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■ Original Research Article

Impact of the COVID-19 Pandemic on Obstetrics and Gynaecology Residency Training in Nigeria

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ABSTRACT

Context: The bid to curtail the COVID-19 pandemic has led to the reduction of several Obstetric and Gynaecological services with possible impairment in training. Hence, the objective of this study was to assess the impact of the COVID-19 pandemic on Obstetrics and Gynaecology residency training programme in Nigeria. **Methods and Materials:** This was a cross-sectional study. An online invitation to participate in the study as well as the study link was sent to Obstetrics and Gynaecology residents in 42 training institutions in Nigeria via residents' WhatsApp groups and emails. The study questionnaire was completed anonymously by consenting residents. Univariable logistic regression analyses were used to evaluate the impact of the COVID-19 pandemic on residents' clinical services and teaching activities as well as on the psychological wellbeing of the residents. **Results:** Two hundred and twenty-one residents completed the survey. Sixty-seven percent of the residents were aged between 31-40 years while eighty-five percent of the residents were training in COVID-19 reference hospitals. Fifty-nine percent and 66.9% of the residents reported significant reduction in general clinical practice and teaching activities respectively during the COVID-19 pandemic. Logistic regression analysis showed that the level of general reduction in clinical practice and the degree of mood impairment were not significantly associated with the residents' characteristics. **Conclusion:** The COVID-19 pandemic has considerably reduced clinical and academic training exposure of Obstetrics and Gynaecology residents in Nigeria.

Keywords: COVID-19 Pandemic, Obstetrics, Gynaecology, Residency training, Nigeria

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INTRODUCTION

The Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), known as Coronavirus 2019 (COVID-19) is an emerging virus that has spread rapidly across the globe[1,2] and was declared a pandemic by the World Health Organization in March, 2020. COVID-19 is associated with detrimental medical, socio-economic, and psychological consequences.[3,4] Globally, health care systems had to rapidly re-organize their capacity to cope with the emergency, aiming to optimize resources and minimize further spread of the deadly virus.[5] Nigeria recorded its first case of COVID-19 in February, 2020 and a year later, has documented over 140,000 cases with about 1,700 deaths.[6] While maintaining a healthy resident doctor workforce is critical for optimum health care delivery in Nigeria, various postgraduate residency training programmes including that in Obstetrics and Gynaecology were placed in a challenging situation during the COVID-19 pandemic.

The aim of the residency training programme is to train specialist Obstetricians and Gynaecologists with advanced professional and academic skills using a time-bound curriculum established on tested and current principles in postgraduate medical education.[7] It involves series of theoretical knowledge and practical exposure to live patients for hands-on

learning in the clinics, wards and theatre.[8] However, this system was jeopardized by the pandemic which disrupted the contact time necessary for learning, as a result, resident doctors try to balance between providing care to women while improving their medical knowledge and developing their clinical skills amidst the fear of contracting the deadly virus.

The bid to curtail the COVID-19 pandemic led to the reduction in the delivery of several Obstetric and Gynaecological services. This was aimed at decreasing contact of health professionals with patients and thereby curbing the viral transmission. Such disruptions include limiting services to those considered urgent and not deferrable, such as labour and delivery, emergency gynaecological and oncologic procedures. Consequently, the daily training activities of doctors dwindled as daily routines were adjusted to embrace new norms while surrounded by uncertainty. Face-to-face training sessions were largely replaced by online meetings conducted through platforms such as Zoom and Google meet, which usually demand more preparation and hence suffer more inconsistencies. Complying with the 'social distancing' principle and reducing interpersonal contact was also difficult for residents and other healthcare workers.[9] Furthermore, many residents had to dedicate part, if not all, of their practice to the management of COVID-19 patients.[5]

As these changes may have significant negative impact on the Obstetrics and Gynaecology residency training as well as clinical service delivery, teaching institutions may need to develop and refine specific strategies to ensure the safety and wellness of their trainees and ensure the implementation of alternative learning strategies, such as telemedicine, simulation and smart learning educational programmes, including tele-mentoring of surgical procedures.[5,10,11] To this end, the true impact of the COVID-19 pandemic on Obstetric and Gynaecological residency training in Nigeria is largely unreported and the institutional adaptive mechanisms to cope with the pandemic need to be explored. Hence, the objective of this study is to assess the impact of the COVID-19 pandemic on Obstetrics and Gynaecology residency training programme in Nigeria.

