

1 **Title: Impact of COVID-19 Lockdown on Depression Severity and the Use of Drugs Among**
 2 **University of Ibadan Students**

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24 **Authors Contribution Statement:**

Contributor Role	Role Definition	Authors									
		1	2	3	4	5	6	7	8	9	10
Conceptualization	Ideas; formulation or evolution of overarching research goals and aims.	X	X	X	X	X	X	X	X	X	X
Data Curation	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later reuse.	X									
Formal Analysis	Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data.	X						X			
Funding Acquisition	Acquisition of the financial support for the project leading to this publication.										
Investigation	Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.	X	X	X	X	X	X	X	X	X	X
Methodology	Development or design of methodology; creation of models				X		X				
Project Administration	Management and coordination responsibility for the research activity planning and execution.	X									

Resources	Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.																			
Software	Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.																			
Supervision	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.																			
Validation	Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.																			
Visualization	Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.																			
Writing – Original Draft Preparation	Creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Writing – Review & Editing	Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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1. Relationship between depression severity and gender
2. Depression among university students during COVID-19 lockdown
3. Relationship between lockdown and risk of initiating drug use among students
4. Coping strategies during lockdown by university students

1 **ABSTRACT**

2 **Background:** Since the declaration of COVID-19 as a pandemic, measures such as nationwide lockdowns
3 have been implemented. The sudden disruption of activities coupled with fear could trigger or aggravate
4 mental illnesses and consequently, increase substance use as a coping mechanism. This study then sought
5 to assess the impact of the lockdown on depression and substance use amongst students in a tertiary
6 institution in Ibadan city, Nigeria.

7 **Methods:** A self-administered 26 questions online questionnaire was employed for data collection of socio-
8 demographic characteristics, Patient Health Questionnaire (PHQ-9) to assess depression, and a section
9 on use of psychoactive drug during lockdown. Data were statistically analyzed using IBM's SPSS and
10 Microsoft Excel.

11 **Results:** We gathered 102 responses, 54.9% were males. Most of the respondents had mild depression
12 (41.2%), followed by 36.3% that reported not having an episode of depression, 15.7% moderate, 4.9%
13 moderately severe and 2% severe depression. Females had more depressive episodes than the males
14 ($p=0.185$). Only 4% reported substance use since the pandemic, all were male. At a 95% confidence
15 interval, there was no significant association between the level of depression and any socio-demographic
16 characteristics of students and between the level of depression and drug use.

17 **Conclusions:** According to this study, lockdown and other mitigation strategies implemented during the
18 pandemic were not found to be associated with drug use. A limitation of this study is the cross-sectional
19 design, as a result, a larger multicenter study is needed to ascertain the possible association between
20 lockdown, depressive symptoms, and drug use among students.

21
22 **Key Words:** depression; COVID-19; drug abuse; mental health; PHQ-9; students;

1 INTRODUCTION

2 Coronaviruses are a group of enveloped viruses with a single stranded, positive-sense RNA genome
3 known to cause respiratory infections such as Middle East Respiratory Syndrome (MERS) and Severer
4 Acute Respiratory Syndrome (SARS).¹ In December 2019, a novel coronavirus, SARS-CoV-2 which was
5 first identified as a viral pneumonia of unknown origin was first confirmed in Wuhan, China.¹ Some
6 symptoms of the coronavirus infection include: fever, chills, cough, sore throat, myalgia, nausea, and
7 diarrhea.² In January 2020, the World Health Organization (WHO) declared the disease to be an emergency
8 internationally, with regards to public health and thereafter named it a pandemic on 11th March, 2020.^{3,4}
9 Therefore, in order to effectively combat this pandemic, governments of countries around the world imposed
10 a compulsory lockdown and cessation of economic activities. These policies have affected the social
11 experience of the populace especially university students with respect to their mental well-being.⁵ A major
12 adverse effect of the COVID-19 pandemic is increased social isolation which is strongly affiliated with
13 anxiety, depression and drug use.⁶ Stringent measures such as lockdown of all schools, restricted
14 movement among other measures, have disrupted daily living for most university students.⁷ Early evidence
15 from published studies suggests that COVID-19 is associated with the prevalence of mental and
16 psychological illnesses like depression, anxiety, and post-traumatic stress disorder.⁷ Due to this
17 association, the COVID-19 pandemic can be considered a traumatic event.

