

Authenticating Psychometric Properties of DASS and MDI for Measuring Depression Severity among Adolescents In Ibadan, Nigeria.

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ABSTRACT: The study examined the authentication of the psychometric properties and comparative analysis of Depression Anxiety Stress Scale (DASS) and Major Depression Inventory (MDI) in measuring the severity of depression in adolescents in Ibadan, Nigeria. Beck's Cognitive Theory provided the framework while cross sectional survey design was utilized. The Multi-stage sampling procedure was adopted. One senatorial district was randomly selected out of the existing three senatorial districts in Ibadan. Four Local Government Areas (LGAs) were randomly selected using Balloting sampling. Purposive sampling was used to select 1200 participants who have been identified with depression using Beck's Depression inventory. The instruments used were Beck's Depression Inventory ($\alpha = 0.91$) to screen participants, DASS ($\alpha = 0.86$) and MDI ($\alpha = 0.78$). Four research questions were answered using Factors analysis, zero order correlation and reliability coefficient. There was a significant relationship among the factors of the DASS and MDI scales, the results showed zero order correlation and the means of the factor analysis ranged from 12.31-33.91. DASS' components reliability were: Depression ($\alpha = 0.78$), Anxiety ($\alpha = 0.70$), Stress ($\alpha = 0.72$), general reliability $\alpha = 0.86$; while MDI's components reliability were: Core symptoms ($\alpha = 0.71$), accompanying symptoms ($\alpha = 0.742$), Highest score ($\alpha = 0.812$), general reliability ($\alpha = 0.78$). DASS and MDI's percentage variance were 30.3% and 86.7% respectively, meaning that MDI was more reliable than DASS in measuring severity of depression in adolescents in Ibadan. Both DASS and MDI were reliable measure of depression among adolescents in Ibadan, with MDI as more reliable. Both scales should be adopted, but with specific attention to MDI to measure depression among adolescents in secondary schools in Ibadan.

Keywords: Stress, Anxiety, Depression severity among secondary school adolescents in Ibadan.

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I. INTRODUCTION

Depression is one of the most prevalent mental health issue affecting teenagers, youths and adolescents in our society. All over the world, adolescents are regarded as future leaders and are expected to carry the mantle of leadership and are viewed as agents of transformation and the most vibrant sub-group in the society. But it is unfortunate to note that this same group of people especially, adolescents in Nigeria are gradually expressing depression and the number of youths with depressive disorder keeps increasing per day.

In the 21st century, more and more adolescents are depressed due to challenges ranging from failure in academics, loss of parents, heartbreaks, child abuse and many more, most times a depressed person ends up either attempting suicide or actually committing suicide, which is capable of disrupting a family, organization and society at large. The prevalence of depression especially among adolescents in Nigeria is now at alarming rate. Africa as a continent was previously believed to have the highest rate of happy people, as they are very resilient and are able to create their own happiness despite the challenges they face, but research has shown that the situation is not the same again.

According to the statistics available in Africa, Djibouti has 5.1% of its population suffering from depressive disorders, Cape Verde and Tunisia both have 4.9% of its population with cases of depressive disorders, Lesotho has 4.8%, Botswana and Ethiopia have 4.7% of its population suffering from depressed moods, and in Nigeria, 3.9% of the total population suffer depressive disorders. (WHO, 2017).

Globally, 322 million people are suffering from depression (WHO, 2017), it is the leading cause of disability worldwide, and is the leading cause of disability worldwide, and is a major contributor to the overall global burden of disease, at its worst, depression can lead to suicide which the second leading cause of death in 15-29 year olds, in which the adolescence age is well represented (WHO, 2017). Studies have estimated that depression affects up to 8.3 of older adolescents, in addition, it is noted that on any single day, about 2% of school aged children and about 8% of adolescents meet the criteria for major depression (Lewinsohn, 1999).

