

Original Article

The Effects of the COVID-19 Pandemic on Orthopedic Practice in Nigeria

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Abstract

Background: COVID-19 has caused worldwide disruption in health-care services including orthopedics as surgeries and clinics are being scaled-down worldwide in conformity with the social-distancing and virus containment measures being applied worldwide, including in Nigeria. Unfortunately, the care of routine diseases such as trauma, infections, and malignancies is also being negatively impacted by the slowdown in activities. **Aims:** The aim of this study was to determine if the ongoing COVID-19 pandemic had affected orthopedic practice in Nigeria, and also to see what measures were already being taken, if any, and to propose solutions. **Materials and Methods:** This was a cross-sectional study conducted via an online survey among orthopedic surgeons practicing in Nigeria. **Results:** One hundred and seventy-three orthopedic surgeons practicing in Nigeria participated in this study. Majority of the participants (71.1%) practice in hospitals where there were no written guidelines on orthopedic care during a viral epidemic. Most (80.9%) did not have enough personal protective equipment (PPE) for work. Most clinic services were able to run during the outbreak (65.3%). There was a marked decrease in the volume of elective and emergency surgeries performed during the pandemic, especially in public hospitals. **Conclusion:** COVID-19 has affected orthopedic practice in Nigeria. Provision of adequate PPE, the use of telemedicine for outpatient consultations, physical distancing, and other techniques may improve care for our patients.

Keywords: COVID-19, Nigeria, orthopedics

INTRODUCTION

The COVID-19 pandemic has proven a significant challenge to health care worldwide. Currently, many people have been infected and died from disease complications, as the it has neither curative nor preventive treatment yet. Health-care facilities in several countries have been overwhelmed. There has also been a tendency to focus on treating only COVID-19 patients.^[1-3]

While measures such as social distancing and isolation may work for the populace, the medical personnel including orthopedic surgeons treat patients and carry out procedures that generate aerosols such as using bone drills and saws, thus putting them at higher risk.

To this effect, worldwide, all surgeries that can be safely postponed are being postponed. The patient load in clinics is being reduced in conformity with the social distancing, and some countries have applied telemedicine to interact with outpatients.^[3]

Due to the possibility of spread through aerosols or contact from contaminated surfaces and the relatively high viral load that health-care workers are exposed to, there is a need for specific personal protective equipment (PPE) for health-care workers.^[1]

The current recommendation is to use N95 respirators, full-face coverage, and full-body PPE for all operations on COVID-19-positive patients.^[1,4] For suspected COVID-19-positive patients, the recommendation at the least is to use an N95 respirator or equivalent as well as a face shield.^[1,4] A meta-analysis of several randomized controlled trials has not

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found a significant difference in rates of infection between using N95 respirators and surgical masks for health-care personnel in the clinical setting despite the observed superiority of N95 respirators in aerosol filtration observed in laboratory studies.^[1,5]

Cloth face masks are not recommended for health-care workers due to the increased risk of infection when using them compared to surgical masks.^[6] There is unfortunately a worldwide shortage of PPEs, and this may encourage the use of inadequate PPE in hospitals.^[5]

Nigeria recorded her first COVID-19 case on February 27, 2020, with the arrival of the index patient who was a foreign national. The Federal Government responded with containment measures such as lockdowns and social distancing.^[7]

Containment measures did not prevent community transmission, and currently the Nigerian Centre for Disease Control at their update on April 29, 2020, confirmed over 1700 cases in the country.^[8]

COVID-19 has caused worldwide disruption in health-care services. Orthopedics is not spared as surgeries and clinics are being scaled down worldwide in conformity with the social distancing and virus containment measures being applied in most countries, including Nigeria. Unfortunately, the care of routine diseases such as trauma, infections, and malignancies is also being negatively impacted by the slowdown in activities. There is also limited data on how orthopedic practice in Nigeria has been affected.

This study will examine the impact of the COVID-19 pandemic on orthopedic practice in Nigeria.

MATERIALS AND METHODS

This was a cross-sectional study conducted via an online survey of orthopedic surgeons practicing in Nigeria as of June 2020 to determine the impact of this novel virus outbreak on orthopedic practice in Nigeria and perhaps propose solutions to the challenges observed.

