolabi & Dennis, 2020; Gao et al., 2018; Honkalampi et al., 2001), anxiety (Gao et al., 2018; Zeitlin & McNally, 1993), stress (Gao et al., 2018), mobile phone addiction (Gao et al., 2018), psychosomatic disorders (Martino et al., 2020; Marchi et al., 2019; Talamonti et al., 2017; Mazaheri et al., 2010; Willemsen et al., 2008; Duddu et al., 2003; Posse & Haellstroem, 1998; Porcelli et al., 1996), trauma (Schimmenti et al., 2017), substance use (Thorberg et al., 2009), post-traumatic stress disorder (Afolabi & Dennis, 2020; Söndergaard & Theorell, 2004), and essential hypertension (Onyedibe & Onyekwelu, 2015).

Since there is no diagnostic criterion for alexithymia, it is challenging to ascertain prevalence. However, based on previous studies, its prevalence ranges from 10% to 60% among diverse populations, including the German general population, Chilean general population, Eastern Finland general population, male patients with alcohol dependency, patients with depressive disorders, obsessive-compulsive disorders and autism spectrum disorder (Franz et al., 2008; Evren et al., 2008; Grabe et al., 2006; Mattila et al., 2006; Berthoz & Hill, 2005; Hintikka et al., 2001; Saarijärvi et al., 2001; Parker et al., 1989).

There is extensive literature on the prevalence of alexithymia in Nigeria. According to Moussa and Senol (2019), there is a high prevalence rate of alexithymia in female (68.58%) and male (66.39%) Nigerian undergraduates. Also, a high prevalence of alexithymia, 55.02%, was uncovered among people with essential hypertension in South-East Nigeria (Onyedibe & Onyekwelu, 2015).

Researchers have developed several measures of alexithymia (Preece et al., 2018). Most popular among these measures include the Toronto Alexithymia Scale (Bagby et al., 1994), Bermond-Vorst Alexithymia Questionnaire (Vorst & Bermond, 2001), and the Perth Alexithymia Questionnaire (Preece et al., 2017). There currently exists no indigenous screening tool for assessing and managing alexithymia in Nigeria. Hence, alexithymia is under-assessed, underdiagnosed,

and undertreated. Therefore, the fundamental aim of this research is to the development and validation of Redeemer's University Alexithymia Scale (RUNAS) as an indigenous measure of alexithymia.

2. Methods

The study adopted a mixed-method design to develop and validate the scale comprising two broad phases 1) development and refinement of screening tool items 2) establishment of psychometric properties. To develop scale items, extensive literature findings on research outputs from previous alexithymia studies and scale development articles were conducted to generate original items for the RUNAS scale. Authors agree on the definition of the construct and development of relatable items based on a range of scenarios based on the definition of alexithymia. Item response ranged from "1 = *Never*" to "5 = *Very Often*" in response to items that measure how in-tune the respondents are with your emotions. Thirty-four items were initially generated from this process.

After generating original items for the scale, items were statistically refined using exploratory factor analysis (EFA) to uncover the Principal Components Analysis (PCA), Bartlett's Test of Sphericity (BTS), and the Kaiser-Meyer-Olkin (KMO) data. The first phase of data collection from 89 female undergraduates of Redeemer's University was conducted in November 2020.

In establishing psychometric properties, item-total statistics, concurrent validity, norms and scoring guide were estimated. The second phase of data collection from 454 female undergraduates of Osun State University took place in May 2021. The sample size for the study's second phase is justified using the Araoye sample size determination formula for a population above 10,000 (Araoye, 2003).

The research procedure follows the guidelines of the World Medical Association Helsinki Declaration (World Medical Association, 2013) and National Code of Health Research Ethics by the Nigerian Federal Ministry of Health (2007). This study was reviewed and is approved by the Redeemer's University Internal Research Ethics Committee. Participation in this study involved no coercion, and all participants remain anonymous.

