



Effects of COVID-19 on Dental Surgery Teaching Methods among Final Year Students in Nigeria: A Cross-Sectional Post-Pandemic Study

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: The COVID-19 Pandemic which took the world by a storm in the year 2020 has had a far-reaching effect on all segments of human development, and especially on education and dental surgery, through the social distancing measures and the phases of lockdowns it imposed, infection prevention measures, among other things.

Objectives: To assess the impact COVID-19 has had on dental surgery teaching methods and skill acquisition among final year students of dentistry and dental surgery in a developing country like Nigeria.

Methodology: A cross-sectional study of final-year dental students across four (4) dental schools in Nigeria using a structured online Google form. Data was collected from fifty-four (54) respondents and the data was analyzed using Statistical Package for Social Sciences (SPSS) version 26.

Results: The respondents agreed that COVID-19 reduced metrics such as physical practical sessions (83.3% of the respondents), contact times with patients (85.2%), physical classes' reduction (31.5%), theatre experiences (61.1%), ability to meet up with training requirements (72.2%), flow chart affectation (79.6%), and availability of equipment for dental surgery training (53.7%). The cost of training increased according to 70.4% of the respondents while dental skills acquisition further reduced according to 61.1% of the respondents.

There was an association between the institution of study and the effect of the pandemic on dental skills acquisition, however, the association wasn't significant (Fischer's exact value – 15.326. Degrees of significance $p = 0.06$. There was also no significant correlation between age and the effect of the pandemic on dental skills acquisition. (Pearson's correlate = -0.030, Significance (2-tailed) = 0.892)

Conclusion: The effect of COVID-19 on dental surgery teaching methods have been largely negative, reducing amount of practical sessions, reducing student's interaction with patients, increasing cost and length of training among other negative effects, with a minor increase in access to journal groups and website links.

Recommendation: Despite the reduction in overall teaching experience, there is a need to inculcate training in infection prevention and control to arm dental trainees with the wherewithal to protect themselves from infection.

In addition, to further improve access to the online classes, the government can channel a part of the budget on education towards subsidizing the cost of data access to online learning platforms like Zoom and Google meet, by liaising with internet service providers and making provision for WiFi in the different campuses.

Keywords: COVID-19; dental surgery; education; medical students; teaching methods.

1. INTRODUCTION

Like the other pathogens, severe acute respiratory syndrome coronavirus- 1 (SARS-CoV-1) and Middle East respiratory syndrome coronavirus (MERS-CoV) that belong to the same Coronavirus family, the emergence of the novel *coronaviridae* shook the world (Fauci et al., 2020). SARS CoV 2 as it is now known, has been traced to have its origin from Huanan Seafood wholesale market in Wuhan, Hubei province China (Ciotti et al., 2020). The very first cases were in individuals who were either present or had contacts with others who patronized this market (Li et al., 2020). Initially, the resulting disease was simply called pneumonia of unknown origin as it failed to match any of the known pathogens of

pneumonia. Eventually using a protocol developed during the epidemic caused by the SARS CoV 1 virus, the Chinese CDC were able to link this novel virus to this family and following the genetic sequencing of the viral DNA, it was officially named the SARS-CoV2 virus (Le et al., 2020).

In the January of 2020, the World Health Organization (WHO) following the recommendations of the investigative team declared the disease to be a public health emergency of international concern and about and shortly afterwards a pandemic (Nkengasong et al., 2020). The WHO also in conjunction with the different national health agencies in the member nations rallied to mount the highest possible medical defence. Personal protective

measures like the use of facemasks, social distancing and practice of hand washing were advocated to reduce spread (WHO 2020). Governments also employed containment approaches like bans on large gatherings, mandating the use of face-masks and social distancing in public spaces and enforcement of lock-downs (Tabari et al., 2020).

These measures resulted in a halt in the face-to-face form of teaching and education worldwide, amongst a whole gamut of effects (Guni Network, 2020). Multiple studies carried out revealed serious negative effects of COVID-19 on education, especially in developing countries (ReliefWeb, 2022, Guni Network, 2020, Hoofman & Secord, 2021).