Depression in Nigeria is more common than we think, depression is a significant public health and societal problem, and at a prevalence rate of 3.9%, 7 million Nigerians currently suffer from it. (WHO, 2017). It is a common mental disorder that presents with depressed mood, loss of interest or pleasure, decreased energy, feelings of guilt or low self esteem/self worth, disturbed sleep or appetite, and poor concentration. It leads to impairment of an individual's ability to function and carry out everyday tasks and responsibilities and could lead to suicide. Several studies conducted among different population have reported higher prevalence of depression among adolescents and young adults as 25% and 26% respectively. (Karl P, et al 2013, Sheikh et al 2015).

Although depression is a common mental disorder globally, there exists a disproportionate prevalence among genders. According to WHO, the burden of depression is 60% higher in females than in males. In Africa, 5.9% of females suffer depression, compared to 4.9% among males (WHO, 2012). Studies in Nigeria have also reported that being female is a significant risk factor of depression (Ibrahim et al, 2014). The disparity however comes as no surprise, low socio-economic status, and intimate partner violence have also been reported as important risk factors are predominantly common among females (Shittu et al, 2013), and 28% and 7% of females reported experiencing physical and sexual violence in their lifetime (National Demographic Health Survey, 2013).

Depression which is a common and serious medical illness that negatively affects an individual feels, thinks, act, which often leads to serious social and educational impairments and an increase rate of smoking substance misuse, and most suicide victims reported to have a depressive disorder at time of death. Depression can be caused by many factors and results from a complex interaction of social, psychological and biological factors which includes, people who have gone through adverse life events: Unemployment, Bereavement, Psychological trauma, academic failure, Heart Breaks, Ill Health, Terminal Illness, Stress, Financial Problems, Low self esteem/Self doubt.

The issue of illness is one of the leading causes of depression, According to research conducted in various parts of Nigeria, about 20%-59% of people living with HIV/AIDS are depressed, with the highest prevalence reported in North Central Nigeria (Obadeji, Ogunlesi, Adebowale, 2014). A study conducted in western Nigeria in 2013 also reported that as high as 44.5% of clinical patient are depressed (Shittu et al, 2014). Others studies conducted among patients with chronic illnesses like stroke, leprosy, and epilepsy have reported a prevalence rate ranging from 27.5% to 46% (National Demographic Health Survey, 2013). There are interrelationships between depression and physical health. For example, cardiovascular disease can lead to depression and vice versa.

Financial difficulties and social adversity have been associated with depression. With high poverty rate of the country, and the difficulties faced by Nigerians every day. Many Nigerians find it hard to feed well due to poverty, this can lead to depression and they lack basic needs in life like shelter, food and clothings. This may lead to borrowing or stealing. If they borrow, paying back may be a challenge; they commit suicide because they do not want to face the shame. It was reported that in 2017, a final year student of University of Nigeria, Nsukka, committed suicide because he owed a large sum of money and was threatened to pay back. He was depressed for a long time and when nothing was coming forth, he committed suicide (Vanguard, 2019; Punch, 2019). In the suicide note he wrote, he included that he could not bear the shame of being a debtor and had been depressed for a long time. It is time we address these challenges and recognize that depression is a real problem to avert the consequences that are sure to follow.

Heartbreaks are common among adolescents as most are trying to have relationship with an opposite gender, and sometimes the love once shared turns sour, in this instance both parties feel embittered and this can lead to depression (WHO, 2017). Just recently in 2017, it was reported that a student of Nigerian University who was depressed wrote a suicide note: *"My mental health has been on life support for a while now. Thanks to those who call, text or visit, speak to me. May we always remember. May we never forget..."* (The Cable, 2019).

Poor academic performances faced by adolescents in their respective schools, is likely the prevalent cause of depression among Nigerian Adolescents and the status-quo will continue to increase. It was also reported that a student of computer science in ObafemiAwolowo University, was depressed because he had an extra year and this made him commit suicide. People who are depressed do not get the help they need to manage depression. In a study by Gureje et al(2007), only 37% of adolescents with depression receive any form of treatment.

