

Prevalence of Depression and Associated Factors among Medical Students in a Southern Nigerian University

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Abstract

Introduction: Medical students may be vulnerable to depression and other psychiatric morbidity. This study sought to assess the prevalence of depression and associated factors among medical students in Niger Delta University, Bayelsa State, Nigeria.

Methods: Using a self-administered, author-developed questionnaire with adaptations from the Patient-rated version of Mini-International Neuropsychiatric Interview (MINI-PR) and the Depression Anxiety Stress Scale (DASS), data including socio-demographic characteristics, alcohol use/abuse, cigarette smoking, features of depression and anxiety were collected from 243 medical students in this descriptive cross-sectional study over a period of 4 months.

Results: Of the 243 participants, 52.7% were male, mostly aged 18 to 24 years (67.1%). The incidence of depression, suicidal ideation, alcohol use, and psychoactive substance use as defined by the MINI questionnaire was 30.5%, 14.8%, 14.8%, and 9.9%, respectively. As defined by DASS 21, almost a third suffered different levels of anxiety (29.6%), and less than one-fifth reported different levels of stress (17.7%). Female gender and year of study showed a significant association with the diagnosis of depression ($\chi^2=15.75$; $p=0.008$). Living arrangement ($\chi^2=11.43$; $p=0.022$), perception of accommodation condition ($\chi^2=16.35$; $p=0.001$), academic performance ($\chi^2=18.02$; $p=0.001$), and experience of academic failure ($\chi^2=5.13$; $p=0.023$) all had a significant relationship with depression among the study population.

Conclusion: Prevalence of depression among medical students is high; its diagnosis showed a significant association with female gender, year of study, and perception of social and academic factors. Several comorbid psychiatric conditions may coexist with depression among medical students; therefore, the approach to their mental health should be holistic with attention paid to associated factors and psychiatric comorbidities.

Keywords: Depression, medical students, associated factors, psychiatric comorbidities

1. Introduction

Depression is a clinical condition characterized by a sad mood, reduction in energy levels and activity (anergia), loss of interest in pleasurable activities (anhedonia), sleep disturbances and pessimism, amongst others (Maj et al., 2020). It is also associated with an increased risk of suicide. It usually begins at a young age and runs a chronic, recurrent course with female preponderance (Marcus et al., 2020). Depression is among the leading causes of global morbidity and mortality, with a lifetime prevalence of about 5–10% in most countries. The World Health Organization estimates that about 350 million people suffer from depression globally. By 2020, it is estimated that depression will be the second most burdensome disease worldwide as measured by the Disability Adjusted Life Years (World Health Organization, 2001). It causes great suffering and economic loss to those affected and to society at large. There is also an increasing prevalence of depression among young people (Mojtabai et al., 2016; Juma et al., 2020). A comparison of mental health problems in higher education students in the United Kingdom of 2015/2016 with 2006/2007 found that the number of students disclosing mental health problems increased *fivefold*, and university deaths by suicide increased by 79% (Thorley, 2017).

Medical students are believed to be at increased risk of depression compared to other students and the general population (Dyrbye et al., 2014; Dyrbye et al., 2016). Studies from different parts of the world have shown an increased prevalence of depression among medical students (Puthran et al., 2016; Roh et al., 2010; Onyishi et al.,

2016). These range from 10–50% across the various studies (Puthran et al., 2016; Roh et al., 2010; Onyishi et al., 2016; Singh et al., 2010; Ngasa et al., 2017; Nwobi et al., 2009). A study in India found 49.1% of medical students were depressed, and with females and medical students in the first two years of study being the most affected (Singh et al., 2010). In Cameroon, Ngasa et al. (2017) noted that 30.6% of medical students in their study had depression. Nwobi et al. (2009) and Aniebue and Onyema (2008) reported a prevalence of 38.1% and 23.3% for depression among medical students in Nigeria. They found depression prevalence was higher among females and associated with examination failures, irregular lectures, inadequate accommodation, academic stress, parental pressures, and financial difficulties (Nwobi et al., 2009; Aniebue & Onyema 2008). Depression has also been linked to elevated stress, sleep deprivation, substance use, and suicidality among different groups of medical students (Dyrbye et al., 2014; Onyishi et al., 2016; Aniebue & Onyema, 2008). Several studies report higher depression and stress among students in the first and second years of study, possibly because they are new in the system and still adjusting to the academic pressure (Roh et al., 2010; Onyishi et al., 2016).

