Original Research Article

Psychosocial impact of COVID-19 tests and positive results on clinical students screened during the second wave of COVID-19 pandemic in Rivers State, Nigeria

ABSTRACT

Background: Destabilization of all educational activities, mixed impact on academic research and professional development, severe effect on the educational assessment system, and reduced employment opportunities, were some of the impacts recorded in the educational sector following the COVID-19 pandemic. The aim of this study was to evaluate the psychosocial impact of COVD-19 and COVID-19 test and results on returning clinical students in a Private Medical University in Port Harcourt in the first quarter of year 2021.

Materials and Methods: A descriptive cross-sectional study was conducted among returning clinical students in a private medical university. Semi-structured questionnaire was used to obtain data from clinical students. Data was analysed using the IBM Statistical Package for Social Sciences (SPSS) version 20.0.

Results: A total of seventy-six (76) respondents who were medical students were involved in the study, with a 98.0% response rate. The impact of the pandemic was felt at home and in school. Study found that 49 students (64.5%) were dissatisfied with school work and twenty-two respondents (28.9%) were observed to be highly stressed while 9 students (11.8%) were observed to have no stress. The female respondents were more affected by the COVID-19 pandemic than their male colleagues.

Conclusion: Assessment of the impact of COVID-19 disease and testing revealed that undergraduate clinical students were affected psychosocially in the pandemic. Respondents were observed to be highly stressed, and a few indicated incapacitating psychological distress. Therefore, psychosocial support of students should be built into response measures for future screening services.

Keywords: COVID-19 Disease and Testing, Psychosocial Impact, Clinical Students, Private University, Port Harcourt, Nigeria

INTRODUCTION

Coronavirus disease is a global pandemic, declared by the World Health Organization (WHO) on the 11th of March 2020.[1, 2] The disease had started as outbreak cases of pneumonia in Wuhan, Hubei Province of China, reported on 31st December 2019 and rapidly spread round the continents of the world.[2] The origin, transmission, and characteristics of human coronaviruses have been severally described.[3-5] The scope in terms of morbidity and mortality associated with the COVID-19 virus pandemic have been described in different countries.[6] Emergence of new strains of the virus has also been reported.[7]

Common symptoms of COVID-19 virus infection include dry cough, fever, diarrhoea, vomiting, shortness of breath and myalgia.[8] Public health preventive and control measures have been described.[9-12] Advocacy has been made for rapid development of COVID-19 vaccines based on risk/benefit calculations to ensure

higher levels of community immunity,[13] as part of public health measures in containing the COVID-19 pandemic. The need for safeguards in vaccine production and usage has also been stressed.[14] Efforts are therefore being channeled towards producing vaccines for disease prevention,[15-17] with different products in various phases of vaccine development.[18] More than 115 vaccine candidates have been developed with each having its own advantages and challenges, and DNA and mRNA platforms are credited with the potential for rapid vaccine development.[19] This potential has been capitalized on and vaccines rapidly produced for the benefit of humanity, especially those at risk. Today, many have been fully vaccinated and booster doses given.

The World Health Organization's list of recommended public health actions intended to curb community spread of COVID-19 virus included school closure, among others.[20] Also, as part of public health containment efforts in the educational sector following resumption of schools, different countries have adopted control measures including the policy of testing and tracking.[21-23] Every student coming back from the compulsory COVID-19 holiday must conduct COVID-19 test before being allowed into the hostels to commence academic / clinical activities at the institution. The aim of this study was to evaluate the impact of COVD-19 and COVID-19 test on arriving clinical students in a Private Medical University in Port Harcourt in the first quarter of year 2021.

MATERIALS & METHODS

Study Area: This study was conducted in Port Harcourt, the capital of Rivers State, Nigeria.

Study Sites/Setting: The study setting was at the Rivers State University Teaching Hospital, the place for clinical rotation of PAMO students which also served as the venue for conducting COVID-19 test, in Port Harcourt the Capital City of Rivers State, South-South of the Federal Republic of Nigeria.

Research Design: A cross-sectional observational study.

Study Population: The study was carried out among returning clinical students of PAMO University of Medical Sciences - a private medical university – in Port Harcourt.

Study Instrument: Self-administered semi-structured questionnaires was used for data collection.

Validity/Reliability of Instrument: The study instrument was designed and critiqued by all authors before use. The study instrument (the questionnaire) was also pre-tested in a similar work environment (amongst students in another university) and corrections made before commencement of study.