MATERIALS AND METHODS

Study Design

This was a cross-sectional study conducted to assess the impact of the COVID-19 pandemic on the Obstetrics and Gynaecology residency training programme in Nigeria. An online invitation to participate in the study as well as the study link was sent to Obstetrics and Gynaecology residents in 42 training institutions in Nigeria via residents' WhatsApp groups and emails. The study questionnaire was completed anonymously by consenting residents. In Nigeria, the duration of the Obstetrics and Gynaecology residency training programme is five to six years. Residents from the first to the sixth year of the programme were invited to participate in the survey. Residents were asked about changes in their clinical practice and teaching activities during the COVID-19 pandemic. They were also asked about the psychological impact of COVID-19 on their clinical practice. Data were collected anonymously from December 07, 2020 to January 09, 2021.

The Questionnaire

The questionnaire was pilot-tested among 20 volunteers and modified before used in this study. The online survey included eight sections. In the first part, demographic data such as age, gender, residents' cadre as well as general information about COVID-19 such as being in a reference centre and about being tested for COVID-19 were obtained. Information about residents' perceived reduction in clinical practice and teaching activities were obtained in sections two to seven. Clinical activities were graded as not affected, slightly reduced, significantly reduced and total suspension while teaching-learning activities were assessed as being conducted regularly, some interruption, completely interrupted and not relevant. In the last section of the survey, residents were asked about the psychological impact of COVID-19 on their clinical approach to patients and concerns about their professional future.

Statistical analysis

The information obtained from participants was transferred from an excel spreadsheet to Stata 15.0 (Stata Corporation, College Station, Texas) statistical software for analyses. Descriptive statistics were calculated for sociodemographic characteristics. Categorical variables such as gender, year of residency and COVID-19 positivity were expressed as absolute numbers and percentages. Univariate comparisons of dichotomous data were performed using Chi-square test with continuity correction.

Univariable logistic regression analysis was used to evaluate the impact of the COVID-19 pandemic on residents' clinical and teaching activities according to residents' gender, year of residency, being a resident in a COVID-19 reference centre, having adequate personal protective equipment (PPE) and having received adequate advice on the use of PPE. The impact of the pandemic on the psychological wellbeing of residents was also evaluated using similar regression modelling according to residents' gender, year of residency, being a resident in a COVID-19 reference centre, previous COVID-19 test, COVID-19 positivity and having an infected colleague. A 2-sided *p* value less than 0.05 (95% confidence interval) was considered statistically significant.

Ethical Consideration

Ethical approval was obtained from the National Health Research Ethics Committee of Nigeria (NHREC Protocol Number: NHREC/01/01/2007-26/11/2020 and NHREC Approval Number: NHREC/01/01/2007-02/12/2020). Being an online survey, an invitation stating the nature of the study, voluntary participation, anonymity and link to the study questionnaire was sent to the participants via residents' WhatsApp groups and emails. Only residents that consented to participate filled the questionnaire.

RESULTS

Study Population

Obstetrics and Gynaecology residents from 42 training institutions in Nigeria were invited through WhatsApp to participate in the survey, and 221 completed the survey. Sixty-seven percent (142/212) of the residents were aged between 31-40 years while 3% (6/212) were more than 50 years. Thirty-three percent (71/212) of the respondents were females and sixty-five percent were registrars (137/212). Residents undergoing training in COVID-19 reference hospitals constituted 84.9% (180/212) of the total number of respondents and 38% (80/212) of the residents reported to have been involved in the management of COVID-19 positive patients. Thirty percent of the residents (64/212) were tested for SARS-COV-2 and seven (10.9%) turned out to be positive. While 54.3% (115/212) of the respondents reported to have received adequate advice on the use of PPE, 12% (26/212) reported to have adequate PPE in their hospitals and 74.1% (157/212) felt they were well informed about prevention and management protocols of COVID-19 (Table 1).