Depression among medical students should be of significant concern to all because such may lead to poor academic and clinical performance and sometimes continue until they graduate as medical doctors. The consequences could include poor productivity, medical errors, and attendant negative outcomes associated with “the impaired Physician.” (Bulent et al., 2017) It is therefore important to investigate depression among medical students with a view to early detection and proffering possible solutions. This becomes even more relevant in developing countries like Nigeria with scanty information on this subject.

Most previous studies assessing depression in medical students and medical doctors made use of less validated instruments (Onyishi et al., 2016; Nwobi et al., 2009; Aniebue & Onyema, 2008; Falade et al., 2020; Issa et al., 2014; Pettersson et al., 2015). In an analysis of twenty instruments frequently used in case finding, diagnosis, and severity grading of major depression, only the Structured Clinical Interview for DSMIV-Axis-I Disorders (SCID-I), Mini International Neuropsychiatric Interview (MINI), and Patient Health Questionnaire-9 (PHQ-9) fulfilled the minimum criteria for sensitivity and specificity (Pettersson et al., 2015). This study was conceptualized to assess the prevalence of depression and associated factors among medical student populations in Niger Delta University, Bayelsa State, Nigeria using diagnostic and widely validated instruments.

2. Materials and Methods

2.1 Study Area

The study conducted was carried out at the pre-clinical lecture theatre of the College of Health Sciences, Niger Delta University (NDU), Amassoma, and also the lecture rooms of the Niger Delta University Teaching Hospital Okolobiri (NDUTH), all in Bayelsa State, Nigeria. The NDU is located at Amassoma in Bayelsa state. The state is located in the heart of the oil-rich Niger Delta region and the South-South geopolitical zone, sharing a boundary with the Atlantic Ocean. It is riverine and mainly inhabited by the Ijaw tribe but also home to other Nigerians and foreigners. The university shows such diversity in its students’ population also. The NDUTH is located at Okolobiri community which is about 20 minutes’ drive from Yenagoa, the state capital. It renders specialized clinical care to residents of Bayelsa state and neighboring states. It also serves as a center for clinical training and research. The pre-clinical students were studied at the pre-clinical lecture theatres Amassoma, while the clinical students were studied in the lecture rooms of the NDUTH Okolobiri (NDU, 2020).

2.2 Study Design

The study was a descriptive cross-sectional study. Data collection occurred for a duration of 4months between August and November 2018.

2.3 Study Population

The study involved all medical students at all levels of study (clinical and pre-clinical) that gave informed consent to be part of the study. Only students who give voluntary consent were recruited for the study.

2.4 Sample Size

We calculated sample size using the formula for estimation of proportion (Eng, J. 2003)stated below with the prevalence of depression in Nigeria (23.3%) as reported by Aniebue et al., 2008, this gave a value of 275 participants.

$$N = \frac{Z^2PQ}{d^2}$$

where N = number of participants, Z= 1.96, P= prevalence (23.3% or 0.233) and D = 0.05. However, the above

estimated minimum sample size is true for populations greater than 10,000. The total population of medical students in the university was estimated to be about three hundred students, with an average of fifty students in each grade of student. Therefore, the sample size is adjusted using a correction formula for desired sample size calculation when a population is less than 10,000 (Bartlett et al., 2001; Mahajan et al., 2010). This is expressed as:

$$n = \frac{N_0}{1 + \frac{N_0 - 1}{N}}$$

where, n = adjusted sample size; N_0 = sample size estimate for population size greater than 10,000 (275); N = Total population of persons with the variable of interest who are the medical students (300 students). Substitution yielded a minimum sample size of 143 participants for the study. We also corrected for non-response using a non-response rate of 20%. The 20% of 143 is approximately 29; hence the final minimum sample size of 172 was obtained for the study. However, we eventually sampled a total of 243 medical students at NDU.

