

Impact of the COVID-19 Pandemic on the Academic Training and Psychosocial Well-Being of Undergraduate Dental Students in Nigeria

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ABSTRACT

Background: Most educational institutions in Nigeria were shut down for a long while at the onset of the COVID-19 pandemic as a preventive measure, and this affected dental students' academic and clinical training. **Aim:** To determine the influence of the pandemic on the academic, clinical training, and psychosocial well-being of dental students in Nigeria. **Subjects and Methods:** This cross-sectional survey was conducted among undergraduate dental students in clinical years in Nigerian dental schools. Participants received the questionnaire through an online platform, it had four sections; socio-demographics, impact on academic training, psychosocial well-being, and an open-ended segment for participants' suggestions to challenges. A mixed method was utilized to analyze the data. The statistical significance level was $P < 0.05$. **Results:** One hundred two dental students from nine dental schools participated, with a mean age of 25.3 ± 2.4 years. There were 56 (54.9%) males. Most students, 80 (78.4%) reported that their stay-at-home had not been rewarding academically. The majority, 90 (88.2%) were worried about contracting COVID-19 on school resumption. Participants' psychosocial well-being had significant associations with gender ($P = 0.001$) and self-directed learning during their stay-at-home ($P = 0.001$). More female students, 33 (71.7%) were severely worried compared to males 20 (35.7%). Their major suggestions were to commence online teaching and examinations (40.1%) and be provided with adequate personal protective equipment (18.6%). **Conclusion:** Most undergraduate students in Nigeria were anxious about COVID-19, and females were more affected. This negatively impacted their academic and clinical training. This underscores the importance of adequate psychological support for undergraduate dental students by school authorities.

KEYWORDS: Academic training, COVID-19, dental students, Nigeria, psychosocial impact

BACKGROUND

Coronavirus disease 2019 (COVID-19) is a novel infection initially reported in Wuhan, China, and eventually pronounced to be a global pandemic on March 11, 2020, by the World Health Organization (WHO).^[1] Consequently, it has resulted in a global health and economic crisis.^[2,3] The rapid spread of the virus forced several countries to enforce drastic measures such as lockdowns, which led to the disruption of numerous business and work routines and in particular, education.^[4] The impact of the pandemic on universities, particularly dental education was unprecedented.^[5,6]

The routine face-to-face interactions, hands-on laboratory teaching, and supervised clinical training were halted in many dental schools as the need for social distancing was declared.^[5] This also resulted in the suspension of preclinical and clinical dental education

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and the treatment of patients by dental students within the clinics.^[7] Furthermore, graduation ceremonies, convocation programs, and academic conferences were suspended. These had psychosocial impacts on both students and faculty members.^[7] The strict rules on isolation and delays in the resumption of academic activity, with the continuous spread of the coronavirus pandemic, could have influenced the mental health of students.^[8]

In Nigeria, the Federal Government (FGN) ordered the instant shut down of all educational institutions, a few weeks after the first case was confirmed, as a major effort to contain the spread of the pandemic.^[9] As of July 17, 2021, the confirmed cases of COVID-19 in Nigeria were 169,206 with 2,414 deaths.^[10] The academic training of university students particularly those in government institutions was seriously disrupted, including the clinical training of undergraduate dental students.

Globally, there is a shift in the use of the virtual field and innovative communication technologies in educating students.^[2] Teachers are utilizing more online platforms to give lectures, webinars, examinations, problem-solving sessions, and written reports.^[5] Although these tools have helped to improve mental health by reducing the perception of isolation,^[2] information technology is limited and facing lots of challenges and barriers in developing countries,^[11] Nigeria is an example.

Previous studies on the quality of academic and clinical training of Nigerian undergraduate dental students have highlighted the importance of students' perspectives about the challenges in their training and how to overcome them.^[12-14] These studies reported dental students to be dissatisfied with the standard of their undergraduate clinical teaching due to infrastructural insufficiencies.^[12-14] The COVID-19 pandemic has presented a brand new set of threats for undergraduate dental training in Nigeria and the world at large.

