Pattern and Determinants of Depression Among Students Attending Tertiary Institutions in Rivers State, Nigeria

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Abstract*: Depression is a mental health issue that can have an impact on one's health and capacity to lead a normal life. It can cause a sad mood, a lack of enjoyment or interest, guilt or a sense of low self-worth, interrupted sleep or food, low energy, and it can seriously impair one's ability to concentrate. Generally, students of tertiary institutions are at higher risk of experiencing depression when compared to the general population. There is a paucity of data on the mental health of students in tertiary institutions in Rivers State, Nigeria. The objective of this study was to assess the pattern and determinants of depression among students attending tertiary institutions in Rives State, Nigeria. This cross sectional study was conducted among 873 students attending tertiary institutions who were selected using a multistage sampling technique. The Patient Health Questionnaire was used to assess depression. Chi square and binary logistic regression analyses were used to determine the relationship between independent variables and depression. A P-value of less than 0.05 was considered statistically significant. Data was analyzed using Statistical Package for Social Sciences. In general, 19.9% of the respondents exhibited symptoms of depression. The pattern of depression showed that 13.5% of the respondents experienced mild depression, 4.1% experienced moderate depression, 1.6% were moderately severely depressed, and 0.7% of the respondents were severely depressed. In the Chi square and binary logistic regression analyses, attending university [p= 0.001, 95% CI: 1.20-3.85], being 22 years of age or younger [p = 0.002, 95% CI: 1.04-2.41], being a member of a monogamous family [p=0.001, 95% CI: 1.75-4.95], being the fourth child or above [p= 0.001, 95% CI: 1.06-2.86], having a maternal education level of secondary and below. In conclusion, depression is prevalent among students attending tertiary institutions in Rivers State. There is a need for the management of tertiary institutions to periodically examine the mental health status of students attending tertiary institutions in Rivers State. Interventions targeted at variations in family structure and restructuring the university curriculum should be implanted to reduce the incidence of depression.

***Keywords*: Depression, Prevalence, Pattern, Students, Rivers State, Nigeria**

I. INTRODUCTION

Depression is a mental illness with severe symptoms that can influence how people go about their daily lives (1). Some of the signs of depression according to Bhowmic *et al.*, *2012*, includes a sad mood, a loss of pleasure or interest, guilt or a low sense of self-worth, disturbed sleep, disturbed eating, and reduced energy (2). Depression has been linked to suicidal thoughts,, self-harming behaviours, and death in many populations (3–5). An estimated 300 billion people all over the world are experiencing some form of depression including 5.0% of adults and 5.7% of adults older than 60 years (6,7).

Students in tertiary institutions may experience various challenges resulting from living independently, accompanied by the rigorous academic calendar, including planning for their lives after they must have completed their education (8,9). This emotional and mental task predisposes them to depression (10) which could lead them to engage in risky behaviours such as smoking (11), alcohol consumption (12) and increased self-injurious activities (13). Furthermore, it may also affect their physical and mental health, thereby leading to infectious illness, suicide ideation and suicide (14).

Depression is more prevalent among students of tertiary institutions when compared to the general population (9,15,16). Across Africa, varying degrees of depression have been observed among students in tertiary institutions. In a survey in Uganda, about 80.7% of the university students presented with symptoms suggestive of depression in 2021 (17). In Kenya, the prevalence of depression among university students ranged from 20% to 30% in 2020 (18). In Ghana, the prevalence of depression among university students was 57% in 2015 (19) and in Egypt, about 17% of the students experienced severe depression in 2020 (20).

Tertiary education in Nigeria, West Africa, is characterised by persistent interruptions due to disputes between the Federal Government and the Academic Staff University Union (ASUU) (21,22). These actions do not just prolong the duration of acquiring tertiary education, it could also have an impact on the mental health of students in tertiary institutions in the country. Across locations in Nigeria, the prevalence of depression ranged from 74% in Dutse, Northern Nigeria in 2022 (23), to 44% among pharmacy students in Enugu, South East Nigeria in 2020, (24) and 16.3% in Ekiti, Western Nigeria (25). In Rivers State, South -South Nigeria, there is a paucity of data on

the mental health status of students in tertiary institutions. However, a study estimated the prevalence of depression in 2019 among medical students in Rivers State at 5.3% (26).