2.5 Sampling Technique

A probability sampling technique, simple random sampling (balloting) was deployed to recruit participants from each level of study. The number on the class attendance register was used to represent each member's unique identifier for the study.

2.6 Study Instrument

The study instrument for this study was a 3-section questionnaire developed by the researchers with a total of 82 items comprising of different validated tools which have been used in different settings to assess depression and associated factors. Section One of the study tool collected data on socio-demographic characteristics, level of study, living arrangement, accommodation conditions, socioeconomic class, financial pressure, and academic performance of participants. Section Two contained the Patient-rated version of Mini-International Neuropsychiatric Interview (MINI-PR) (Roh et al., 2010, Sheehan et al., 1998, Aguocha et al., 2015) exploring features of depression, suicidal ideation, alcohol, and substance use/abuse. This was used to diagnose depression among participants. The Depression Anxiety Stress Scale (DASS) investigates the levels of stress and anxiety among participants and forms the Section Three of the study tool. These instruments have been widely used and validated in the assessment of depression, substance/alcohol use and abuse, anxiety, and stress in our locality ((Roh et al., 2010; Sheehan et al., 1998; Aguocha et al., 2015; Lovibond et al., 1995; Oladiji et al. 2009).

2.7 Study Procedure

Two trained research assistants in collaboration with the two principal investigators collected data for the study. The research assistants were recruited from medical officers working in the Internal medicine department of the Niger Delta University Teaching Hospital (NDUTH). The training involved explaining the different items on the questionnaire to the research assistants to ensure they understood the response each item on the questionnaire was designed to elicit. The objectives and procedure for sampling and seeking consent for the study were also enumerated during the training. Before the data collection proper, the various class representatives were intimated with the objectives, purpose, and benefit of the study, hence their support was secured, and they helped organize class members who had the questionnaire administered to them during their breaks.

The questionnaires were given to the recruited members of each class to self-administer it on themselves. On the return of the questionnaire, each questionnaire was cross-checked to make sure it was properly filled. Each questionnaire took no more than 15 minutes to complete. Research assistants who had been trained by the authors and the authors themselves were available to assist participants where necessary in filling the questionnaires. Anonymity and confidentiality were upheld. The questionnaires were pretested prior to the commencement of the study at the University of Benin among 3rd year medical students to further ensure the reliability and validity of the questionnaire.

2.8 Data Analysis

Data were analyzed using the Statistical Package for Social Sciences version 23 (SPSS 23) (Bryman & Cramer 2013). Categorical variables were summarized in frequencies and percentages, and relationships between socio-demographic characteristics, financial pressure, living arrangement, academic performance, and depression were explored using the Chi-square tests of proportion. The level of significance was set at ≤ 0.05 (at 95% Confidence Interval).

2.9 Ethical Issues

The study was conducted in accordance with the Helsinki declaration, (World Medical Association Declaration of Helsinki, 2013) and ethical clearance was obtained from the Research and Ethics committee of the Niger Delta University Teaching Hospital. Voluntary written informed consent was obtained from the study participants. All data was handled with strict confidentiality.

3. Results

3.1 Socio-Demographic Characteristics of Participants

Of the 243 participants in the study, 52.7% were male medical students, and most were aged 18 to 24 years (67.1%), single (94.2%), Christian (97.5%), and in the first year of study (24.3%).

Table 2 revealed that most students live in the hostel (42.0%) and consider their accommodation conditions fair (49.0%). About half think they suffer moderate financial pressure. While 43.2% of the study population considers their academic performance of average standard, about a third has experienced academic failure in medical school (32.9%).