Sampling Method: All clinical students registered for the semester were eligible. Students who had opted out of semester for reasons of ill health etc were excluded. The questionnaire was self-administered. Counselling sessions was organized for the asymptomatic clinical students with a positive COVID-19 test, carried out by the most senior member of the team, during the isolation period using telephone, and face to face, after the period of self-isolation. The cases requiring further counselling sessions continued to receive guidance within the semester. The questionnaire measured their perceptions of psychosocial impact of the testing. The Psychosocial Index (PSI)[24] - a self-rating scale was adapted and used to ascertain psychosocial impact. The scores for each question in the scale were labelled "not al all" (1), "only a little" (2), "somewhat" (3), and "a great deal" (4). All were calculated into a observer rating: highly stressful life, stressful life, and non-stressful life. Quality of your life during the COVID 19 test and wave was rated as very poor (5), poor (4), fair (3), good (2), and excellent (1). The relationship between these perceptions and positive cases were also assessed.

Data Analysis: Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.0.

RESULTS

A total of seventy-six (76) respondents who were medical students were involved in the study, with a 98.0% response rate.

Table 1: Socio-Demographic Characteristics of Respondents (n =76)

Variables	Number	Percentage
Sex		
Male	33	43.4
Female	43	56.6
Age		
Less than 25 years	72	94.7
25- 40 Years	4	5.3
Marital Status		
Single	75	98.7
Married	1	1.3
Religion		
Christianity	69	90.8
Islam	4	5.3
Others	3	3.9

The demographic characteristics of the respondents summarized in Table 1 indicated that 33 (43.4%) respondents were males while were 43 (56.6%) were females. Seventy-two (94.7%) respondents were less than 25 years of age, and only 4 (5.3%) were between 25 and 40 years. Seventy-five (98.7%) were single and only 1 respondent was married. Sixty-nine (90.8%) were Christians, while three of the respondents were neither Christian nor Muslim.

Table 2: Emotional, Social and Impact of COVID-19 Test

	YES		NO	
	Freq.	(%)	Freq.	(%)
Feel overwhelmed by the demands of everyday life during the COVID-19 test	50	65.8	26	34.2
Feeling that one cannot make it during the COVID-19	11	14.5	65	85.5
Tend to be influenced by people with strong opinions during the COVID-19 test	12	15.8	64	84.2
Tend to worry about what other people think of you during the COVID-19 test	9	11.8	67	88.2
Feel under pressure at school during the COVID-19 test	34	44.7	42	55.3
Feel tired waking always on waking up during the COVID-19 test	16	21.1	60	78.9

Experienced stomach/bowel pains during the COVID-19 test	6	7.9	70	92.1
Feel dizzy or faint during the COVID-19 test	12	15.8	64	84.2
Feelings of pressure or head tightness or body during the COVID-19 test	17	22.4	59	77.6
Feel sad or depressed during the COVID-19 test	10	13.2	66	86.8
Feel tense or wound up during the COVID-19 test	18	23.7	58	76.3
Drink alcohol during the COVID-19 test	3	3.9	73	96.1
Smoke cigarette during the COVID-19 test	2	2.6	74	97.4
Take recreational drugs during the COVID-19 test	1	1.3	75	98.7
Drink coffee or tea during the COVID-19 test	10	13.2	66	86.8
Experienced death of a family member during the COVID-19 test	9	11.8	67	88.2
Experienced separation from spouse or long-time partner during the COVID-19 test	8	10.5	68	89.5
Experienced moving within the same city during the COVID-19 test	27	35.5	49	64.5
Experienced moving to another city during the COVID-19 test	8	10.5	68	89.5

Table 2 shows the emotional, social and financial impact of COVID-19 test on the respondents. It details different feelings experienced by the respondents which ranged from being overwhelmed by the demands of everyday life, being influenced by people with strong opinions, and feeling of being under pressure at school during the COVID-19 test.