It has been noted that majority of Nigerian youths lack awareness about mental health, and available mental health services(Izibelokoand Uys (2013). With the abysmal mental health services in the country, particularly in rural areas, financial difficulties pose an additional barrier to accessing health service (Izibelokoand Uys (2013). Stigma and lack of mental health services like lack of professionals like therapists, psychologists, and also lack of mental inventories that suits the Nigerian system are some of the other various challenges usually faced in seeking and utilizing mental services. A study reported that majority of health practitioners in a health care center in Benin City have limited knowledge of depression, with 78% of them facing difficulties in working with depressed patients (James et al 2011).

Mental health services should become an integral and functional part of primary health care, to ensure universal access. There is also a need for more mental health practitioners in the country in order to meet the needs of the ever growing number of people who will need to be treated (Izibeloko and Uys (2013). It is important that health workers actively seek to diagnose depression among patients and provide the appropriate health services to ensure they get optimum treatment. This implies that general practitioners and other health care workers need to be properly and regularly sensitized about depression and other mental health disorders,

However, there is a dearth of data on depression and other mental health disorders, emphasizing the need for more research in this area, especially in developing inventories and scales to measure depression and other mental health disorders in the community, schools, as data is needed for appropriate health planning.

In the course of this study, research was carried out on depression severity in adolescents using the Depression Anxiety stress scale (DASS), and the Major depression inventory scale (MDI) to measure its severity, and then compare them so as to know their suitability for the Nigerian Adolescent. However, this study was based on the authentication of psychometrics and comparative analysis of DASS and MDI, to measure the severity of depression in adolescents.

The Becks depression Inventory (BDI) is a series of questions developed to measure the intensity, severity and depth of depression in patients with psychiatric diagnosis, the sum of all BDI item scores indicates the severity of depression (Laasa et al, 2000), this will be used to measure the severity first before the DASS and MDI are authenticated and comparatively analysed. The DASS and MDI are multiple choice self-report inventories that are used as a screening and diagnostic tool for mental health disorder and also to measure depression severity.

The DASS is made up of 42 self report items to be completed over five to ten minutes, each reflecting a negative emotional symptom. The main purpose of the DASS is to isolate and identify aspects of emotional disturbance, for example to assess the degree of severity of the core symptoms of depression anxiety or stress. While the DASS can be administered and scored by individuals without psychology qualifications, it is recommended that the interpretation and decisions based on results are made by an experienced clinician in combination with other forms of assessment (Lovibond 1995).

The MDI is a self report mood questionnaire developed by the World Health Organization. The instrument was constructed by a team led by professor Per Bech, a psychiatrist based at Frederiksborg, General Hospital in Denmark (Bech, 2001). The MDI differs from many other depression inventories such as BDI, because it is able to generate an ICD-10, or DSMIV diagnosis of clinical depression in addition to an estimate of symptom severity. (Olsen, 2003).

Previous studies have examined the utilization of DASS and MDI in a number of studies on severity of depression globally, with little attention paid to authenticating their psychometric properties, comparative analysis and cultural suitability for Nigerian adolescents. Therefore, this study was set to authenticate and compare the psychometric properties of DASS and MDI scales on the severity of depression and Nigerian adolescents.

II. RESEARCH QUESTIONS

1. What are the characteristics of DASS and MDI (mean, standard deviation, and total item correlation) for each item in both scales
2. What are the factor analysis indicative of DASS and MDI
3. Is there any significant relationship among all the components of depression scale
4. To what extent will each of the components of DASS and MDI display significant satisfactory reliability coefficient.

III. THEORETICAL FRAMEWORK

Beck's Cognitive Theory:

This study was anchored on Beck's Cognitive Theory of Depression, which studied people suffering from depression and found that depressed people appraised events in a negative way. This appraisal has been found typical of Nigerian adolescents. Beck (1967) identified three mechanisms that he thought were responsible for depression:

1. The cognitive triad (of negative automatic thinking)
2. Negative self schemas
3. Errors in logic (i.e. faulty information processing).