3.2 Prevalence of Depression, Suicidal ideation, Alcohol, and Psychoactive Substance Use

Table 3 shows that the incidence of depression, suicidal ideation, alcohol use, and psychoactive substance use as defined by the MINI questionnaire is 30.5%, 14.8%, 14.8%, and 9.9%, respectively. The incidence of other classifications of these medical conditions is shown in Table 3.

Table 4 highlights the incidence of depression, anxiety, and stress as defined by the DASS 21 questionnaire. Depression as defined by DASS 21 is seen in about a quarter of participants, while almost a third suffer different level of anxiety (29.6%), less than one-fifth reported different levels of stress (17.7%).

3.3 Relationship between Depression and Independent Variables in the Study

Table 5 shows the relationship between depression and socio-demographic characteristics of the study participants. Female gender and the year of study show a significant association with the diagnosis of depression ($X^2=3.80$; $p=0.051$, $X^2=15.75$; $p=0.008$, respectively).

Table 6 reveals that living arrangement ($X^2=11.43$; $p=0.022$), perception of accommodation condition ($X^2=16.35$; $p=0.001$), academic performance ($X^2=18.02$; $p=0.001$) and experience of academic failure ($X^2=5.13$; $p=0.023$) all have significant relationship with depression among the study population.

Table 1. Sociodemographic characteristics of study participants

Characteristics	Frequency (n = 243)	Percent (%)
Sex		
Female	115	47.3
Male	128	52.7
Age group		
18 - 24 years	163	67.1
25 - 29 years	51	21.0
30 - 34 years	15	6.2
≥ 35 years	14	5.8
Religion		
Christian	237	97.5
Others	6	2.5
Marital Status		
Married	14	5.8
Single	229	94.2
Socioeconomic status		
High	10	4.1

Middle	193	79.4
Low	40	16.5
Level of Study		
100	59	24.3
200	26	10.7
300	35	14.4
400	47	19.3
500	25	10.3
600	51	21.0

Table 2. Distribution of conditions that can trigger depression among study participants

Characteristics	Frequency (n = 243)	Percent (%)
Living arrangement		
Live alone	60	24.7
Live with Student	21	8.6
Live with Parents	10	4.1
Live in Hostel	102	42.0
Live outside	50	20.6
Perception of Accommodation condition		
Satisfactory	90	37.0
Just fair	119	49.0
Unsatisfactory	31	12.8
Deplorable	3	1.2
Financial Pressure		
High	58	23.9
Moderate	129	53.1
Low	32	13.2
None	24	9.9
Academic Performance		
Excellent	16	6.6
Good	116	47.7
Average	105	43.2
Below average	3	1.2
Poor	3	1.2
Have you experienced Academic failure in the Medical School?		
No	163	67.1
Yes	80	32.9

Table 3. Depression, Suicidality, Alcohol and Psychoactive substance use disorder as classified by MINI Scale

Characteristics	Frequency (n = 243)	Percent (%)
Depression		
Major Depressive Episode, Current	74	30.5
Major Depressive Episode, Recurrent	70	28.8
Depression with Melancholic features	65	26.7
Suicidality		
Suicide ideation	36	14.8
Suicide Risk, Current		
No risk	207	85.2
Low risk	27	11.1
Moderate risk	5	2.1
High risk	4	1.6
Alcohol Abuse and Dependence		
Alcohol Use	36	14.8
Alcohol abuse, current	14	5.8
Alcohol dependence, current	12	4.9
Psychoactive Substance Use Disorder		
Psychoactive substance Use	24	9.9
Psychoactive substance use disorder	13	5.3
Psychoactive substance use Abuse	9	3.7
Psychoactive substance use Dependence	5	2.1

Table 4. Depression, Anxiety and Stress as classified by DASS 21

Characteristics	Frequency (n = 243)	Percent (%)
Depression		
Normal	181	74.5
Mild Depression	26	10.7
Moderate Depression	15	6.2
Severe Depression	9	3.7
Extreme Severe Depression	12	4.9
Anxiety		
Normal	171	70.4
Mild Anxiety	13	5.3
moderate Anxiety	28	11.5
Severe Anxiety	12	4.9
Extreme Severe Anxiety	19	7.8
Stress		
Normal	200	82.3
Mild Stress	16	6.6
Moderate Stress	11	4.5
Severe Stress	10	4.1
Extreme Severe Stress	6	2.5