Table 3: Other Emotional, Social and Financial Impact of COVID-19 Test

	YES		NO	
	Freq.	(%)	Freq.	(%)
Begins new relationship during the COVID-19 test	12	15.8	64	84.2
Experienced legal challenges during the COVID-19 test/waves	5	6.6	71	93.4
Experienced serious argument with close relatives during the COVID-19 test	15	19.7	61	80.3
Feel tension at home during the COVID-19 test/waves	19	25.0	57	75.0
Live by self or alone during the COVID-19 test	3	3.9	73	96.1
Have anyone to confide in during the COVID-19 test	48	63.2	28	36.8
Get along well with people during the COVID-19 test	48	63.2	28	36.8
Ever hospitalized during the COVID-19 test/waves	6	7.9	70	92.1
Any surgical operations and illness treatment given during the COVID-19 test	13	17.1	63	82.9
Taken any medication during the COVID-19 test	22	28.9	54	71.1

Have any financial difficulty during the COVID-19 test/era	41	53.9	35	46.1
Parents or Guardian have job problem during the COVID-19 test/waves	26	34.2	50	65.8
Parents or Guardian unable to find a job during the COVID-19 test/waves	8	10.5	68	89.5
Parents or Guardian have change or loss of job during the COVID-19 test/waves	11	14.5	65	85.5
Satisfied with school work during the COVID-19 test/waves	27	35.5	49	64.5
Have problems with colleagues at school during the COVID-19 test	19	25.0	57	75.0

Table 3 shows other emotional, social and financial impact of COVID-19 Test as experienced by the respondents. The parents or guardian of 11 (14.5%) respondents lost their jobs during the period under study, and 8 (10.5%) were unable to find a new job. Five (6.6%) students had legal problems associated with COVID-19 test. Nineteen (25.0%) respondents had tension at home, 6 (7.9%) were hospitalized, 41 (53.9%) had financial difficulty, 19 (25.0%) had problems with their colleagues, and 49 (64.5%) were no longer satisfied with school work.

Table 4: Psychological Impact of COVID-19 Test

	Not at all	Only a little	Somewhat	A great Deal
	N (%)	N (%)	N (%)	N (%)
Take a long time to fall asleep during the COVID-19 test/wave	56(73.3)	11(14.5)	5(6.6)	4(5.3)
Have restless sleep during the COVID-19 test/wave	61(80.3)	4(5.3)	6(7.9)	5(6.6)
Wake too early and find it difficult to fall asleep again during the COVID-19 test/wave	59(77.6)	6(7.9)	8(10.5)	3(3.9)
Hear ones' heart beating during the COVID-19 test	57(75.0)	8(10.5)	8(10.5)	3(3.9)
Have breathing difficulty during the COVID-19 test	58(76.3)	7(9.2)	5(6.6)	6(7.9)
Feeling tired and lack energy during the COVID-19 test	51(67.1)	10(13.2)	10(13.2)	5(6.6)
Get easily angry (irritated) during the COVID-19 test/wave	54(71.1)	11(14.5)	6(7.9)	5(6.6)
Lose interest in most things during the COVID-19 test	48(63.2)	7(9.2)	13(17.1)	8(10.5)
Have panic attacks during the COVID-19 test	61(80.3)	6(7.9)	2(2.6)	7(9.2)
Believed to have physical disease but doctors have not diagnosed it correctly	63(82.9)	4(5.3)	6(7.9)	3(3.9)
When read or hear about an illness, get similar symptoms during the COVID-19 test	57(75.0)	4(5.3)	11(14.5)	4(5.3)
Find it difficult to think of something else when noticed a body sensation during the COVID-19 test	48(63.2)	15(19.7)	7(9.2)	6(7.9)

The psychological impact of COVID-19 Test is shown in Table 4. Although majority of respondents were "not-at-all" psychologically impacted, a few others were impacted in varying degrees.

Table 5: Observer Rating Score (n = 76)

Variables	Number	Percentage
Observer rating on Stress		
Highly stressful	22	28.9
Stressful	19	25.0
Non-Stressful life	9	11.8
No observation	26	34.2
Observer rating on Well-being		
Excellent	6	7.9
Good	18	23.7
Fair	17	22.4
Poor	7	9.2
Absent	2	2.6
No observation	26	34.2
Observer rating on psychological distress		
Incapacitating	5	6.6
Severe	9	11.8
Moderate	19	25.0
Slight	5	6.6
Absent	12	15.8
No observation	26	34.2
Observer rating on abnormal illness behavior		
Incapacitating	1	1.3
Severe	4	5.3
Moderate	11	14.5
Slight	10	13.2
Absent	24	31.6
No observation	26	34.2
Other impact experience during the COVID-19 test		
Boredom and Tiredness	4	5.3
Expensive/cost	4	5.3
Limitation in Travelling	4	5.3
Headache & Catarrh	3	3.9
Reduced Academic Performance	2	2.6
None	59	77.6