Studies have reported the psychosocial impact of the COVID-19 pandemic on the medical staff, college medical students, and older adults.^[8,15-17] Although a recent study reported inadequate knowledge of COVID-19, yet positive attitudes toward disease control measures amongst clinical dental students in Nigeria,^[18] the impact of the pandemic on the training and psychosocial well-being and anxiety level of undergraduate dental students in Nigeria is unknown. Before the COVID-19 pandemic, the most common mode of teaching in Nigerian Universities was through face-to-face contact. The online teaching model by the Nigerian Universities Commission (NUC) was limited

in scope, and was mostly via the open and distant learning (ODL) and dual-mode universities, which are very few, and are far below acceptable best practices. Such ODL institutions used interactive texts for teaching and learning, supplemented with resources such as CDROM, DVD, or USB sticks to deliver; e-books, simulations, and assessments. [NUC ref] Comprehending these challenges following the pandemic will guide the dental faculty to assist students through this trying period. Thus, this study aimed to appraise the impact of the COVID-19 outbreak on the academic, clinical training, and psychosocial well-being of undergraduate dental students in Nigeria.

MATERIALS AND METHODS

Ethical approval for the study was obtained from the Institutional Review Board of the Lagos University Teaching Hospital after submitting the full details of the study protocol. The Health Research Committee number is LUTHHREC/EREV/0420/12.

Study design: This was a descriptive, cross-sectional study. The study population constituted undergraduate dental students from dental schools in Nigeria. The inclusion criteria were students in their clinical years, that is, the fifth (penultimate) and sixth (final) years, whereas the exclusion criteria were non-clinical undergraduate dental students in Nigeria. The data collection was carried out between April 30 and June 6, 2020, using self-administered questionnaires (Google forms). The questionnaires were administered to respondents using an online platform (Students' WhatsApp platform) and via direct WhatsApp messages to representatives, selected from the 12 dental schools to assist with the distribution of the online forms to the students.

The convenience (non-probability) sampling method was utilized to recruit the study participants. The authors utilized an online sample size calculator (Calculator.net),^[19] to calculate the minimum sample size, at a 98% confidence level with a 10% margin of error, which was to reduce the type 1 error in the study. Undergraduate clinical dental students in Nigeria were estimated to be 400, a proportion of the dental students in Nigeria. Individual dental schools/National Dental Students Association was contacted to get a rough estimate of undergraduate dental students in each school.

No incentives were offered for filling out the questionnaire. All participants were assured of confidentiality and anonymity. The data collection tool was developed by the researchers after an extensive literature search and relevant discussions among the research team members. Our questionnaire was well

validated before the study. A thorough review of the available literature was done in constructing the questionnaire. In addition, a pilot test was done before the study to ensure that the questions were well framed and properly understood. The questionnaire was then edited after the pilot test to correct the sections that were unclear to respondents.

Cronbach's alpha reliability score for the questionnaire was 0.740. The anxiety scale used in the study was similar to the 1-item scale for anxiety described previously.^[20,21] The questionnaire had four sections. Section one: socio-demography, whereas section two recorded variables on their academic training during the school closure. Academic training refers to all forms of didactic training received by the students outside the clinical environment, for example, classroom teaching, group discussions, etc.

Psychosocial well-being was assessed using seven questions: maintaining social distance in the classroom, observing procedures in the dental clinic, performing procedures in the dental clinic, maintaining social distance in the dental clinic, performing laboratory procedures, fulfilling the clinical requirement in view of time spent at home, and maintaining social distance in the hostel. These were evaluated on a 5-point Likert scale: (1: not worried; 2: slightly worried; 3: moderately worried; 4: very worried; 5: severely worried). All the scores were summed up and ranged from 7–35 points.

Section four contained an open-ended question to record the participants' perspectives, suggestions, and comments with regard to the COVID-19 pandemic and how the negative effects of the pandemic on their academic training could be mitigated.

