

The Impact of the COVID-19 Pandemic on Postgraduate Ophthalmology Training Program in Nigeria

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Abstract

Background: The severe acute respiratory syndrome coronavirus 2 which causes coronavirus disease 2019 (COVID-19) has resulted in a challenging and an unprecedented pandemic in the 21st century. This pandemic affects almost all aspects of human life including the medical field. **Methods:** This was a cross-sectional, descriptive multicenter survey of resident doctors in ophthalmology training programs in Nigeria. An anonymous web survey was created on Google form and circulated to ophthalmology residents in Nigeria using electronic communication tools between April and July 2020. **Results:** Seventy-two ophthalmology residents in 25 residency training institutions across five geopolitical zones of the country participated in the online survey. There was a significant decrease in the number of patients attended to in the clinic per week by respondents, time spent in consulting per patient, number of unit admissions per week, frequency of eye camps and outreaches per month, and number of surgeries performed by the unit per month ($P = 0.000$) in the COVID era compare to the pre-COVID era. Two-thirds of respondents felt their posting schedules had been affected at least to a moderate extent, this in turn affected their eligibility for examinations. Three-quarters of the respondents also felt that the pandemic had negatively affected trainer–trainee and mentor–mentee relations in terms of knowledge transfer. Respondents recommended a greater focus on online learning. **Conclusion:** In this survey, the impact of the COVID-19 pandemic has been shown to negatively impact ophthalmology residency training. A need for a paradigm shift in training may be the way forward.

Keywords: COVID-19, ophthalmology, residency training

INTRODUCTION

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which causes coronavirus disease 2019 (COVID-19) has resulted in a challenging and unprecedented pandemic in the 21st century.^[1,2] The disease was first reported to the World Health Organization on the December 31, 2019.^[3] It was declared a Public Health Emergency of International Concern on January 30, 2020^[4] and a global pandemic on the March 11, 2020.^[5] The first confirmed case of COVID-19 in Nigeria was announced on the February 27, 2020, when an Italian citizen tested positive for the virus in Lagos.^[6] By August 20, 2020, over 50,000 cases had been confirmed in the country, with Lagos state being the epicenter of the outbreak.^[7]

The COVID-19 pandemic has affected almost all aspects of human life and the medical field has not been spared. It has impacted clinical care, training and healthcare research

globally.^[8] This has led to a reduction in the number of patients reported^[9] and cancellation or reduction of elective procedures in various teaching hospitals across the world.^[10,11] Eye-care workers are particularly at risk of infection with the virus both due to their close proximity to patients during clinical evaluation, and because of their high volume of outpatient and surgical cases.^[12]

Clinical training of ophthalmology residents has also been adversely affected by the pandemic in terms of didactic teaching and practical sessions.^[12,13] In a global survey of

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ophthalmology residents by Ferrara *et al.*,^[14] more than half of the respondents reported a severe impact of the pandemic on their training. To reduce the impact of the pandemic, there has been some restructuring of clinical care, training of doctors, and healthcare research. Many training programs have embraced alternative methods of learning such as web-based teaching and virtual grand rounds.^[13,14] However, there are still cogent concerns about the difficulty in acquiring important clinical and surgical competencies, and fears about the possible and unpredictable prolongation of training programs.^[12,14]

The aim of this study was to assess the impact of the early phase of COVID-19 pandemic on ophthalmology residency training programs in Nigeria from the residents' perspective, as well as their subsequent adaptations and recommendations. We hope the findings would be useful in influencing the inevitable restructuring of the program as a result of the pandemic in Nigeria and other similar settings.

METHODS

The study was a cross-sectional, descriptive multicenter survey of resident doctors in ophthalmology training programs in Nigeria. There are about 40 ophthalmology training institutions in Nigeria and an estimated 300 ophthalmology residents. An anonymous web survey was created on Google form and circulated to ophthalmology residents in Nigeria using electronic communication tools (WhatsApp and Telegram platforms), particularly via the Ophthalmological Society of Nigeria (OSN) and the Young Ophthalmologists' Forum arm of the OSN between April and July, 2020. The call to participate and the Google form link were circulated twice weekly on these platforms for the duration of the study (eight times). Members on these platforms were also requested to circulate the link on the residents' communication platforms of their individual institution resident to improve participation.