18 According to WHO reports, community based studies revealed an overall prevalence for mental disorders
19 around 25% in several national or cultural contexts.⁸ Besides, the abuse of common drugs such as
20 hallucinogens (drugs that affect thought, feeling), nicotine, opioids (drugs that relieve pain), and sedatives
21 has also increased significantly.⁹ Depression, having seen to be one of the consequences of substance
22 abuse, is also recognized as a form of mental illness.¹⁰ Recently, studies regarding mental health in relation
23 to the outbreak, were conducted in Asia and focused on specific sub-populations such as college students
24 and medical workers and indicated that majority of the participants (63.5%) exhibited depressive symptoms
25 in varying degrees.⁵ Self-reported depression, anxiety, and suicidal attempts were found to be associated
26 with COVID-19 related issues such as self-isolation, quarantine, misinformation, deaths and others among
27 health workers and general public.¹¹ besides, the double effect of COVID-19 pandemic on benzodiazepine
28 and alcohol abuse – there was increase in their abuse in some areas while lockdown caused shortage and
29 reduced access in some other areas.^{12,13}

30 To the best of our knowledge, there has not been any study to evaluate the relationship between depression
31 and substance use by students as a result of the COVID-19 lockdown in sub-Saharan Africa. Hence, this
32 study seeks to examine how this pandemic has caused depression and possibly drug abuse among the
33 students of the University of Ibadan. It also aims to test for the relationship between demographic
34 characteristics of students and severity of depression.

36 MATERIALS AND METHODS

37 Study design

1 The study was a cross-sectional study carried out among the students of the University of Ibadan, Nigeria
2 during the COVID-19 pandemic. Data were collected from July to August, 2020.

3 **Population and Sample**

4 The study population comprised of the current undergraduate students at the University of Ibadan with
5 access to smartphones and the internet. About 30,000 students are currently enrolled in the university. All
6 participants were provided with a consent form to either decline or accept to take part in the study. All
7 respondents consented willingly to taking part in the survey. The link to the survey was randomly sent to
8 students of the University through WhatsApp groups for different departments and halls of residence. Also,
9 each co-author shared the link privately to up to 50 contacts eligible for the study.

10 **Data collection instruments**

11 The online questionnaire administered was composed of 26 questions which were divided into three
12 sections which include: sociodemographic characteristics, assessment of depression, and assessment of
13 drug use. Sociodemographic characteristics included data on age range, religion, gender, faculty and year
14 of study.

15 The severity of depressive symptoms of the students were assessed through the questionnaire tool, Patient
16 Health Questionnaire (PHQ-9) in English. The PHQ-9 is a self-administered version of the PRIME-MD
17 diagnostic instrument for common mental disorders.¹⁴ The PHQ-9 is the depression module, which scores
18 each of the 9 DSM-IV criteria as '0' (not at all), '1' (several days), '2' (more than half the days) and '3' (nearly
19 every day). It has been validated for use in primary care.¹⁵ The results had been recorded into five severity
20 categories: 0-4 as 'none', 5-9 as 'mild', 10-14 as 'moderate', 15-19 as 'moderately severe', 20-27 as
21 'severe'.¹¹ The respondents were asked six questions to assess their drug use during the pandemic.

22 Pilot survey was initially conducted to test the feasibility and efficiency of the questionnaire and data
23 collected was not included in the study.

24 **Data analysis**

25 The data gathered was saved as Google Sheet then exported to Microsoft Excel package for cleaning and
26 scoring. Descriptive analysis with pie chart and bar chart was also conducted on Microsoft Excel. Proper
27 tabulation and statistical analysis for Chi Square test was performed using the Statistical Packages for
28 Social Sciences (SPSS) version 19. Chi-square test was conducted using SPSS to determine relationship
29 between depression and socio-demographic characteristics with *P*-value which indicate whether the
30 relationship is statistically significant. A *P*-value of ≤ 0.05 at 95% confidence interval was considered to be
31 statistically significant.