Ethical approval was obtained from the National Health Research Ethics Committee of Nigeria for this study. Informed consent was obtained from all participants in this study.

There are about 300 practicing orthopedic surgeons in the country with 256 registered on the Nigerian Orthopaedic Association social media database.

The Cochrane formula for sample size calculation for a population <10,000 was used with an attrition rate of 10%. $n = Z^2pq/d^2$ Hence, our sample size was calculated to be 171.

Our sample questionnaire contained questions on sociodemographic characteristics; effect of COVID-19 on outpatient clinics; emergency and elective surgeries and ward rounds; and questions on availability and use of PPEs.

Mean, median, and ranges were used to describe variables. Chi-square tests were carried out to assess the association

between demographic variables, type of institution against variables on the effect of COVID-19 on clinical activities, and availability and use of PPE.

RESULTS

One hundred and seventy-three orthopedic surgeons practicing in Nigeria participated in the study. There were 171 males and 2 females. Majority were 39 years and below in age (97% or 56.7%), had been in practice for 10–30 years post fellowship (95% or 54.9%), and practiced in public hospitals (147% or 85%) [Table 1].

The percentage of the participants practicing in hospitals with isolation wards was statistically significantly higher among those in public hospitals (74.8% vs. 50%, $P < 0.001$).

There were dedicated teams for managing COVID-19 patients in the hospitals as reported by 100 (57.8%) participants, but 11 (6.4%) did not know if there was one in their hospital of practice. The percentage of the participants practicing in hospitals with dedicated teams for managing COVID-19 patients was also statistically significantly higher among those in public compared with private hospitals (64.6% vs. 19.2%, $P < 0.001$).

Table 1: Effect of COVID-19 on orthopedic outpatient clinic by participants' demographics and practice characteristics

Participant/practice characteristics	Able to run outpatient clinic		Total (%)	P
	No (%)	Yes (%)		
Age				
<29	0 (0.0)	1 (100)	1 (0.6)	0.893
30-39	33 (34)	54 (66)	97 (56.1)	
40-50	20 (35.7)	36 (64.3)	56 (32.4)	
≥50	7 (36.8)	12 (63.2)	19 (11.0)	
Gender				
Male	60 (35.1)	111 (64.9)	171 (98.8)	0.300
Female	0	2 (100)	2 (1.2)	
Years of practice				
<10	24 (35.8)	43 (64.2)	67 (38.7)	0.308
10-30	30 (31.6)	65 (68.4)	95 (54.9)	
>30	6 (54.5)	5 (45.5)	11 (6.4)	
Type of practice*				
Private	6 (23.1)	20 (76.9)	26 (15.0)	0.177
Public	54 (36.7)	93 (63.3)	147 (85.0)	
Location of practice				
Northcentral	14 (37.8)	23 (62.2)	37 (21.4)	0.001
Northeast	4 (50.0)	4 (50.0)	8 (4.6)	
Northwest	9 (42.9)	12 (57.1)	21 (12.1)	
Southeast	1 (3.1)	31 (96.9)	32 (18.5)	
South-south	5 (8.3)	16 (76.2)	21 (12.1)	
Southwest	27 (50.0)	27 (50.0)	54 (31.2)	

Number of years of practice post fellowship. *Type of hospital where participant has majority of his/her practice. Location of practice by geopolitical zones in Nigeria

Most of the participants (123, 71.1%) practiced in hospitals where there were no written hospital guidelines on orthopedic care during a viral epidemic. Only 68 (37.3%) were aware of any national guidelines.

Most of the participants (80.9%) did not have adequate quantities of PPE. The availability of appropriate PPE correlated with the type of hospital of practice; inadequate PPE quantities were significantly higher in public hospitals compared to private ones (87.1% vs. 46.2%, $P < 0.001$). In the hospital, shortage of PPE occurs most often in outpatient clinics, wards, and theater in 74 (42.8%), 58 (33.5%), and 19 (11.0%) cases, respectively. Ten (5.8%) participants did not use any PPE in outpatient clinics. Among those that used PPE (163 or 94.2%), the three commonly used were surgical mask with gloves, surgical mask only, and N95 mask or surgical mask with gloves, as shown in Figure 1.