The survey instrument comprised of four sections: demographic features, clinical and academic practice in the pre-COVID era, clinical and academic practice in the COVID era, and perceived impact of the pandemic, and adaptations and recommendations as a result of the pandemic. Variables of interest include clinical and academic practice patterns before and during the COVID-19 pandemic, impact of the pandemic on training activities, personal and clinical adaptations, and recommendations for the program in view of the current state of affairs following the pandemic.

Data were descriptively summarized with means and standard deviations calculated for continuous variables, and proportions for categorical variables. The responses to the questionnaire were collated and the following outcome measures evaluated in view of the COVID-19 pandemic:

- (1) Impact on clinical practice and academics
- (2) Impact on training
- (3) Recommended modifications for training programs in Nigeria
- (4) Adaptations made during the pandemic

The study inclusion criterion was that respondents had to be ophthalmology resident doctors in training at the time of the study. Exclusion criterion was being less than 1 year in training at the time of the study. Informed consent was obtained by requiring a positive response to an initial mandatory question on the study instrument requesting consent to participate in the study. The study adhered to the tenets of the Declaration of Helsinki.

RESULTS

Demography of participants

Seventy-two ophthalmology residents of 25 residency training institutions across five geopolitical zones of the country participated in the online survey carried out between April and July 2020. Participants' demographic features are as summarized in Table 1. Their ages ranged from 29 to 49 years, with a mean age of 34 [standard deviation (SD) 3.74] years. Duration of residency training ranged from 1 to 8 years, with a mean duration in training of 3.45 years (SD 1.89). There was no participant from the North-East geopolitical zone of the country.

Impact on clinical practice and academics

A comparison of clinical practice in the pre-COVID and COVID eras is summarized in Table 2. There was a significant decrease in the number of patients attended to in the clinic per week by respondents, time spent in consulting per patient, number of unit admissions per week, frequency of eye camps and outreaches per month, and number of surgeries performed by the unit per month ($P = 0.000$) in the COVID era compared to the pre-COVID era.

In terms of routine ophthalmic examinations and investigations, there was a decrease across board for all categories [Figure 1] in the COVID era compared to the pre-COVID era. This decrease was especially evident for procedures such as gonioscopy (12.5% vs. 95.8%), direct

Table 1: Demographic features of participants

S.No.	Demographic feature	Frequency (%)
1	<i>Gender</i>	
	Female	37 (51.4%)
	Male	35 (48.6%)
2	<i>Marital status</i>	
	Married	59 (81.9%)
	Single	12 (16.7%)
	Separated	1 (1.4%)
3	<i>Geopolitical zone</i>	
	North-Central	11 (15.3%)
	North-East	0
	North-West	10 (13.9%)
	South-East	11 (15.3%)
	South-South	6 (8.3%)
	South-West	34 (47.2%)

Table 2: Comparison of clinical practice in the pre-COVID and COVID eras

S. No.	Clinical practice pattern	Pre-COVID era		COVID era		P-value
		<30	>30	Total		
1	Estimated number of patients in clinic per week	<30, 6 (8.3%)	6 (100%)	0 (0%)	6 (100%)	0.000
		>30, 66 (91.7%)	52 (78.8%)	14 (21.2%)	66 (100%)	
		Total 72 (100%)	58 (80.6%)	14 (19.4%)	72 (100%)	
2	Estimated consultation time in minutes	<15, 35 (48.6%)	<15, 33 (94.3%)	>15, 2 (5.7%)	>15, 35 (100%)	0.000
		>15, 37 (51.4%)	>15, 23 (62.2%)	>15, 14 (37.8%)	>15, 37 (100%)	
		Total 72 (100%)	56 (77.8%)	16 (22.2%)	72 (100%)	
3	Estimated number of admissions per week	<20, 60 (83.3%)	<20, 59 (98.3%)	>20, 1 (1.7%)	>20, 60 (100%)	0.012
		>20, 12 (16.7%)	>20, 10 (88.3%)	>20, 2 (16.7%)	>20, 12 (100%)	
		Total 72 (100%)	69 (95.8%)	3 (4.2%)	72 (100%)	
4	Estimated number of outreaches/surgical camps per month	<3, 56 (77.8%)	<3, 56 (100%)	>3, 1 (1.6%)	>3, 56 (100%)	0.000
		>3, 16 (22.2%)	>3, 15 (93.8%)	>3, 1 (1.4%)	>3, 16 (100%)	
		Total 72 (100%)	71 (98.6%)	1 (1.4%)	72 (100%)	
5	Estimated number of surgeries per month	<20, 49 (68.1%)	<20, 48 (98%)	>20, 1 (2%)	>20, 49 (100%)	0.000
		>20, 23 (31.9%)	>20, 19 (82.6%)	>20, 4 (17.4%)	>20, 23 (100%)	
		Total 72 (100%)	67 (93.1%)	5 (6.9%)	72 (100%)	