Table 5. Relationship between depression and Socio-demographic characteristics of Study participants

Characteristics	Depression			X^2	df	pValue
	Total N = 243 (%)	Yes N = 74 (%)	No N = 169 (%)			
Sex						
Female	115 (47.3)	42 (56.8)	73 (43.2)	3.80	1	0.051
Male	128 (52.7)	32 (43.2)	96 (56.8)			
Age group						
18 - 24 years	163 (67.0)	57 (77.0)	106 (62.7)	5.97	3	0.113
25 - 29 years	51 (21.0)	13 (17.6)	38 (22.5)			
30 - 34 years	15 (6.2)	2 (2.7)	13 (7.7)			
≥ 35 years	14 (5.8)	2 (2.7)	12 (7.1)			
Religion						
Christian	237 (97.5)	72 (97.3)	165 (97.6)	0.02	1	0.877
Others	6 (2.5)	2 (2.7)	4 (2.4)			
Marital Status						
Married	14 (5.8)	2 (2.7)	12 (7.1)	1.83	1	0.176
Single	229 (94.2)	72 (97.3)	157 (92.9)			
Socioeconomic status						
High	10 (4.1)	3 (4.1)	7 (4.1)	2.07	2	0.344
Middle	193 (79.4)	55 (74.3)	138 (81.7)			
Low	40 (16.5)	16 (21.6)	24 (14.2)			
Level of Study						
100	59 (24.3)	20 (27.0)	39 (23.1)	15.75	5	0.008*
200	26 (10.7)	16 (21.6)	10 (5.9)			
300	35 (14.4)	10 (13.5)	25 (14.8)			
400	47 (19.3)	11 (14.9)	36 (21.3)			
500	25 (10.3)	6 (8.1)	19 (11.2)			
600	51 (21.0)	11 (14.9)	40 (23.7)			

Table 6. Relationship between depression and perception of social and academic factors

Characteristics	Depression			X^2	df	pValue
	Total N = 243 (%)	Yes N = 74 (%)	No N = 169 (%)			
Living arrangement						
Live alone	60 (24.7)	13 (17.6)	47 (27.8)	11.43	4	0.022*
Live with Student	21 (8.6)	10 (13.5)	11 (6.5)			
Live with Parents	10 (4.1)	4 (5.4)	6 (3.6)			
Live in Hostel	102 (42.0)	38 (51.4)	64 (37.9)			
Live outside	50 (20.6)	9 (12.2)	41 (24.3)			
Perception of Accommodation condition						
Satisfactory	90 (37.0)	20 (27.0)	70 (41.4)	16.35	3	0.001*
Fair	119 (49.0)	35 (47.3)	84 (49.7)			
Unsatisfactory	31 (12.8)	16 (21.6)	15 (8.9)			
Deplorable	3 (1.2)	3 (4.1)	0 (0.0)			

Financial Pressure						
High	58 (23.9)	20 (27.0)	38 (22.5)	3.45	3	0.327
Moderate	129 (53.1)	36 (48.6)	93 (55.0)			
Low	32 (13.2)	13 (17.6)	19 (11.2)			
None	24 (9.9)	5 (6.8)	19 (11.2)			
Academic Performance						
Excellent	16 (6.6)	2 (2.7)	14 (8.3)	18.02	4	0.001*
Good	116 (47.7)	30 (40.5)	86 (50.9)			
Average	105 (43.2)	36 (48.6)	69 (40.8)			
Below average	3 (1.2)	3 (4.1)	0 (0.0)			
Poor	3 (1.2)	3 (4.1)	0 (0.0)			
Have you experienced Academic failure in the Medical School?						
No	163 (67.1)	42 (56.8)	121 (71.6)	5.13	1	0.023*
Yes	80 (32.9)	32 (43.2)	48 (28.4)			