Table 1. General and COVID-19 Exposure Characteristics of Obstetrics and Gynaecology Residents in Nigeria

Co-variates (n=212)	Frequency	Percentage
Age (years)		
21-30	24	11.3
31-40	142	66.9
41-50	40	18.9
>50	6	2.8
Gender		
Females	71	33.5
Males	141	66.5
Cadre		
Registrars	137	64.6
Senior Registrars	75	35.4
Number of years in Institution		
0-3	118	55.7
4-6	53	25.0
>6	41	19.3
Residents in COVID-19 Reference Centres		
No	32	15.1
Yes	180	84.9
Residents involved in Management of COVID-19 Patients		
Yes	80	37.7
No	85	40.1
May be	47	22.2
COVID-19 Test		
Yes	64	30.2
No	148	69.8
COVID-19 Test Result		
Negative	58	89.2
Positive	7	10.8
COVID-19 Positive Colleague		
Yes	172	81.1
No	40	18.9
Received PPE Advice		
Yes	115	54.3
No	71	33.5
May be	26	12.3
Adequate PPE in Centres		
Yes	26	12.3
No	139	65.6
May be	47	22.2

Impact of COVID-19 on Clinical Services and Training Activities

Regarding residents perceived general reduction in clinical practice and teaching activities during the COVID-19 pandemic, 59.4% and 66.9% of the residents reported significant reduction in clinical practice and teaching activities respectively. Although 4.3% (9/212) of the respondents reported no reduction in their training activities, total suspension of training activities was reported by 8.0% (Figure 1). According to 66.9% of the residents, the reduction was caused by reorganization of work shifts, while 9.4% and 5.2% have reduced their activities because of low patient turn-out and mandatory isolation, respectively. Thirty-two residents had more than one reason for the reduction.

Residents' involvement in minor and major surgeries during the COVID-19 pandemic has been most affected, with significant reduction in 40.6% of diagnostic procedures, 31.1% of minor therapeutic procedures, 39.6% of major benign surgeries and 35.9% of major oncological surgeries. Fifty-five percent of the residents reported no reduction in their involvement in emergency surgeries. Similarly, residents' involvement with labour and delivery services were less affected, with significant reduction in the management of spontaneous deliveries according to 10.9% of the respondents. Participation in Caesarean sections was not affected according to 56.6% of respondents, while 0.94% experienced total suspension of this service (Table 2).

Residents' involvement in gender-based violence care and comprehensive abortion care was respectively not affected as reported by 60.4% and 57.1% of the residents. Infertility services underwent significant reduction according to 32.6% of the responses and were totally suspended as reported by 20.8% of the residents. Residents' involvement in antenatal care (ANC) was slightly reduced according

to 40.1% of the responses while Gynaecology clinic was significantly

Table 2: Residents' involvement in clinical services during the COVID-19 pandemic

Clinical Services	Frequency	Percentage
Spontaneous Deliveries		
Not affected	104	49.1
Significantly reduced	23	10.9
Slightly reduced	83	39.2
Total suspension	2	0.9
Instrumental Deliveries		
Not affected	111	53.9
Significantly reduced	43	20.9
Slightly reduced	48	23.3
Total suspension	4	1.94
Caesarean Section		
Not affected	120	56.6
Significantly reduced	22	10.4
Slightly reduced	68	32.1
Total suspension	2	0.94
Diagnostic procedures		
Not affected	38	17.9
Significantly reduced	86	40.6
Slightly reduced	73	34.4
Total suspension	15	7.1
Minor procedures		
Not affected	53	25.0
Significantly reduced	66	31.1
Slightly reduced	83	39.2
Total suspension	10	4.7
Colposcopy		
Not affected	34	16.0
Not relevant	8	3.8
Significantly reduced	64	30.2
Slightly reduced	64	30.2
Total suspension	42	19.8
Emergency surgeries		
Not affected	117	55.2
Significantly reduced	25	11.8
Slightly reduced	68	32.1
Total suspension	2	0.94
Major Benign surgeries		
Not affected	18	8.5
Significantly reduced	84	39.6
Slightly reduced	57	26.9
Total suspension	53	25.0
Major Oncological surgeries		
Not affected	32	15.1
Not relevant	8	3.8
Significantly reduced	76	35.9
Slightly reduced	68	32.1
Total suspension	28	13.2