The Cognitive Triad is a three form of negative (i.e. helpless and critical) thinking that are typical of individuals with depression: namely negative thoughts about the self, the world and the future. These thoughts tended to be automatic in depressed people as they occurred spontaneously. For example, depressed Nigerian

adolescents tend to view themselves as helpless, worthless, and inadequate. They interpret events in the world in an unrealistically negative way, and they see the world as posing obstacles that cannot be handled.

As these three components interact, they interfere with normal cognitive processing, leading to impairments in perception, memory and problems solving with the person becoming obsessed with negative thoughts. Beck also believed that depression prone individuals develop a negative self-schema. They possess a set of beliefs and expectations about themselves that are essentially negative and pessimistic. Beck claimed that negative schemas may be acquired in childhood as a result of traumatic events. Experiences that might contribute to negative schemas include: Death of a parent, parental rejection, criticism, overprotection, neglect or abuse, bullying at school or exclusion from peer group. However, a negative self-schema predisposes the individual to depression, and therefore someone who has acquired a cognitive triad will not necessarily develop depression. Some kind of stressful life event is required to activate this negative schema later in life. Once the negative schema are activated a number of illogical thoughts or cognitive biases seem to dominate thinking. People with negative self-schemas become prone to making Logical errors in their thinking and they tend to focus selectively on certain aspects of a situation while ignoring equally relevant information.

Beck (1967) identified a number of systematic negative bias' in information processing known as logical errors or faulty thinking. These illogical thought patterns are self-defeating, and can cause great anxiety or depression for the individual. For example:

1. Arbitrary Inference: drawing a negative conclusion in the absence of supporting data
2. Selective Abstraction: Focusing on the worst aspects of any situation
3. Magnification and Minimisation: If they have a problem they make it appear bigger than it is. If they have a solution they make it smaller.
4. Personalization: Negative events are interpreted as their fault.
5. Dichotomous Thinking: everything is seen as black and white, there is no in between.

Depression in adolescents, predicts a range of mental health disorders in adult life notably, anxiety disorders, substance related disorders and bipolar disorders as well as suicidal behavior, unemployment and physical health problems, and thus an episode of depression during adolescence often heralds a chronic or relapsing disorder, and forecasts a broad range of psychosocial difficulties and ill health. The Major Depression Inventory scale MDI, and Depression Anxiety Stress Scale, DASS are most widely used psychometric tests for measuring the severity of depression.

IV. METHOD

Design

The study utilized cross sectional survey design, with the use of structured questionnaires. This is because the variable of interest had already happened or occurred in nature prior to the commencement of the study. A cross section of secondary school adolescents in Ibadan was studied.

Participants

The study population comprised of all adolescents in Ibadan. Their age spanned 13-21 years old, and resides within Ibadan. One Thousand Two Hundred (1200) secondary school adolescents were selected. The Multi-stage sampling procedure was adopted. One senatorial district was randomly selected out of the existing three senatorial districts in Ibadan. Four Local Government Areas (LGAs) were randomly selected using simple random sampling. Purposive sampling was used to select 1200 participants who have been identified with depression using Beck's Depression inventory.

Instrument

The instruments used were Beck's Depression Inventory ($\alpha = 0.91$) to screen participants, DASS ($\alpha = 0.86$) and MDI ($\alpha = 0.78$).

Beck's depression inventory scale developed by Beck was administered to the adolescents to screen the adolescents that were depressed, the criterion was based on Lassa (2000) i.e adolescents who scored above 29 were considered to have depression. It is a 21-question multiple-choice self-report inventory, one of the most widely used psychometric test for measuring the severity of depression.

The DASS scale was developed was developed by Lovibund and Lovibund (1995). The scale focused on depression, anxiety and stress. It was made up of 42 self report items to isolate and identify aspects of emotional disturbance each of which was rated on a four point scale of how much the patient had the symptoms in the last week.