Globally, various studies have identified depression among students in tertiary institutions. Across Asia, students have shown symptoms suggestive of depression. (27–29). In Malaysia, in 2018, approximately 30% of the university students experienced depression (8). Among university students in Japan, the level of depression ranged from 29.85% to 37.81% in 2019 (30), while the prevalence was as high as 40% among university students in Bangladesh in 2022 (31).

In Europe, varying levels of depression have been observed among university students. In Moldova, a prevalence of 36.6% was reported, while the prevalence of depression among students in Romania and France were 26.3% and 21.3%, respectively in 2018 (32).

While in South and North America, the mental state of students in universities is not too different from the global pattern - 32% of university students in Brazil showed symptoms of depression in 2020, (33), in Mexico, the prevalence of depression among students ranged from 23.7% to 42.6% in 2022 (34) and 32.6% of students in Canada experienced depression in 2022 (35).

There have been varying reports on the residence of the students as a risk factor for depression. While a study in Kenya reported that depressive symptoms were predominant among students living off campus (18), a report in Bangladesh suggested that living in the school hostels was a risk factor for being depressed (31).

There is a variance in the view of sex as a risk factor for depression according to sex. While being a female student has been reported as a risk factor (9,12,33,35,36), other studies have identified reported that depression is more prevalent among males (17,19).

Age, is a major risk factor for depression among students, with younger students exhibiting more symptoms of depression than older students (1,33).

Lack of social support has been shown to be a risk factor for exhibiting symptoms of depression among students (9,37). Students face numerous challenges while pursuing their degrees; as a result, they require extensive social support to overcome these obstacles. Students in their final year experience a lot of stress that accompanies the final phase of their education. They have to conduct comprehensive research together with other requirements to be awarded the degree they seek; hence, they could they could be predisposed to depression in situations where they cannot meet their timelines (17,19).

There are indications that depression could be genetically acquired, a study has implicated having a family history of depression as a risk factor for depression among students in universities (33). Depression could be more prevalent among students from low social and economic backgrounds because of the limited ability of the students to meet the financial demands that accompany acquiring higher education (8,12)

The abuse of substances by students in tertiary institutions has been implicated as a risk factor for depression. Students who are depressed may indulge is substance abuse to lighten up their mood in a depressive state (12,33) Having no one to talk to could exacerbate the problem of depression among tertiary students (20)

Other risk factors for depression includes: having sleeping disorders (37), having eating disorders (32), being obese (4), being from a nuclear family, being a first child, (31) low level of parental education, having family conflicts, having poor academic performance and staying too long away from the family (38).

A holistic assessment of the mental health of students in tertiary institutions in Rivers State, Nigeria taking into consideration the various forms of tertiary education, is needed to inform interventions to address the mental health challenges of students attending tertiary institutions in Rivers State, Nigeria. The objective of this study was to ascertain the prevalence of depression and its determinants among students attending tertiary institutions in Rivers State, Nigeria.

II.METHODS

A. Study Area

The study was conducted among students in tertiary institutions in Rivers State, in southern Nigeria. The State is well endowed with oil and other natural resources; thus, attracting people from different parts of Nigeria to live and work in the state (39). Over seven tertiary institutions of learning are located in the state(40).

B. Study Design

The study was a cross-sectional study

C. Sample Size

The sample size was calculated using the Cochran sample size for proportion,

$$n = \frac{Z^2 pq}{e^2}$$

Where n is the sample size, Z is the standard normal deviate at 5% significance level, e is the margin of precision at 5%, P is the prevalence of depression among students in tertiary institutions in Dutse, Nigeria, which was estimated to be 74.7%, (36) and q is 1-p. The minimum sample required to conduct the study was estimated to be 645 after adding a 10% non-response rate and a design effect of 2.