33 **RESULTS**

34 **Sociodemographic**

35 56 (54.9%) were males while 46 (45.1%) were females. Most of the participants are young adults within the
36 age group of 19-21 years old (55.9%). Very large number of participants were Christians (79%) and others
37 were Muslims (20%) and African traditional religion (1.0%). Most of the students were in 2nd year (35.3%)

1 and 3rd year (34.3%). 51% of participants were in Faculty of Clinical Sciences while the remaining spread
2 across 11 other faculties. **Table 1** shows the socio-demographic characteristics of participants.

3 **Depression Severity**

4 The level of depression severity found, using the PHQ-9 questionnaire are shown in **Figure 1**. The
5 comparison of depression severities between male and female students are shown in **Figure 2** (P -
6 value=0.185). 44.6% of male and 26.0% of female showed no level of depression.

7 There was no significant association between the level of depression and any socio-demographic
8 characteristics of students (**Table 2**).

9 **Drug Use**

10 Only 4 (4%) participants responded to have started taking psychoactive drugs only when COVID-19 started
11 and they were all males. Opioid (tramadol), tobacco and marijuana were the psychoactive substances used.
12 The drugs were taken for relaxation, sleep stimulant and boredom. There was no significant association
13 between level of depression and drug use among the students (P -value = 0.650).

15 **DISCUSSION**

16 Overall, University of Ibadan students reported depressive symptoms with a larger portion reporting mild
17 and moderately severe depressive symptoms which may be due to several indoor coping strategies. This
18 is consistent with the study done in Bangladesh.¹⁶ The same is the case with the use of psychoactive drugs;
19 4.0% of participants recorded that they started using psychoactive drugs such as opioids (tramadol),
20 tobacco and marijuana during the COVID-19 lockdown. The drugs were taken for relaxation, sleep
21 stimulation, and boredom. Studies have shown that both loneliness and social isolation are associated with
22 decreased cognitive function.¹⁷ There is a possibility that home confinement during the COVID-19 pandemic
23 increased daytime stress, anxiety level and depression level because most people, including students, are
24 living with changes in their routine, uncertainty about their health, and they cannot participate in vitality
25 giving activities like sport, visiting, friends, and going to religious gatherings.¹⁸⁻²⁰

26 Although not statistically significant, depressive symptoms were higher in female students compared to
27 male students as more females reported moderate, moderately severe and severe depressive symptoms
28 than male students. This finding correlates with a recent study done in a cohort in Cyprus which showed
29 that women were more likely to have depressive symptoms than men.²¹ Depressive symptoms were most
30 prevalent among the 19-21 age groups. One possible explanation for this is that the lower age groups can
31 still afford to be under the protection of their parents or guardians that ensure better decisions on their
32 mental health while those in the 19-21 age group are old enough to make their own decisions about their
33 mental space albeit poorly.²¹ A study in Trinidad showed that University students with good religious
34 practices, and regarded their faith as important, are less likely to have depressive symptoms.^{22,23}
35 Unfortunately, due to lockdown the campus religious activities were discontinued which might have
36 contributed to depressive symptoms in some students.

1 Fear, stress, anxiety and, in worse case scenarios, depression are all side effects of the lockdown.²⁴ People
2 living with physical and/or mental health conditions have been found to be more vulnerable to these effects
3 of the lockdown.²⁴ University students generally comprise a population which experiences a high level of
4 psychological distress. Anxiety levels and depression are likely to increase during the lockdown
5 characterized by social distance, isolation and quarantine. Seeing that their daily routines and activities are
6 disrupted, boredom and sleep problems would not be far-fetched. Increased alcohol consumption, smoking
7 and abuse of psychoactive substances are likely side effects of the lockdown on this population.²⁵
8 Medications, binge-watching TV series, surfing the internet, watching pornography and few other things
9 have been suggested to relieve stress and shun difficult thoughts.²⁶⁻²⁹ Use of these substances as well as
10 engaging in the aforementioned activities are some of the possible social behaviors to alleviate mental
11 stress of the lockdown and pandemic. Nevertheless, there remains a high tendency that they may advance
12 into habits which are quite difficult to break.³⁰⁻³¹

13 Alcohol and other psychoactive drugs interfere with the nervous system and they are ingested at alarming
14 rates by people avoiding difficult thoughts, unpleasant emotions, anxiety, and stress.³³⁻³⁵ It was suggested
15 that alcohol is the most commonly used psychoactive substance after caffeine; followed by smoking
16 tobacco and lastly recreational drugs.³⁶

17 Psychoactive substances like opioids (e.g. tramadol), tobacco and marijuana were found to be consumed
18 by the participants. Although the level of depression and drug use among students did not have an
19 association that is statistically significant (P value >0.05), 4% of the participants started taking psychoactive
20 substances during the lockdown.