Data analysis

The Statistical Product and Service Solution (SPSS) version 20 was used to analyze the data. For categorical variables, descriptive statistics were used and presented as frequencies and percentages. Associations between categorical variables were assessed using the Pearson Chi-square test. Continuous variables (age) were presented as means and standard deviations. The total Likert scale scores were re-categorized into three for analysis: not worried (scores 7–15), slightly and moderately worried (scores 16–25), and very and severely worried (scores 26–35). The qualitative data were analyzed using thematic analysis. The statistical significance level was set at P values < 0.05 .

RESULTS

Socio-demographics characteristics

One hundred two (102) clinical dental students were enrolled in the study. A majority of the participants were males (56, 54.9%). The mean age was 25.3 ± 2.4 years with an age range of 21–31 years. Most of the respondents in the study were in their final year of study (74, 72.5%) and were from 9 (75%) out of the 12 dental schools in the country. The schools were Bayero University of Kano-2 (2%), University of Medical Sciences, Ondo-2 (2%), University of Ibadan-5 (4.9%), Lagos State University-5 (4.9%), University of Benin-6 (5.9%), University of Nigeria Nsukka, Enugu-12 (11.7%), University of Maiduguri-15 (14.7%), Obafemi Awolowo University-20 (19.6%), and the University of Lagos-35 (34.3%).

Psychosocial well-being of the dental students

Most (90, 88.2%) of the participants were worried about contracting COVID-19 following the school resumption [Figure 1]. Most of the students were very/severely worried about performing procedures in the dental clinic (74, 72.5%) and finishing their clinical procedural requirements in view of time spent at home (73, 71.6%) [Table 1].

Relationship between sociodemographic variables, academic training, and psychosocial well-being

Most students (67, 65.7%) participated in online courses during the school closure, whereas the majority (80, 78.4%) preferred physical lectures to online lectures [Figure 2]. Their psychosocial well-being was significantly associated with their self-directed learning at home ($P < 0.001$) and the gender of respondents ($P < 0.001$). A significant proportion of females (33, 71.7%) were severely worried compared to males (20, 35.7%) ($P < 0.001$), whereas 59 (57.8%)

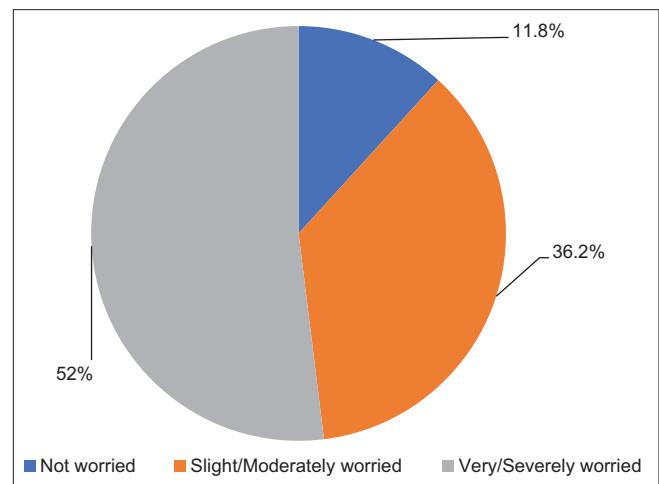


Figure 1: Psychosocial well-being/anxiety level of dental students

Table 1: Questions on psychosocial well-being

Questions	Not worried n (%)	Slight/moderately worried n (%)	Very/severely worried n (%)
Maintaining social distance in the classroom	14 (13.7)	48 (47.1)	40 (39.2)
Observing procedures in the dental clinic	10 (9.8)	29 (28.4)	63 (61.8)
Performance of procedures in the dental clinic	8 (7.8)	20 (19.6)	74 (72.5)
Maintenance of social distance in the dental clinic	9 (8.8)	22 (21.6)	71 (69.6)
Performing laboratory procedures	19 (18.6)	45 (44.1)	38 (37.3)
Fulfillment of clinical requirements in view of time spent at home	8 (7.8)	21 (20.6)	73 (71.6)
Maintaining social distance in the hostel	8 (7.8)	22 (21.6)	72 (70.6)