Table 5 shows the observer rating scores on stress, well-being, psychologic distress and other impact experiences of the COVID-19 test. Twenty-two (28.9%) respondents were highly stressed and 9 (11.8%) did not feel any stress. The well-being of 6 (7.9%) respondents was excellent, while 17 (22.4%) respondents reported poor well-being. Psychological distress was incapacitating in 5 (6.6%), severe in 9 (11.8%), and

moderate in 19 (25.0%) of respondents. Abnormal illness behaviour was incapacitating in 1 (1.3), severe in 4 (5.3%), and absent in 24 (31.6%) respondents. Fifty-nine (77.6%) respondents had no other impact experience of COVID-19 test.

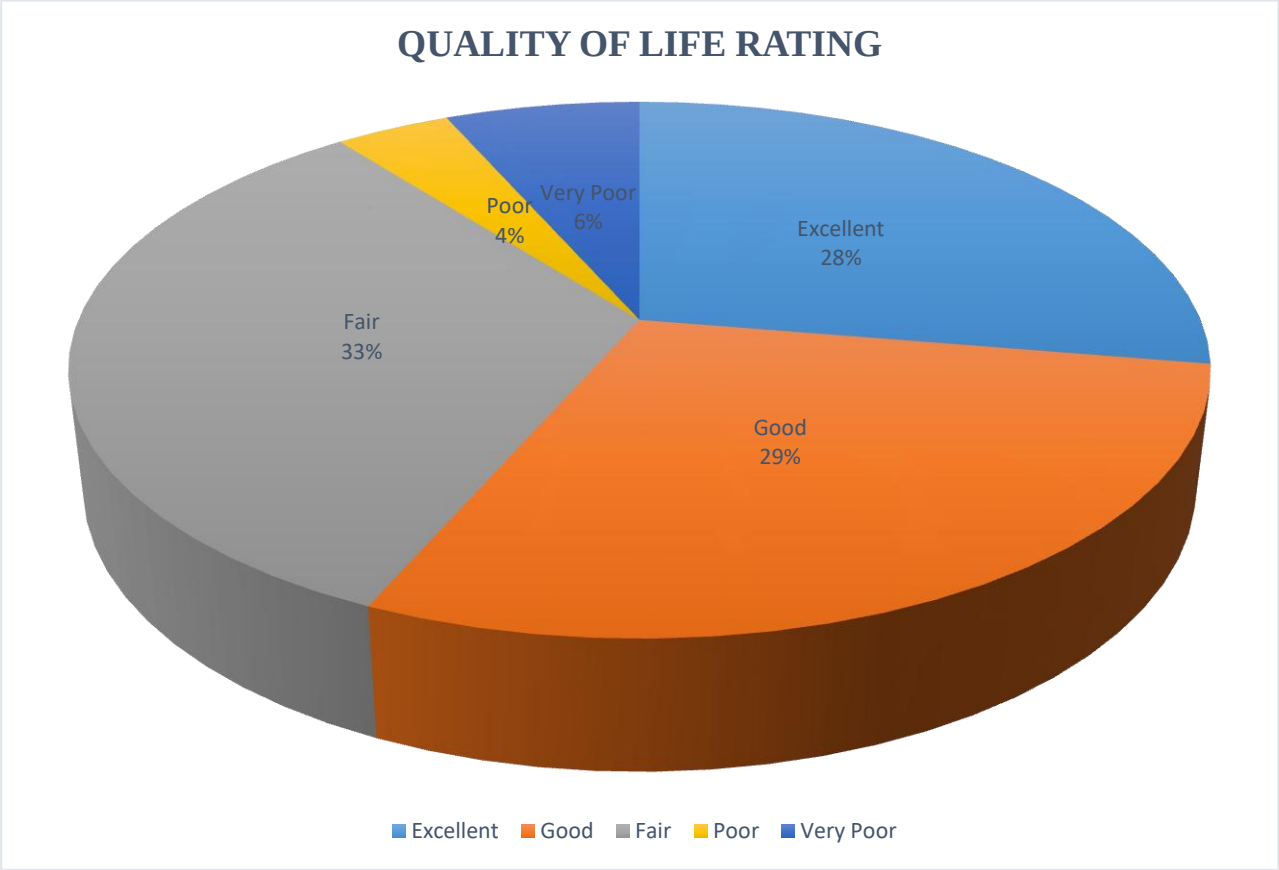

Figure 1: Respondents rating of quality of their life during the COVID-19 test

The respondents' opinion on their quality of life was given as poor by (3.9%), very poor by (6.6%), fair by (32.9%), good by 28.9%, and excellent by (27.6%) of respondents respectively (see Figure 1).