The MDI is a self report mood questionnaire developed by the World Health Organization. The instrument was constructed by a team led by Professor PerBech (2001). The MDI differs from many other self-report inventories, such as the Beck Depression Inventory, because it is able to generate an ICD-10 or DSM-IV diagnosis of clinical depression in addition to an estimate of symptom severity.

Data Analysis

Descriptive statistics such as percentage, mean and standard deviation were used to describe data. Internal consistency method and factor analysis were used for the psychometric analysis. Data were analysed using Statistical Package for the Social Sciences (SPSS).

V. RESULTS

Research Question one: What are the characteristics of Depression Scale (DASS) and MDI depression scale (Means, Standard deviation and total item correlation for each item).

Table 1: Showing the descriptive statistic and inter-item correlation of each items' of DASS and MDI.

Items	DASS Scale			MDI depression scale			
	Mean	Std. Dev.	Inter-item Correlation	Items	Mean	Std. Dev.	Inter-item Correlation
1	2.61	.629	.089	1	4.46	.881	.344
2	2.18	.723	.433	2	4.18	.819	.572
3	2.54	.576	.370	3	4.25	.844	.583
4	2.46	.576	.389	4	4.07	.858	.679
5	2.50	.638	.367	5	4.25	.799	.504
6	2.43	.690	.551	6	4.07	.813	.509
7	2.54	.693	.273	7	4.14	.848	.498
8	2.57	.634	.459	8a	4.00	.943	.563
9	2.50	.638	.522	8b	3.96	.881	.324
10	2.46	.637	.275	9a	3.43	1.168	.370
11	2.36	.621	.437	9b	3.93	1.359	.200
12	2.54	.576	.425	10a	3.39	1.343	.092
13	2.46	.637	.385	10b	3.93	1.359	.259
14	2.61	.567	.359				
15	2.68	.476	-.249				
16	2.39	.629	.281				
17	2.64	.559	.078				
18	2.39	.685	.329				
19	2.29	.713	.475				
20	2.71	.535	.193				
21	2.54	.637	.324				
22	2.50	.694	.393				
23	2.29	.897	.454				
24	2.57	.634	.342				
25	2.54	.637	.412				
26	2.57	.634	.228				
27	2.43	.634	.426				
28	2.50	.638	.477				
29	2.61	.567	.099				
30	2.54	.693	.384				
31	2.43	.742	.537				
32	2.54	.693	.430				
33	2.21	.787	.741				
34	2.57	.690	.365				
35	2.43	.742	.470				
36	2.50	.694	.501				
37	2.64	.488	.469				

38	2.64	.488	.649			
39	2.54	.576	.256			
40	2.57	.573	.180			
41	2.57	.573	.133			
42	2.46	.693	.184			

Table 1 reveals the characteristics (mean, standard deviation and inter item correlation) of DASS: and MDI. For adequate selection of item; mean, standard deviation (to check for floor and ceiling effect), intra-class correlation coefficient was computed in-order to remove non-responsive items and to reduce item redundancy. The 30 items survived this section. Table 1 also shows that the 30 items retained has inter item correlation that ranges from 0.301 to 0.581 which is above 0.3 specified according to rule of thumbs ($r = 0.3$ is considered as moderate correlation (Nunnally, 1987). This justifies that DASS has good factor validity and is suitable to undergo exploratory factor analysis. Furthermore, the mean scores of DASS range from 1.97 to 3.68 while the standard deviation range from 0.83 to 1.204. This measures of central tendency indicated that the result is normal. For the MDI scale, seven items survived internal consistency reliability and the inter item correlation ranged from 0.324 to 0.679, the mean ranged from 3.39 to 4.46 while the standard deviation ranged from 0.799 to 1.359.

Research question two: What are the factors indicative of DASS and MDI scales?