Concerning the impact COVID-19 has had on dental education, a study published by Saeed B. Alzahrani et al. revealed that many dental surgery schools have had to halt all daily face-to-face teaching, hands-on laboratory training, and clinical training under supervision (International Journal of Health Sciences, Research, 2020). This led to the development of other alternatives to the above-listed methods of education. They include the use of online lectures, webinars, problem-solving sessions, written reports and computer-based exams. (Barabari & Moharamzadeh, 2020, MDC Nigeria, 2022).

Very few studies have been carried out to assess the effects of the COVID-19 pandemic on dental surgical education in developing countries, however, a study on the effect of Covid-19 on education in Africa and its Implications for the use of technology revealed that lack of access to technology was considered to be the biggest barrier for learning during the current pandemic.

This study hopes to bridge the gap identified in the literature and assess the impact COVID-19 has had on dental surgery teaching methods and dental surgery training in a developing country like Nigeria.

2. MATERIALS AND METHODS

2.1 Study Area and Design

This study is a cross-sectional study conducted among students of dentistry and dental surgery in four (4) Universities offering training in Dentistry and Dental surgery in Nigeria viz. University of Nigeria Teaching Hospital (UNTH), University of Benin Teaching Hospital (UBTH),

University of Calabar Teaching Hospital (UCTH), and Jos University Teaching Hospital (JUTH).

Nigeria is currently classified as a developing country according to the United Nations Human Development Index (WPR, 2022) and thus it can adequately display the effects the Covid-19 pandemic has had on dental surgery teaching methods in a developing country.

2.2 Sampling Procedure

The sampling procedure is mainly convenience sampling since persons who voluntarily consented to participate were readily available via the various social media platforms in the different institutions.

Data was collected from fifty-four (54) final year students of dentistry and dental surgery.

2.3 Study Population

Final year students of Dentistry and Dental surgery in University of Nigeria Teaching Hospital (UNTH), University of Benin Teaching Hospital (UBTH), University of Calabar Teaching Hospital (UCTH), and Jos University Teaching Hospital (JUTH).

2.4 Data Collection Tool and Methods

Data was collected using a semi-structured online-based questionnaire created on Google forms.

The questionnaire has 2 sections:

Section 1 assesses the socio-demographic characteristics of the respondents like age, sex, marital status, religion, ethnic group and living arrangement.

Section 2 assesses the effect of COVID-19 on undergraduate training and dental surgery teaching methods.

2.5 Statistical Analysis

Data analysis was carried out using the Statistical Package for Social Sciences (SPSS) by IBM version 26. Descriptive statistics and bivariate analysis methods were employed.

3. RESULTS

As shown in Fig. 1, total number of participants in the study was fifty-four (54) dental surgery final

year students from the 69 total number of forms sent (Response rate = 78%).

Details of the socio-demographic of the population are as shown Fig. 1.

A summary of the major findings on the effects of COVID-19 on dental surgery teaching methods among final year students in a developing country is presented in the bar graph Fig. 2.

4. DISCUSSION

The effects of COVID-19 pandemic on dental skills acquisition among the dental surgery students are in line with that predicted from the

literature review (Ciotti et al., 2020, Le et al., 2020) and that effect is largely negative. These findings are also in keeping with similar papers by Imediegwu et.al; in surgical education amongst medical students and surgery resident doctors (Imediegwu et al., 2022, Imediegwu et al., 2024).

From the data shown in Fig. 2, most of the respondents opined that the pandemic has led to reduced dental surgery skill acquisition, prolonged graduation times, increased the already high cost of education, and has retarded comprehension (the majority of the participants opined that they understand better in physical classes).

