

Depression and Associated Factors Among University Students in Western Nigeria

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The aim of this study was to determine the associations between depression, sociodemographic, social and health variables among undergraduate students of Obafemi Awolowo University in Nigeria. A cross-sectional survey was conducted with undergraduate students that were recruited randomly from classes. The sample included 820 university students (54.3% men and 45.7% women), with a mean age of 22.3 years (SD=3.1). Results indicate a prevalence of 7.0% severe depression and 25.2% moderate to severe depression. In multivariate logistic regression lack of social support, having screened positive for PTSD and having a moderate to severe sleeping problem were associated with depression. Considerable rates of depression were found. Several risk factors including comorbidity (PTSD and sleeping problems) and lack of social support were identified which can be utilized in guiding interventions.

Key words: depression, risk factors, university students, Nigeria

A recent review on the prevalence of depression among university students found that reported prevalence rates ranged from 10% to 85%, with a weighted mean prevalence of 30.6% (Ibrahim, Kelly, Adams, & Glazebrook, 2013). It is suggested that university students experience rates of depression that are substantially higher than those found in the general population (Ibrahim et al., 2013). In Africa, among Egyptian university students 37% scored above the threshold for moderate depression (Ibrahim, Kelly, & Glazebrook, 2012) Ethiopian university students showed 23.6% symptoms of depression (Terasaki, Gelaye, Berhane, & Williams, 2009). Aniebue and Onyema (2008) found among 262 medical students from the University of Nigeria a prevalence of depression of 23.3%, and in another sample of university students in Nigeria a total of 101 (8.3%) students met the criteria for depressive disorder with 68 (5.6%) having a minor depressive disorder and 33 (2.7%) having major depressive disorder (Adewuya, Ola, Aloba, Mapayi, & Oginni, 2006).

Factors increasing the risk of depression in university students have been identified as follows: 1) sociodemographic factors such as older age or higher study year (Chen et al., 2013; Ibrahim et al., 2013), female gender (Adewuya et al., 2006), lower socioeconomic status (Chen et al., 2013; Ibrahim et al., 2012; Ibrahim et al., 2013; Steptoe, Tsuda, Tanaka, & Wardle, 2007); 2) stressful and traumatic life events including life stressors (Afewuya et al., 2006; Reyes-Rodríguez, Rivera-Medina,

Cámara-Fuentes, Suárez-Torres, & Bernal, 2013), gender-based violence (Gelaye, Arnold, Williams, Goshu, & Berhane, 2009), witnessing parental violence (Nicodimos, Gelaye, Williams, & Berhane, 2009), and posttraumatic stress disorder (Peltzer, 1998); 3) addictive behaviour including high level of alcohol consumption (Adewuya et al., 2006; Peltzer, 2003), smoking (Adewuya, 2006; Adewuya et al., 2006), and gambling (Moode, & Finnigan, 2006); 4) other health risk behaviour such as physical inactivity (Taliaferro, Rienzo, Pigg, Miller, & Dodd, 2009), overweight or obesity (Wilson, Gallivan, Kratzke, & Amatya, 2012; Zhao et al., 2009), HIV risk behaviour (Agardh, Canto-Graae, Ostergren, 2012; Lundberg et al., 2011), sleeping problems (Angelone, Mattei, Sbarbati, & Di Orio, 2011), nonfatal unintentional injury (Chen, Deng, Chn, Kelleher, & Xiang, 2005), and use of skin lightening products (Ladizinski, Mistry, & Kundu, 2011); 5) social variables including social support (Kim, 2001), religiosity and/or spirituality (Berry & York, 2011), low sense of control (Steptoe et al., 2007); and 6) poor academic performance (Yusoff, 2013).

Goal of the Study

Currently, there are insufficient data on university students regarding the association between depression, social and health risk variables within the West African context. Therefore, the aim of this study was to determine the association between depression, sociodemographic, social and health risk variables

among undergraduate students of Obafemi Awolowo University in Nigeria. Research questions included: 1) What is the prevalence of depression among university students? 2) What are the factors (sociodemographic, social, health risks and academic performance) associated with the prevalence of depression among university students of Obafemi Awolowo University in Nigeria?