Statistical Package for Social Sciences (SPSS) version 21 was engaged for data analysis using Principal Component Analysis (PCA), Bartlett's Test of Sphericity (BTS), Kaiser-Meyer-Olkin (KMO) test, Scree plots, Varimax analysis, item-total statistics, correlation matrix, reliability coefficients, cut-off point estimation for ascertaining the psychometric properties of the scale.

3. Results

Phase One: Development and Refinement of RUNAS

The initial stage of development of RUNAS involved generating 34 items for the scale as guided by extensive literature findings and test-development ethics. All 34 items generated at this phase were administered to 89 university under-

graduates aged 16 - 25 years (Mean = 18.70; SD = 1.82) to generate data for item refinement using exploratory factor analysis (EFA). The EFA uncovered the Principal Components Analysis (PCA), Bartlett's Test of Sphericity (BTS), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of the 34 items of the RUNAS.

Results reveal a KMO measure of sampling adequacy of .59, which falls within the statistically significant range of 0 to 1. The Bartlett's test of sphericity was also significant (X^2 = 1022.608, df = 561, p = .000). These results support the factorability of the correlation matrix, signifying that the factor analysis is considered appropriate. Hence the Principal Components Analysis (PCA) was conducted.

The Principal Components Analysis indicated that the items on the scale had twelve components, and the analysis of the components revealed all items that loaded based on the presence of 12 components exceeding an eigenvalue of 1. The eigenvalues of the twelve components range between 5.969 to 1.025, with a percentage ranging from 17.557 to 3.016, as presented in Table 1.

Table 1. Summary of principal component analysis showing extracted 12 components for the 34-item measure for RUNAS.

| | | Component Matrix[a] | | | | | | | | | | | |
| | N | Component | | | | | | | | | | | |
		1	2	3	4	5	6	7	8	9	10	11	12
Most times I cannot tell what sensations I feel in my body	AS 32	.633											
I struggle when I have to give details about how I feel to others	AS 23	.571											
I sometimes find it difficult to express my excitements	AS 1	.566											
I find it challenging to connect with what others feel	AS 17	.552											
I usually get confused when asked to describe my feelings	AS 5	.542						.412					
I usually cannot identity when or why I am upset	AS 24	.539											
I will rather not show affection to others	AS 12	.523											
I usually prefer to keep conversations short and sharp	AS 27	.523											
I will rather use actions to express my emotions than verbalise them	AS 22	.503											
People complain that I do not express my emotions	AS 34	.501											.433
I cannot seem to connect my sensations to my emotions	AS 15	.494											
I find it difficult to describe how I feel to others	AS 2	.487											

Continued

I do not connect with other people easily	AS 6	.462				−.408							
Sometimes I have outbursts of anger for no significant reason	AS 11	.442						−.430					
Only weak people talk about their emotions often	AS 8	.432						.409					
Most times I am not sure what I feel on a matter	AS 21	.431											
I usually have outbursts of tears from time to time for no significant reason	AS 18												
I prefer not to bother myself with the concerns of others	AS 4		.639						−.423				
I easily imagine the hurts and feelings of others like they were mine	AS 28		.624										
I prefer to help others with physical tasks than unboxing their emotions	AS 33		.460										
I hardly get stressed	AS 13		.443										
I am usually unable to remember the contents of my dreams	AS 7												
I am more logical than emotional when faced with problems	AS 3			.593									
I will rather choose action movies over movies that depict a lot of emotions	AS 26			.409									
I keep a lot of close friends	AS 19				.602								
I prefer to face my work/duty and avoid conversations	AS 16				.440								
I do not think I entirely understood myself	AS 14					−.545							
I am often told to describe further how I feel even after I have made attempts to	AS 29		−.409			.433							
I do not see the need to play	AS 31	.407				.411							
I look forward to times when I get to unbox my feelings to others	AS 10												
I usually do not when or why others get upset with me	AS 30							.545					
Situations that make me talk about my emotions are highly distressing	AS 9	.468								.499			
I rarely have any dreams when I sleep	AS 25	.472									−.492		
I find it difficult to interact with children	AS 20											.504	
Percentage of Variance		17.557	7.907	6.147	5.625	4.853	4.578	4.246	4.044	3.903	3.616	3.454	3.016
Cumulative Percentage		17.557	25.463	31.610	37.235	42.088	46.666	50.912	54.956	58.859	62.475	65.929	68.945