Table 6: Impact, waiting time, and outcome of COVID-19 test (n = 76)

Variables	Frequency	Percentage
Did you do COVID-19 test before resumption from vacation		
Yes	76	100.0
No	0	0.0
Period of waiting for COVID-19 test result (Mean = 3.96±4.14)		
1 - 5 days	62	81.6
6 - 10 days	8	10.5
11 - 15 days	3	3.9
16 - 20 days	3	3.9
Feeling - while waiting for the COVID-19 test result		
Not anxious	32	42.1
A little anxious	28	36.8
Very anxious	16	21.1
Outcome of the COVID-19 test		

Positive	17	22.4
Negative	56	73.7
Don't Know	3	3.9
Impact of result if positive		
Deprived me from entering the hostel	3	3.9
Deprived me from attending classes	1	1.3
Kept me in isolation	14	18.4
Kept me away from friends	3	3.9
All of the above	1	1.3
The result was negative	54	71.1
Feeling before testing positive to COVID-19		
Nothing	10	13.2
Anxious	6	7.9
Fearful	4	5.3
Crying	3	3.9
The result was negative	53	69.7

Table 6 shows the Impact, waiting time, and outcome of COVID-19 test. All 76 (100%) respondents reported that they had COVID-19 test done before returning to school. The waiting time for COVID-19 test was reported by 62 (81.6%) respondents to be 1-5days, with a Mean of 3.96 ± 4.14days. Seventeen (22.4%) respondents had positive COVID-19 test. Respondents had varying experiences for positive test: 14 respondents (18.4%) were kept in isolation, 3 (3.9%) were kept away from friends, and 3 (3.9%) were prevented from entering the hostel. The psychologic impact of the exercise was enough to make 6 (7.9%) respondents to feel anxious, 4 (5.3%) were fearful, and 3 (3.9%) were crying.

Table 7: Support, rating of management, and waiting time for repeated COVID-19 test (n = 76)

Variables	Frequency	Percentage
Support received for testing positive for COVID-19		
No support	3	3.9
Counselled	3	3.9
Treated	2	2.6
Supported	10	13.2
The result was negative	58	76.3
Rating the management/support received		
Not effective	5	6.6
Effective	9	11.8
Very effective	3	3.9
The result was negative	59	77.6
Period of waiting before repeating COVID-19 test after positive result		
3 days	1	1.3
7 days	7	9.2

14 days	9	11.8
The result was negative	59	77.6
Feeling about the whole experience		
Nothing	42	55.3
Concerned	26	34.2
Worried	3	3.9
Frightened	3	3.9
Terrible	2	2.6

Table 7 shows the respondents opinion of the support/ rating of management, and waiting time for repeated COVID-19 test. Ten (13.2%) respondents sais they got some support, 2 (2.6%) were treated and 3 (3.9%) were counselled. Nine (11.8%) respondents considered the support received to be effective, and 3 (3.9%) opined that the support was very effective. It was the opinion of 9(11.8%) respondents that the waiting time between a positive COVID-19 test and a repeat was 14days, while 7(9.2) respondents indicated 7 days. Twenty-six (34.2%) respondents were concerned about the whole experience, 3 (3.9) were frightened, and 2 (2.6%) respondents felt terrible about the experience.

DISCUSSION

Almost all of the respondents were below 25years of age, with majority being Christians. This is expected as the study was conducted among undergraduate students of a university located in Port Harcourt, a Southern Nigeria City, known to be predominantly Christian.[25-27] Diverse emotional and social impact of the COVID-19 pandemic and the associated test were recorded among respondents, worsening the “normal” pressure of medical education. Similar psychosocial impact were recorded among students in the United States of America,[28, 29] Spain,[30] Egypt,[31] Brazil,[32] Philippines,[33] Bangladesh,[34] Ghana,[35] and 15 other countries.[36] Our study shows that more than a quarter of respondents reported being highly stressed, and a quarter of respondents reported moderate psychosocial distress. The quality of life of a few of the respondents was poor and awful, and the wellbeing of some was also poor. However, majority of respondents had no abnormal illness behaviour. Destabilization of all educational activities, mixed impact on academic research and professional development, severe effect on the educational assessment system, and reduced employment opportunities, were some of the impacts recorded in the educational sector following the COVID-19 pandemic.[37]