Method

Research Design

A cross-sectional survey design was used. An anonymous, self-administered questionnaire was used to collect data.

Participants and Procedure

The sample included 820 university students (54.3% men and 45.7% women), with a mean age of 22.3 years ($SD=3.1$). Concerning the sampling procedure, one department was randomly selected from 13 faculties (with probability of selection proportional to department size) at Obafemi Awolowo University. For each selected department, undergraduate courses offered by the department were randomly ordered, with larger classes having a greater probability of being near the beginning of the list and smaller classes having a greater probability of being near the end. The study protocol was approved by the respective University Research Ethics Committees and permission was obtained from the university management. The cover pages of the questionnaires briefly explained about the study and provided instructions to the respondents on how to fill it up. It also provided information about the researchers. It also mentioned that anonymity and confidentiality would be maintained and that the participation of students was voluntary. It specified that data would be used only for research purposes. Written informed consent was taken from participating students, and the study was conducted from January to February 2013.

Measures

Centers for Epidemiologic Studies Depression Scale (CES-D). We assessed depressive symptoms using the 10-item version of the CES-D (Andresen, Malmgren, Carter, & Patrick, 1994). While the CES-D 10-item survey has not been directly compared to clinical diagnosis of major depression, the sensitivity and specificity of the CES-D 20-item survey has been reported to average 80% and 70%, respectively, compared to formal diagnostic interview (Mulrow et al., 1994). Scoring is classified from 0-9 as having a mild level of depressive symptoms, 10 to 14 as moderate depressive symptoms, and 15 representing severe depressive symptoms (Kilbourne et al., 2002). The Cronbach α reliability coefficient of this 10-item scale was 0.79 in this study.

Traumatic experiences. Participants were asked if they had ever been hit by a sex partner; forced to have sex; physically abused as a child; sexually abused as a child; and been diagnosed as HIV positive. Traumatic experience items were coded as yes/no (Kimerling et al., 2006).

Post traumatic stress disorder (PTSD). A 7-item screener ($\alpha=0.71$) was used to identify PTSD symptoms in the past month (Kimerling et al., 2006; Sikkema et al., 2007). Items asked whether the respondent had experienced difficulties related to a traumatic experience (e.g., "Did you begin to feel more isolated and distant from other people?", "Did you become jumpy or get easily startled by ordinary noises or movements?"). Consistent with epidemiological evidence, partici-

pants who answered affirmatively to at least four of the questions were considered to have a positive screen for PTSD (Kimerling et al., 2006; Sikkema et al., 2007). The Cronbach α reliability coefficient of this 7-item scale was 0.72 in this study.

Sleeping problems. The prevalence of *sleeping problems* was estimated based on the question: 'Overall in the last 30 days, how much of a problem did you have with sleeping, such as falling asleep, waking up frequently during the night, or waking up too early in the morning?' Response options ranged from 1 (none) to 5 (extreme/cannot do). Sleeping problems were defined by the response to this question with 'moderate', 'severe' or 'extreme/cannot do'.

Substance use and gambling. *Tobacco use* was assessed with the question: Do you currently use one or more of the following tobacco products (cigarettes, snuff, chewing tobacco, cigars, etc.)? Response options were "yes" or "no" (WHO, 1998). *Alcohol* consumption was measured by asking participants which of the following terms best described them: non-drinker, special occasions drinker, occasional and regular drinker. Occasional and regular drinkers were asked, "how often do you have (for men) five or more and (for women) four or more drinks on one occasion?" The *South Oaks Gambling Screen* (SOGS), a standardized measure of pathological gambling and gambling behaviours in their lifetime (Lesieur & Blume, 1987) was used to assess 9 different gambling behaviours, e.g. "Played cards for money." Response options ranged from 1=not at all to 3=Once a week or more. Students who scored positive on any of the 9 gambling behaviours were classified as engaged in gambling. Cronbach alpha for this 9 item scale was 0.86 in this sample.