Not worried=Likert scale 1. Slight/moderately worried=Likert scales 2 and 3 combined. Very/severely worried=Likert scales 4 and 5 combined

Table 2: Association between sociodemographic variables, academic training, and psychosocial well-being/anxiety level

Variable	Not worried n (%)	Slight/moderately worried n (%)	Very/severely worried n (%)	Total	P
Gender					
Male	9 (16.1)	27 (48.2)	20 (35.7)	56 (54.9)	0.001*
Female	3 (6.5)	10 (21.7)	33 (71.7)	46 (45.1)	
Age (years)					
≤25	7 (12.3)	22 (38.6)	28 (49.1)	57 (55.9)	0.810
>25	5 (11.1)	15 (33.3)	25 (55.6)	45 (44.1)	
Year of Study					
Penultimate year	2 (7.1)	10 (35.7)	16 (57.1)	28 (27.5)	0.634
Final year	10 (13.5)	27 (36.5)	37 (50.0)	74 (72.5)	
No. of roommates in the hostel before closure					
≤1	5 (11.9)	20 (47.6)	17 (40.5)	42 (41.2)	0.144
≥2	7 (11.7)	17 (28.3)	36 (60.0)	60 (58.8)	
Place of residence before school closure					
Outside the hostel	0 (0.0)	6 (46.2)	7 (53.8)	13 (12.7)	0.339
Hostel	12 (13.5)	31 (34.8)	46 (51.7)	89 (87.3)	
Limited access to online courses					
Yes	12 (13.6)	29 (33.0)	47 (53.4)	88 (86.3)	0.128
No	0 (0.0)	8 (57.1)	6 (42.9)	14 (13.7)	
COVID-19 has made me too anxious to focus on studies					
Yes	7 (11.9)	12 (20.3)	40 (67.8)	59 (57.8)	0.001*
No	5 (11.6)	25 (58.1)	13 (30.2)	43 (42.2)	

*Statistically significant. Total Likert scores: 7-15 (not worried). 16-25 (slightly/moderately worried). 26-35 (very/severely worried)

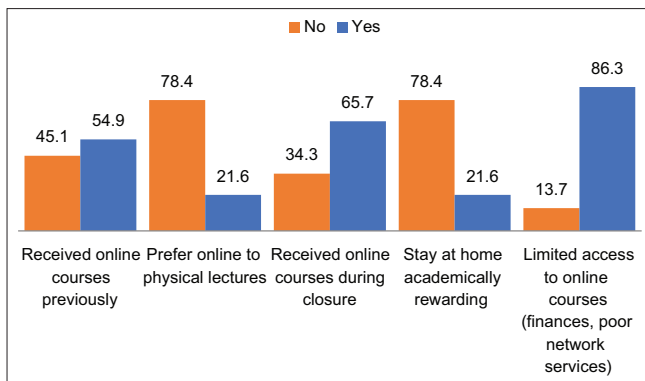


Figure 2: Dental students' suggestions in the open-ended section

participants who were severely worried were too anxious to focus on their studies during the lockdown [Table 2].

Thematic areas of dental students' responses in the open-ended segment

From the open-ended section, the students proffered different suggestions to improve their training during the COVID-19 pandemic in Nigeria. The main thematic areas were the preference for online programs (lectures, seminars, exams, and tests) (40, 40.1%), adequate provision of PPE (19, 18.6%), and reduction/cancellation of all clinical procedures (16, 15.7%) [Table 3].

