

The Impact of the COVID-19 Pandemic on Eye Care Services and Training in Nigeria

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Abstract

Background: The COVID-19 pandemic greatly affected eye care globally in terms of service provision and training. It is important to recognize the challenges faced and the adaptations instituted to overcome them. **Aim:** The aim of this study was to determine the impact of the COVID-19 pandemic on eye care services and training in eye institutions in Nigeria. **Materials and Methods:** This was a cross-sectional survey involving ophthalmologists and senior ophthalmology trainees selected purposively to ensure a varied representation in terms of location and type of practice. Data collection was done through a web-based questionnaire (Google Forms). The main outcome of interest was the impact of the pandemic on four major aspects of practice: outpatient care, surgical care, inpatient care, and residency training. Data on respondents' sociodemographic features and practice details were descriptively summarized with means and standard deviations (SDs) for the continuous variables and proportions for the categorical variables. Practice patterns before and at the height of the pandemic were compared for the four aspects of practice, and $P < 0.05$ was considered statistically significant. **Results:** A total of 59 responses were received from eye institutions in 28 states in Nigeria. The mean age of respondents was 38.1 years (SD 6) and 36 (61%) were female. Forty-seven (81.4%) responses were from participants working in public institutions and 40 (67.8%) responses were from respondents whose institutions run ophthalmology residency training programs. Glaucoma was the most affected subspecialty during the pandemic (24, 40.7%). Respondents reported complete closures of clinics (21, 35.6%), theaters (40, 67.8%), and wards (18, 30.5%) at the height of the pandemic. Training activities requiring physical contact were negatively affected, while reports on the use of virtual seminars increased to 75% ($n = 30$) at the peak of the pandemic from 5% ($n = 2$) before the pandemic. Overall, all respondents affirmed that the pandemic negatively affected their practice, and 51 (86%) reported an extent of more than 25%. **Conclusion:** The COVID-19 pandemic has disrupted most aspects of ophthalmology practice. Adaptations are required to ensure the optimization of patient care and training experiences in the post-COVID era.

Keywords: COVID-19 pandemic, eye care, impact, ophthalmology practice

INTRODUCTION

The severe acute respiratory syndrome coronavirus-2 infection was described first in December 2019 in a group of patients with atypical pneumonia in Wuhan, China.^[1] The infection spread rapidly throughout the world within weeks and was declared a pandemic by the World Health Organization (WHO) on March 11, 2020.^[2] Countries subsequently instituted public health measures to prevent and contain its spread, including issuing lockdown orders, travel restrictions, and the suspension of nonessential health services. The restriction of health care to essential services

was necessary because of safety concerns for both patients and the health workforce.

In Nigeria, the first case of the infection, an international traveler, was confirmed on February 27, 2020.^[3] More cases

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were reported in the following weeks leading to the institution of lockdown and suspension of nonessential services in the country.^[4] This led to disruption in the delivery of different services, including clinical services. Since then, there have been 212,829 confirmed cases in the country with a case-fatality rate of 1.37% as of November 10, 2021, contributing to 3.5% of confirmed cases and 2% of deaths from COVID-19 in the WHO Africa subregion.^[4]

The COVID-19 disease presents a special challenge to the practice of ophthalmology. This is because the ophthalmologist's interaction with patients involves close physical contact, which poses an increased risk of infection with the virus.^[5] The presence of ocular features and the detection of viral ribonucleic acid in tears of some infected patients also suggest additional risks for viral transmission in ophthalmic clinics.^[6] There are also concerns about the possible transmission during aerosol-generating procedures such as phacoemulsification and vitrectomy.^[7,8] Dr. Li Wenliang, a Chinese ophthalmologist who first warned colleagues about the outbreak, contracted the disease from a patient and subsequently died from it.^[9]

The COVID-19 pandemic has greatly affected eye care services globally. The institution of international and national guidelines and recommendations led to a great reduction in the number of ophthalmic clinical activities undertaken worldwide (including Nigeria), with many centers shutting down at the peak of the pandemic.^[10-12] Services were mainly restricted to emergency and urgent care. Patients' perception of urgency of their eye conditions, fear of contracting the virus from the hospital, and travel restrictions also prevented easy access to the eye care services.^[5,13]