D. Study Duration

This study was conducted between and December 2021 to October 2022.

E. Study Population

The study was conducted among students in Rivers State. All students were eligible to be included in this study. However, students who were too ill to respond and students who were away on industrial attachments were excluded from this study.

F. Sampling methods

A multistage sampling technique was used to select participants in this study. First, three tertiary institutions were randomly selected, after which three faculties were randomly selected in each institution, followed by the random selection of three departments from the faculties and finally the systematic selection of participants from the departments.

G. Study Instrument

The study instrument comprised a semi-structured interviewer-administered questionnaire that captured the social-demographic characteristics and the Patient Health Questionnaire (PHQ-9), which assessed depression among the respondents. The PHQ-9 has total possible score of 27. The instruments classifies individuals into four levels of depression based on their total score. A score of 0-4 is categorised as no depression, a score of 5-9 is categorised as mild depression, a score of 10-14 is categorised as having moderately severe depression, a score of 15-19 is categorised as being moderately depressed and score of 20-27 is categorised as having severe depression.

H. Quality Assurance

The research assistants were adequately trained on the use of the Open Date Kit (ODK) and data collection methods for a period of one week.

I. Data Management

The Open Data Kit (ODK) was used to collect data with the assistance of three research assistants. The data was downloaded from the ODK server and uploaded into Statistical Package for Social Sciences (SPSS 25) for analysis. The data were described in means and proportions. The pattern of depression was determined by assigning a score of 0 to a not at all response, a score of 1 to several of the days, a score of 2 to the response more than half of the days and a score of 3 to the response nearly every day. The total possible score was 27, the respondents were then classified into four levels of depression based on their total score. A score of 0-4 was categorised as no depression, a score of 5-9 was categorised as mild depression, a score of 10-14 was categorised as having moderately severe depression, a score of 15-19 was categorised as being moderately depressed and score of 20-27 was categorised as having severe depression. The respondents were further grouped into having depression and not having depression, the respondents who had mild to e severe depression were categorised as having depression. Chi-square analysis was used to determine the relationship between variables at a P-value ≤ 0.05. Statistically significant variables were further subjected to a binary logistic regression analysis.

J. Ethical Consideration

The protocol for this study was reviewed and approved by the research ethics committee of University of Port Harcourt, Rivers State. A written informed consent was obtained from the research participants after a detailed explanation of the nature of the study and the assurance of the confidentiality of the study.

III. RESULTS

A total of 873 respondents were interviewed, of whom 455(52.1%) were from the University of Port Harcourt, (UNIPORT), 162(18.6%) were from Rivers State University and 256(29.3%) were attending Elechi Amadi Polytechnic. Also, 400(54.8%) of the respondents were males, 757(86.7%) of the respondents were between the ages of 21-25 years with a mean age of 21. Furthermore, 313(35.8%) of the respondents were in their third year of study, 635(72.7%) of the respondents reside outside the campus, 430(49.3%) of the respondents live with their parents and both parents of 770(88.2%) of the respondents were alive. (Table 1)

Table 1: Social demographic characteristics of the respondents

Variable	Frequency (n=873)	Percent (%)
School		
Uniport	455	52.1
RSUT	162	18.6
Amadi Poly	256	29.3
Sex		
Male	400	45.8
Female	473	54.2
Age group		
<20	77	8.8
21-25	757	86.7
26-30	37	4.3
Over 30	2	0.2
Mean±SD	*21.9±2.2*	
Level of study		
100/ND1	279	32.0
200/ND2	149	17.1
300/HND1	313	35.9
400//HND2	95	10.9
500	19	2.1
600	18	2.0
Residence		
On campus	238	27.3
Off campus	635	72.7
Living Status		
Lives alone	149	82.9
Live with spouse/Family members	329	37.7
Live with parents	430	49.3
Parents alive		
None	61	7.0
Mother only	39	4.5
Father only	3	0.3
Both Parents	770	88.2

Table 2 shows that 547(70.8%) of the respondents' fathers had tertiary education, 564(69.7%) of the respondents' mothers had tertiary education. Also, 775(88.8%) of the respondents' were raised by both parents, 593(67.9%) of the respondents belonged to a monogamous family and 616(70.6%) of the respondents were the first or second child of their parents.