Table 3: Dental students' suggestions in the open-ended section

Thematic area	No. of students (%)
Preference for online lectures, seminars, tests, exams	41 (40.1)
Adequate provision of PPEs	19 (18.6)
Reduction in/cancellation of all clinical procedures	16 (15.7)
Maintenance of social/physical distancing in classes, clinics, and hostels	10 (9.8)
Provision of subsidized/free internet service	9 (8.8)
Provision of more IPC training	5 (4.9)
Provision of additional teaching aids and alternatives to practical	3 (2.9)
Delay school resumption	2 (1.9)
Restructuring curriculum for more focused learning	2 (1.9)
Decontamination of hostels, classrooms, clinics	1 (0.9)
No suggestions	8 (7.8)

DISCUSSION

Dental education has faced several challenges globally as well as in Nigeria on account of the COVID-19 pandemic. The impact of the pandemic on the training of undergraduate dental students and their psychosocial well-being has been reported in countries such as China and the US.^[6-8] Such published reports are scarce among undergraduate clinical dental students from developing countries such as Nigeria. This study provides a national perspective as it represents clinical undergraduate dental students, as they seem to have been more affected by the restriction of dental treatment to urgent and emergency dental care as a result of the pandemic.

A small proportion of students in the present study had a preference for online lectures (22, 21.6%) and this is lower than the 44.2% reported among undergraduate dental students in Indonesia for distance learning during the present COVID-19 pandemic.^[22] This may be attributed to their limited financial resources for Internet access and poor network services/access as reported by 86.3% of the students. As highlighted previously, ease of access is important for online learning.^[23] Although the desire for an online mode of teaching and assessments was higher (40.1%) among the students in the open-ended section.

It should be noted that before the pandemic, the students were used to face-to-face communication and enjoyed closer interactions with their tutors. However, the exigencies of the pandemic and school closure might have resulted in the desire for online lectures by the students to avoid further disruption in the school calendar and extension of their time in school. This

was reflected in a comment by one of the respondents. *"Lastly, if there is a way we can restructure classes so we can write our exams on time, some people are getting depressed because of the time spent in dental school"*. This is further buttressed by the report that 78.4% of the students stated that the stay-at-home period had not been rewarding academically. It is encouraging to note that during the early phase of the pandemic, some dental schools such as the University of Lagos commenced online mode of didactic lectures delivered through the learning management system (LMS) and zoom meetings.

Online learning has its benefits as it creates an enabling platform to facilitate communication between students and the faculty, via virtual libraries, video conferencing webinars, emails, telecommuting, and chatting.^[2] Faculties of Dentistry around the world have switched to the virtual field/space.^[2] Nigeria is no exception, inferring that online learning may become a matter of necessity and not just a preference for the academic training of students in dentistry in the immediate and foreseeable future. Due to some of the infrastructural deficiencies, however, online learning should be balanced with some physical teaching sessions for students, particularly when it involves hands-on demonstrations such as simulations and chairside clinical teaching.

Dental training has a key clinical phase/stage where important and vital manual and cognitive skills are taught to dental students to prepare them for practice in the profession.^[2] The partial lockdowns restricted access to learning opportunities for dental students in the clinic, with little opportunity to manage patients in the affiliated dental clinics.^[2] It is pertinent to note that more than half of the students (72.5%) in this study were in their final year and bound to be more concerned about the dramatic shifts in their academic activities, which were kept on hold.

Only 15.7% of the students in the present study expressed a desire to reduce the number of their clinical requirements due to COVID-19, which could imply that the remaining students (84.3%) were most likely interested in completing their required clinical procedures. A large proportion (83%) of dental students in Malta, Southern Europe, were also anxious and more concerned about losing their manual dexterity, because of the initial halt in their education by the government at the beginning of the COVID-19 pandemic.^[24] It is comprehensible that despite the pandemic, most dental students did not lose sight of the needed proficiency in their clinical skills, as graduate dentists. In dental education, clinical procedures are a critical part of the assessment of skills and competence required for dental students to be successful dental professionals.

Dental school authorities would have to balance school resumption and completion of required clinical requirements by dental students, with the safeguarding of their health and those of the faculty against the COVID-19 pandemic. This will enable dental students to gain the competencies needed while ensuring their optimum protection from COVID-19.