COVID, coronavirus disease.

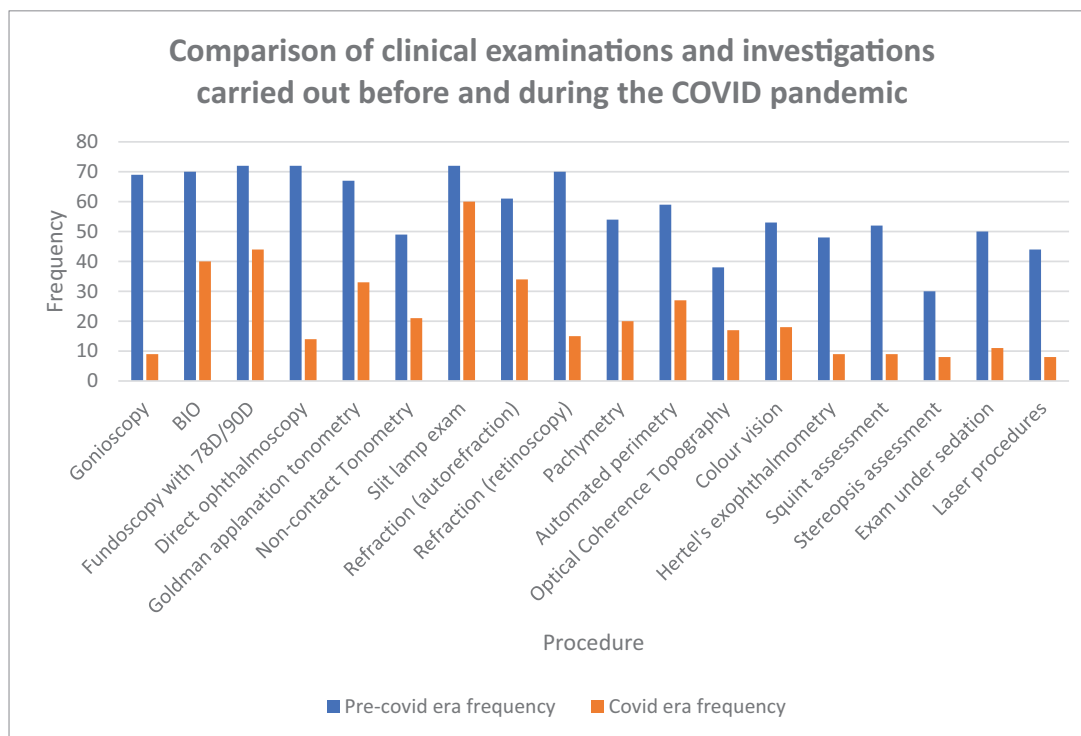


Figure 1: Comparison of clinical examinations and investigations carried out before and during the COVID pandemic. COVID, coronavirus disease.

ophthalmoscopy (19.4% vs. 100%), and refraction with retinoscopy (20.8% vs. 97.2%).

Table 3 summarizes a comparison of academic activities before and during the COVID pandemic. There was a significant decline in frequency of physical academic seminars. Eighteen (85.7%) respondents reported that they held more than twice weekly physical academic seminars in

the pre-COVID era, compared with the reports of only three (14.3%) respondents in the COVID era.