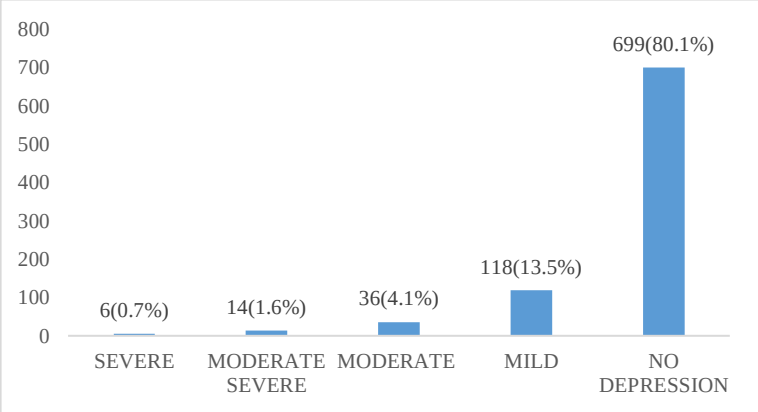

Figure 1: Pattern of depression

A total of 19.9% of the students showed signs of depression. The pattern of depression showed that 80.1% of the respondents were not depressed, 13.5% were mildly depressed, 4.1% were moderately depressed, 1.6 were moderately severely depressed and 0.7% were severely depressed. (Figure 1)

Table 2: Factors associated with depression

Variable	Depressed		X^2(p-value)
	No n (%)	Yes n (%)	
School type			
University	466(66.7)	151(86.8)	27.199(<0.001) *
Polytechnic	233(33.3)	23(13.2)	
Sex			
Male	329(47.1)	71(40.8)	2.201(0.138)
Females	370(52.9)	103(59.2)	
Age group			
≤22years	449(64.2)	90(51.7)	9.231(0.002) *
>22 years	250(35.8)	84(48.3)	
Level of study			
≤ Third Year	599(85.7)	142(81.6)	1.811(0.178)
>Third Year	100(14.3)	32(18.4)	
Residence			
On campus	180(25.8)	58(33.3)	4.039(0.044) *
Off campus	519(74.2)	116(66.7)	
Parents alive			
None/One parent	64(9.2)	39(22.4)	23.532(<0.001) *
Both parents	635(90.8)	135(77.6)	
Father education			
Tertiary	488(76.6)	59(43.4)	59.805(<0.001) *
None/Prim/Sec	149(23.4)	77(56.6)	
Mother education			
Tertiary	502(75.5)	62(43.1)	58.975(<0.001) *
None/Prim/Sec	163(24.5)	82(56.9)	

*Statistical significance

The type of tertiary institution the respondents attended was significantly associated with the occurrence of depression (p<0.001) More students who attended universities exhibited symptoms of depression than those who did not (87% vs. 67%). Conversely, more polytechnic students did not report the signs of depression than those who did (33% vs. 13%). Also, fewer of the respondents who were 22 years or younger exhibited symptoms of depression compared to those who did not exhibit symptoms of depression (51.7% vs. 64.2%), while more of the respondents over 22 years displayed symptoms of depression compared to the ones who did not (48.3% vs. 35.8%) and this difference was statistically significant (p=0.002). Furthermore, there was a significant difference in the pattern of depression based on the where the students resided: a higher proportion of the students who resided on campus exhibited symptoms of depression the compared to ones who did not exhibit symptoms of depression (33% vs. 25.8%), conversely fewer of the students who reside off campus exhibited symptoms of depression compared to those who did not display symptoms of depression (66.7% Vs. 72.2%) and the difference was statistically significant (p=0.044). Depression was higher among respondents who had none/one parent alive (22.4% vs. 9.2%) compared to the respondents who had both parents alive (77.6% vs. 90.8%) and the difference was statistical significant at p<0.001. The result also showed that the father's education level was significantly associated with depression P<0.001, the respondents whose fathers had tertiary education exhibited less symptoms of depression (43.7% vs. 76.6%) compared to the respondents whose fathers had secondary education or below who displayed more symptoms of depression (56.6% vs. 23.4%). The education level of the mothers was also significantly associated with depression, p<0.001. Fewer of the respondents who mothers had tertiary education exhibited symptoms of depression (43.1% vs 75.5%) compared to more of the respondents whose mothers had secondary education and below who exhibited symptoms of depression (56.9% vs. 24.5%) (Table 2)

