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A Survey of the Impact Lockdown Due to COVID-19 Pandemic on the Volume of Patients Accessing Breast Cancer Care in Nigeria

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Abstract

Background: The coronavirus disease 2019 (COVID-19) pandemic has disrupted cancer care, among others and increased the suffering of breast cancer (BC) patient owing to the imposed lockdown. This study investigated the impact of COVID-19 lockdown on the volume of BC patients accessing care in a poor resource setting.

Methods: We surveyed general surgery units (GSU) in Northcentral and Southwestern Nigeria during the first lockdown in April/May 2020. Using an electronically mailed questionnaire, we requested data on patients accessing clinics, chemotherapy and definitive surgery before and during lockdown. The data were analyzed and presented in descriptive statistics using SPSS v 20 and Microsoft Excel software.

Results: Among the 22 GSUs, only 5(23%) prepared for maintaining oncology or breast cancer services during the lockdown. Compared to the volume before the lockdown, 15(60%) GSUs received <30% of the usual volume of new cases, 16 (73%) received <30% of the usual of patients chemotherapy patients and no patient accessed definitive surgery in 15 (68%) GSUs.

Conclusion: There was a marked reduction in the volume of BC patients accessing outpatient clinics, chemotherapy facilities, and definitive surgery during the COVID-19 lockdown

Keywords: Breast cancer, access, COVID-19, Lockdown

1.0 INTRODUCTION

The coronavirus disease 2019 (COVID-19) disease, which began in Wuhan, China and caused hospitalization of its first cluster of victims in December of 2019 [1-3], has spread globally, infecting over 18 million people in more than 188 countries/regions and claiming over 600,000 thousand lives as of August 2020 according to the COVID resource center of the Johns Hopkins University [4]. The COVID-19 pandemic has caused massive disruption of social, economic, and medical services due to implementation of social distancing measures and lockdown with profound implications for cancer care and cancer patients [5-7]. The implications of COVID-19 include increased risk of infection due to reduced immunity from cancer and its treatment, delaying of cancer screening and diagnosis due to suspension of services, altering of treatment pathways, redefining of access to cancer care to accommodate the demands of COVID-19 on resources, and suspension of cancer researches and clinical trials [5, 8, 9].

Although the impact of COVID-19 on cancer care is still evolving [9, 10] and concrete statistics are not fully known, reports in the UK [6] estimate that the diagnosis of new cancer cases has reduced by 2,300 per week (75% reduction). The patients accessing radiotherapy have reduced by 400 (10% reduction), and patients accessing chemotherapy have reduced by 1,200 (30% reduction) [6]. We expect the disruptive wave of the COVID-19 pandemic to impact health systems in Africa more severely because of a plethora of reasons such as less prudent resource management, inhibitory sociocultural behaviors, poor health system [11, 12] and poor leadership.

Before the COVID-19 pandemic, breast cancer (BC) was one of the most common causes of cancer-related morbidity and mortality in Africa [13, 14], and the challenges of access; diagnosing and treating breast cancer are two dominant factors linked to the poor outcomes of the disease in Africa [15, 16]. Therefore, in this research, we aimed to study the impact of COVID-19 on the volume of patient's access to breast cancer care in Nigeria. Our purpose is to provide data to understand the immediate impact of the lockdown owing to COVID-19 on access to breast cancer services and to provide data for estimating the short and long term ramifications of COVID 19 lockdown in low resource settings. The lockdown was imposed for 4-6 weeks in the first instance and the Federal Government of Nigeria announced the easing in most states on May 4, 2020

2.0 METHODOLOGY

2.1 Study Setting and Population

In Nigeria, division of general surgery of tertiary hospital manage most of the breast cancer patients. The divisions usually comprise 2-3 relatively autonomous units (General Surgery unit -GSU) headed by the consultant(s), and all GSUs usually manage breast cancer except in centers with dedicated oncology or breast units. The activity of each GSU is directed by the consultant(s) through their Senior registrar(s). We surveyed GSUs managing breast cancer in Northcentral and Southwestern Nigeria. We included tertiary hospitals having a full-time general surgeon who was a member of the Northcentral and Southwestern Regional Breast Cancer Group (NSBCG) or a full-time surgeon who had collaborated with NSBCG in the past. We excluded GSUs in cities that were not locked down.