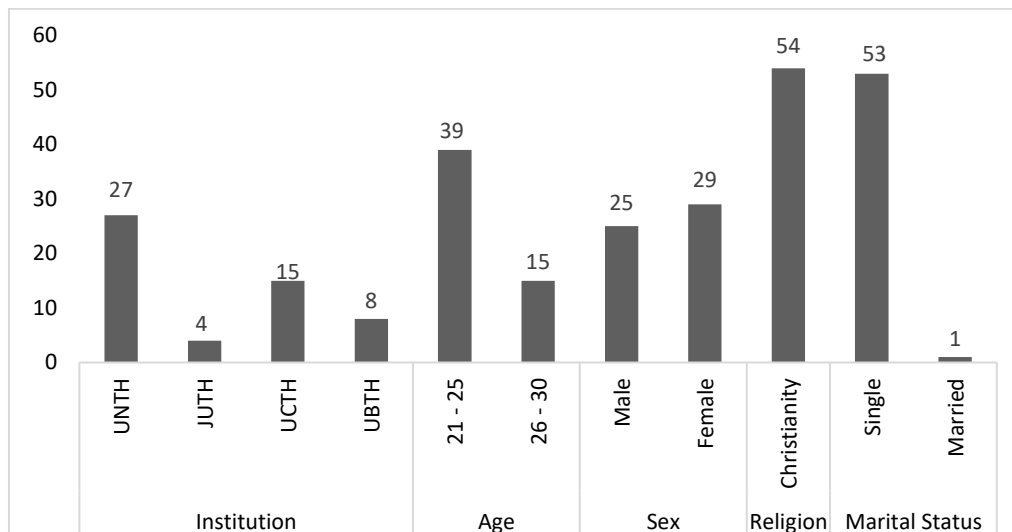


Fig. 1. Socio-demographic characteristics

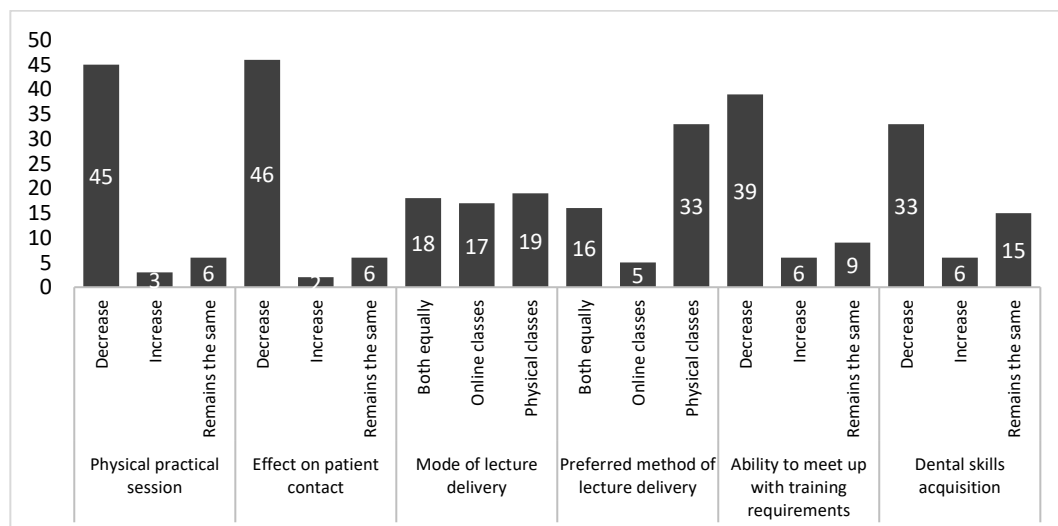


Fig. 2. A bar graph showing a number of significant effects COVID-19 has had on dental surgery teaching methods and skills acquisition in a developing country

Similarly, a greater proportion of the respondents had received no form of training in infection prevention and control, hence necessitating the need for the stringent lockdown and avoidance of contact with patients, to avoid furthering the spread of the virus, however, the obvious negative effect of this is the reduced contact times with patients and lecturers, and thus the resulting barrier to dental skills acquisition.

However, not all is doom and gloom, as there seemed to be an increase in access to journal groups and website links due to the pandemic. In addition, the increase in online teachings, when compared to the pre-pandemic era, is a positive especially as the students alluded to learning other innovative forms of dental surgery techniques. This was supported by findings from dental surgery education papers by Kamireddy et.al., (2024) Lee et al. (2024) Ching Yung et al. (2024) and Noor et al. (2022). In a similar study in Ghana among dental surgery students in Ghana, the students demonstrated a positive attitude towards the required changes following the COVID-19 and this should further buttresses the importance of the Ministry of Education and Health to provide more support in all forms of virtual educational learning platforms (Hewlett et al., 2022).

