

# Impact of Virtual Resources and Effect of COVID-19 Pandemic on Plastic Surgery Residency and Training among Residents in Southern Nigeria

## Abstract

**Background:** Despite the increased usage of virtual, nonphysical resources for medical education during the coronavirus disease-2019 (COVID-19) pandemic, plastic surgical training still suffered adversely in some aspects. **Objectives:** The aim of this study was to explore the overall impact of virtual resources and effect of the COVID-19 pandemic on plastic surgery training among residents in Southern Nigeria. **Materials and Methods:** This was a cross-sectional study conducted among senior plastic surgery residents in southern Nigeria using a well-structured online questionnaire carried out over a 3-month period. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) software program, version 25.0. Measures were taken to significantly minimise response, answer order, and other survey research errors/bias. A pilot study was done. Consent was obtained from all participants. **Results:** A total of 29 plastic surgery residents completed the questionnaire. Mean age was 35.15 years with standard deviation of 6.31. The response rate was 72.5%. According to a majority of the residents, there were no significant changes in the frequency of burn, hand, and facial injury cases during the pandemic; training courses on plastic surgery (44.3%) and operative cases decreased (48.3%), whereas there was a significant increase in intraoperative teaching (27.6%) as well as simulations and conferences (41.4%). Majority of the respondents also alluded to the significant financial and psychological impacts of the pandemic on residents and a significant decline in cases with general anaesthesia as compared with cases with local anaesthesia. **Conclusion:** The COVID-19 pandemic has caused a mixture of significant positive and negative changes in the plastic surgery training of residents.

**Keywords:** COVID-19, plastic surgery, residents, training

**Kelechi Uzodinma Imediegwu, Chidera V. Magbo<sup>1</sup>, Ebube I. Umeji, Emmnauel K. Azumah, Chiamaka Q. Onyebuchukwu<sup>1</sup>, Kenechukwu Judah Okonkwo<sup>1</sup>, Jude C. Abor<sup>1</sup>, Anthonia Uduezue**

*National Orthopaedic Hospital, Enugu, <sup>1</sup>University of Nigeria, Enugu, Nigeria*

## Introduction

The coronavirus disease-2019 (COVID-19) pandemic and its containment measures have important ramifications on the training of medical doctors.<sup>[1]</sup> The surgical specialties, being largely dependent on patient flow for surgical hands-on experience, stand the greatest risk of being negatively affected by the pandemic. This comes as plastic surgeons may be at greater risk of contracting COVID-19 as compared with professionals of other specialties, especially as they are relatively more frequent at the emergencies while on duty and also with the completion of certain procedures such as rhinoplasty and nasal reconstruction, which could result in the aerosolisation of viral particles; they, however, must strictly comply with the appropriate social distancing measures in order to be safe while performing duties.<sup>[2]</sup>

With respect to the challenge of decreased operative exposure due to the COVID-19 pandemic, the use of technology allows for adequate training and practice to be upheld as much as possible during this challenging period. A good example includes virtual grand rounds and educational conferences as well as interactive software on anatomy which have been gradually integrated into residents' learning and work.<sup>[3,4]</sup> They also provide unique benefits such as the ability to more easily connect with international experts in the field, greater flexibility to attend such events, and the patient-safe nature of such tools.<sup>[3]</sup> As the impacts of such strategies are further explored such as in regulating access and process to join and record virtual sessions,<sup>[5]</sup> improvements can be made in the long run to encourage their use as a complementary surgical training modality. This may help to develop strong social capital of the type of bonding

**Received:** 13-Oct-2022  
**Accepted:** 07-Nov-2022  
**Published:** 18-Jan-2023

**Address for correspondence:**  
Dr. Kelechi Uzodinma Imediegwu,  
Department of Orthopaedic  
Surgery, National Orthopaedic  
Hospital Enugu, PMB 01294  
Enugu, Nigeria.  
E-mail: drkelsresearch@gmail.com  
All data that support the study  
results are available from the  
corresponding author (Dr.  
Kelechi Uzodinma Imediegwu,  
e-mail: drkelsresearch@gmail.com) on request.