Before the COVID-19 outbreak in Nigeria, the challenges of managing breast cancer centered around late presentation with large tumors necessitating the use of chemotherapy and mastectomy. Hence, this research focused on the access to care, namely; outpatient services for new and old BC patients, chemotherapy, and surgical treatment for BC during the COVID-19 lockdown.

2.2 Data Collection and Study Duration

After obtaining approval from the Ethical Committee of the University of Ilorin Teaching Hospital (UITH) (ERC PAN/2020/05/0015), data collection occurred within ten days because this was time-sensitive research aimed at an ongoing pandemic with the rationale of accruing data to mitigate an evolving patient care crisis.

We identified eligible GSUs from a pre-existing database of breast cancer researches previously approved by the UITH Ethical committee and conducted in Northcentral and Southwestern Nigeria. An anonymized specially designed and pilot-tested questionnaire was electronically mailed to consenting consultants or senior registrars in eligible GSUs within 3 days (May 6-9, 2020). The response was expected within seven days of questionnaire delivery by electronic mail (May 10-16, 2020). The questionnaire requested volume of breast cancer patients accessing care (outpatient clinic, chemotherapy, and definitive surgery) before COVID-19 pandemic based on a recalled estimate from the preceding weeks/month and the volume accessing care during the COVID-19 lockdown. The volume recorded for each event was a recalled range. Events recalled as not occurred at all was accepted as an absolute Zero value. In the end, respondents were asked to select a single value

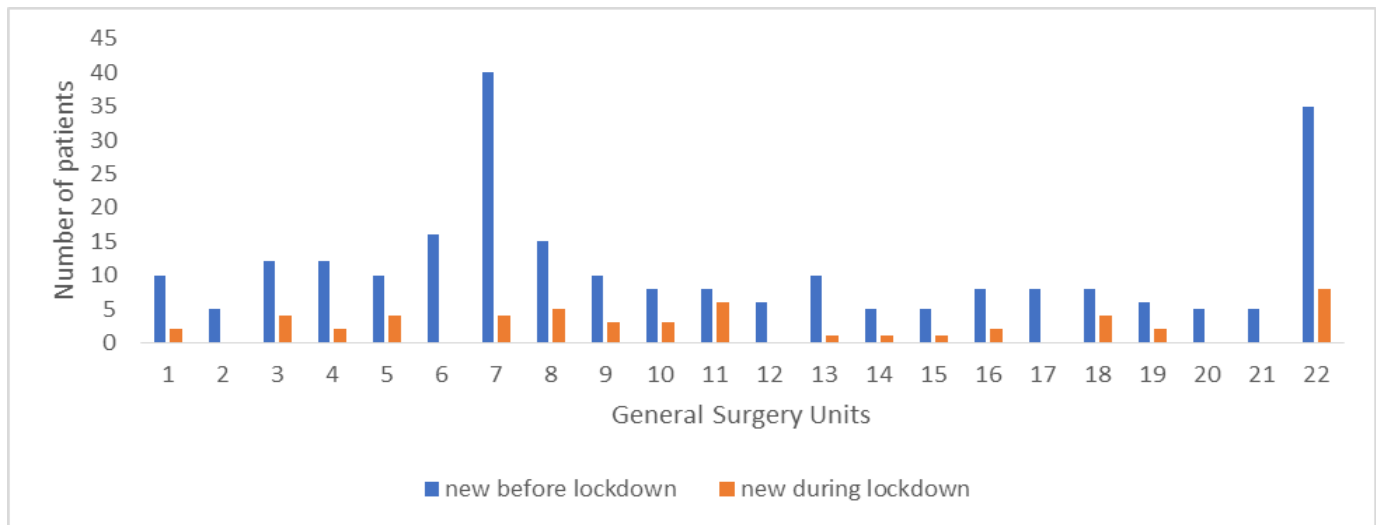


Figure 1. Volume of New Patients accessing Outpatient clinic compared to before COVID-19 lockdown