There was an association between the institution of study and the effect of the pandemic on dental skills acquisition, however, the association wasn't significant (Fischer's exact value = 15.326. Degrees of significance $p = 0.06$. This further highlight the national similar effect of the COVID-19 pandemic across all the institutions at various regions. There was also no significant correlation between age and the effect of the pandemic on dental skills acquisition. (Pearson's correlate = -0.030, Significance (2-tailed) = 0.892).

5. CONCLUSION

The effect of COVID-19 on dental surgery teaching methods have been largely negative, with a minor increase in access to journal groups and website links.

There is a need to inculcate training in infection prevention and control to arm dental trainees with the wherewithal to protect themselves from infection.

This will in addition to the safety of lives, and reduction in health spending it will result in, also enable dental students to interact with patients

and trainers even amidst the pandemic with the resultant positive effect being the elimination of a major portion of the adverse effects the pandemic has had on dentistry and dental surgical training.

Also, the government can channel a part of the budget on education towards subsidizing the cost of data access to online learning platforms like Zoom and Google meet, by liaising with internet service providers and making provision for WiFi in the different campuses.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

CONSENT

Respondents were informed that their participation was voluntary and consent was implied upon completion of the questionnaire.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- Barabari, P., & Moharamzadeh, K. (2020). Novel coronavirus (COVID-19) and dentistry: A comprehensive review of literature. *Dentistry Journal*, 8(2), 53. <https://www.ncbi.nlm.nih.gov/labs/pmc/articles/PMC7345990/>
- Ching, Y. K., Liong, K. L., Md Sabri, B. A., Pullishery, F., Bilal, S., & Gopinath, D. (2024). Online learning in dental education: Comparison of perspectives of lecturers and undergraduate students between a public and private university: A mixed-method study. *International Journal of Dentistry*. <https://doi.org/10.1155/2024/7389743>
- Ciotti, M., Ciccozzi, M., Terrinoni, A., Jiang, W. C., Wang, C. B., & Bernardini, S. (2020). The COVID-19 pandemic. *Critical Reviews in Clinical Laboratory Sciences*, 57(6),