reduced in 34.4% of responses. Residents' involvements in family planning clinics and gynae-emergency units were not affected in 25.0% and 50.9% of the responses respectively. However, twenty percent of the residents reported total suspension of the oncologic screening clinic and colposcopy, 30.2% reported significant reduction while 16.0% of residents did not experience any reduction in these activities (Table 3).

Table 4 shows that the degree of interruption of residents' teaching-learning activities varied

Table 3. Residents' Involvement in Out-Patient Clinics and Services during the COVID-19 Pandemic

Out-patient Clinics/Services	Frequency	Percentage
Antenatal Clinic		
Not affected	46	21.7
Significantly reduced	68	32.1
Slightly reduced	85	40.1
Total suspension	13	6.1
Gynaecology Clinic		
Not affected	20	9.4
Significantly reduced	73	34.4
Slightly reduced	55	25.9
Total suspension	64	30.2
Gynae Emergencies		
Not affected	108	50.9
Significantly reduced	24	11.3
Slightly reduced	78	36.8
Total suspension	2	0.94
Family Planning Clinic		
Not affected	54	25.5
Significantly reduced	55	25.9
Slightly reduced	79	37.3
Total suspension	24	11.3
Infertility		
Not affected	38	18.0
Not relevant	1	0.5
Significantly reduced	69	32.6
Slightly reduced	60	28.3
Total suspension	44	20.8
Gender Based Violence		
Not affected	128	60.4
Not relevant	15	7.1
Significantly reduced	28	13.2
Slightly reduced	38	17.9
Total suspension	3	1.4
Abortion		
Not affected	121	57.1
Not relevant	4	1.9
Significantly reduced	25	11.8
Slightly reduced	60	28.3
Total suspension	2	0.9

considerably. Didactic lectures, morning reviews and seminar presentations were completely interrupted in 40.6%, 38.2% and 34.4% of responses respectively. Sixty-one percent of the residents reported some interruption of teaching rounds. However, thirty-nine percent of the residents had more time dedicated to their individual study, and 91.5% of the residents had increased virtual learning experience. Group discussions and research activities were only conducted regularly by 7.1% and 7.6% of the residents respectively.

The COVID-19 pandemic has caused a significant change to residents' motivation to work according to 38.2% of the residents while their approach to physical interaction with patients was also

significantly changed according to 51.9% of their responses. Interestingly, seventy-nine percent of the

Table 4. Residents' Teaching-Learning Activities during the COVID-19 Pandemic

Teaching-Learning Activities	Frequency	Percentage
Didactic		
Being conducted regularly	10	4.7
Complete interruption	86	40.6
Not relevant	12	5.7
Some interruption	104	49.1
Morning reviews		
Being conducted regularly	46	21.7
Complete interruption	81	38.2
Some interruption	85	40.1
Seminar Presentations		
Being conducted regularly	32	15.1
Complete interruption	73	34.4
Some interruption	107	50.5
Ward rounds		
Being conducted regularly	22	10.4
Complete interruption	60	28.3
Some interruption	130	61.3
Group Discussions		
Being conducted regularly	15	7.1
Complete interruption	59	27.8
Not relevant	2	0.9
Some interruption	136	64.2
Research		
Being conducted regularly	16	7.6
Complete interruption	50	23.6
Not relevant	9	4.3
Some interruption	137	64.6
Time dedicated to study		
Decreased	84	39.6
Increased	83	39.2
Total suspension	7	3.3
Unchanged	38	17.9
Virtual Learning		
Decreased	7	3.3
Increased	194	91.5
Total suspension	5	2.4
Unchanged	6	2.8
Attendance at Courses		
Decreased	110	51.9
Increased	39	18.4
Total suspension	26	12.3
Unchanged	37	17.5