These disruptions in health-care service delivery also affected ophthalmic training globally. A decrease in patient volume and the range of services provided reduced the likelihood of hands-on skills acquisition that was possible during that period. Training programs tried to overcome the resulting challenges by seeking the virtual means of maintaining ophthalmic education through online learning and virtual meetings, as well as through simulation-based surgical training.^[14-19] Telemedicine also became an invaluable strategy for maintaining patient contact for nonurgent cases.^[14,20,21]

Before the pandemic, eye care delivery in Nigeria was already burdened by long patient waiting times during clinic appointments, long surgery waiting lists, and inadequate health workforce and infrastructure.^[22-24] The aim of this study was to determine the impact of the COVID-19 pandemic on eye care services and training in Nigerian eye institutions. It is important to recognize the challenges faced and potential adaptations to overcome them.

MATERIALS AND METHODS

The study was a cross-sectional survey that assessed the impact of the COVID-19 pandemic on ophthalmology

practice in eye health institutions across Nigeria. Respondents included ophthalmologists and senior registrars in eye institutions across Nigeria, and these were purposively selected to ensure as varied a representation as possible in terms of location and type of practice. This group of people was deemed knowledgeable of the true state of affairs of the functioning of their institutions based on the domains that were assessed. All participants gave their written consent to participate in the study, and their responses were anonymized. Data collection was done through a web-based questionnaire (Google Forms) and analyzed using the Statistical Package for the Social Sciences (SPSS) software version 20.0 (IBM Corp., Armonk, NY, USA).

The main outcomes of interest were the impact of the pandemic on the four major aspects of ophthalmic practice: outpatient activities, surgical activities, inpatient care, and residency training.

The data on respondents' sociodemographic features and practice details were descriptively summarized with means and standard deviations (SDs) for the numerical variables and proportions for the categorical variables. Practice patterns in the three months before and at the height of the pandemic were compared for the four aspects of practice using McNemar test for categorical variables. Respondents were also asked to estimate how much of a negative impact the pandemic had on their practice and their responses were analyzed based on quartiles. $P < 0.05$ was considered statistically significant.

RESULTS

A total of 59 participants completed the online questionnaire. Thirty-six (61%) of them were females, and their mean age was 38.1 (SD 6) years. Responses were received from 28 of the 36 states, across the six geopolitical zones of the country: North-Central, North-East, North-West, South-East, South-South, and South-West. Forty-seven (81.4%) responses were from public institutions, while six (10.2%), four (6.8%), and one (1.7%) were from private, mission, and public-private institutions, respectively. The three reported most affected subspecialties were glaucoma (24, 40.7%), vitreoretinal (12, 20.3%), and community ophthalmology (9, 15.3%).

All the respondents affirmed that the pandemic negatively affected their practice as an institution, with 51 (86%) reporting an extent of more than 25% [Figure 1].

Some respondents reported complete closure of clinics (21, 35.6%), theaters (40, 67.8%), and wards (18, 30.5%) at the height of the pandemic. These areas were closed for periods ranging from one to 60 weeks (clinics), two to 60 weeks (theatres) and one to 52 weeks (wards). The median duration of closure was four weeks (interquartile range, [IQR]: 2–8) for clinics and eight weeks (IQR: 4–12) for theaters and wards, respectively. Reasons for closure included adherence to hospital or national guidelines to limit the spread of the COVID infection, fear of contracting the infection, exposure

or infection of other members of staff, and lack of personal protective equipment.

Using McNemar test to compare the different categories of eye care services delivered before and at the height of the pandemic, significantly more respondents reported attending to fewer new ($P < 0.001$) and follow-up ($P = 0.012$) clinic patients at the height of the pandemic compared to before the pandemic [Table 1]. None of the 15 respondents who reported attending to < 10 new patients before the pandemic reported an increase in the number of new patients seen at the height of the pandemic. Furthermore, among those who reported attending to more than 10 new patients per day before the pandemic (29 respondents), only 15 (51.7%) maintained this trend at the peak of the pandemic. Similarly, there were significantly more reports of fewer numbers of refractions, cataract surgeries, and ward admissions at the height of, compared to before the pandemic ($P < 0.001$).