NB. The volume in each GSU before the lockdown is 100%, the bars represent a fraction of the 100% seen during the lockdown

between 0 and 100% representing the overall degree of activity perceived to have occurred in their unit during the lockdown. GSU that could not be contacted on telephone for prior consenting hence not served the questionnaire was recorded as not available, and GSU that had not returned the questionnaire by May 20, 2020, was recorded as non-response.

All collected data were entered directly from the soft copy questionnaire into a specially designed Microsoft Access database. The data was analyzed using SPSS version 20 and Microsoft excel. The presentation of results was in descriptive statistics.

3.0 RESULTS

3.1 Demographics

A total of 31 GSUs from 14 hospitals were eligible, 22 (71%) GSUs completed and returned the questionnaire via electronic mail, five (16%) were not available, and four (13%) did not respond. Four hospitals had 3 GSUs managing BC, seven had 2 GSUs, and three had a dedicated oncology/breast unit. Nine respondents were consultants (41%) and 13 (59%) were Senior registrars.

3.2 The Volume of Access Before COVID-19 Outbreak

Before the COVID-19 outbreak, a recalled total of 1,252 patients accessed breast cancer care monthly in all the 22 GSUs. A total of 247 were new patients, 378 accessed chemotherapy facility, and 519 were on follow-up surveillance (Table 1). The recalled number of definitive surgeries per month before COVID-19 was 108 (9% of all (1,252) patients accessing BC care per month). No GSUs

had formal telemedicine facilities; thus, all GSUs/Hospital policy was to manage their patients by physical contact. However, one respondent frequently offered remote consultation by telephone or WhatsApp messaging, 10 offered occasional remote consultation while the others never offered remote consultation. Eight of the 22 units managed their patients in a multidisciplinary team (MDT) and six units reported that their patients received home visitation by the palliative team of their hospital.

3.3 The Volume of Access During the COVID-19 Lockdown

Only 23% (5) of 22 GSUs discussed a protocol for maintaining oncology or breast cancer services during the lockdown. The recalled number of patients accessing breast cancer care in all the GSUs was 285, 23% of pre-COVID-19, the number of new patients was 52, 21% of pre-COVID-19, the number accessing chemotherapy was 134 (36% of pre-COVID 19) and the number accessing follow-up facilities was 82, 17% of pre-COVID-19. The recalled number of definitive surgeries during the lockdown was 16, 15% of pre-COVID-19. Seven of 22 GSUs initiated telephone calls to follow-up on patients during the lockdown, while 10 GSUs received calls from patients during the lockdown. Among the ten patients who initiated calls to their doctor, two who could not receive neoadjuvant chemotherapy reported symptoms of locoregional progression, one who could not receive chemoradiation reported locoregional progression and one who could not receive salvage chemotherapy reported distant progression. The specific challenges reported were lack of personal protective equipment (PPE) hence fear of contracting COVID-19 from patients or exposing other patients to COVID-19 infection. Transportation issues told to GSUs

Table 1. Statistics of Patients Accessing Breast Cancer Care in all 22 General Surgery Units Before COVID-19 and During COVID-19 Lockdown

	Before COVID-19				COVID-19 lockdown			
	New	Follow-up	Chemo	Surgery	New	Follow-up	Chemo	Surgery
Total	247	519	378	108	52	82	134	16
min	5	3	1	1	0	0	0	0
max	40	100	150	16	8	16	16	3
median	8	30	12	4	2	12	7	0
IQR	6-12	6-29	4-20	4-6	0-4	0-6	1-7	0-2

NB. New: patients presenting for the first time, Follow-up surveillance: patients who have completed chemotherapy and Surgery, Chemo: patients on neoadjuvant, adjuvant or salvage chemotherapy, Surgery: patients who had definitive surgery. IQR: Interquartile range