21 Besides, although the mental health of the entire populace might be affected by pandemic, the marginalized
22 populations may have higher risk due to a larger number of daily stressors and an even larger strain on
23 resources.³⁷

24 **Limitations**

25 There were some limitations and challenges encountered in the study which included the method of data
26 collection, that is, online data collection which was employed primarily due to lockdown. Only eligible
27 participants with access to mobile phone or internet could participate which might affect the generalization
28 of result. Also, there is risk of selection and information bias due to online data collection method. Besides,
29 low reported number of drug use may be because respondents already started taking psychoactive
30 substances before the lockdown. Also, the study was conducted only in one University, hence, the external
31 validity is limited and the result may not apply to general population because of small sample size. Lastly,
32 we could not ascertain background psychiatric conditions in participants.

33 **CONCLUSIONS**

34 The level of depression among the study participants was high and not associated to gender. However, the
35 severity was minimal. Government and stakeholders should consider impact of lockdown and other
36 mitigating strategies for reducing the transmission of COVID-19 and future public health emergencies on
37 mental health of youths and general population while making policies. A multicentered study would be

- 1 necessary to assess the incidence as well as the severity of depression on a larger scale. We also suggest
- 2 that this study should be replicated among the marginalized populations.

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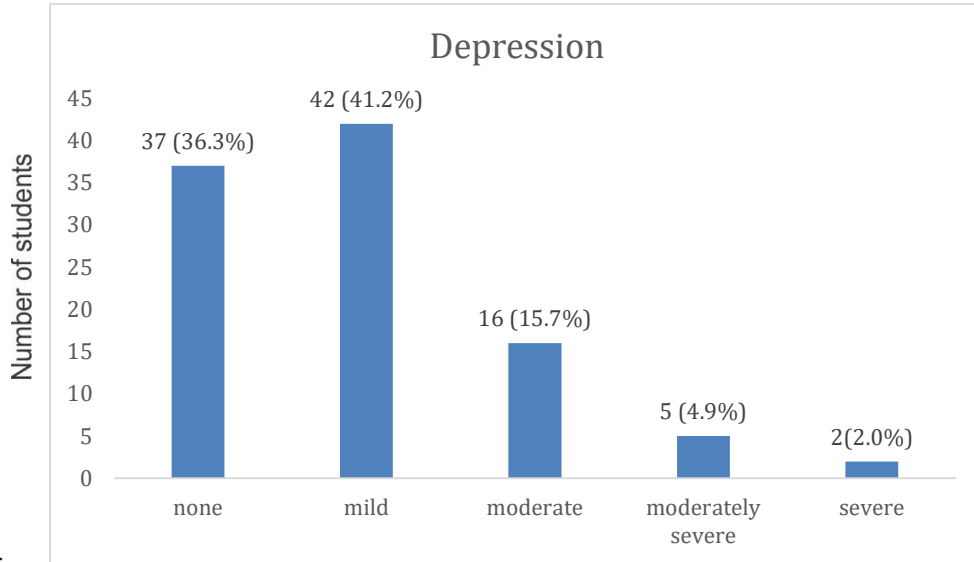
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1 **FIGURES AND TABLES**