Impact on training

Two-thirds of respondents felt their posting schedules had been affected at least to a moderate extent in terms of eligibility for examinations. Three-quarters (75%, $n = 54$)

Table 3: Comparison of academic activities before and during the COVID pandemic

S. No.	Academic activities	Pre-COVID era	COVID era			P-value
			<2	>2	Total	
1	Frequency of physical academic seminars per week	<2, 51 (70.8%)	49 (96.1%)	2 (3.9%)	51 (100%)	0.000
		>2, 21 (29.2%)	18 (85.7%)	3 (14.3%)	21 (100%)	
		Total 72 (100%)	58 (80.6%)	14 (19.4%)	72 (100%)	
2	Participation in online departmental seminars	Yes	Yes	No	Total	0.000
		Yes, 11 (15.3%)	10 (90.9%)	1 (9.1%)	11 (100%)	
		No, 61 (84.7%)	45 (73.8%)	16 (26.2%)	61 (100%)	
3	Participation in personal online courses	Total 72 (100%)	55 (76.4%)	17 (23.6%)	72 (100%)	0.012
		Yes	Yes	No	Total	
		Yes, 45 (62.5%)	45 (100%)	0 (0%)	45 (100%)	
4	Participation in online academic webinars	No, 27 (37.5%)	22 (81.5%)	5 (18.5%)	27 (100%)	0.000
		Total 72 (100%)	67 (93.1%)	5 (6.9%)	72 (100%)	
		<3, 56 (77.8%)	56 (100%)		56 (100%)	
5	Wetlab hours per week	>3, 16 (22.2%)	15 (93.8%)	1 (1.6%)	16 (100%)	1.000
		Total 72 (100%)	71 (98.6%)	1 (1.4%)	72 (100%)	
		<3, 64 (88.9%)	59 (92.9%)	5 (7.8%)	64 (100%)	
6	Hospital work hours per week	>3, 8 (11.1%)	6 (75%)	2 (25%)	8 (100%)	0.000
		Total 72 (100%)	65 (90.3%)	7 (9.7%)	72 (100%)	
		<40, 16 (22.2%)	16 (100%)	0 (0%)	16 (100%)	
7	Study hours per week	>40, 56 (77.8%)	49 (87.5%)	7 (2.5%)	56 (100%)	0.000
		Total 72 (100%)	65 (90.3%)	7 (9.7%)	72 (100%)	
		<12, 48 (66.7%)	24 (50%)	24 (50%)	48 (100%)	
		>12, 24 (33.3%)	3 (12.5%)	21 (87.5%)	24 (100%)	
		Total 72 (100%)	27 (37.5%)	45 (62.5%)	72 (100%)	
		<12, 48 (66.7%)	24 (50%)	24 (50%)	48 (100%)	

COVID, coronavirus disease.

Table 4: Extent of impact on training

S. No.	Training aspect affected	Frequency (%)
1	<i>Posting schedule in terms of examination eligibility (n = 72)</i>	
	Not at all	9 (12.5%)
	To a little extent	14 (19.4%)
	Moderately	19 (26.4%)
2	To a large extent	30 (41.7%)
	<i>Negative impact on trainer–trainee and mentor–mentee relations in terms of knowledge transfer (n = 54)</i>	
	To a little extent	4 (7.4%)
	To a moderate extent	14 (25.9%)
	To a large extent	35 (64.8%)
	Completely	1 (1.9%)

of the respondents also felt that the pandemic had negatively affected trainer–trainee and mentor–mentee relations in terms of knowledge transfer, with majority of these opining that it was to at least a moderate extent [Table 4].

Sixty-six (91.7%) respondents believed that the training strategy for ophthalmic residency should change following the COVID-19 experience. Open-ended questions were used to evaluate respondents’ opinions about the ways in which the pandemic had affected their training and their recommendations on how the training program may be modified going forward. Their personal

adaptations as well as adaptations in the clinics and theaters since the onset of the pandemic were also assessed. Answers to these open-ended questions were coded and recurring themes identified. The main themes are as shown in Figures 2–5. Perceived negative impact on ophthalmology residency training programs include fewer learning and mentorship opportunities fewer patients for hands-on experience and disrupted academic and examination schedules [Figure 2].