Table 1 indicated that 16 of the 34 items loaded best in the first component, four items loaded best in the second component, two items loaded in the third and fourth components, 3 loaded best in the fifth component, none loaded on the sixth component, 1 item each loaded in the seventh, ninth, tenth, and eleventh components.

Of the 16 items loaded in the first component, five items loaded in more than one component, rendering those items as complex structures. One of the four items in the second component loaded in more than one component, rendering the item a complex structure. All items loaded in components three and four were retained. However, items not in the first component were not revealing any significant subsections hence a confirmatory factor analysis was further adopted to refine the scale into one component.

Also, a scree plot analysis was conducted to ascertain the scale's factorability further. In agreement with the analysis from the PCA, the scree plot confirmed a break after the first component. Hence, items beyond the first component were expunged leaving the total number of items at twelve. A summary of the items retained is presented below in Table 2.

Table 2 indicates only one component comprising 12 items. Based on this, all 12 items were retained.

Phase Two: Establishment of Psychometric Properties of RUNAS
Summary of Reliability Testing for RUNAS

A summary of the reliability details of the instrument is presented in Table 3.

Table 2. Summary of principal component analysis showing extracted 1 component for the 12-item measure for RUNAS.

Component Matrix		
	N	Components 1
Most times I cannot tell what sensations I feel in my body	AS 32	.609
I sometimes find it difficult to express my excitements	AS1	.608
I usually prefer to keep conversations short and sharp	AS27	.590
I find it challenging to connect with what others feel	AS17	.589
I struggle when I have to give details about how I feel to others	AS23	.577
I will rather not show affection to others	AS12	.570
I will rather use actions to express my emotions than verbalise them	AS22	.545
I usually cannot identity when or why I am upset	AS24	.532
I find it difficult to describe how I feel to others	AS2	.500
I cannot seem to connect my sensations to my emotions	AS15	.478
Most times I am not sure what I feel on a matter	AS21	.471
I prefer to face my work/duty and avoid conversations	AS16	.422
Percentage of Variance		20.916
Cumulative Percentage		20.916

Table 3. Item-Total Statistics for RUNAS.

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Most times I cannot tell what sensations I feel in my body	34.20	53.004	.475	.765
I sometimes find it difficult to express my excitements	34.12	51.473	.506	.761
I usually prefer to keep conversations short and sharp	34.29	54.527	.441	.769
I find it challenging to connect with what others feel	34.17	53.233	.462	.766
I struggle when I have to give details about how I feel to others	34.53	53.502	.485	.764
I will rather not show affection to others	34.13	53.186	.440	.769
I will rather use actions to express my emotions than verbalise them	34.37	54.509	.438	.769
I usually cannot identity when or why I am upset	33.99	54.511	.392	.774
I find it difficult to describe how I feel to others	34.49	55.253	.401	.773
I cannot seem to connect my sensations to my emotions	34.30	56.532	.360	.777
Most times I am not sure what I feel on a matter	34.28	56.000	.361	.777
I prefer to face my work/duty and avoid conversations	34.31	55.764	.331	.780

Using data derived from the initial sample, values of the corrected item/total correlations were used to indicate discriminations in the items in the scale. All items had values ranging between .331 - .506, indicating that all items have good discrimination and should be retained.

Furthermore, the internal consistency of RUNAS among the Nigerian sample revealed a Cronbach coefficient (α) of .79, a Spearman-Brown coefficient of .80, and Guttman Split-Half coefficient of .79, all indicating that the scale is reliable.