International Physical Activity Questionnaire (IPAQ). Physical activity was assessed using the IPAQ short version, self-administered last 7 days (IPAQ-S7S). We used the instructions given in the IPAQ manual for reliability and validity, which is detailed elsewhere (Craig et al., 2003). To sum up the single indicators to an overall indicator of PA-related EE (Metabolic equivalent, MET min⁻¹) is a major goal of the IPAQ instruments. We used the recommended, following MET estimates of IPAQ: Vigorous PA =8 METs, moderate PA = 4 METs, walking on average = 3.3 METs. For calculating the overall METs PA, each category was multiplied with its special MET estimate value. We also used the recommended categorical score, three levels of PA (low, moderate and high) as proposed in IPAQ Scoring Protocol (short form). Low activity represented individuals who do not meet the criteria for moderate and vigorous intensity categories (< 599 MET-min/week). Moderate activity represented moderate – or vigorous -intensity activities achieving a minimum of at least 600 Met-min/week. High activity represented achieving a minimum of at least 3000 Met-min/week (Craig et al., 2003).

Anthropometric measurements. *Height* (without footwear) using a stadiometer and *weight* (without footwear and any heavy accessories) using a calibrated weighing scale was measured. Body mass index (BMI) was calculated as weight in kg divided by height in metre squared. Overweight was defined as 25 BMI and obesity=30 kg/m²

Injury. For the main outcome, study participants were asked, "During the past 12 months, how many times were you seriously injured?" (serious injury was defined as "when it makes you miss at least one full day of usual activities (such as university, sports, or a job) or requires treatment by a doctor or nurse). Eight options were provided, ranging from 1=0 times to 8=12 or more times. A response of "0" was described as not

having sustained a serious injury, while a response of one or more times was classified as having experienced a serious injury (CDC, 2009).

Other health variables included HIV risk behaviour (number of sexual partners in the past 12 months) and the use of skin lightening products in the past 12 months. In addition, self-rated academic performance was assessed with the response options ranging from 1=Excellent to 5=Not satisfactory.

Social Variables

Social support. Three items were drawn from the Social Support Questionnaire to assess perceived social support (Brock, Sarason, Sarason, & Pierce, 1996). The items were selected to reflect perceived tangible and emotional support: If I were sick and needed someone to take me to a doctor I would have trouble finding someone (reversed); I feel that there is no one I can share my most private concerns and fears (reversed); and I feel a strong emotional bond with at least one other person. These items were responded to on 4-point scales, 1 = completely true, to 4 = completely false, and summed to a score with a range of 3-12. Cronbach's alpha for this sample was 0.59.

Duke University Religion Index (DUREL). *Religiousness* was assessed with the five-item DUREL (Koenig, Meador, & Parkerson, 1997). The instrument assesses the three major dimensions of religiosity: organizational religious activity, non-organizational religious activity, and intrinsic religiosity (or subjective religiosity) (Koenig & Büssing, 2010). The DUREL measures each of these dimensions by a separate "subscale", and correlations with health outcomes are analyzed by subscale in separate models (Koenig & Büssing, 2010). Cronbach alpha for the intrinsic religiosity scale was 0.63 for this sample.

Sense of control. Sense of control was operationalized with one dimension: personal mastery. "Personal mastery refers to one's sense of efficacy or effectiveness in carrying out goals." (Lachman & Weaver, 1998). Three items measured personal mastery, e.g., "I can do just about anything I really set my mind to." (Lachman & Weaver, 1998). Respondents indicated the extent to which each of those statements described them using a 5-point scale (1 = strongly disagree and 5=strongly agree). Higher scores reflect greater personal mastery. Estimates of internal consistency (coefficient α) of the personal mastery scale were 0.63 in this study.