More than half of the respondents (40, 67.8%) stated that their institutions were involved in residency training. The levels of participation in all residency training activities such as didactic lectures, physical seminars, virtual seminars, wet

laboratory sessions, simulation-based surgical training, and clinic-based hands-on teaching were statistically significantly reduced ($P < 0.001$) at the height of the pandemic as compared to the pre-pandemic period except for virtual seminars and simulation-based surgical training [Figure 2]. The number of people who reported the use of simulation-based surgical training reduced from 11 (27.5%) before the pandemic to five (12.5%) at the height of the pandemic. On the contrary, only two (5%) respondents reported engaging in virtual seminars in their institutions prior to the pandemic. The number, however, significantly increased to 30 (75%) during the pandemic ($P < 0.001$).

DISCUSSION

This study assessed the impact of the COVID-19 pandemic on eye care services and training in Nigerian eye institutions. In response to the challenges posed by the pandemic, several guidelines were released by international and national ophthalmological societies to ensure the safety of patients and eye care workers. The Ophthalmological Society of Nigeria issued an advisory on safe ophthalmic practice during the pandemic in line with Nigerian national guidelines and the recommendations of the American Academy of Ophthalmology.^[25] It advised that only urgent or emergency ophthalmic care be undertaken at the peak of the pandemic and that adequate precautions be taken to prevent the spread of the coronavirus. Thus, the provision of eye care services was greatly restricted during the pandemic.

In general, the pandemic negatively affected eye care services and training. In this study, 86% (51) of respondents reported a negative impact of more than 25%. This is in keeping with studies globally which have shown that the pandemic adversely affected most aspects of ophthalmic practice. According to an online survey of ophthalmology trainees globally by Ferrara *et al.*,^[18] 55.2% of 504 respondents described the impact of the pandemic as severe. Furthermore, in this study, a third of respondents disclosed a complete closure of both outpatient and inpatient care, while two-thirds reported a total cessation of surgical activities for various periods at the height of the pandemic. The closures may have critically hampered patient access to even emergency care during the periods these services were unavailable.

Table 1: Comparison of eye care services before and during the COVID-19 pandemic

Category of service	Before COVID (patients)	During COVID		Total, n (%)	P
		<10 patients, n (%)	>10 patients, n (%)		
New clinic patients	<10	15 (100)	0	15 (100)	<0.001
	>10	29 (66)	15 (34)	44 (100)	
Follow-up clinic patients	<10	4 (80)	1 (20)	5 (100)	0.012
	>10	10 (19)	44 (81)	54 (100)	
Refractions	<10	4 (100)	0	4 (100)	<0.001
	>10	31 (56)	24 (44)	55 (100)	
Cataract surgery	<10	14 (100)	0	14 (100)	<0.001
	>10	34 (76)	11 (24)	45 (100)	
Admissions	<10	27 (100)	0	27 (100)	<0.001
	>10	26 (81)	6 (19)	32 (100)	

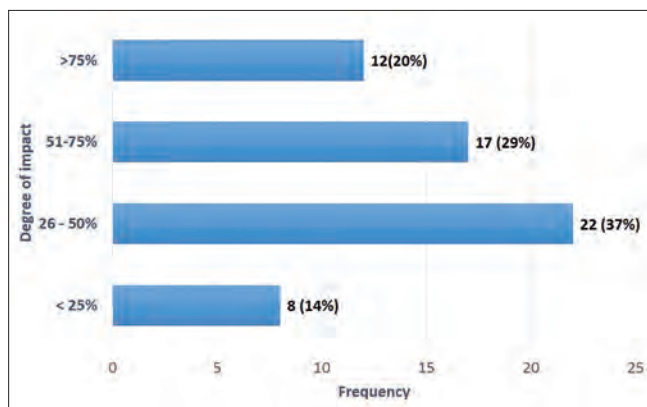


Figure 1: Overall negative impact of the COVID-19 pandemic on eye institutions in Nigeria

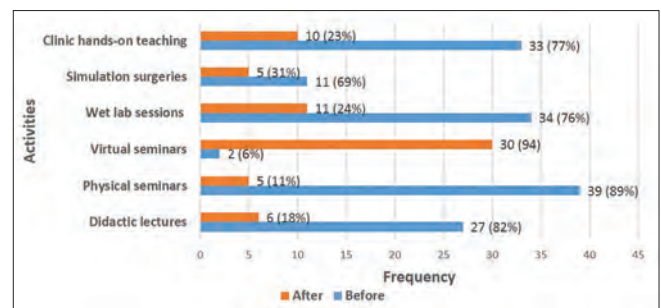


Figure 2: Change in residency training activities before and at the height of the COVID-19 pandemic