However the impact has been reported to be both positive and negative, and notable positive is the fight for survival of the education sector with stretch to technology-based new teaching and discussion platforms.[37-41] Similar effect on the educational system has been reported across the globe including Nigeria.[42-46] The educational sector in post COVID-19 era may run with some of the modifications that were initiated during the COVID-19 pandemic.[37] In a United Kingdom national survey of the impact of the COVID-19 pandemic on final year medical students, it was reported that public health measures resulted in significant disruptions affecting students’ confidence and preparedness in training.[47] Proper inductions, support and supervision was therefore recommended.[47]

The parents / guardians of a few respondents lost their jobs with accompanying financial hardship; a quarter of respondents started having problems with their colleagues, and majority were no longer satisfied with their school work. The relationship between individual mood or hidden feelings and social interactions have been reported,[48-51] with a strong mood having a tendency to influence a person's behavior or social interaction.[52, 53] A negative mood has also been reported to affect team task performance.[54] The mean waiting time for COVID-19 test result was 3.96 ± 4.14days. This period was significant for the students as it was full of uncertainty. About a quarter of respondents tested positive, and were isolated from others. While some respondents felt anxious, others were fearful and yet a few others were crying all through.

Although respondents received some support/counselling or treatment during the period, some respondents considered the support given as not effective. The waiting time from one positive test to the result of another test was another period that may have negatively impacted on the students, with more than a quarter feeling concerned about the whole exercise, while a few were frightened, and felt terrible. Psychological support and counselling are very important when bad news is received, and for these students, it was important for them to know that support was available; isolation from friends and family members and not being allowed into the hosptel without a negative test result added to the stress and anxiety for the students, 3.9% of who were very frightened. That a few of them felt that the support given to them was not effective is important and should be taken into consideration in working with young people and appropriate tools developed and possibly individually tailored to the expressed needs.

Study Limitation: This is a questionnaire-based study, and therefore subject to the demerits of such studies.

CONCLUSION

Assessment of the impact of COVID-19 disease and testing revealed that undergraduate clinical students were affected psychosocially in the pandemic. About a third of respondents were observed to be highly stressed, and a few indicated incapacitating psychological distress. The parents or guardian of some respondents were also affected, and some students reported developing some problems with their colleagues, while some others were no longer satisfied with school work. In addition to the general stress associated with the COVID-19 era, the period of waiting for the result of conducted test was associated with significant anxiety. A positive test eventually compounded the situation, but psychological support was provided, though not adequate for a few respondents.

Recommendation: Psychosocial support of students should be built into response measures for future screening services.

Ethical Considerations: The approval of the Ethics Review Committee of the PAMO University of Medical Sciences / Rivers State University Teaching Hospital was obtained before commencement of the study.