Some personal adaptations and coping measures were instituted by the respondents during the pandemic in the

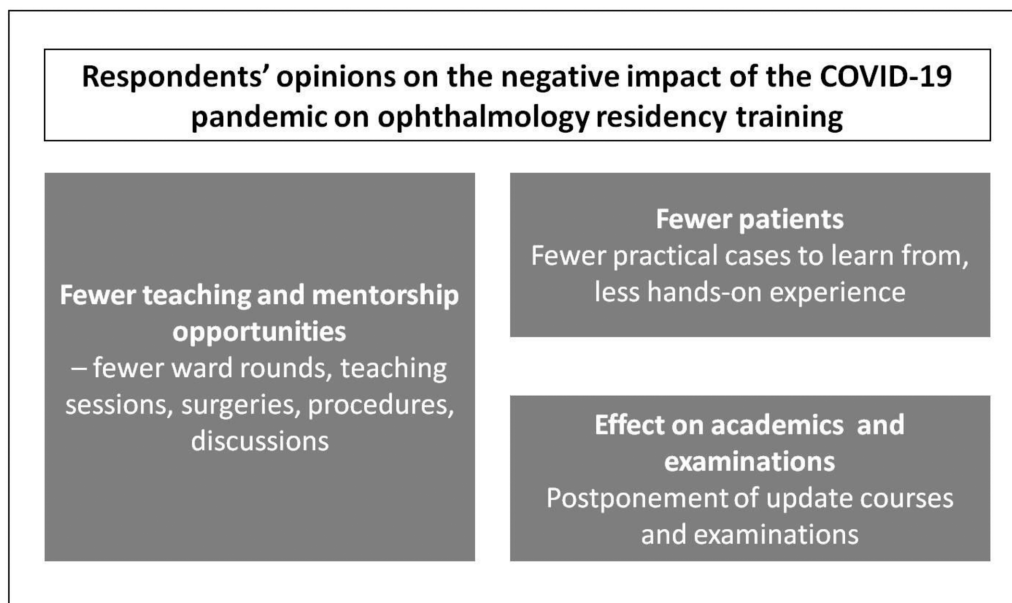


Figure 2: Opinions on the negative impact of the COVID-19 pandemic on ophthalmology residency training. COVID-19, coronavirus disease 2019.