- 365–388.
<https://doi.org/10.1080/10408363.2020.1783198>
- Developing countries 2022. (2022, March 7). *World Population Review*.
<https://worldpopulationreview.com/country-rankings/developing-countries>
- Fauci, A. S., Lane, H. C., & Redfield, R. R. (2020). COVID-19: Navigating the uncharted. *The New England Journal of Medicine*, 382(130), 1268–1269.
<https://doi.org/10.1056/NEJme2002387>
- Hewlett, S. A., Newman-Nartey, M. A., Osei-Tutu, K., Acheampong, A. O., & Nartey, N. O. (2022). Dental education with the COVID-19 pandemic: Ghanaian dental students' experience. *Journal of West African College of Surgeons*, 10(3), 8–14.
https://doi.org/10.4103/jwas.jwas_48_21
PMCID: PMC9202605 PMID: 35720955
- Hoofman, J., & Secord, E. (2021). The effect of COVID-19 on education. *Pediatric Clinics of North America*, 68(5), 1071–1079.
<https://www.ncbi.nlm.nih.gov/labs/pmc/articles/PMC8445757/>
- Imediegwu, K. U., Ilo, E. C., Dimson, C. J., Okeke, K. C., Agulanna, S. T., Ugwuanyi, U. D., Omoleye, T. O., Igwe, O. P., Onwuka, P. C., Uku, T. U., & Onwuasoigwe, C. A. (2024). Assessment of the effects of the COVID-19 pandemic on orthopaedic surgery training among orthopaedic residents in Southern Nigeria. *Journal of The West African College of Surgeons*, 14(4), 380–383.
https://doi.org/10.4103/jwas.jwas_125_23
- Imediegwu, K. U., Onwuka, P. C., Uwaezuoke, A. C., Abor, J. C., & Oladiran, A. (2022). Effects of COVID-19 pandemic on the surgical training of final year medical students in South-eastern Nigeria. *Journal of West African College of Surgeons*, 12(3), 64–70.
https://doi.org/10.4103/jwas.jwas_129_22
- International Journal of Health Sciences, Research (IJHSR). (2020). Impact of COVID-19 pandemic on dental education, research, and students. *IJHSR*, 10(6).
https://www.ijhsr.org/IJHSR_Vol10_Issue6_June2020/IJHSR_Abstract032.html
- Kamireddy, M., Kumar, R. V. S. K., Athuluru, D., Gomasani, S., Reddy, V. P., & Prasanth, P. S. (2024). Effect of online teaching methods on dental education among undergraduate dental students during the Coronavirus Disease 2019 pandemic in Nellore City: A cross-sectional study. *Journal of Indian Association of Public Health Dentistry*, 22(2), 179–184.
https://doi.org/10.4103/jiaphd.jiaphd_24_23
- Le, T. T., Andreadakis, Z., Kumar, A., Roman, R. G., Tollefsen, S., Saville, M., et al. (2020). The COVID-19 vaccine development landscape. *Nature Reviews Drug Discovery*, 19, 305–306.
<https://doi.org/10.1038/d41573-020-00073-5>
- Lee, M., Youn, A. S., & Ihm, J. (2024). Dental students' satisfaction with web-based learning during the initial phase of the COVID-19 pandemic: A mixed methods study. *Journal of Medical Internet Research*, 26.
<https://preprints.jmir.org/preprint/50278>
- Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., Tong, Y., Ren, R., Leung, K. S. M., Lau, E. H. Y., Wong, J. Y., Xing, X., Xiang, N., Wu, Y., Li, C., Chen, Q., Li, D., Liu, T., Zhao, J., Liu, M., Tu, W., Chen, C., Jin, L., Yang, R., Wang, Q., Zhou, S., Wang, R., Liu, H., Luo, Y., Liu, Y., Shao, G., Li, H., Tao, Z., Yang, Y., Deng, Z., Liu, B., Ma, Z., Zhang, Y., Shi, G., Lam, T. T. Y., Wu, J. T., Gao, G. F., Cowling, B. J., Yang, B., Leung, G. M., & Feng, Z. (2020). Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *The New England Journal of Medicine*, 382, 1199–1207.
<https://doi.org/10.1056/NEJMoa2001316>
- MDC Nigeria. (2022, February 28). *Mdcnigeria.org*.
<https://www.mdcnigeria.org/Dental%20Schools.htm>
- Nkengasong, J., Iwasaki, A., Victora, C., Oh, J., Gao, G. F., Agrawal, A., Drosten, C., Soderberg-Naucler, C., Lopez-Collazo, E., Pollock, A. M., Viola, A., Baker, M. (2020). The global response to the COVID-19 pandemic. *Med (N Y)*, 1(1), 3–8.
<https://doi.org/10.1016/j.medj.2020.12.003>
PMID: 33363282; PMCID: PMC7748395
- Noor, R., Dalvinder, S., Anjali, A., Shahnaz, M., & Mohd, I. (2022). Perception of dental students towards the online method of dental education during the COVID-19 pandemic. *Journal of Oral Biology and Craniofacial Research*, 12(2), 223–227.
- Tabari, P., Amini, M., Moghaddam, M., & Moosavi, M. (2020). International public health responses to COVID-19 outbreak: A

- rapid review. *Iranian Journal of Medical Sciences*, 45(3), 157–169. <https://doi.org/10.30476/ijms.2020.85810.1537> PMID: 32546882; PMCID: PMC7253494
- The effect of COVID-19 on education in Africa and its implications for the use of technology. (2020, February 28). *Guni Network*. <https://www.guninetwork.org/publication/effect-covid-19-education-africa-and-its-implications-use-technology>
- The impact of COVID-19 on education systems in the Commonwealth - World. (2022, February 28). *ReliefWeb*. <https://reliefweb.int/report/world/impact-covid-19-education-systems-commonwealth>
- World Health Organization. (2020, January 26). *Novel coronavirus (2019-nCoV): Situation Report-6*. <https://www.who.int/docs/default-source/coronavirus/situation-reports-20200126-sitrep-6-2019-ncov.pdf>

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