Appendices

Questionnaire

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

REFERENCES

1. Organization WH. WHO Director-General's opening remarks at the media briefing on COVID-19-11 March 2020. 2020.
2. Organization WH. Archived: WHO timeline-covid-19. Retrieved from Archived: Who Timeline-COVID-19. 2020.
3. Shereen MA, Khan S, Kazmi A, Bashir N, Siddique R. COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. Journal of Advanced Research. 2020.
4. Ahn D-G, Shin H-J, Kim M-H, Lee S, Kim H-S, Myoung J, et al. Current status of epidemiology, diagnosis, therapeutics, and vaccines for novel coronavirus disease 2019 (COVID-19). 2020.
5. Hussain A, Kaler J, Tabrez E, Tabrez S, Tabrez SS. Novel COVID-19: A comprehensive review of transmission, manifestation, and pathogenesis. Cureus. 2020;12(5).
6. Organization WH. Coronavirus disease (COVID-19): situation report, 162. 2020.
7. Koyama T, Weeraratne D, Snowdon JL, Parida L. Emergence of drift variants that may affect COVID-19 vaccine development and antibody treatment. Pathogens. 2020;9(5):324.
8. Sohrabi C, Alsafi Z, O'Neill N, Khan M, Kerwan A, Al-Jabir A, et al. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). International Journal of Surgery. 2020.
9. Paudel S, Dangal G, Chalise A, Bhandari TR, Dangal O. The Coronavirus Pandemic: What Does the Evidence Show? J Nepal Health Res Counc. 2020;18(1):1-9.
10. Organization WH. Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages: interim guidance, 6 April 2020. World Health Organization; 2020.
11. Nussbaumer-Streit B, Mayr V, Dobrescu AI, Chapman A, Persad E, Klerings I, et al. Quarantine alone or in combination with other public health measures to control COVID-19: a rapid review. Cochrane Database of Systematic Reviews. 2020(9).
12. Hartley DM, Perencevich EN. Public health interventions for COVID-19: emerging evidence and implications for an evolving public health crisis. Jama. 2020;323(19):1908-9.
13. Graham BS. Rapid COVID-19 vaccine development. Science. 2020;368(6494):945-6.
14. Lurie N, Sharfstein JM, Goodman JL. The development of COVID-19 vaccines: safeguards needed. Jama. 2020.
15. Haynes BF, Corey L, Fernandes P, Gilbert PB, Hotez PJ, Rao S, et al. Prospects for a safe COVID-19 vaccine. Science translational medicine. 2020;12(568).
16. Liu C, Zhou Q, Li Y, Garner LV, Watkins SP, Carter LJ, et al. Research and development on therapeutic agents and vaccines for COVID-19 and related human coronavirus diseases. ACS Publications; 2020.
17. Dai L, Zheng T, Xu K, Han Y, Xu L, Huang E, et al. A universal design of betacoronavirus vaccines against COVID-19, MERS, and SARS. Cell. 2020;182(3):722-33. e11.
18. Wu SC. Progress and Concept for COVID-19 Vaccine Development. Biotechnology Journal. 2020.
19. Chen W. Promise and challenges in the development of COVID-19 vaccines. Human Vaccines & Immunotherapeutics. 2020:1-5.
20. Organization WH. Responding to community spread of COVID-19: interim guidance, 7 March 2020. World Health Organization; 2020.
21. Melnick H, Darling-Hammond L. Reopening Schools in the Context of COVID-19: Health and Safety Guidelines from Other Countries. Policy Brief. Learning Policy Institute. 2020.
22. Ilesanmi OS, Afolabi AA. Six months of COVID-19 response in Nigeria: lessons, challenges, and way forward. Journal of Ideas in Health. 2020;3(Special1):198-200.