residents experienced some degree of negative psychological impact in terms of mood changes. There was also anxiety related to fear of contagion of COVID-19, which was more during invasive procedures (87.7%) than during non-invasive procedures (77.8%). Concern about the professional future was reported by 79.7% of the residents and 49.5% believe that their training has been irreversibly compromised as illustrated in Figure 2.

Notwithstanding, being a resident in a COVID-19 reference centre did not have any effect on the negative psychological wellbeing of respondents (p=0.858). Even though all the residents that got infected with the COVID-19 virus were working in a reference centre, the association between previous infection by the virus and working in a reference centre was not statistically significant (p=0.294).

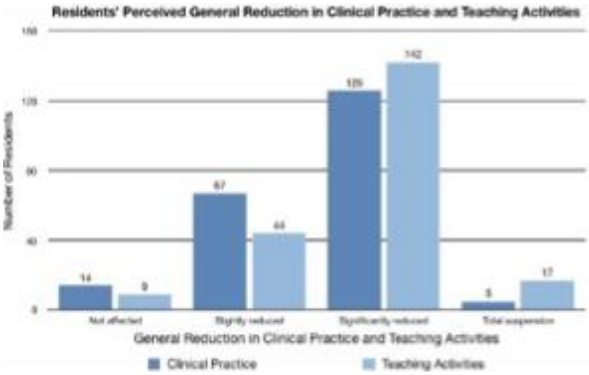

Figure 1: Residents' Perceived General Reduction in Clinical Practice and Teaching Activities during the COVID-19 Pandemic

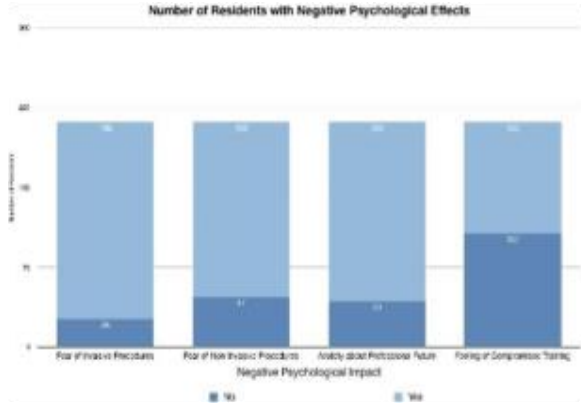

Figure 2: Negative Psychological impact of C0VID-19 on residents

However, there was evidence of significant association between being a resident in COVID-19 reference hospital and general reduction in clinical practice (p=0.011), as well as general reduction in teaching activities (p=0.019).

Logistic regression analysis showed that the level of general reduction in clinical practice was not significantly associated with residents' gender (odds ratio [OR] 1.11, 95% confidence interval [CI] 0.36-3.45; p=0.855), year of residency (OR 2.11, 95% CI 0.44-10.09; p=0.597), being in a COVID-19 reference centre (OR 2.43, 95% CI 0.71-8.28; p=0.181), having adequate PPE (OR 0.25, 95% CI 0.03-2.01; p=0.293) and receiving adequate PPE advice (OR 0.88, 95% CI 0.10-7.87; p= 0.170).

While exploring the negative psychological impact of the COVID-19 pandemic, logistic regression analysis also showed that the degree of mood impairment was not associated with residents' gender (OR 0.76, 95% CI 0.37-1.57; p=0.462), year of residency (OR 1.45, 95% CI 0.63-3.34; p=0.669), being in a COVID-19 reference centre (OR 1.05, 95% CI 0.42-2.60; p=0.922), having a COVID-19 test (OR 0.73, 95% CI 0.36-1.47; p= 0.378), COVID-19

positivity (OR 2.09, 95% CI 0.23-18.83; *p*= 0.510) or presence of an infected colleague (OR 1.80, 95% CI 0.83-3.92; *p*=0.135).