For ward rounds (95.6%) that use PPE, the three top PPE for ward rounds were surgical mask with gloves, surgical masks alone, and surgical mask or cloth mask with gloves, as shown in Figure 2.

The top three PPE used for operations on patients not tested for COVID-19 besides routine gowns and gloves were surgical mask alone, surgical mask with face shield, and surgical mask/N95 mask with face shield, as shown in Figure 3.

Most participants were able to run clinic services during the COVID-19 outbreak (113% or 65.3%). There were marked differences between the various regions, with 50% of those practicing in the southwest and northeast being unable to run clinics, while only 3.1% of those in the southeast region could not run clinics ($P < 0.001$). More participants in private hospitals compared to public hospitals, were unable to run outpatient clinics, but the difference was not statistically significant (36.7% vs. 23.1%, $P = 0.177$) [Table 1].

Eighty-three percent of the participants made changes to be able to run their outpatient clinics. The two top changes made

in the public hospitals were reduced patient load (RPL), RPL with staggered appointment system, and use of PPE, whereas the two top changes in private hospitals were telemedicine for selected patients and staggered appointment system plus telemedicine [Figure 4].

Before the COVID-19 pandemic, an average weekly number of 5–10 emergency operations were done in majority (42.2%) of the hospitals, which dropped to an average weekly number of <5 emergency operations done in majority (69.4%) of the hospitals during the pandemic. Nearly 40.5% of the hospitals did an average weekly number of >10 elective operations prior to the COVID-19 outbreak and only 1.7% during the outbreak [Table 2].

During the COVID-19 outbreak, the three most common elective operations done were fracture fixation (70, 40.5%), amputation (50, 28.9%), and tumor excision (18, 10.4%), whereas the three most common emergency operations were fracture fixation (135, 78.0%), amputation (126, 72.8%), and tumor excision (37, 21.4%).

Only 4.6% of the participants routinely tested patients for COVID-19 before elective procedures. This happened more in private hospitals (19.2% vs. 2.0%; $P < 0.001$).

Most participants (83.3%) required all patients for elective orthopedic operations to have preoperative testing for COVID-19.

Most participants (77.5%) would perform emergency operations on COVID-19 patients if given full PPE.

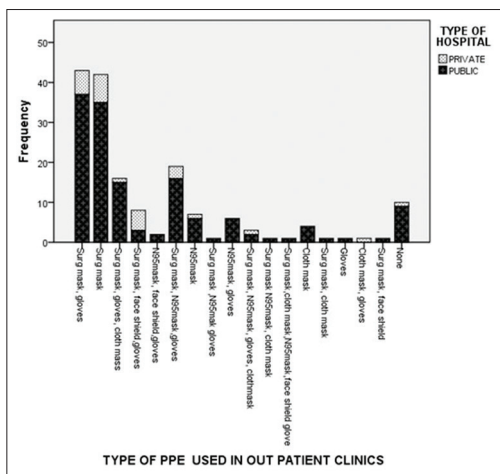


Figure 1: Types of personal protective equipment used in outpatient clinics in hospital practice by type of hospital