4. Discussion

Stressors such as higher academic requirements, social and emotional adjustments, new found independence, socioeconomic challenges, and time management pressure may be associated with university learning (Mutambara & Bhebe, 2012; Rice, 2009). Medical students, in particular, are typically faced with these and several other challenges, including; a large academic workload, several qualifying examinations that determine whether or not they proceed to clinical classes, in addition to the pressures of the clinical environment (Moir et al., 2018; Brazeau et al., 2014; Oku & Owoaje, 2015; Martin, 1997; Sreeramareddy et al., 2007; Gureje et al., 2006). The present study found that major depressive episodes, suicidal ideation, alcohol use, and psychoactive substance use among medical students were 30.5%, 14.8%, 14.8%, and 9.9%, respectively, as defined by the MINI questionnaire among study participants. The patient-rated version of Mini International Neuropsychiatric Interview (MINI-PR) used to diagnose depression among participants in this study is widely used and validated instrument (Puthran et al., 2016; Sheehan et al., 1998; Aguocha et al., 2015).

The incidence of major depressive episodes (MDE) in the medical students in this study is at least ten times higher than the general population (Gureje et al., 2006) with results from the Nigerian Survey of Mental Health and Well-being (2002/2003) showing lifetime and 12-month estimates of MDE of 3.1% and 1.1% respectively in the general population (Gureje et al., 2006) and the MDE found to be highly comorbid with anxiety disorder. A review of studies from 1990 and 2010 reporting on depression prevalence among university students suggests they experience rates of depression substantially higher than those found in the general population with reported prevalence rates ranging from 10% to 85% with a weighted mean prevalence of 30.6% (Ibrahim et al., 2013). A recent meta-analysis showed depression affected approximately a third of medical students worldwide, and other psychological difficulties, such as anxiety, suicidal thoughts, burnout, and substance abuse, may accompany depressive symptoms in these students (Rotenstein et al., 2016). This is similar to findings in the present study, which showed almost a third of the medical students suffered different levels of anxiety (29.6%) while less than one-fifth reported different levels of stress (17.7%) as defined by DASS 21.

A comparison of mental health problems in higher education students in the UK of 2015/2016 with 2006/2007 found that the number of students disclosing mental health problems increased fivefold, and university deaths by suicide increased by 79% (Thorley 2017). Medical students are required to assimilate tremendous amounts of information, spend more years in training than their peers in most other disciplines, recall information from prior courses and score high grades in continuous assessments and examinations (Rotenstein et al., 2016). Some may struggle with the large medical curriculum, and these pressures may result in psychiatric morbidities (Falade et al. 2020). The present study found that perception of academic performance and the experience of academic failure had significant relationships with depression among the study population. This finding is similar to previous studies in both medical and non-medical students (Nwobi et al., 2009; Aniebue & Onyema, 2008; Falade et al., 2020; Khan et al., 2018). Falade et al. 2020 in a study involving 944 medical students found a 25.0% prevalence of psychiatric morbidity among the respondents, and associated independent factors also included; being a student of a private institution, average academic performance, and below-average academic performance. Using a

cross-sectional design, Khan et al. (2018) collected data on several stressors psychiatric morbidities from 379 students. The stressors included workload, emotional and interpersonal demands, while the psychiatric morbidities included depression, anxiety, and social dysfunction. They found the perceived stressors and symptoms of mental illness were negatively related to the students' academic performance.

Living arrangements and perception of accommodation conditions were also significantly associated with depression. Our findings are also similar to previous findings by Nwobi et al. (2009); and Aniebue, and Onyema (2008) who also found depression prevalence was also associated with the perception of inadequate accommodation. Research shows satisfaction with one's living environment provides a buffer against poor mental health in everyday life, while dissatisfaction with accommodation/living arrangement can pose a significant risk to a person's mental health (World Health Organization & Calouste Gulbenkian Foundation, 2014).