Table 3: Factors associated with depression (Continued)

Variable	Depressed		X^2(p-value)
	No n (%)	Yes n (%)	
Raised by			
Both parents	640(91.6)	135(77.6)	27.296(<0.001) *
Single parents/others	59(8.4)	39(22.4)	
Family type			
Monogamy	441(63.1)	152(87.4)	37.656(<0.001) *
Polygamy	258(36.9)	22(12.6)	
Birth position			
Ist to 3rd	628(89.8)	132(75.9)	24.166(<0.001) *
4th and above	71(10.2)	42(24.1)	

*Statistical significance

The respondents who were raised by both parents exhibited fewer symptoms of depression (77.6% vs. 91.6%) compared to

the respondents who were raised by a single parents who displayed more symptoms of depression (22.4% vs. 8.4%) and the difference was statistically significant (p<0.001). Also, more respondents who belonged to a monogamous family displayed symptoms of depression than those who did not (87.4% vs. 63.1%), conversely, more respondents who belonged to a polygamous family did not display symptoms of depression than those who did (12.6% vs. 36.9%), the difference was statistically significant (p<0.001). The birth order of the respondents was significantly associated with having symptoms of depression (p<0.001), more respondents who were between the first to third child of their parents displayed less symptoms of depression than those who did (75.9% vs. 89.8%), while more respondents whose birth position was from the fourth position exhibited symptoms of depression than those who did not (24.1% vs. 10.2%). (Table 3)

Table 4: A multivariable binary logistic regression analysis of determinants of Depression

Variable	AOR (95% C.I.)	p-value
School type		
University	2.15(1.20-3.85) *	0.010
Poly technic [R]		
Age group		
>22 years	1.58(1.04-2.41) *	0.034
≤22 years [R]		
Residence		
On campus	1.01(0.65-1.56)	0.979
Off campus		
Family type		
Monogamous	3.22(1.74-5.95) *	<0.001
Polygamous [R]		
Parents alive		
Single parents/none	1.03(0.45-2.39)	0.932
Both parents [R]		
Raised by		
Single parents/none	1.32(0.56-3.14)	0.529
Both parents [R]		
Birth position		
Fourth and above	1.74(1.06-2.86) *	<0.001
First to Third [R]		
Mother education		
None/Primary/Secondary	2.81(1.85-4.26) *	<0.001
Tertiary [R]		
Father education		
None/Primary/Secondary	2.95(1.92-4.55) *	<0.001
Tertiary [R]		

R Reference category, AOR-ADJUSTED ODDS RATIO

*****Statistical significance

Students who attended a university had a two-fold increased odds of experiencing depression compared to students who attended a polytechnic [AOR = 2.15, 95% CI: 1.20-3.85]. When compared to students aged 22 or younger, students over the age of 22 had a 1.58 increased risk of showing signs of depression [AOR = 1.58, 95% CI: 1.20-3.85]. Also, students from a monogamous family had a statistically significant three-fold increased odds of showing signs of depression than those from a polygamous family [AOR = 3.11, 95% CI: 1.68–5.80]. Furthermore, the students' birth position was a significant determinant of showing signs of depression [AOR = 1.74, 95% CI: 1.06-2.86], with students born fourth or higher having a 1.74increased odds of exhibiting symptoms of depression. Students with secondary education or less had a 2.81increased odds of showing signs of depression [AOR = 2.81, 95% CI: 1.8-4.26], and students with secondary education or less had a 2.95increased odds of showing signs of depression [AOR = 2.95, 95% CI: 1.92-4.55]. [Table 4]