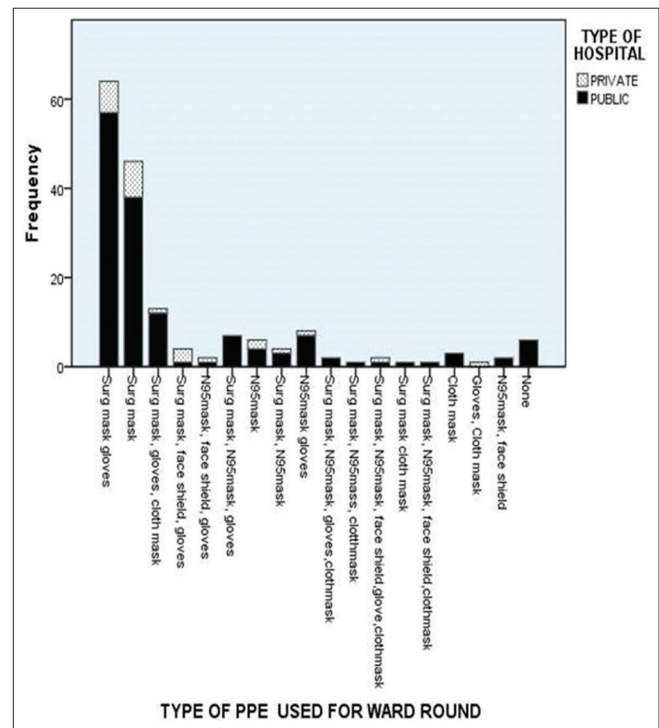


Figure 2: Type of personal protective equipment used for ward rounds by type of hospital

Table 2: Average weekly number of surgeries done in hospital by type of hospital before and during COVID-19

Type/average weekly number of surgeries	Before COVID-19			P	During COVID-19			P
	Private	Public	Total (%)		Private	Public	Total (%)	
Emergency								
>10	3	53	56 (32.4)	0.001	0	4	4 (2.3)	0.172
5-10	9	64	73 (42.2)		4	30	34 (19.7)	
<5	14	30	44 (25.4)		17	103	120 (69.4)	
None	0	0	0		5	10	15 (8.7)	
Elective								
>10	5	65	70 (40.5)	0.001	0	3	3 (1.7)	0.891
5-10	7	57	64 (37.0)		3	14	17 (9.8)	
>5	14	22	36 (20.8)		13	74	87 (50.3)	
None	0	3	3 (1.7)		10	56	66 (38.2)	

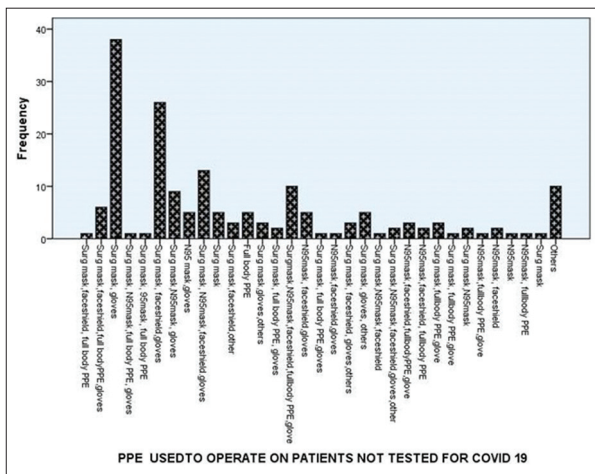


Figure 3: Personal protective equipment used to operate on patients not tested for COVID-19

The three main challenges against performing operations during the COVID-19 pandemic were lack of PPE (74%), hospital policy (40%), and refusal of anesthetists to anesthetize patient for surgery (31.8%) [Table 3].

DISCUSSION

The predominance of male participants in our study is a further reflection of stronger representation of male orthopedic surgeons among residents in training as has been reported in other centers.^[9]

There was a higher number of relatively young orthopedic surgeons; this may also serve a protective role against the severity of the infection among older orthopedic surgeons as the disease has been noted to be more fatal among older individuals.^[10] The younger orthopedic surgeons were also more involved in the running of the outpatient clinics.

Our study revealed that more public compared with private hospitals had dedicated isolation wards for suspected or confirmed COVID-19 infection. The establishment of isolation wards is in line with the recommendations of the Nigeria Centre for Disease Control guidelines on infection prevention

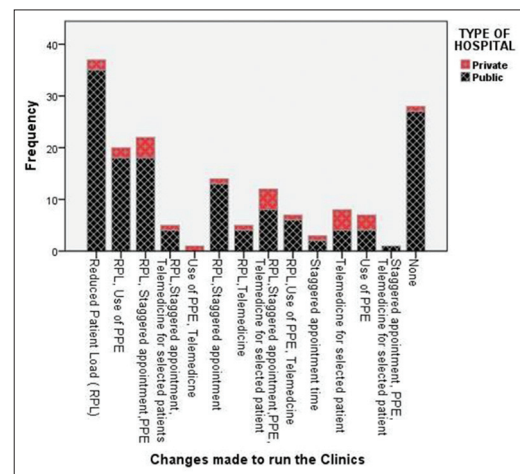


Figure 4: Changes made in order to run the orthopedic clinics during the COVID-19 outbreak by type of hospital of practice

and control.^[11] This may be due to these institutions being more directly under the supervision of the government, as well as usually having more space to allow for the creation of isolation wards without unduly compromising other services.