Socioeconomic background was assessed by rating their family background as wealthy (within the highest 25% in Nigeria, in terms of wealth), quite well off (within the 50% to 75% range for their country), not very well off (within the 25% to 50% range from Nigeria), or quite poor (within the lowest 25% in their country, in terms of wealth) (Steptoe & Wardle, 1992). We subsequently divided the students into poorer (not very well off and quite poor) and wealthier (wealthy, quite well off) categories.

Data Analysis

The data were analysed using IBM SPSS (version 20.0). First, gender differences were analysed for all depression variables using Chi-square tests. Since there were no significant gender differences in depression, subsequent models were analysed for men and women together. Logistic regression was used to identify factors that were associated with depression. Predictor variables were entered in a single step.

Results

Sample Characteristics

Of the 860 students included in the study, 820 agreed to participate in the survey, 95.3% response rate. Of the 820 students 34.2% studying in their first or second year, 29.9% the third year, and 35.9% in third or higher year, and 82.6% were from an economically well-off family background. Regarding depression, 7.0% reported severe depression and 25.2% moderate to severe depression. In all 12.7% screened positive for PTSD, 39.1% had a moderate to extreme sleeping problem, 20.4% reported at least less than monthly heavy episodic drinking, a few (2.2%) were current tobacco users and 13.7% had ever gambled. Childhood abuse was 8.5% childhood physical and 6.3% sexual abuse. Both women and men indicated that they were subjected to physical and sexual partner violence. Few (2.2%) indicated that they were HIV positive and had a history of a sexually transmitted infection (2.0%). Other health variables included that 14.2% were overweight or obese and 14.3% underweight, 48.5% engaged in low physical activity, 23.5% had sustained one or more physical injury in the past 12 months, and 33.9% had used skin lightening products in the previous 12 months (see Table 1).

Association Between Depression and Study Variables

In bivariate analyses lack of social support, lack of non-organised religious activity, lack of intrinsic religiosity, the use of skin lightening products, having screened positive for PTSD, having a moderate to severe sleeping problem and poor academic performance were associated with depression. In multivariate logistic regression lack of social support, having screened positive for PTSD and having a moderate to severe sleeping problem were associated with depression (see Table 2)

Discussion

This study found among a sample of university students in Nigeria a moderate prevalence of depression was found (7.0% for severe depression and 25.2% moderate to severe depression). This finding seems to show slightly lower rates than previously found in Africa (Adewuya et al., 2006; Ibrahim et al., 2012; Terasaki et al., 2009) and globally (Ibrahim et al., 2013).

As found in some other studies (Adewuya et al., 2006; Chen et al., 2013; Ibrahim et al., 2012, 2013; Steptoe et al., 2007), this study did not find any sociodemographic differences (age, gender, economic status) in depression prevalence. It is possible that the measurement of socioeconomic status was not sensitive enough, as almost all students classified themselves as coming from a well-off or the wealthy family background. In terms of social factors, social support and religiosity were found to be protective of depression in this study, as found in previous studies (Berry & York, 2011; Kim, 2001).

Having screened positive for PTSD and having a moderate to severe sleeping problem were found to be associated with depression in this study. Similar findings were found in previous studies (Angelone et al., 2011; Peltzer, 1998). This finding calls for a combined intervention for depression, sleeping problems and PTSD and these university students. The National Institute of Mental Health recommends that interventions be designed to prevent the onset of clinical depression in at-risk groups including College students (Buchanan, 2012). Specific traumatic experiences including childhood abuse and gender-based violence could not be identified to have been associated with