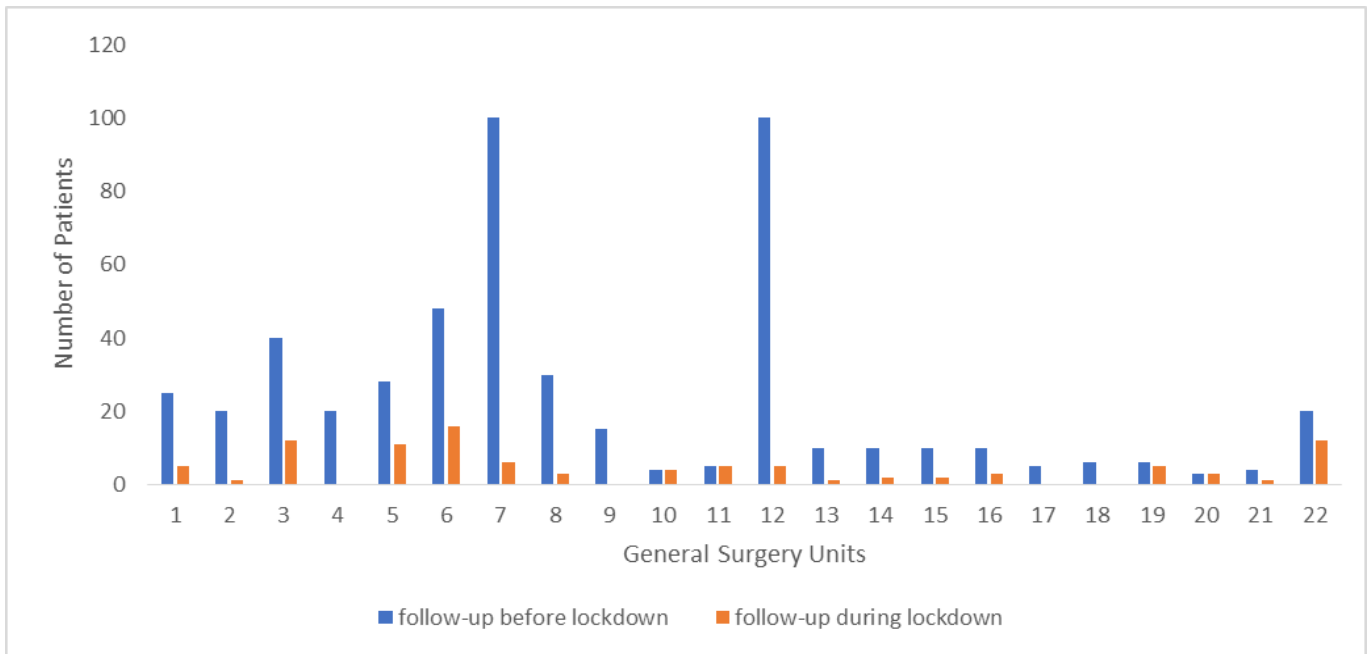


Figure 2. Volume of Patients accessing Follow-up facilities compared to before COVID-19 lockdown

NB. The volume in each GSU before the lockdown is 100%, the bars represent a fraction of the 100% seen during the lockdown