Table 2 Showing KMO measures and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.676
Bartlett's Test of Sphericity	Approx. Chi-Square (DASS)	8425.583
	Df	561
	Sig.	.000

Table 2 shows the KMO measures and Bartlett's Sphericity for DASS scale. It was observed that MDI scale could not load any factor and hence did not show any factor structure, only DASS fits in the factor analysis model. To certify the assumption of factorability of DASS scale, Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity was conducted. $KMO=.676$ and Bartlett's Test of Sphericity (Approx. Chi-Square (561) = 8425.583, $p < 0.01$ for DASS and 635.323 for MDI). This reveals that the sample size was adequate enough $KMO > .6$ for both scales (Field, 2000). For the fitness of the scale, Bartlett's Test of Sphericity is significant. The overall implies an acceptable factorability potential. DASS was more significant than MDI, which implies that DASS fitted in the test of Sphericity, so it measures severity of depression more, among Nigerian adolescents, than MDI scale.

Exploratory Factor Analysis (EFA) with varimax rotation was conducted on all 42 items of the DASS scale on the three factors (Depression, Anxiety, and Stress) since MDI could not produce any factor. Factor solutions were based on the following criteria: eigen values of 2.0(although it should be 1.0) or greater, factor loadings of .40 or greater and rotated component (Cattell, 1978; DeVellis, 2003). The majority of the items initially merged into ten factors, corresponding with the postulated factor structure. Items that loaded into factors outside of the ten had loadings of less than 2.0. As a means to "clean up" the model, a factor plot in rotated factor space was conducted to determine the number of factors retained in the scale; results suggested that 3-factor models were the most appropriate fit (DeVellis, 2003).

Table 3 Showing the total variance explained by the components extracted

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.061	11.945	36.725	4.061	11.945	36.725	3.941	11.590	32.593
2	3.189	9.378	46.103	3.189	9.378	46.103	3.754	11.041	43.634
3	2.256	6.636	52.739	2.256	6.636	52.739	3.096	9.105	52.739

Extraction Method: Principal Axis Analysis.

Table 3 shows the total variance explained by the components extracted for DASS scale because only DASS scale could be extracted for Principal Axis Analysis. It was observed in table 1 that 30 items were retained for DASS while 7 items were retained for MDI, so a factor analysis of three factors produced the

cleanest factor structure for the 30-item DASS scale; the three factors accounted for some percentage of variance respectively (11.945, 9.378, 6.636) the factors combined accounted for 52.739 percent of the variance.

Table 4 Showing the Structure of Factor loading via the Extraction

	DASS scale				MDI SCALE			
	GMA	MPA	MEA	Communalities	Factor1	Fcator2	Factor3	Communalities
1	.593			.520				
2	.581			.443				
3	.521			.348				
4	.765			.683				
5	.716			.660				
6	.745			.760				
7	.734			.605				
8	.696			.526				
9	.807			.698				
10	.544			.303				
12	.701			.640				
13	.700			.524				
14	.638			.435				
15	.482			.448				
16			.757	.713				
17			.870	.806				
18				.240				
19			.855	.817				
20				.362				
21	-.494			.449				
23			.618	.625				
24		.506		.373				
25			.312	.191				
26		.899		.867				
27		.502		.305				
22		.829		.760				
12		.711		.672				

Note: Factor loadings > .30 are in boldface. GMA =8.729 ; MPA = 3.447 anxiety; MEA = 3.412

Table 4 shows the structure of factor loading through the extraction for DASS scale. It could be observed from table 4 only DASS scale survived the factor loading. After verimax rotation 27 items loaded strongly above .4(while 2 items were removed because they loaded below .4) on the three subscales (Depression, Anxiety, and Stress) of depression scale (certifying the rule of thumb). The communality reveals a high percentage of variance explained by each of the items, .303-.867(from 30.3% to 86.7%).

Research Question 3

Is there any significant relationship among all the components of DASS scale?

Table 5: Zero order correlation showing relationship among the factors of DASS scale

Factors of Scales.	Mean	Standard Deviation	1	2	3
Depression	33.91	4.625	1.000		
Anxiety	30.11	3.781	.508**	1.000	
Stress	12.31	2.036	.441**	.344**	1.000

*significant at 0.05 (2-tailed)

Table 5 reveals a significant relationship among the component of DASS (Depression, Anxiety, and Stress); this indicates that the components converge within it.