IV.DISCUSSION

A significant proportion of students in tertiary institutions are experiencing depression. This has severely affected their lives, such that they have little interest in activities around them. The depressed students feel moody a lot and find it difficult to fall asleep or stay asleep. The respondents have been affected by depression. A lot of them have poor appetites, while others tend to overeat. Students in tertiary institutions need a lot of concentration to carry out their daily tasks. However, being depressed has severely affected the concentration. They feel like failures and tend to have little energy to carry out their tasks. Some of the depressed respondents are beginning to develop suicidal tendencies. A lot of them felt it was better they were not alive. The prevalence of depression was far lower than the prevalence observed in Northern Nigeria (36), and among students in Uganda (17). However, the prevalence of depression among students in this study was comparable to the prevalence of depression among students in in Egypt (20) and Ciobanu et al. (2018) in Europe(32). The type of institutions showed a significant association with depression using the 95% and P-value approaches. Students attending universities appear to be more affected by depression. This may be because the students in universities are exposed to less practical application of their discipline unlike their colleagues in polytechnics (41) and they also experience a lot of interruptions due to industrial actions by the academic staff of universities which may prolong their duration in school (22).

The age group of students showed a significant association with depression. The older students exhibited more symptoms of depression when compared to the younger students. This finding was different from other report where depression was more prevalent among younger students (18,33). Older students may be in higher level of study with a more demanding curriculum, this could predispose them to depression when they become overwhelmed with the increased workload.

The type of family the student belonged to was significantly associated with depression. The student from a polygamous

family seemed to be less depressed. Polygamy is a common practice in Africa whereby a man marries two or more women. It is usually characterized by having a large number of family members hence there are enough people to share one's burden with when one is depressed, unlike in a monogamous family with fewer family members. Having no one to talk to was a significant determinant of depression among students in Egypt. Being from a nuclear family was also reported as a risk factor for developing symptoms of depression among students in China (38).

Acquiring tertiary education in Nigeria comes with a lot of financial demand, in most cases, the students are sponsored by both parents. In a situation where one or both of the parents are not alive to provide these support for their wards, they may be forced to take up part time jobs, thereby exerting more pressure on them, which could lead them to depression in situations where they are unable to take care of all the financial requirements. In this study, parental living status was significantly associated with the occurrence of depression. Students who had lost one or both of their parents exhibited more symptoms of depression. This finding was similar to a the finding of a study among students in Malaysia, where being from an economically disadvantageous background was a major risk factor for depression (8).

Students whose parents acquired tertiary education will be aware of some of the bottlenecks that students in tertiary education could encounter. Hence, they will do everything possible to prevent their children from being stuck with those challenges before they even arise by offering advice and providing the means for them to overcome them. In this study, parent's education status was significantly associated with the occurrence of depression. Depression was more prevalent among students whose parents did not acquire tertiary education. Low parental education was also associated with depression among students in China (38).

The birth positions of the students showed a significant relationship with depression. The students whose birth order was four or above exhibited more symptoms of depression. This may be because they are the last children of their parents, so they will receive a lot of care and attention both from their parents and older siblings. This family support may not be sustained when they arrive in the school environment. This observation was different from what was observed among students in Bangladesh, where being the first child was a risk factor for depression (31).

V.CONCLUSION

A lot of students attending tertiary institutions in Nigeria are experiencing depression, especially those whose parents did not attain tertiary education and those from monogamous families. There is need for the management of tertiary institutions to periodically examine the mental health status of students attending tertiary institutions in Nigeria. Students experiencing depression could take advantage of the counselling services offered by the institutions.

K. Limitation of the study

This study mainly relied on the validated PHQ-9 used to assess depression, there was no clinical diagnosis.

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