## Access this article online

**Website:**  
www.jwacs-jcoac.com

**DOI:** 10.4103/jwas.jwas\_238\_22

## Quick Response Code:



**How to cite this article:** Imediegwu KU, Magbo CV, Umeji EI, Azumah EK, Onyebuchukwu CQ, Okonkwo KJ, et al. Impact of virtual resources and effect of COVID-19 pandemic on plastic surgery residency and training among residents in southern Nigeria. J West Afr Coll Surg 2023;13:50-4.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**For reprints contact:** reprints@medknow.com

between plastic surgeons and residents, which can have long-term benefits in preventing adverse mental health outcomes as social distancing is now a major cornerstone of disease prevention.<sup>[6]</sup>

A study conducted at a tertiary centre in Iran in 2021 reported a significant reduction in the total number of plastic surgeries done after the COVID-19 outbreak with the highest reduction being in aesthetic surgeries, microscopic surgeries, and craniofacial surgeries, and the lowest reduction in trauma cases and reconstructive surgeries.<sup>[7]</sup> In another study surveying plastic surgery residents in the USA, majority of residents expressed concern over reduced exposure to operations following the COVID-19 pandemic.<sup>[8]</sup> Similarly, another study conducted by Zaidman *et al.*<sup>[9]</sup> showed that there were significantly more residents who felt that their clinical exposure was better and more sufficient before the COVID-19 pandemic.

A study conducted at a tertiary hospital in southern India in 2021 revealed that outpatient clinics were closed and emergency consultations were reduced due to the pandemic, and that the number of consultations reduced significantly by 97% while the number of surgeries performed dropped by 85%. It also reported that despite telemedicine being helpful, the overall benefits were subpar and that academic activities were continued on virtual platforms.<sup>[10]</sup> Similarly, another study conducted in India in 2020 by Dharini *et al.*<sup>[11]</sup> showed a two-third fall in the number of outpatient department cases and elective surgeries after the outbreak, whereas another study reported an increase in research activities following the pandemic with an affectation of the academic curriculum for residency training.<sup>[12]</sup>

The aim of this study was to assess the perspectives of residents on the effect of COVID-19 pandemic and impact of virtual resources on the plastic surgery residency and training among residents in Nigeria. The participants in this study were senior registrars in plastic surgery. These are residents specialising in plastic surgery after initially completing the general surgery prerequisites for the fellowship degree award for plastic surgery in both West African Postgraduate College of Surgery and National Postgraduate Medical College of Nigeria, Faculty of Surgery.

## Materials and Methods

### Study area

This study was carried out among all specialist health institutions in southern Nigeria accredited for plastic surgery training in Nigeria.

### Study type

This was a descriptive cross-sectional online survey conducted among 29 plastic surgery residents in southern Nigeria in a bid to determine the effect of the COVID-19

pandemic on their residency training and the impact of virtual resources.

### Study population

The sample population was senior plastic surgery resident doctors in southern Nigeria.

### Sampling method

The stratified sampling method was adopted, where each institution offering plastic surgery residency training was regarded as a stratum out of which each individual plastic surgery resident was randomly selected. All strata had a proportionate representation in the sample as every unit in the strata had an equal chance of being selected.

### Data collection/study design

A pre-designed online-based questionnaire was developed by the principal investigator.

The questionnaire was made up of two sections: social demographics and effect of the COVID-19 pandemic on plastic surgery training.

The questions asked required each respondent to indicate whether there had been an increase, a decrease, or no change in various aspects of plastic surgery training and practice, which includes operative cases, intraoperative teaching, conferences, mortality, financial impact, psychological impact, adherence to COVID-19 protocols, training courses, emergency consultation volume, clinic waiting time, emergency timely promptness to care, elective clinic timing, telecommunication, changes in hand, burn and facial injuries.

Chief residents/key representatives of individual centres assisted in distributing the forms via group forums and individual contacts.

### Study duration

The study was carried out over a period of 3 months.

### Sample size

Of 40 senior residents who received the link to the online Google Forms questionnaire, 29 responded—a response rate of 72.5%.

### Data analysis

Descriptive and inferential data analysis was done using the Statistical Package for the Social Sciences (SPSS) software program, version 25.0. Descriptive analyses were conducted to determine frequencies and proportions of categorical variables in the total study sample. Significance was set at  $P < 0.05$ , with confidence interval at 95%. Mean and standard deviations were calculated for the variables.

### Measures to limit bias

Nonresponse bias was limited by increasing callbacks and messages at particular time intervals; interval breaks

were ensured to reduce agreement bias. In addition, two independent analysts were employed to prevent systematic bias with randomisations in the questionnaire to minimise answer order bias. A pilot study with 10 residents was also done.

**Ethical consideration**

Participants were informed of the purpose of the study and who the researchers were.

They were also provided with information on risks, benefits, privacy, and anonymity in the language they could understand so that they could make an informed decision whether or not to participate.

Participants who agreed to participate were asked to sign a consent form containing the above information.

Ethical approval was obtained from the Health Research and Ethical Committee of the University of Nigeria Teaching Hospital, Enugu, Nigeria with Reference No. UNTH/HREC/2022/06/475.

**Results**

As shown in Table 1, a total of 29 respondents were recorded, out of which 93.1% were male, the majority (62.1%) were aged between 31 and 40 years, and 51.7% were single.