Table 1
Sample Characteristics

Socio-demographics	Total		Depression (moderate-severe)			Depression (severe)		
	N or M	% or SD	N or M	% or SD	<i>p</i>	N or M	% or SD	<i>p</i>
All	820		107	25.2		57	7.0	
<i>Gender</i>								
Female	375	45.7	110	24.7	0.706	21	5.6	0.169
Male	445	54.3	97	25.9		36	8.1	
Age in years	22.3	3.2	22.3	3.1	0.791	22.4	3.0	0.797
<i>Family background</i>								
Quite poor, Not very well off	140	17.4	39	27.9	0.487	15	10.7	0.056
Quite well off, wealthy	603	82.6	166	25.0		41	6.2	
Social variables								
Social support index (3-12)	9.1	1.7	8.8	1.7	0.001	8.5	2.0	0.004
<i>Personal mastery/sense of control</i>								
Low	113	15.3	37	32.7	0.146	11	9.7	0.269
Medium	357	48.4	90	25.2		26	7.3	
High	267	36.2	62	23.2		14	5.2	
<i>Organised religious activity</i>								
Less than once a week	263	36.9	77	29.3	0.138	31	11.8	0.001
More than once a week	450	63.1	109	24.2		22	4.9	
<i>Non-organised religious activity</i>								
Less than daily	224	31.5	73	32.6	0.024	26	11.6	0.017
Daily	249	35.1	55	22.1		14	5.6	
More than once daily	237	33.4	57	24.1		13	5.5	
<i>Intrinsic religiosity</i>								
Low	161	22.5	53	32.9	0.055	19	11.8	0.056
Medium	252	35.3	68	27.0		18	7.1	
High	301	42.2	68	22.6		17	5.6	
<i>Traumatic experiences</i>								
Ever been hit by a sex partner	47	6.3	16	34.0	0.214	7	14.9	0.043
Ever been forced to have sex	60	8.0	18	30.0	0.523	6	10.0	0.449
Physically abused as a child	64	8.5	20	31.2	0.375	5	7.8	0.949
Sexually abused as a child	47	6.3	10	21.3	0.410	4	8.5	0.758
Diagnosed HIV positive	14	2.2	1	7.1	0.110	0	0.0	0.288
Health variables								
Current tobacco use	18	2.2	8	44.4	0.059	3	16.7	0.102
Heavy episodic alcohol use	79	20.4	21	26.6	0.948	8	10.7	0.568
Gambling	113	13.8	33	29.2	0.297	13	11.5	0.040
Injury	170	23.5	48	28.2	0.571	18	10.6	0.050
<i>Body Mass Index</i>								
Normal weight	578	71.4	27	23.3	0.610	7	6.0	0.844
Underweight		116	14.4	142	24.6		41	7.1
Overweight or obese	115	14.2	33	28.7		9	7.8	
Physically inactive	397	48.5	110	27.7	0.106	31	7.8	0.359
Sexual partners two or more in the past 12 months	89	10.9	25	28.1	0.513	10	11.2	0.092
History of sexually transmitted infection	16	12.0	2	12.5	0.236	0	0.0	0.270
Use of skin lightening products in the past 12 months	260	33.9	79	30.4	0.043	26	10.0	0.029
Screened positive for PTSD	92	12.7				19	20.7	<0.001
Sleeping problem (moderate-extreme)	290	39.1	96	33.1	0.001	33	11.4	0.001
Academic performance) (very good or excellent)	269	35.7	53	19.7	0.011	11	4.1	0.019