There was a reduction in the number of both emergency and elective operations in both private and public hospitals during the outbreak. This was worse in public hospitals. It may be related to the restriction on the movement of individuals and the ban on public gatherings during the lockdown, which may have also contributed to the reduction in the number of musculoskeletal trauma cases presenting to the emergency room. In addition, some surgeons and anesthetists were reluctant to carry out surgery during this period.

The high demand for PPE has put a big stretch on health-care resources, even in the most developed countries.^[12] The most common PPE available in most centers were the surgical/face masks and gloves. N95 masks were not as commonly found.

Besides the standard precautions highlighted above, part of the protocol for orthopedic care in institutions represented in our study was to prioritize urgent and emergent cases over elective surgery and where possible, to consider nonoperative

Table 3: Challenges of continuing to offer orthopedic surgical care during the period of COVID-19 pandemic among the participants (n=173)

Challenges to operating on patients	Frequency (%)
Lack of PPE	128 (74.0)
Hospital policy	64 (40.0)
Refusal of anesthetist to anesthetize patient for surgeries	55 (31.8)
Surgeon unwilling to continue operations on patients until crisis has passed	53 (30.6)
Inability to secure social distancing at work	43 (24.9)
Federal and state policy	25 (14.5)
Refusal of spouse or member of family to allow surgeon to operate on COVID-19 patient	17 (9.8)
Difficulty in reaching workplace	14 (8.1)
Anxiety and fear over the extent of protection by PPE	2 (1.2)
Failure of some patients to disclose COVID-19 exposure history	1 (0.6)
Unavailability of life assurance cover	1 (0.6)
Patient not financially ready for procedures	1 (0.6)
Failure of patient to obtain COVID-19 test	1 (0.6)

PPE: Personal protective equipment

over operative care for musculoskeletal trauma. This is in line with the WHO recommendation on the rational use of PPE.^[13]

The question of the added risk of infection with COVID-19 when performing aerosol-generating procedure (AGP) has called for additional concerns particularly from anesthetists.^[14-16] The concern over AGP may have contributed to the low motivation of anesthetists to anesthetize for surgical procedures particularly with the unavailability of N95 masks. The question of better protection being offered using an N95 mask over the surgical mask has also been studied.^[17]

The institutions in the southeastern and south-southern regions of the country were able to run outpatient clinics during the pandemic, without much change in their practice possibly due to the fact that the COVID-19 pandemic started much later in these regions of the country and the lower number of confirmed cases as compared to states such as Lagos and Kano, which are in the southwest and northwest regions, respectively. The public institutions were able to do this by reducing the patient load, staggering appointments, and maintaining physical distancing. For the private clinics, the use of telemedicine (usually video conferencing) played a prominent role probably because of prior computerization of the outpatient services in most of these clinics prior to the pandemic as compared to the public health institutions. The place of telemedicine in clinical medicine to reduce the risk of infection spread has gained a lot of relevance since the outbreak of the pandemic.^[18]

Routine testing of patients for elective surgery for COVID-19 infection is advocated by most orthopedic surgeons. This may be a challenge in future as there are ethical issues to be considered along with the inadequate number of test kits and test centers in our study location.

CONCLUSION

COVID-19 has profoundly affected orthopedic practice in Nigeria. Measures such as provision of adequate PPE, the use of telemedicine for outpatient consultations, physical distancing, use of physical barriers during triage (plastic or glass), having a dedicated health care team for COVID-19 patients to allow extended use of PPE, and isolation of confirmed cases of COVID-19 may all be of help to limit infection spread while maintaining optimal patient care.

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Conflicts of interest

There are no conflicts of interest.

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