As shown in Table 2, from the opinions of the respondents, the pandemic had drastic effects on the plastic surgery residency training among residents as operative cases, intraoperative teaching, training courses, cases with general

anaesthesia, and elective clinic consultations reduced. There were, however, some notable increased effects in the training with some aspects of the training having no significant change despite the pandemic.

**Discussion**

Our study shows that plastic surgery residency training was significantly impacted both positively and negatively by the COVID-19 pandemic. The old forms of surgery teachings were largely agreed to have been replaced in many centres with virtual learning using software applications such as Zoom and Google Meet as well as other forms of telecommunication, and this was reflected in our survey by the significant agreed increase with seminars and conference presentations according to majority of the respondents and reduced training courses, elective consultations, and operative cases usually used for hands-on-training; this was in accordance with a study conducted in a tertiary hospital in southern India, which revealed that outpatient clinics were closed due to the pandemic, and that the number of consultations reduced significantly by 97% while the number of surgeries performed dropped by 85%. It also reported that despite telemedicine being helpful, the overall benefits were suboptimal and that academic activities were continued on virtual platforms.<sup>[10]</sup> Similar to this, another study conducted in India in 2020 by Dharini *et al.*, showed a two-third fall in the number of outpatient department cases and elective surgeries after the outbreak.<sup>[11]</sup> Also, in accordance with our findings in Table 2 which showed a decrease in operative cases, another study conducted at a tertiary centre in Iran reported a significant reduction in the total number of plastic surgeries done after the COVID-19 outbreak with the highest reduction being in aesthetic surgeries, microscopic surgeries, and craniofacial surgeries, and the lowest reduction in trauma cases and reconstructive surgeries.<sup>[7]</sup> This was also in accordance with another study done by Zaidman *et al.*<sup>[9]</sup> which showed that there were significantly more residents who felt that their clinical exposure was better and more sufficient before the COVID-19 pandemic.

However, from our study as represented in Table 2, most respondents affirmed that the number of emergency consultations remained the same, which was not in accordance with a study conducted at a tertiary hospital in southern India which revealed that outpatient clinics were closed and emergency consultations were reduced due to the pandemic. The disparity may be due to the iceberg phenomenon existing in a low-income country such as Nigeria.

The pandemic also had significant negative financial and psychological impacts on the residents in southern Nigeria. There was also a significant decline in cases with general anaesthesia as opposed to cases with local anaesthesia, and this may be due to preference of doctors to minimise invasive procedures in a bid to reduce contact with patients, thus reducing/preventing the spread of the virus.

**Table 1: Sociodemographics of the respondents**

Variable	n	%
Sex		
Female	2	6.9
Male	27	93.1
Age		
21–30	6	20.7
31–40	18	62.1
41–50	5	17.2
	Mean = 35.15	SD = 6.31
Marital status		
Married	14	48.3
Single	15	51.7
Number of part 1 attempts		
>1	6	20.7
1	23	79.3
Work type		
Both government and private practice	8	27.6
Works only in government practice	21	72.4
Years of dedicated experience in plastic surgery		
>1	11	38.0
1	18	62.0

**Table 2: Effects of COVID-19 on plastic surgery residency training**

Variable	n	%
Operative cases		
Decreased	14	48.3
Increased	5	17.2
Same	10	34.5
Intraoperative teaching		
Decreased	10	34.5
Increased	8	27.6
Same	11	37.9
Conferences		
Decreased	11	37.9
Increased	12	41.4
Same	6	20.7
Mortality among patients		
Decreased	6	20.7
Increased	8	27.6
Same	15	51.7
Financial impact		
Not sure	7	24.1
Significant	13	44.8
Very significant	9	31.0
Psychological impact		
Not sure	3	10.3
Significant	18	62.1
Very significant	8	27.6
Adherence to COVID-19 guidelines/protocols		
Moderate	16	55.2
Poor	8	27.6
Very good	5	17.2
Cases with general anaesthesia as opposed to local anaesthesia		
Decreased	17	58.6
Increased	1	3.4
Same	11	37.9
Training courses on plastic surgery		
Decreased	13	44.8
Increased	4	13.8
Same	12	41.4
Emergency consultation volume		
Decreased	9	31.0
Increased	7	24.1
Same	13	44.8
Clinic waiting time		
Decreased	8	27.6
Increased	10	34.5
Same	11	37.9
Emergency timely promptness to care		
Decreased	8	27.6
Increased	5	17.2
Same	16	55.2
Elective clinic consultation volume		
Decreased	11	37.9
Increased	9	31.0
Same	9	31.0

**Table 2: Continued**

Variable	n	%
Telecommunication		
Decreased	1	3.4
Increased	24	82.8
Same	4	13.8
Change in burn injury frequency since pandemic		
Decreased	3	10.3
Increased	10	34.5
Same	16	55.2
Change in hand injury frequency since pandemic		
Decreased	5	17.2
Increased	4	13.8
Same	20	69.0
Change in facial injury frequency since pandemic		
Decreased	6	20.7
Increased	1	3.4
Same	22	75.9

The clinic waiting time, emergency timely promptness to care, and changes in frequency of burn injury, hand injury, and facial injury were not significantly affected by the COVID-19 pandemic as seen in findings from Table 2.