Table 2
 Logistic Regression Analyses Predicting Depression

Socio-demographics	Crude Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI) ^a
<i>Gender</i>		
Female	1.00	---
Male	0.94 (0.69-1.29)	---
Age in years	1.01 (0.96-1.06)	---
<i>Family background</i>		
Quite poor, Not very well off	1.00	---
Quite well off, wealthy	0.87 (0.58-1.30)	---
Social variables		
Social support index	0.85 (0.77-0.94)**	0.86 (0.76-0.97)*
Personal mastery/sense of control		
Low		1.00
Medium		
High	0.89 (0.50-1.57)	0.94 (0.44-1.60)
Organised religious activity		
Less than once a week	1.00	---
More than once a week	0.77 (0.55-1.09)	---
Non-organised religious activity		
Less than daily	1.00	1.00
Daily	0.59 (0.39-0.88)*	0.81 (0.49-1.33)
More than once daily	0.66 (0.44-0.99)*	0.74 (0.44-1.27)
Intrinsic religiosity		
Low	1.00	1.00
Medium	0.75 (0.49-1.16)	0.71 (0.41-1.21)
High	0.60 (0.39-0.91)*	0.75 (0.44-1.60)
<i>Traumatic experiences</i>		
Ever been hit by a sex partner	1.49 (0.79-2.78)	---
Ever been forced to have sex	1.21 (0.68-2.15)	---
Physically abused as a child	1.29 (0.74-2.24)	---
Sexually abused as a child	0.74 (0.36-1.52)	---
Diagnosed HIV positive	0.22 (0.03-1.69)	---
Health variables		
Current tobacco use	2.42 (0.94-6.21)	---
Heavy episodic alcohol use	0.98 (0.56-1.72)	---
Gambling	1.26 (0.81-1.96)	---
Injury	0.81 (0.99-3.29)	---
<i>Body Mass Index</i>		
Normal weight	1.00	---
Underweight		0.93 (0.58-1.49)
Overweight or obese	1.24 (0.79-1.93)	---
Physically inactive	1.30 (0.95-1.78)	---
Sexual partners two or more in the past 12 months	1.18 (0.72-1.93)	---
History of sexually transmitted infection	0.42 (0.09-1.85)	---
Use of skin lightening products in the past 12 months	1.41 (1.01-1.97)*	1.35 (0.86-2.11)
Screened positive for PTSD	2.83 (1.80-4.43)***	2.53 (1.45-4.43)***
Sleeping problem (moderate-extreme)	1.79 (1.28-2.49)***	1.57 (1.05-2.37)*
Academic performance (very good or excellent)	0.63 (0.44-0.90) *	0.75 (0.48-1.19)

Note. ^aHosmer & Lemeshow Chi-square =2.94, P=0.938; Nagelkerke R² : 0.10; ***P<.001; **P<.01; *P<.05

depression, as found in some other studies (Gelaye et al., 2009; Nicodimos et al., 2009).

In bivariate analysis, the use of skin lightening products and poor academic performance were found to be associated with depression. Previous studies found that depression deteriorates cognitive functioning (Yusoff, 2013). The use of skin lightening products and its relation to depression would need further investigation. Ladizinski et al. (2011) have highlighted the psychosocial dimension of the use of skin lightening products. Unlike in some other studies (Adewuya, 2006; Adewuya et al., 2006; Agardh et al., 2012; Chen et al., 2005; Moode, & Finnigan, 2006; Lundberg et al., 2011; Peltzer, 2003; Taliaferro et al., 2009; Wilson et al., 2012; Zhao et al., 2009), this study did not find any association between a number of health related behaviours (substance use, gambling, physical inactivity, obesity, HIV risk behaviour, nonfatal unintentional injury) and depression.

Study Limitations

Limitation pertains to the generalizability of the study results, where caution should be taken when interpreting these results, as only full-time undergraduate students between the ages of 18 to 31 were included in this study. It is unknown to what extents these findings can be generalize to part-time or non-resident students. The data used in the study were obtained by self-report which could have been the result of desired participants' responses. Although the study was anonymous, the sensitive nature of the items related to sexual behaviour could have an impact on the participants' responses. Moreover, this study was based on data collected in a cross-sectional survey. We cannot, therefore, ascribe causality to any of the associated factors in the study. A further limitation was that certain mental health measures were brief screenings and may be interpreted only as indicators of poor mental health (Andresen et al., 1994; Kimerling et al., 2006).

Conclusion

Moderate rates of depression were found among the studied university student population. Several risk factors including comorbidity (PTSD and sleeping problems) and lack of social support were identified which can be utilized in guiding interventions. Coordinated mental health services to meet the needs of university students would be desirable. Coordinated mental health services to meet the needs of university students would be desirable.

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Author Notes

Partial funding for this study was provided by the South African Department of Higher Education.