4. Concurrent Validity for RUNAS

For this phase of the study, four hundred and fifty-four (454) undergraduates selected from Osun State University, Osogbo, Osun State, were sampled using Redeemer's University Alexithymia Scale (RUNAS) and Toronto Alexithymia Scale (TAS-20). The Toronto Alexithymia Scale (TAS-20) developed by Bagby, Parker and Taylor (1994) is a 20-item instrument that is one of the most commonly used measures of alexithymia. TAS-20 demonstrates good internal consistency (Cronbach's alpha = .81) and test-retest reliability (.77, $p < .01$). Research using the TAS-20 demonstrates adequate levels of convergent and concurrent validity. The 3-factor structure was theoretically congruent with the alexithymia construct. In addition, it is stable and replicable across clinical and non-clinical populations.

Table 4 summarises Pearson's r of RUNAS and TAS-20 scores. Results show that a positive significant validity coefficient exists between the composite scores of RUNAS and TAS-20 (r = .496, p = .000). Results further reveal significant

validity coefficients between RUNAS and the Difficulty Describing Feeling (r = .454, p = .000), Difficulty Identifying Feelings (r = .451, p = .000), Externally Oriented Thinking (r = .364, p = .000) subscales of TAS-20. This result proves that RUNAS is a valid measure of alexithymia.

5. Calculation of Norms for the Redeemer's University Alexithymia Scale (RUNAS)

This study employed the 95% Confidence Interval method in estimating the cut-off point for RUNAS. As summarised in Table 5 with 95% confidence, the population mean is between 32.3 and 33.5 based on 454 samples [32.87 (95% CI 32.3 to 33.5)]. The lower limit of the interval (i.e., mean score minus one margin of error) of ≥ 32.3 is considered the cut-off point for the sample.

6. Redeemer's University Alexithymia Scale (RUNAS): Final Draft

Below is a Redeemer's University Alexithymia Scale (RUNAS) sample and its scoring guide. Responses are presented on a 5-point Likert scale ranging from Never to Very Often. The highest possible score on the scale is 60, while the lowest possible score of 12. The scale adopts a direct scoring pattern. Hence, the total alexithymia score is derived by summing up all responses on the scale (See Table 6 and Table 7).

7. Discussion

This research aimed to develop a tool to measure alexithymia, the inability to recognise or describe one's emotion. The study was conducted in two phases.

Table 4. Correlation matrixes of RUNAS and TAS-20.

	R	p	Mean	S.D
TAS-20	.496**	.000	55.78	11.43
Difficulty Describing Feelings	.454**	.000	13.97	3.61
Difficulty Identifying Feelings	.451**	.000	18.86	4.88
Externally Oriented Thinking	.364**	.000	22.95	5.03

Table 5. The 95% confidence interval of cut-off point determination for RUNAS.

	Sample
Margin of Error	0.58
Sample size	454
Sample mean	32.87
Standard deviation	6.35
95% Confidence Interval	32.87 (95% CI 32.3 to 33.5)
Cut-off point	≥32.3

Table 6. Redeemer's University Alexithymia Scale (RUNAS).

Instructions: This form is designed to measure how in-tune you are with your emotions. It is not a test so there are no right or wrong answers. Please answer ALL items as carefully and as accurately as you can. All responses remain strictly confidential. 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Very Often	
1 Most times I cannot tell what sensations I feel in my body	1 2 3 4 5
2 I sometimes find it difficult to express my excitements	1 2 3 4 5
3 I usually prefer to keep conversations short and sharp	1 2 3 4 5
4 I find it challenging to connect with what others feel	1 2 3 4 5
5 I struggle when I have to give details about how I feel to others	1 2 3 4 5
6 I will rather not show affection to others	1 2 3 4 5
7 I will rather use actions to express my emotions than verbalise them	1 2 3 4 5
8 I usually cannot identity when or why I am upset	1 2 3 4 5
9 I find it difficult to describe how I feel to others	1 2 3 4 5
10 I cannot seem to connect my sensations to my emotions	1 2 3 4 5
11 Most times I am not sure what I feel on a matter	1 2 3 4 5
12 I prefer to face my work/duty and avoid conversations	1 2 3 4 5

Table 7. Score guide for Redeemer's University Alexithymia Scale (RUNAS).