Reliability of the Scale

To examine the internal consistency of the DASS and MDI especially the surviving items, cronbach alpha was computed for each of the components of the scale after that was the final computation still using cronbach alpha and spearman correlation coefficient.

Research Question 4: To what extent will each of the components of depression scale display significant satisfactory reliability coefficient.

Table 6: showing the reliability coefficient of DASS scale

	Components of the scale (DASS)	Cronbach alpha	Components of the scale (MDI)	Cronbach alpha
1	DASS-Depression	0.771	Core Symptoms	0.711
2	DASS-Anxiety	0.702	Accompanying symptoms	0.742
3	DASS-Stress	0.721	Highest Score	0.812
Total	General reliability(DASS)	0.855	General reliability(MDI)	0.771
	Reliability Coefficient rho	0.773	Reliability Coefficient rho	0.854

o *Significant $\geq .7$

- Table 6 reveals good reliability coefficient satisfying the criteria specified by cohen (1988) and Field (2000) that says a good reliability coefficient should be 0.7 and above. These therefore indicate that the depression scales are reliable enough to be used.

VI. DISCUSSION

Research question one examined the characteristic of DASS and MDI depression scales, The mean, standard deviation and total item correlation for each items was determined. The characteristics of DASS and MDI were determined; the intra-class correlation coefficient was computed in order to remove non-responsive items and to reduce item redundancy. Lovibond (1995). The 30 items out of 42 items in DASS survived this section, the result showed that all the 30 items retained has inter item correlation that ranges from 0.301 to 0.581, and 10 items retained has inter item correlation that ranges from 0.324 to 0.679 which is above 0.3 which corroborates with Nunnally, 1987 that according to rule of thumbs ($r = 0.3$ is considered as moderate correlation, (Nunnally, 1987). This justifies that DASS has good factor validity and is suitable to undergo explanatory factor analysis. Furthermore, the mean scores of MDI ranged from 1.97 to 3.68 and the standard deviation range from 0.8 to 1.3, while the mean scores of DASS ranged from 2.18 to 2.71, and the standard deviation range from 0.4 to 0.8, this measures of central tendency indicated that the result is normal as it partially corroborates with Lovibond (1995) who stated that the standard deviation of the scores obtained should be between 0.2-0.9.

Research question two examined the factors indicative of DASS and MDI scale. To certify the assumption of factorability Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Barlett’s Test of Sphericity was conducted. $KMO=.676$ and Barlett’s Test of Sphericity (Approx. Chi-Square (561)=8425.583, $p,<0.01$) this reveals that the sample size was adequate enough $KMO>.6$ which corroborates with Scorton Field that states that for the fitness of the scale, Bartlett’s Test of Sphericity is significant, which implies an acceptable factorability potential (Scorton Field, 2000). A factor analysis of three factors produced the cleanest factor structure for the DASS scale , the factor accounted for some percentage of variance respectively (11.945, 9.378,6.636) the factors combined accounted for 52,739 percent of the variance.Explanatory Factor Analysis (EFA) with varimax rotation was conducted on all items of the MDI scale on the factors, factor solutions were based on the following criteria: eigen values of 2.0 (although it should be 1.0) or greater. the result of the findings corroborated with the factor analysis carried out by Catell, 1978; DeVellis, 2003, factor loadings of .40 or greater are rotated component of each of the variables which implies an acceptable factorability potential.

Research Question three examined the significant relationship among all the components of DASS scale. The result showed zero order correlation showing relationship among the factors of DASS scale, the means of the factor ranged from 12.31-33.91 and the standard deviation ranged from 2.036-4.625, these results were significant at 0.05 (2-tailed) which corroborates with DeVellis (DeVellis, 2003) which states that when the results of the factors are significant at 0.05 (2-tailed) this indicates that the components converge within it and reveals a significant relationship among the components of DASS.