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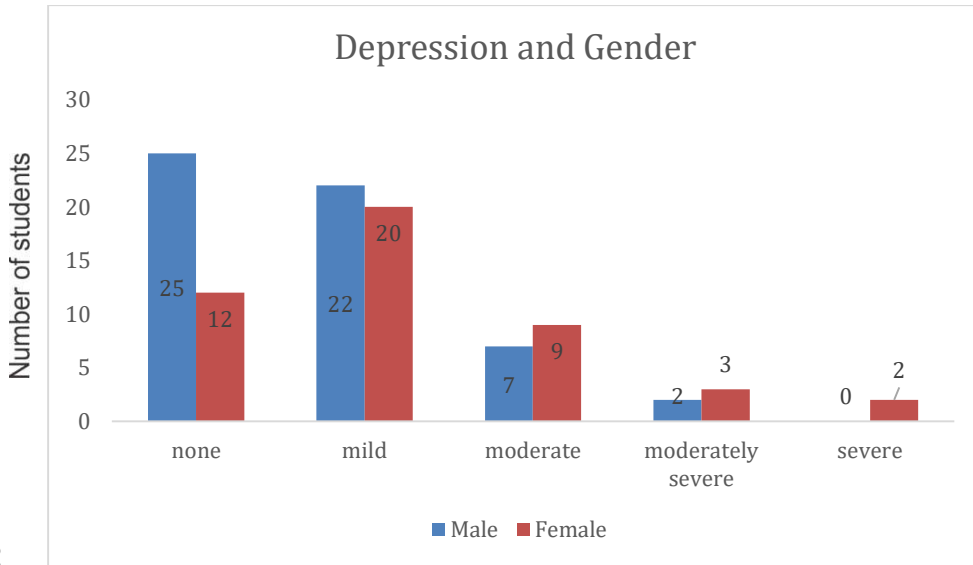
3 **Figure 1: Level of depression among university students**



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1 **Figure 2: Comparison between Level of Depression and Gender**



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1 **Table 1: Descriptive Analysis for Socio-Demographic Statistics**

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Study variables	N(%) (n= 102)
Gender	
Male	56(54.9)
Female	46(45.1)
Age	
16-18	19(18.6)
19-21	57(55.9)
22-25	21(20.6)
25 and above	5(4.9)
Religion	
African traditional religion	1(1)
Christianity	81(79.4)
Islam	20(19.6)
Faculty	
Agriculture and forestry	8(7.8)
Arts	3(2.9)
Basic medical sciences	9(8.8)
Clinical sciences	52(51)
Dentistry	7(6.9)
Economic and management science	2(2)
Education	2(2)
Law	2(2)
Pharmacy	1(1)
Sciences	6(5.9)
Technology	6(5.9)
The social sciences	4(3.9)
Year of study	
1st	8(7.8)
2nd	36(35.3)
3rd	35(34.3)
4th	17(16.7)
5th	4(3.9)
6th	2(2)

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1 **Table 2: Relationship between Depression and Socio-Demographic Characteristics**2 **Relationship between depression severity and socio-demographic characteristics**

Characteristics	None (n=37) n(%)	Mild (n=42) n(%)	Moderate (n=16) n(%)	Moderately severe (n=5) n(%)	Severe (n=2) n(%)	P-value
Age group						
16-18	7(18.9)	6(14.3)	4(25)	1(20.0)	1(50.0)	0.704
19-21	19(51.4)	24(57.1)	9(56.2)	4(80.0)	1(50.0)	
22-24	7(18.9)	11(26.2)	3(18.8)	0(0.0)	0(0.0)	
25 and above	4(10.8)	1(2.4)	0(0.0)	0(0.0)	0(0.0)	
Gender						
Male	25(67.6)	22(52.4)	7(43.8)	2(40.0)	0(0.0)	0.185
Female	12(32.4)	20(47.6)	9(56.2)	3(60.0)	2(100.0)	
Religion						
Christianity	31(83.8)	35(83.3)	11(68.8)	2(40.0)	2(100.0)	0.310
Islam	6(16.2)	6(14.3)	5(31.2)	3(60.0)	0(0.0)	
African Tradition		1(2.4)	0(0.0)	0(0.0)	0(0.0)	
Year						
1st Year	2(5.4)	3(7.1)	2(12.5)	1(20.0)	0(0.0)	0.813
2nd Year	14(37.8)	12(28.6)	7(43.8)	1(20.0)	2(100.0)	
3rd Year	14(37.8)	14(33.3)	4(25.0)	3(60.0)	0(0.0)	
4th Year	5(13.5)	10(23.8)	2(12.5)	0(0.0)	0(0.0)	
5th Year	2(5.4)	1(2.4)	1(6.2)	0(0.0)	0(0.0)	
6th Year	0(0.0)	2(4.8)	0(0.0)	0(0.0)	0(0.0)	

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