Global recommendations to limit eye clinic consultations to urgent and emergent care resulted in a marked decline in ophthalmic outpatient visitations worldwide. In this study, there was a significant decline in reports of both new and follow-up outpatient consultations. This trend was similarly experienced in many major eye centers across Nigeria. Onakoya^[26] in Lagos, the epicenter of the pandemic in Nigeria, reported that only ophthalmic emergencies were attended to while observing strict safety guidelines at the eye clinic of the Lagos University Teaching Hospital. Some safety measures adopted included the use of personal protective equipment, use of protective shields on slit lamps, and social distancing. However, Eze *et al.*^[27] in a nationwide survey reported that 63.9% of eye care workers were dissatisfied with the personal protective devices provided by their hospitals. Osaguona *et al.*^[12] in Southern Nigeria reported a 76% decrease in outpatient visits in April 2020, the peak of the national lockdown. In the United States, there was a drastic decrease in patient volume by about 79%, which was the greatest recorded for any specialty.^[10] Fear of infection during hospital visits may have further discouraged patients from presenting for care even when their conditions required it. Results of a telephone survey by Lindeke-Myers *et al.*^[13] among patients at high risk of blindness suggests that fear was associated with a fourfold increase in the odds of loss to follow-up. An important adaptive measure undertaken by various eye centers to ensure some continuity is telemedicine. In Lagos, Nigeria,^[26] nonurgent appointments were re-scheduled and contact telephone numbers were made available for further patient-related information as was the practice in many eye centers across Nigeria. The use of telemedicine consultation rose rapidly in the United States with a decline in physical clinic attendance.^[28]

Surgical care is another aspect of eye care that was negatively affected by the pandemic. This study revealed that the number of participants who reported performing more than 10 cataract surgeries per week significantly dropped from 45 (80%) to 11 (20%) during the pandemic. Most centers only provided emergency surgical services during the pandemic. In Egypt, Abdullatif *et al.*^[15] noted that ophthalmic surgeries reduced by 80%–100%. Similarly, in a nationwide survey in India by Nair *et al.*,^[29] emergencies comprised the bulk of surgical cases (81.8%), while cataract surgery contributed only 5.7%. Cataract surgery, though an elective procedure, is very important because cataract is the leading cause of avoidable blindness worldwide.^[30] Cessation or reduction of surgical services may have, therefore, contributed to the burden of avoidable blindness.

In terms of inpatient ophthalmic care, the results of this study show a significant decline in inpatient admissions at the peak of the pandemic. The reduction in the number of outpatient cases and volume of surgery may have also contributed to this reduction. Usually, patients are admitted when they require surgeries or through the outpatient department if they need further inpatient care. Franzolin *et al.*^[31] in Italy noted a significant reduction in admissions for retinal detachment cases

in their center at the height of the pandemic compared to trends in the previous four years for the same period.

Residency training is time-bound and trainees are expected to gain both theoretical knowledge and practical skills during the period of their training. The emergence of the pandemic greatly impeded training activities globally as a result of reduced hospital attendance due to safety concerns, and the redeployment of specialists to some areas with health worker shortages to help care for COVID patients.^[18,32] In this study, there was a significant decrease in aspects of training that require physical contact of trainees with their trainers or with patients from pre-pandemic levels such as hands-on clinical training, wet laboratory sessions, and simulation-based surgeries. There was, however, a significant increase in the uptake of virtual seminars which were previously unpopular. Similarly, Chatziralli *et al.*^[14] in a global survey of 321 physicians involved in ophthalmic education noted that prior to the pandemic, 48% of respondents had only relied on traditional teaching modalities and did not engage in any e-learning. Various other reports around the world showed that many training programs have incorporated different e-learning modalities in their programs to enhance the education and training of residents and fellows.^[16,18,26,32,33] Therefore, though the pandemic may have impaired practical skills acquisition for trainees, it provided new opportunities for revolutionizing teaching and expanding educational experiences even beyond the borders of individual institutions.

CONCLUSION

The COVID-19 pandemic disrupted most aspects of ophthalmology practice and made eye care and training challenging. The adoption of alternative means of consultation (e.g. telemedicine), web-based learning, and simulation-based training were helpful in various centers and may be incorporated into future training. These strategies are necessary to ensure that patient care and training experiences are optimized going forward.

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Conflicts of interest

There are no conflicts of interest.

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