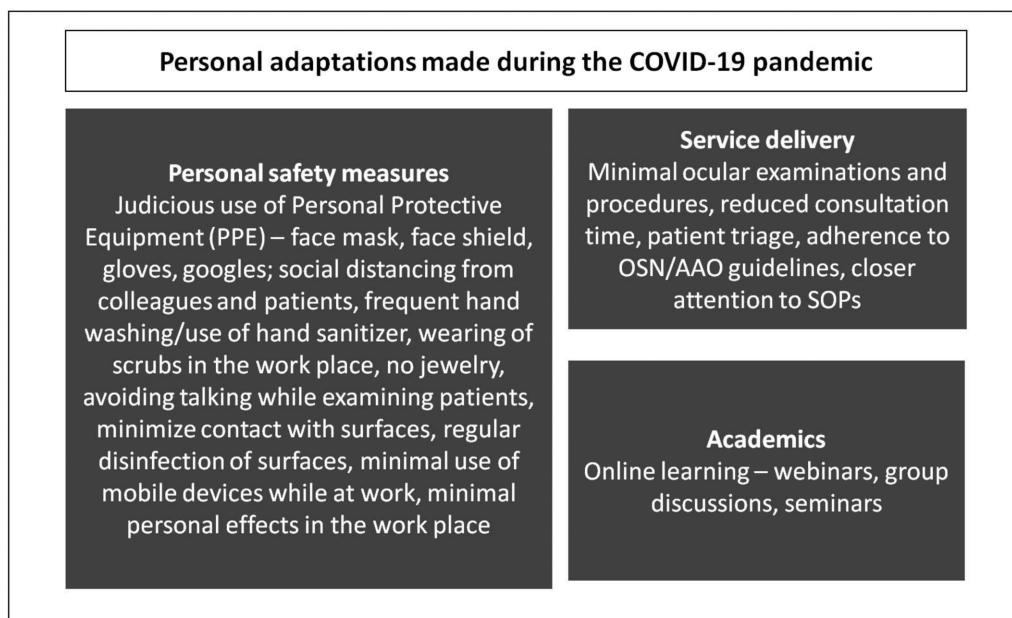


Figure 3: Personal adaptations made during the COVID-19 pandemic. AAO, American Academy of Ophthalmology; COVID-19, coronavirus disease 2019; OSN, Ophthalmological Society of Nigeria; SOP, standard operating procedure.

areas of personal safety measures, service delivery, and academics [Figure 3].

Institution-based measures were also established to make the clinical and theater spaces as safe as possible for both health workers and patients [Figure 4]. Prominent among these measures were instituting safety measures in the clinics and theater, triaging of patients, and limiting care and surgeries to emergencies as much as possible.

Respondents made some recommendations for modification of the residency training program such as placing more emphasis on online learning, decentralization of

examinations to minimize gatherings during examinations, better trainer–trainee relationship, ensuring a good balance between training, individual study time, service delivery; and maintaining the crowd control structure that has been out in place even after the pandemic is over [Figure 5].

DISCUSSION

The aim of this study was to identify the impact of the COVID-19 pandemic on postgraduate (residency) training in the ophthalmology specialty, adaptations, and possible recommendations for training. It was carried out within the

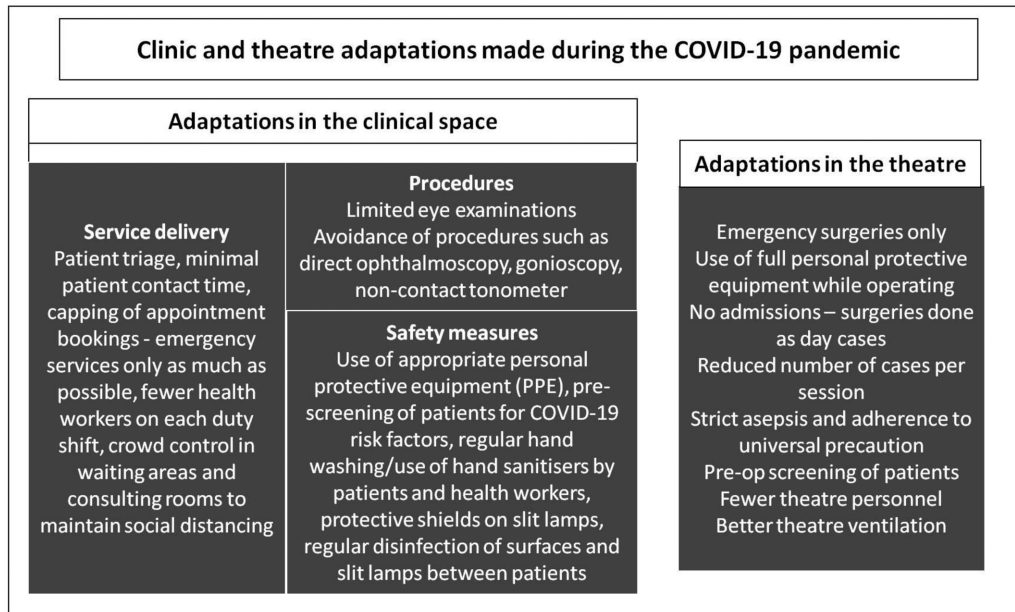


Figure 4: Clinic and theatre adaptations during the COVID-19 pandemic. COVID-19, coronavirus disease 2019.