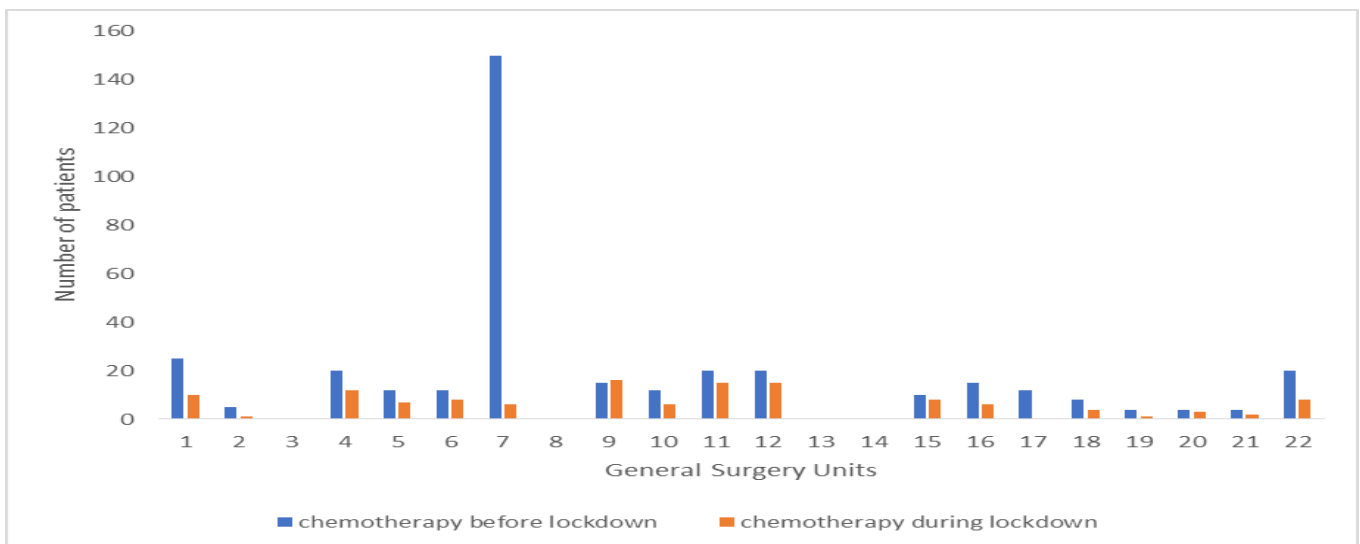


Figure 3. The volume of patients accessing chemotherapy

NB. The volume in each GSU before the lockdown is 100%, the bars represent a fraction of the 100% seen during the lockdown

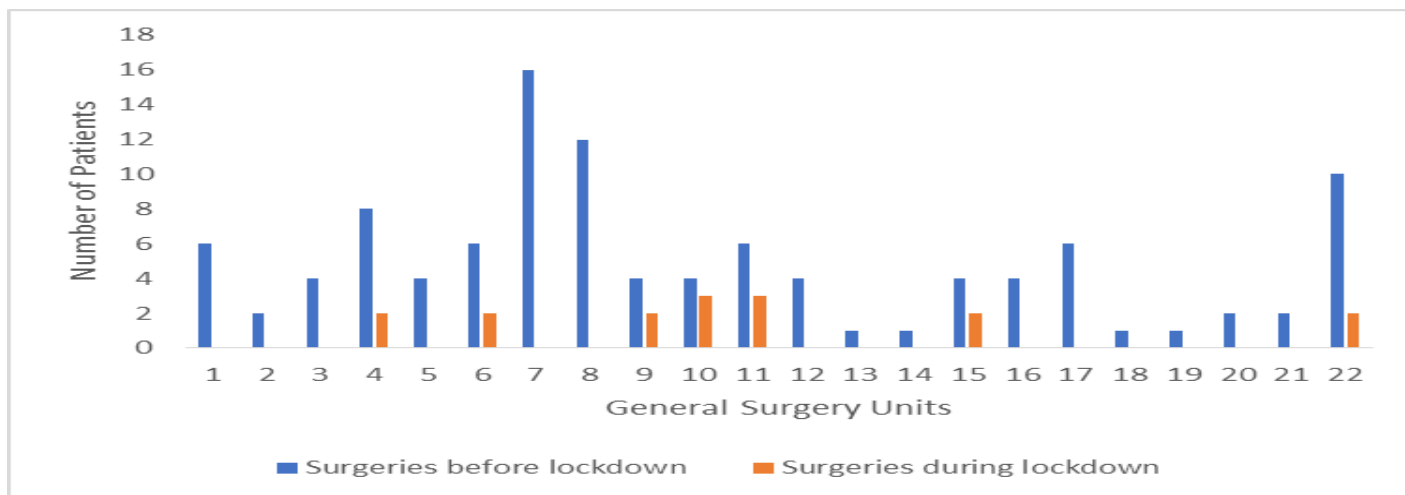


Figure 4. The Volume of Surgeries Performed

NB. The volume in each GSU before the lockdown is 100%, the bars represent a fraction of the 100% seen during the lockdown