In assessing the relationship between depression and socio-demographic characteristics of the study participants, both female gender and year of the study show a significant association with the diagnosis of depression. Similar to our study, which found depression was common in the lower classes, several studies report higher depression and stress among students in the lower classes, especially the first and second years of study (Roh et al., 2010; Onyishi et al., 2016; Zoccolillo et al., 2006; Basnet et al., 2012) possibly because they are new in the system and still adjusting to the academic pressure. In a survey carried out among the undergraduate medical students in Nepal (Basnet et al. 2012), the prevalence of depression in the first and third year was 36.74 and 22.22 percent, respectively. Both the first and third-year students attributed mostly academic stress and a hectic lifestyle as the major stress-inducing factors (Zoccolillo et al., 2006). However, students are likely to learn to adopt active coping strategies such as positive framing, leisure activities, talking to family and friends, and exercising (Pierceall et al., 2007; Bamuhair et al., 2015) to deal with stress, by their final year of medical school than in earlier years (Puthran et al., 2016).

Contrary to this, some researchers suggest that the mental health of medical students' declines with increasing years of study and continues to decline as trainees enter the workforce (Aguocha et al., 2015). A meta-analysis by Dyrbye et al 2005 showed that medical students at the start of medical school have similar mental health profile as their non-medical peers (Dyrbye et al., 2005; Carson et al., 2000). The decline in higher years and even post qualification decline may be attributable to various sources of stress, some of which include the increased academic workload, concern for academic performance, and the pressure of several qualifying examinations that determine academic and career progression (Sheehan et al., 1998; Guthrie et al., 1995; Cohen et al., 2005).

Similar to our findings, several studies show gender differences in the diagnosis of depression, with female medical students experiencing more depression than males (Singh et al., 2010; Nwobi et al., 2009; Aniebue & Onyema, 2008; Dahlin et al., 2005, Ibrahim et al., 2015). The trend that females medical students experience more depression than males may be because they tend to be more concerned about working hard to secure higher marks in exams, are more competitive and concerned about their academic performance, may exaggerate their sadness, and tend to be less engaging with exercise (Inam et al., 2003; Zaid et al., 2007).

The incidence of suicidal ideation among medical students in the present study was 14.8%. Suicidal ideation refers to thoughts about suicide, that may deliberately be constructed to fail or be discovered or may fully be intended to succeed (Aqeel et al., 2014). Globally, suicide is among the top three leading causes of death in men and women aged 15 - 44 years, accounting for nearly one million deaths annually (van Niekerk et al. 2012). This represents an annual age-standardized suicide rate of 11.4 per 100 000 population globally and 6.11 per 100 000 population for Nigeria (Adewuya et al., 2016). A previous study in the general population in Lagos, Nigeria showed a 7.28% prevalence of suicidal ideation with independently associated factors being older age, female, single status, low socioeconomic status, depression, somatic symptoms, anxiety, and disability (Schernhammer, 2005). Prevalence of suicidal ideation and suicidal attempt tends to be at least 2-10 times higher in medical students compared to age matched general population (World Health Report, 2003; WHO Mortality Database Documentation May 2013. Medical students have a higher risk of suicidal ideation, suicide, burnout, and a lower quality of life than age-matched populations (World Health Report, 2003; Ayala et al., 2017; Jahrami et al., 2019; Jahrami et al., 2020).

4.1 Limitations

Responses depend on the truthfulness of the respondents.

5. Conclusion

The prevalence of depression among medical students is high. It is more prevalent in the lower (entry classes) medical classes and in female students. Several comorbid psychiatric conditions may also coexist with depression

in medical students, and approach to their mental health should be holistic with attention also paid to associated factors and psychiatric comorbidities.

Data Sharing Statement

The datasets analyzed during the current study are available from the corresponding author on reasonable request.

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Authors' Contributions

EUC designed the study, wrote the protocol, and managed the statistical analysis, while TEO and EUC both contributed to writing the final manuscript. All authors contributed toward data analysis, drafting and revising the paper and agree to be accountable for all aspects of the work.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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