Rating	Scoring
Normal	≤10
Mild Alexithymia	11 - 32
Moderate Alexithymia	33 - 53
Severe Alexithymia	≥54

The first phase was the item generation and refinement with 89 sampled undergraduates, while the second phase was the establishment of the reliability and validity of the construct using 454 undergraduates. Bartlett's Test of Sphericity (BTS) and Kaiser-Meyer-Olkin (KMO) test were conducted to test for the adequacy of the sample for factorability. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to ascertain the structuring of the items. From the pool of 34 items initially generated, 12 items were appropriately loaded on a single component and explained the unidimensionality of the scale.

Contrary to previous measures that had generated varying numbers of subscales for the construct, the present study found no definite distinction among the various previously identified sub-sections like difficulty describing feelings, difficulty identifying feelings, externally-oriented thinking (Bagby et al., 1994; Preece et al., 2017), or emotionalising, fantasising, identifying, analysing and verbalising (Vorst & Bermond, 2001). If there are strong similarities among res-

pondents' experience or general appraisal of feelings, there are tendencies that the chances to have definite dimensions would be slim. Another possible reason could be that cultural perception towards describing and identifying feelings could be limited or enhanced similarly. Based on these, the measure of alexithymia in Nigeria is a unidimensional scale.

The RUNAS measure showed a good Cronbach coefficient (α) of .79, a Spearman-Brown coefficient of .80, and Guttman Split-Half coefficient of .79. The validity of the scale was established in a concurrent validity where it demonstrated good convergent validity with the 20-item Toronto alexithymia scale (TAS-20). A positive relationship was found between RUNAS and the overall score obtained in TAS-20. In addition, it was observed that the relationship between RUNAS and the three dimensions of TAS-20 were also positively significant. This implied that RUNAS reflected alexithymia as a construct and indicated the identified possible sub-sections found in literature.

Also, norms were established for RUNAS, and it was indicated that scores from individuals below the score of 10 are perceived as normal, those that scored between 11 and 32 had mild forms of alexithymia, those that scored between 33 and 53 are described as having moderate form of alexithymia, while scores 54 and above are regarded as severe.

RUNAS is a promising brief measure for the assessment of alexithymia in research and clinical practice. Despite the novelty that this study presents in the development of a standardised scale for the assessment of alexithymia, there are some limitations to the study due to requiring further research. First, only female undergraduates were used as sample for the test development and further studies is required for more inclusive sampling of general population including males, adults and clinical populations. Hence, RUNAS needs to be validated among larger and more diverse samples so as to further ascertain the viability of the scale. Also, a test-retest analysis could be incorporated in further research to determine the consistency of the scale in its measurement of the construct.

8. Conclusion and Recommendations

The study was two-phase research conducted to create an indigenous measure for alexithymia in Nigerian society. It also established the psychometric properties of the construct. The development of RUNAS serves as a more appropriate tool to measure alexithymia among Nigerian samples since it is an indigenous developed scale with items structured based on the cultural and social perception of sensations and feelings in the society. By implication, the scale could be utilised for both health management and research purposes.

However, there is still a need to undertake other studies utilising samples selected across the country (Nigeria) to establish a more generalised norm and indicate the prevalence of alexithymia within the multicultural Nigerian society. In addition, alexithymia is not a concept that could be associated with adolescents and youths alone; thus, the samples should include other categories of individu-

als if a generalisable norm is projected.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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