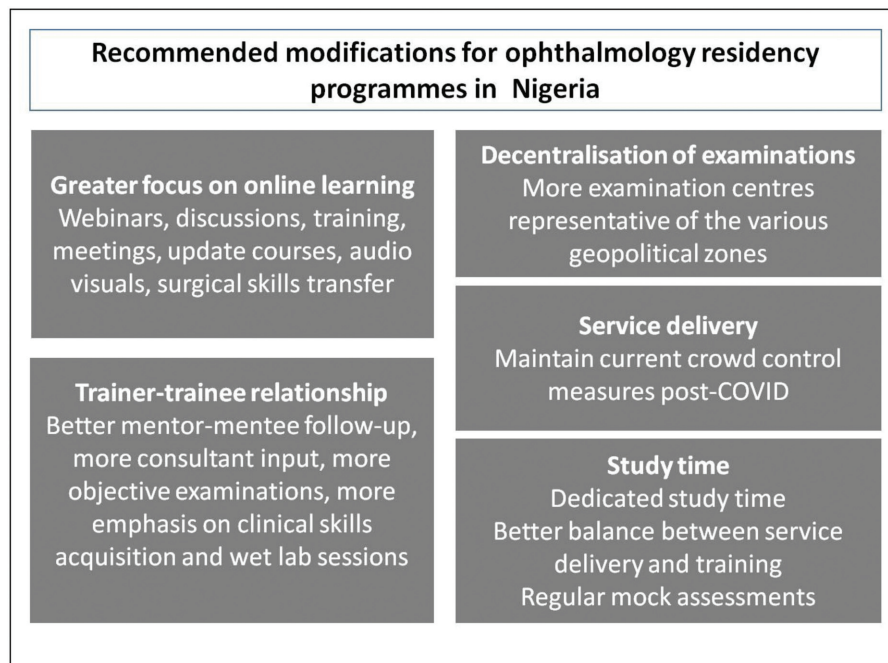


Figure 5: Recommended modifications for ophthalmology residency programs in Nigeria. COVID-19, coronavirus disease 2019.

months of April and July 2020 during the early period of the COVID-19 pandemic in Nigeria. Although there was a lockdown throughout this period, health care as an essential service was being rendered. Training institutions from five out of the six geopolitical zones participated, giving a fairly representative national spread of respondents [Table 1]. Among the zones that participated, the South-West zone had the highest respondents, whereas the South-South had the least. Although the study instrument was circulated on the most popular virtual communication platforms for ophthalmologists in the country on several

occasions, there was no response from the North-East zone. Reason for this nonresponse from the North-East region could not be explained.

Impact on clinical practice and academics

Mehrotra *et al.*^[9] carried out a study on the impact of the COVID-19 pandemic on outpatient visits between February and May 2020 and reported a significant drop in the number of patients to 60% in the last week of March. This did not return to the normal level throughout the study period. Our

study revealed a similar significant drop in the average number of patients reported weekly during the COVID-19 study period when compared with the pre-COVID period [Table 2]. Majority of the respondents [61 (91.7%)] saw more than 30 patients per week in the pre-COVID era. This number significantly dropped to 14 (21.2%) of the respondents seeing more than 30 patients per week in the COVID era. This may be because of the advice by the Nigeria Centre for Disease Control (NCDC) and the measures instituted by each training center to ensure proper physical distancing of patients in the waiting area and consulting rooms to avoiding overcrowding, and the fact that only patients deemed to truly require urgent evaluation were attended to. Patients who were meant to present for routine follow-up may also have deferred their appointments to avoid unnecessarily exposing themselves to the risk of contracting the virus during transit or in the hospital. The number of admissions per week and the number of surgeries per month were significantly less during the COVID era. This may be attributed to the general drop in the number of patients presenting for evaluation in this period. It may also be due to possible stricter indications for admission and the fact that only emergencies and urgent surgical cases were attended to at that time. The estimated number of admissions also significantly reduced which may be a reflection of the significant drop in the number of patients reported in general during the COVID era.

The estimated consultation time per patient was significantly less during the COVID era. As 35 (48.6%) respondents reported that they spent ≤ 15 minutes consulting with each patient in the pre-COVID era, this number significantly increased to 56 (77.8%) respondents during the COVID era. This shows that a lot of the doctors now spend less time with each patient. It is possible that some aspects of clinical evaluation that are not absolutely necessary were postponed to a more appropriate time. This can be explained by comparing the clinical examinations and investigations carried out before and during the COVID era which showed a significant drop in all evaluated items, as depicted in Figure 1. These are important routine clinical procedures that the resident doctors need to carry out to fine tune their clinical competencies.