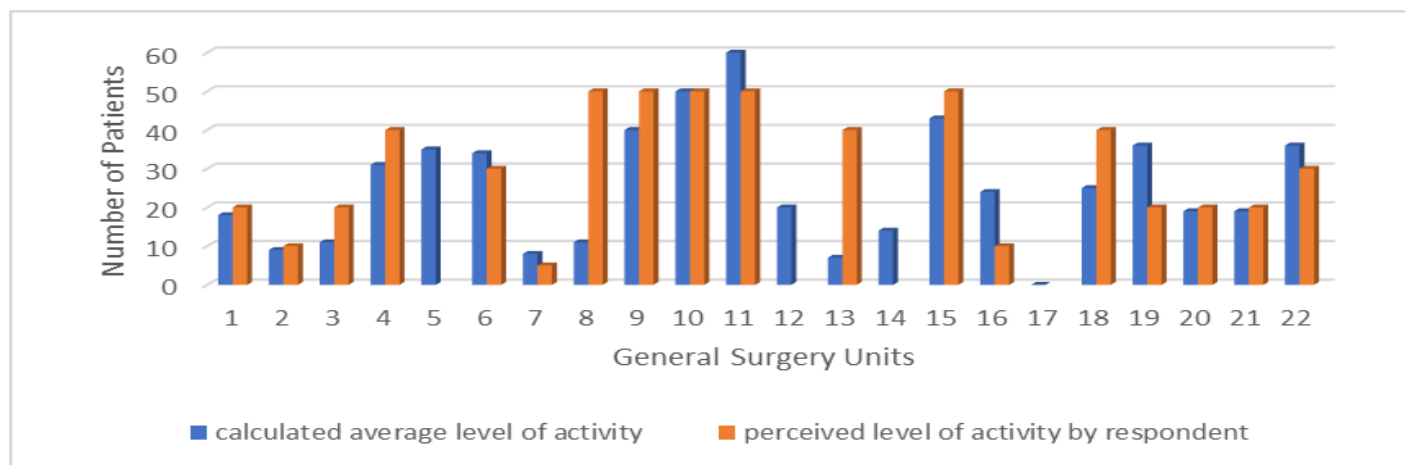


Figure 5. Calculated Level of Activity vs. Perceived Level of Activity

NB. The calculated level of activity compared to the level of activity in each GSU as perceived by the respondents on a scale of 0-100%

by patients and fear of contracting COVID-19 in the hospital reported told to two GSUs by patients GSUs.

3.4 Distribution of activity in Each General Surgery Unit

Compared to the volume before the lockdown, 60% (15) GSUs received $\leq 30\%$ of the usual volume of new cases. Six (27%) received 31-50% of the usual volume of new cases, and only one GSU received $>50\%$ of the usual volume (Figure 1).

The volume of follow-up patients was $\leq 30\%$ in 16 (73%) GSUs, the volume was 31-50% in 4(18%) GSUs and the volume was $>50\%$ in two GSUs (Figure 2). The volume of patients accessing chemotherapy services was between 31-50% in 6 of 19(32%) GSUs, and the volume was $>50\%$ in 8 of 19(45%) GSUs (Figure 3). No patient accessed definitive surgery in 15 (68%) GSUs. (Figure 4). There was similarity (within 10%) between the calculated total level of

activity of the GSU and the level of activity perceived by the respondents in 14(74%) out of 19 GSUs (Figure 5).