DISCUSSION

This study evaluated the impact of the COVID-19 pandemic on Obstetrics and Gynaecology residency training programme in Nigeria. It was conducted ten months into the first wave of the pandemic in Nigeria, and significant training impairment among Obstetrics and Gynaecology residents was found to be associated with the COVID-19 pandemic. A similar study among Obstetrics and Gynaecology residents in Italy,[12] India[13] and Ethiopia[14] found similar findings. Previous studies have demonstrated the wide-ranging effects of the COVID-19 pandemic on surgical training programmes,[15-17] with negative impact on residency training and medical education across different medical specialties.[15,16,18] This negative impact would be felt more among surgical specialties, where hands-on training cannot be replaced by distance or online education.[16]

Obstetrics and Gynaecology residency training encompasses diverse and heterogeneous programmes, in which the acquisition of medical, surgical and emergency management skills is mandatory. Consistent clinical practice with solid theoretical background, plays a fundamental role and prepares residents for independent clinical practice thereafter.[8,12] Sixty-seven percent (67%) of residents reported a significant reduction in teaching activities which was higher than the 54.7% reported by Italian Obstetrics and Gynaecology residents.[12] Urology residents in Italy (80%) reported such a reduction in training activities also.[5] Interestingly, residents in this study just like other residents in a previous study noted increased virtual learning experience and more time dedicated to individual study.[19]

This study revealed that more than three-quarters of the residents experienced some degree of anxiety related to fear of contagion by the virus. This is similar to findings by Bitonti et al.[11] Prior studies have reported severe psychological impact of COVID-19 on healthcare providers.[20,21] This anxiety could impact on their ability to learn, practice and offer clinical services to the population during the pandemic.

To the best of our knowledge, this may be the first study evaluating the impact of the pandemic on Nigerian residents training in Obstetrics and Gynaecology. The large number of centres that participated in this study contributed to its primary strength. There was a good representation, hence findings can be generalised to the target population. The study was however, limited by the paucity of data on the subject matter in similar environments which hindered adequate comparison with the results obtained. Secondly, data was not collected on residents' recommendations for improved training practices. This would have allowed for a better analysis and understanding of our participants' perspectives.

Nevertheless, we believe our findings provide meaningful insights on the impact of the COVID-19 pandemic on Obstetrics and Gynaecology residency training programme in Nigeria. Our findings should stimulate further discussions by heads of Obstetrics and Gynaecology departments, training institutions and the post-graduate medical colleges overseeing residency training in Nigeria to develop optimal solutions to limit the impact of the COVID-19 pandemic on the quality of residency training programmes. Likewise, a further study to fully assess the impact of the pandemic disruption on actual skill acquisition should be considered. New organisational strategies may be necessary to minimise training deficiencies. Most importantly, innovative solutions such as online practice questions, teleconferencing, involving residents in telemedicine clinics, use of simulators, and the use of surgical videos may go a long way in improving residency training in the face of such a pandemic.

CONCLUSION

The COVID-19 pandemic has considerably reduced contact times for clinical and academic training in Obstetrics and Gynaecology residency programme in Nigeria. This may negatively impact on the practice of future Obstetricians and Gynaecologists. Innovative postgraduate academic and clinical training programmes should be evaluated to mitigate the inadequate training exposure and poor psychological wellbeing among Nigerian Obstetrics and Gynaecology residents.

Competing Interests; Authors declared they have no conflict of interest.

Authors' Contributions: SFU contributed to conception and design, obtaining ethical approval from National Health Research Ethics Committee (NHREC), acquisition of data, analysis, interpretation of data and drafting the article. DKW and DK contributed to conception and design, data acquisition and interpretation of data. All authors were involved in critically revising the final manuscript.

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