### Conclusion/Recommendation

The impact of virtual resources has been quite significant and the effect of COVID-19 pandemic on plastic surgery residency training has some merits and demerits.

From the results of our study, we recommend the following.

Government should endeavour to release adequate funds to the hospitals to help in provision of standard plastic surgery care and also create more awareness on the importance of observing the COVID-19 protocols in surgical practice.

Theatres should be better equipped in the hospitals with personal protective equipment to protect surgeons, including plastic surgery residents, from being infected. The hospital management board should ensure a healthy environment for patient care and doctor training by ensuring adequate adherence to COVID-19 prevention protocol.

Doctors should practice adequate hand washing techniques at all times to increase protection of both patient and doctor and they should strictly adhere to COVID-19 protocols to ensure that they are not exposed during their training protocol in the hospital.

### Acknowledgement

The authors thank the plastic surgery residents in southern Nigeria who participated in the study.

### Financial support and sponsorship

Not applicable.



### Conflicts of interest

There are no conflicts of interest.

### Data availability statement

### Ethical approval

The ethical approval was obtained from the Health, Research and Ethical Committee of the University of Enugu Teaching Hospital, Enugu, Nigeria.

### References

1. Pertile D, Gallo G, Barra F, Pasculli A, Batistotti P, Sparavigna M, *et al.*; SPIGC Working Group. The impact of COVID-19 pandemic on surgical residency programmes in Italy: A nationwide analysis on behalf of the Italian polyspecialistic young surgeons society (SPIGC). *Updates Surg* 2020;72:269-80.
2. Unadkat SN, Andrews PJ, Bertossi D, D'Souza A, Joshi A, Shandilya M, *et al.* Recovery of elective facial plastic surgery in the post-coronavirus disease 2019 era: Recommendations from the European Academy of Facial Plastic Surgery Task Force. *Facial Plast Surg Aesthet Med* 2020;22:233-7.
3. Zingaretti N, Contessi Negrini F, Tel A, Tresoldi MM, Bresadola V, Parodi PC. The impact of COVID-19 on plastic surgery residency training. *Aesthetic Plast Surg* 2020;44:1381-5.
4. Kania K, Abu-Ghname A, Agrawal N, Maricevich RS. Four strategies for plastic surgery education amid the COVID-19 pandemic. *Plast Reconstr Surg* 2020;146:252e-3e.
5. Cho MJ, Hong JP. The emergence of virtual education during the COVID-19 pandemic: The past, present, and future of the plastic surgery education. *J Plast Reconstr Aesthet Surg* 2021;74:1413-21.
6. Wong ASY, Kohler JC. Social capital and public health: Responding to the COVID-19 pandemic. *Global Health* 2020;16:88.
7. Kalantar-Hormozi A, Habibzadeh Z, Yavari M, Mousavizadeh SM, Hassanpour SE, Motamed S, *et al.* Impact of COVID-19 pandemic on plastic surgery activities and residency programs in a tertiary referral centre in Iran. *Eur J Plast Surg* 2021;44:817-23.
8. Collins C, Mahuron K, Bongiovanni T, Lancaster E, Sosa JA, Wick E. Stress and the surgical resident in the COVID-19 pandemic. *J Surg Educ* 2021;78:422-30.
9. Zaidman M, Al-Shaqsi S, Yeung C, Novak CB, Dengler J. COVID-19 restrictions presented opportunities and challenges for plastic surgery residents. *Plast Surg (Oakv)* 2021;29:294-302.
10. Chellamuthu A, Kumar JS, Ramesh BA. Impact of COVID-19 pandemic on plastic surgery practices in a tertiary care set up in southern India. *Niger J Clin Pract* 2021;24:1558-64.
11. Dharini, Shalabh K, Amrita M, Mandara H. The impact of COVID-19 and lockdown on plastic surgery training and practice in India. *Indian J Plast Surg* 2020;53:273-9.
12. Harkirat ST, Tushar AN, Vikas KP, Ankur M, Arup KM. A nationwide cross-sectional study to assess the impact of COVID-19 on surgical residency programs in India. *J Edu Health Promot* 2021;10:440.