4.0 DISCUSSION

At the time of this report in August of 2020, the incidence and direct morbidity and mortality of COVID-19 was relatively low in Africa compared to Europe, America, and Asia. The total confirmed cases in Nigeria were less than 35,000, with less than a thousand deaths [17] compared to close to 5 million cases with approximately 161,000 deaths in the US [18] and more than 300,000 cases with over 46,000 deaths in the UK [18]. Nonetheless, the indirect impact on the economy, social existence, and disruption of medical services was enormous in Nigeria, Africa, as elsewhere [19]. Our study found that the volume of patients accessing the various aspects of breast cancer care in Northcentral and Southwestern Nigeria reduced significantly during the COVID-19 lockdown. On-

ly one-fifth of the usual monthly volume of new cases presented, approximately two-thirds of patients on chemotherapy did not access care, and more than 80% of follow-up services and surgical services were not rendered.

Compared to South Africa where oncology services were being maintained during the pandemic as much as possible and for as long as possible [11], only one of 5 GSUs in our survey discussed protocol(s) for maintaining oncology services during the lockdown, others simply scaled-down or shutdown the oncology facilities without defined strategies. Consequently, five of the GSUs received no new patients during the lockdown, only two received more than 50% of the pre-COVID-19 volume while most received just about a third of the pre-COVID-19 volume.

We expected a reduction in the number of new and old BC cases during the lockdown. Nevertheless, the degree of reduction is worrying especially when we are unsure of an exit plan or when normalcy will resume. Also, because many patients in Nigeria are priority A and B, according to categories in COVID-19 pandemic breast cancer consortium [20] (C19PBCC) report [20], requiring chemotherapy and mastectomy urgently due to florid locoregional grave signs and metastatic disease [21, 22]. These are patients in whom even short delays might be life-threatening.

Only one out of every three patients on chemotherapy accessed care during the lockdown. We were not able to determine the specific indications, but from our clinical experience and the known pattern of presentation, we suspect a large proportion of our patients required neoadjuvant chemotherapy hence even short interruption(s) may result in disease progression and significant change in outcomes. In one of our researches in Northcentral and Southwestern Nigeria, we found that a delay of one month to specialist center was associated with stage migration in 3% of patients and a delay of 3 months was associated with progression in more than half [23]. In that study, the subjects did not include patients with fungation, those with metastasis and those with visceral crises. Moreover, the delay duration did not include the diagnosis and treatment intervals. A study from South [24] Africa suggested that a median delay of more than three months was associated with advanced disease. Different studies from Ghana [25] and Uganda [26] did not find a worsening of presentation after six months delay. Less than 20% of the pre-COVID volume of surgeries were performed in all the centers.

Usually, many definitive breast cancer surgeries in Nigeria are salvage or debridement for cases resistant to

chemotherapy or large tumors. The reduction in breast cancer services at the time of the first COVID-19 lockdown was not due to flooding of the hospital with COVID-19 patients neither was it due to reassignment of oncologists /surgeons to the frontline as the COVID-19 team were mostly public health physicians and internal physicians with most isolation centers being remote from the tertiary hospitals. Rather, the scaling down or shutting down of facilities was due to physical distancing measures, lack of personal protective equipment (PPE) for routine services and to prevent patient-doctor cross-transmission. As we already know, BC tends to bear more aggressive biology among Africans/blacks, the implication of even a short period of delay may be far more severe compared to similar delays among Caucasian women. The immediate implication of delay means more physical and psychological suffering and escalation of the already high cost of treatment [11] and in the long term implication means even poorer outcomes of treatment thus it is important that oncology treatments resume quickly.

Some centers in Spain received all new oncology patients and some follow up cases during the pandemic but surgeries were limited to urgent and emergent cases [27]. Other centers in Asia performed large volumes of surgeries without COVID-19 infecting their personnel as cited by Fuertes *et al.*, [27]. GSUs in Nigeria might adopt or adapt recommendations of the COVID-19 pandemic breast cancer consortium [20] (C19PBCC) and/ or models used in hospitals that have sustained significant services through the pandemic. Handling follow-up surveillance cases in Nigeria might be less problematic in the short run. Based on the report of by Arowolo *et al.*, [22] that 9 months disease-free survival was approximately 70% and one-year mortality was about 45% among BC patients on follow-up surveillance in Southwestern Nigeria, we may safely recommend that patients on follow-up surveillance within 6-12 months of completing mastectomy and adjuvant therapy might be given a long appointment for remote consultation while those on follow-up surveillance beyond 12 months might have more frequent remote consultations and preferably with a checklist of items to detect disease recurrence or progression quickly.