23. Adeiza S, Shuaibu GM, Abdulraheem U, Shuaibu AB. COVID-19 in a Nigerian university: Modelling the Spread of SARS-CoV-2 on an average university Campus. Microbes and Infectious Diseases. 2020;1(3):140-52.
24. Piolanti A, Offidani E, Guidi J, Gostoli S, Fava GA, Sonino N. Use of the psychosocial index: a sensitive tool in research and practice. Psychotherapy and Psychosomatics. 2016;85(6):337-45.
25. Ihejirika WC. Muslim minorities and media access in a predominantly Christian city: The case of Port Harcourt, Nigeria. Journal of African Media Studies. 2009;1(3):469-91.
26. Ojule J, Macpepple D. Family planning practice in a tertiary health institution in Southern Nigeria. West African journal of medicine. 2011;30(3):178-81.
27. Okeke OE. Conflicts between Fulani herders and farmers in central and southern Nigeria: Discourse on proposed establishment of grazing routes and reserves. AFRREV IJAH: An International Journal of Arts and Humanities. 2014;3(1):66-84.
28. Browning MH, Larson LR, Sharaievska I, Rigolon A, McAnirlin O, Mullenbach L, et al. Psychological impacts from COVID-19 among university students: Risk factors across seven states in the United States. PloS one. 2021;16(1):e0245327.
29. Kee CE. The impact of COVID-19: Graduate students' emotional and psychological experiences. Journal of Human Behavior in the Social Environment. 2021;31(1-4):476-88.
30. Gallego-Gómez JI, Campillo-Cano M, Carrión-Martínez A, Balanza S, Rodríguez-González-Moro MT, Simonelli-Muñoz AJ, et al. The COVID-19 pandemic and its impact on homebound nursing students. International Journal of Environmental Research and Public Health. 2020;17(20):7383.
31. Ghazawy ER, Ewis AA, Mahfouz EM, Khalil DM, Arafa A, Mohammed Z, et al. Psychological impacts of COVID-19 pandemic on the university students in Egypt. Health Promotion International. 2021;36(4):1116-25.
32. Amaral-Prado HM, Borghi F, Mello TMVF, Grassi-Kassisse DM. The impact of confinement in the psychosocial behaviour due COVID-19 among members of a Brazilian university. The International Journal of Social Psychiatry. 2020.
33. Carreon AD, Manansala MM. Addressing the psychosocial needs of students attending online classes during this Covid-19 pandemic. Journal of Public Health. 2021;43(2):e385-e6.
34. Khan AH, Sultana MS, Hossain S, Hasan MT, Ahmed HU, Sikder MT. The impact of COVID-19 pandemic on mental health & wellbeing among home-quarantined Bangladeshi students: a cross-sectional pilot study. Journal of affective disorders. 2020;277:121-8.
35. Owusu-Fordjour C, Koomson C, Hanson D. The impact of Covid-19 on learning-the perspective of the Ghanaian student. European Journal of Education Studies. 2020.
36. Batra K, Sharma M, Batra R, Singh TP, Schvaneveldt N, editors. Assessing the psychological impact of COVID-19 among college students: an evidence of 15 countries. Healthcare; 2021: Multidisciplinary Digital Publishing Institute.
37. Jena PK. Impact of Covid-19 on higher education in India. International Journal of Advanced Education and Research (IJAER). 2020;5.
38. Jena PK. Impact of pandemic COVID-19 on education in India. International Journal of Current Research (IJCR). 2020;12.
39. Dwivedi YK, Hughes DL, Coombs C, Constantiou I, Duan Y, Edwards JS, et al. Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. International Journal of Information Management. 2020;55:102211.
40. Jena PK. Challenges and Opportunities created by Covid-19 for ODL: A case study of IGNOU. International Journal for Innovative Research in Multidisciplinary Field (IJIRMF). 2020;6.
41. Mhlanga D, Moloi T. COVID-19 and the Digital Transformation of Education: What Are We Learning on 4IR in South Africa? Education Sciences. 2020;10(7):180.
42. Jacob ON, Abigeal I, Lydia A. Impact of COVID-19 on the higher institutions development in Nigeria. Electronic Research Journal of Social Sciences and Humanities. 2020;2(2):126-35.
43. Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The socio-economic implications of the coronavirus pandemic (COVID-19): A review. International journal of surgery (London, England). 2020;78:185.
44. Upoalkpajor J-LN, Upoalkpajor CB. The impact of COVID-19 on education in Ghana. Asian journal of education and social studies. 2020:23-33.
45. Rulandari N. The Impact of the Covid-19 Pandemic on the World of Education in Indonesia. Ilomata International Journal of Social Science. 2020;1(4):242-50.
46. Johnson N, Veletsianos G, Seaman J. US Faculty and Administrators' Experiences and Approaches in the Early Weeks of the COVID-19 Pandemic. Online Learning. 2020;24(2):6-21.
47. Choi B, Jegatheeswaran L, Minocha A, Alhilani M, Nakhoul M, Mutengesa E. The impact of the COVID-19 pandemic on final year medical students in the United Kingdom: a national survey. BMC medical education. 2020;20(1):1-11.
48. Gross JJ, Levenson RW. Hiding feelings: the acute effects of inhibiting negative and positive emotion. Journal of abnormal psychology. 1997;106(1):95.

49. Flory JD, Räikkönen K, Matthews KA, Owens JF. Self-focused attention and mood during everyday social interactions. Personality and Social Psychology Bulletin. 2000;26(7):875-83.
50. Broudy R, Brondolo E, Coakley V, Brady N, Cassells A, Tobin JN, et al. Perceived ethnic discrimination in relation to daily moods and negative social interactions. Journal of behavioral medicine. 2007;30(1):31-43.
51. Schuster TL, Kessler RC, Aseltine RH. Supportive interactions, negative interactions, and depressed mood. American journal of community psychology. 1990;18(3):423-38.
52. Forgas JP, Bower GH, Krantz SE. The influence of mood on perceptions of social interactions. Journal of Experimental Social Psychology. 1984;20(6):497-513.
53. Fleishman JA, Sherbourne CD, Crystal S, Collins RL, Marshall GN, Kelly M, et al. Coping, conflictual social interactions, social support, and mood among HIV-infected persons. American journal of community psychology. 2000;28(4):421-53.
54. Jordan PJ, Lawrence SA, Troth AC. The impact of negative mood on team performance. Journal of Management & Organization. 2006;12(2):131-45.