Research Question four examined to what extent each of the components of the two depression scales (DASS&MDI) display significant satisfactory reliability coefficient. To examine the internal consistency of the DASS and MDI especially the surviving items cronbach alpha was computed for each of the components of the scale after that was the final computation still using cronbach alpha and spearman correlation coefficient. The components of the scale of DASS showed the Cronbach alpha ranging from 0.702-0.771, the general reliability was 0.855, and the spearman correlation coefficient was 0.773 while the MDI scale showed the Cronbach alpha ranging from 0.711-0.812, general reliability was 0.771 and the spearman correlation coefficient was 0.854. This reveals good reliability coefficient which corroborates with the specified by cohen(1998) and Field (2000) that says a good reliability coefficient should be 0.7 and above . These therefore indicate that the depression scales are reliable enough to be used and is suitable for the Nigerian Adolescents to measure the severity of depression.

VII. CONCLUSION

The conclusion of this study is based on findings of this study, also take into consideration additional support from research observation, the conclusions that are made

From the findings of this study, the characteristics of the scales were examined i.e. the mean, standard deviation and total item correlation of each items, which justifies that DASS and MDI has good factor validity and is suitable to undergo exploratory factor analysis which shows this result is normal. The internal consistency of the DASS and MDI especially the surviving items, were examined by using the cronbach alpha which was computed for each of the components of the scale after that was the final computation still using cronbach alpha and spearman correlation coefficient. The reliability coefficient satisfying the criteria specified by cohen (1988) and Field (2000) that says a good reliability coefficient should be 0.7 and above. These therefore indicate that the depression scales is reliable enough to be used for adolescents in secondary schools to measure the severity of depression in adolescents. The present study established the technical quality of the DASS and MDI, the process and strategic quality, however still remain to be assessed. All adolescents in this study filled out the DASS and MDI , which is a tentative indication that both scales are user friendly. This assumption should, however be tested in a less motivated population of adolescents to ensure it is actually user friendly. Whether the DASS and MDI can be implemented in a school depends for a large part on logistic aspects of administering the DASS and MDI. One procedure could be that the DASS and MDI is administered to all adolescents with mental health problems prior to the consultation with the researcher, the researcher is the able to use the information from the DASS and MDI as an aid to his/her own diagnostic process. These aspects of process quality and the utility of the DASS and MDI should be addressed in future implementation research. An important question is whether routinely administering the DASS prior to the consultation leads to a more accurate diagnosis of school counselors. Furthermore, the effect of the DASS on patient outcome also needs to be evaluated. Recognition of anxiety disorder and depression is a necessary, though not sufficient condition to improve outcome. In conclusion, the results of the present study suggest that DASS and MDI are valid instruments for use in secondary schools to measure depression in adolescent students. It can be helpful in ruling out depression and anxiety in adolescents with depression issues. The results showed confirmatory factor structure and validity of this tool for application usages and clinical diagnosis are acceptable and can be used in the Nigerian system.

VIII. RECOMMENDATION

The present research has examined the psychometric properties and comparative analysis of DASS and MDI to measure the severity of depression amongst adolescents in Ibadan north, Oyo State of Nigeria. Based on this finding of the study, the following recommendations are made:

1. DASS has been found to be internally consistent than MDI in measuring severity of depression among Nigerian adolescents, it was therefore recommended that DASS has substantive reliability and is suitable to measure depression among adolescents in Nigeria.
2. It was found that items of DASS produced the cleanest factor structure and accounted for higher percentage variance than MDI, it was therefore recommended that items of DASS can be used to collect data on depression researches among adolescents in Nigeria.
3. The finding has also revealed that DASS showed high significant relationships among its components, it was therefore recommended that DASS can be associated with other clinically validated depression related constructs to measure depression among adolescents in Nigeria.
4. The present study has found that, despite higher reliability of DASS, both DASS and MDI showed high level of coefficient alpha using Cronbach method, which implies that both scales were reliable. It was

therefore recommended that both scales are reliable enough to be used and suitable for the Nigerian adolescents to measure the severity of depression.

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