Regarding the interruption of chemotherapy, we might use the indications and the response to chemotherapy as a guides to pacing appointments and in-person visits. In different reports by Samuel *et al.*, [21], Northcentral Nigeria and Arowolo *et al.*, [22], Southwestern Nigeria the rate of complete response was approximately 7% while

the rate of nonresponse was between 48% [22] and 63% [21] for patients on neoadjuvant chemotherapy. This suggests that a large proportion of patients requiring neoadjuvant chemotherapy might be priority A category—life-threatening conditions, unstable or uncomfortable symptoms needing urgent treatment or high stratum of the priority B category—not immediately life-threatening conditions needing treatment as soon as possible according to C19PBCC [20] recommendations. Provided sorting and triaging mechanism can be instituted, and availability of PPE can be guaranteed then we agree that neoadjuvant treatment need not be delayed for any BC patients in Nigeria and similar climes in Africa [11]. Aside from the restrictions imposed by the authorities, reduction in the volume of BC patients accessing care might also be due to altruistic behavior by patients trying not to overburden the health system [5] or having the fear of contracting COVID-19 in the hospital. Judging from our experience on the stigma around breast cancer, the fear of contracting COVID-19 in the hospital might mature into stigmatization and further mistrust of the hospital if allowed to persist.

To prevent this, there must be intense social media messaging to allay patients fears and reiterate that oncologic patients deserve urgent medical care irrespective of the COVID-19 pandemic. Few of the GSUs managed their patients in MDT before the pandemic, only one retained MDT meetings during the lockdown. The benefits of managing BC in MDTs cannot be overstated, as different specialties contribute ideas and help to ensure a holistic approach to treatment with the best outcomes. We strongly recommend that MDTs should not be suspended under any circumstance as they can be sustained via teleconferencing.

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the problem of poor record-keeping and retrieval system which was worsened by the lockdown together with the scaling down of facilities and personnel prevented triangulation. Nonetheless, it was interesting to see that the volume of activity calculated from the recalled figures was remarkably similar to the perceived volume of activity during the lockdown in the majority of GSUs (Table 5). Furthermore, we did not report on the impact of the pandemic on accessing diagnostic facilities (pathologic, radiologic, and laboratory). However, the accessing of such facilities usually depend on the volume of patients seen and referred by the clinicians.

Our research is one of the very few original articles available globally attempting to quantify the impact of -19 pandemic on breast cancer care. The report by Fierres *et al.*, [27], on oncology and non-oncology cases, was unable to determine whether oncology service was significantly impacted. The report by Cancer Research UK [6] outlined the reduction in weekly access to cancer-related services generally. We expect that our research will be useful when developing strategies to contain the impact of COVID-19 on breast cancer care/oncology services in poor resource centers. Our study revealed that the volume of BC patients accessing outpatient services, chemotherapy facility and surgery in Northcentral and Southwestern Nigeria was markedly reduced during the COVID-19 lockdown. Categorizing patients into need strata and initiating remote consultation and MDT services might help to mitigate the impact of lockdowns on breast cancer patient care.

Conflict of Interest

The authors declare that there is no conflict of interest.

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Authors Contribution

OSA collected data, contributed to data analysis tools and performed data analysis; **GAR, SAO** contributed to data analysis tools and analysis of data; **IA, AWY, SO, JGO, AE** performed data collection; **AAS** contributed to data collection and data analysis tools; **KOF** contributed to data collection and analysis of data. All authors contributed to study design, writing and approved the final version of the manuscript

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