Outreaches and surgical camps take eye-care services to the unreached and neglected persons of the society. These are people who normally do not have access to eye-care services for various reasons that range from a lack of such facilities in their localities, to financial constraints.^[15-19] In our study, respondents who carried out more than three outreaches per week reduced from 16 (22.2%) pre-COVID era to just 1 (1.6%) in the COVID era. This significant drop in routine outreaches will negatively impact the eye-care services received by the underserved persons in our society.

The number of respondents who reported that they had more than two physical academic seminars per week dropped significantly from 21 (29.2%) respondents to 14 (19.4%) in the pre-COVID and COVID era, respectively [Table 3]. On the other hand, reports of participation in online seminars

increased from just 11 (15.3%) to 55 (76.4%) respondents in the pre-COVID and COVID eras, respectively. Participation in online courses and academic webinars also significantly increased in the COVID era. As this shows that other veritable means to continue academic activities were imbibed during this pandemic period, the limitations of online training for the medical profession cannot be overlooked. Some key aspects of their training will be deficient. Medicine is both an art and a science.^[20] This is because both are interdependent and inseparable, just like two sides of a coin. The art aspect is as a result of skills acquired by observation and experience, and medicine deals with a human being, his or her body, mind, and soul. Until these are adequately captured under an online training setting, medical training with this method will be inadequate. For now, a hybrid of both physical and online training may be the way to go.

Impact on training

In this study, two-thirds of the respondents felt that their posting schedules had been negatively affected at least to a moderate extent. Three-quarters of the respondents also felt that the pandemic had negatively affected trainer–trainee and mentor–mentee relations in terms of knowledge transfer, with majority of these opining that they were affected at least to a moderate extent. Respondents' opinions on the negative impact of the pandemic on their training included fewer teaching and mentorship opportunities, fewer patients, and postponement of update courses and examination [Figure 2]. These negative impacts would likely affect their acquisition of the required competencies and may prolong their residency training beyond the expected duration.

Adaptations made during the early COVID-19 pandemic period

On a personal level, adaptive measures to the pandemic included the use of appropriate personal protective equipment and other safety measures as recommended by the NCDC and the individual guidelines of the various institutions [Figure 3]. Service was provided with minimal ocular examinations and procedures, reduced consultation time, patient triage, and adherence to recommended departmental and institutional guidelines. Institutional adaptations [Figure 4] included ensuring that members of staff adhered to safety protocol and that patient volume was reduced significantly to allow for appropriate crowd control in the clinics. Surgeries were restricted to emergencies and urgent cases, whereas elective surgeries were spaced appropriately to ensure a reduction in the minimum number of surgical cases per list. Universal safety precaution measures were maintained for all patients.

Recommended modifications of the training program in Nigeria by the respondents

In our study, the respondents recommended greater focus on online learning via webinars for discussions, training, update

courses, and surgical skills transfers [Figure 5]. They also advocated for better trainer–trainee and mentor–mentee relationships. They felt this would improve trainers’ input in their training, promote emphasis on clinical skills acquisition and wet-labs, and also bring about more objective examinations. In the area of service delivery, respondents recommended that the current crowd control measures should be sustained in the post-COVID pandemic era. This may not be unconnected with the constant overcrowded nature of most ophthalmic clinics in the pre-COVID era and this current measure if sustained would ensure crowd control in the post-COVID pandemic era. In terms of study time during their residency training, they advocated for a dedicated study time in their training schedule by their training institutions. There should also be a better balance between service delivery, training, and regular mock assessments. This recommendation may not be unconnected with the ever busy nature of ophthalmic clinics with increased demand for service delivery, and the possible negative impact on the other needed training aspects for comprehensive development of competencies.

CONCLUSION

The COVID-19 pandemic has obviously affected all aspects of human existence, and healthcare and medical training are no exceptions. The current adaptations and other recommendations are clear indications for a paradigm shift in medical training and specifically postgraduate training of prospective ophthalmologists. We hope that the outcome of this study would help drive this paradigm shift in training from all the necessary authorities.

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Conflicts of interest

There are no conflicts of interest.

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