Studies have indeed found that public health emergencies or crises can cause varying degrees of psychosocial effects on undergraduate university students, which may be expressed in the form of anxiety, fear, worry, disturbance by economic stressors,^[8,25] or depression.^[5] From the present study, the negative impact on the psychosocial well-being of clinical dental students in Nigeria during the COVID-19 pandemic was high as most students (88.2%) were quite worried about contracting COVID-19 upon school resumption. As pointed out by Mijiti and Huojia,^[26] the high transmissibility of the coronavirus may cause psychosocial problems, such as anxiety, depression, and stress. To buttress this, 72.5% and 61.8% of the dental students in this study were very worried about contracting COVID-19 while performing and observing clinical procedures, respectively, on school resumption. In a recently conducted study, among undergraduate dental students in Italy, most respondents were also worried about being infected with COVID-19 during their daily activities, with 40.9%, 40.9%, and 2% reporting little, moderate, and extreme worry, respectively.^[17] It is important to bear in mind that during the data collection period for the Italian and present studies, the COVID-19 vaccination had not commenced, and the uncertainties surrounding the infectivity of the SARS-CoV-2 were enormous.

The COVID-19 pandemic has placed an enormous psychosocial strain on students, which could be related to the uncertainties about their future graduation dates due to the nature of the pandemic. Before the school closure, most of the dental students (87.3%) in the present study resided in school hostels, and a notable proportion (58.8%) had at least two roommates. This may not have been a source of concern to the students and school authorities, before the pandemic, but may now cause some anxiety in the face of the new normal of the current pandemic, particularly regarding social/physical distancing. The students thus expressed their dilemma and were very/severely worried about how to maintain social distancing in the hostels, (70.6%) and clinics (69.6%). A conducive and safe environment is necessary for effective learning. Students' accommodation particularly regarding the number of students in a room, could negatively affect their education and mental well-being.

Despite the reported a higher prevalence of COVID-19 among males than females in Nigeria,^[10] the male students in the present study were less worried than their female colleagues. This is similar to a recent survey in the UK that revealed women as being more worried about getting infected than men.^[27] Our finding is also in agreement with a Chinese study, which found that anxiety was more likely to be observed in females,^[28] but contrasts with the study that found both male and female students encountered stress and negative emotions alike due to the COVID-19 epidemic.^[8]

A few students in the present study expressed a need for infection prevention and control (IPC) training (4.9%) but more wanted adequate provision of personal protective equipment (PPE) (18.6%) to facilitate the safe practice of dentistry. PPE should be made available to both students and tutors to allay anxieties about the transmission of the virus in the clinic, classroom, and hostel environments. This would go a long way in providing additional psychosocial support for the students, as it would minimize their risk of contracting COVID-19 within the dental setting. The availability and ongoing administration of COVID-19 vaccines in many countries, including Nigeria, should also provide some succor to the students.^[29] However, the unprecedented demand for vaccines globally and their limited distribution may imply that the impact of the pandemic on mental health may persist for some time. IPC training is important in health care settings and has been shown to reduce the risk of transmission of COVID-19 infection.^[30] According to the WHO, IPC training prepares health care workers (HCWs) to identify and respond swiftly to such infections and properly implement IPC measures to limit human-to-human transmission within healthcare facilities.^[30]

A major limitation of this study is the non-probability sampling method employed due to the possibility of selection bias because the participants were accessed through an online forum. Nevertheless, the study gives some perspective on the impact of COVID-19 on the training and psychosocial well-being of dental students in Nigeria.

CONCLUSION

The COVID-19 pandemic has negatively affected the academic and clinical training of undergraduate dental students in Nigeria. The psychosocial well-being of the students, particularly of females, was also adversely affected. The government and school authorities should provide good infrastructural facilities to enhance unhindered, online teaching platforms for undergraduate dental students in Nigeria. Regular and periodic mental

health assessment and counseling for undergraduate dental students should be instituted. There is a need for further studies to explore the various teaching and learning methods, which would be most suitable and cost-effective, for both didactic and clinical undergraduate dental training, in developing countries such as Nigeria.

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Conflicts of interest

There are no conflicts of interest.

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