

Research Article

COVID-19 and Breast Cancer: A Case Study of a Tertiary Healthcare Facility in Nigeria

Adesokan Joseph Oluwatobi¹ , Felix Olaniyi Sanni^{2, *} , Abiodun Olaiya Paul³ ,
Odunlade Adekola John⁴ , Chidozie Mbada⁵ 

¹Pure Physiotherapy Limited, Doncaster, United Kingdom

²Research and Development, Fescosof Data Solutions, Ota, Nigeria

³Public Health Department, Texila America University, Abuja, Nigeria

⁴Mersey Care NHS Foundation Trust, Bootle, United Kingdom

⁵Manchester Metropolitan University, Manchester, United Kingdom

Abstract

Background: Oncologists have faced major challenges in managing the administration in delivering uninterrupted quality cancer treatment while reducing exposure for patients throughout care during COVID-19. **Objectives:** This study examines how COVID-19 has affected breast cancer screening and treatment in a tertiary healthcare facility in Nigeria. **Methodology:** A qualitative cross-sectional design was employed, using semi-structured interviews with 36 healthcare providers directly involved in breast cancer management during the COVID-19 pandemic, including doctors, laboratory scientists, and technicians from the pathology, oncology, and internal medicine departments at Lagos State University Teaching Hospital (LASUTH). Thematic analysis was conducted using QDA Miner software to interpret recurring patterns/themes in the data. **Result:** Many participants said they were hesitant to work during the pandemic due to fear of infection and limited access to personal protective equipment (PPE). Still, most noted that breast cancer testing continued during this time. The facility was widely seen as having put reasonable safety measures in place. There were mixed views on how the pandemic affected patient visits; some noticed a drop early on, while others saw little change. Similar differences were reported about diagnostic turnaround time. Most agreed that fewer breast samples were tested during the pandemic than before or after. **Conclusion:** The pandemic significantly disrupted breast cancer services at LASUTH, primarily due to staff shortages, patient hesitancy, and limited medical supplies. While safety protocols helped mitigate some risks, the experience highlights the need for strengthened healthcare systems with robust contingency plans to ensure continuity of cancer care during health emergencies.

Keywords

Breast Cancer, COVID-19, Diagnosis, Protective Clothing, Pandemic

*Corresponding author: fescosofanalysis@gmail.com (Felix Olaniyi Sanni)

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1. Introduction

An estimated 20 million new cancer cases were diagnosed worldwide in 2022, and 9.7 million deaths attributed to cancer [1]. Cancer affects both men and women, with approximately one in five individuals developing the disease during their lifetime. Around one in nine men and one in twelve women die as a result of cancer [1]. Additionally, it was estimated that cancer deaths would climb from 7.6 million in 2007 to 11.5 million by 2030 [2]. The number of cancer fatalities annually exceeds the number of deaths from HIV/AIDS, tuberculosis, and malaria. However, if cancer is identified early, it can be prevented, treated, and cured through palliative care [3]. Cancers are classified according to the body part from which they originate. Breast cancer begins in the breast tissue [4]. Breast cancer, like other types of cancer, can penetrate and develop into the tissue around the breast. It can also spread to other body parts, forming additional tumours, a process known as metastasis [5].

Breast cancer is one of the most frequent types of cancer, killing over 800,000 people worldwide each year and is expected to reach approximately 16 million by 2020. Developing and low-income countries are predicted to account for 70% of new instances of breast cancer [6]. This emphasises the need for governments to provide proper healthcare services to prevent breast cancer-related morbidity and mortality. In Nigeria, breast cancer has an age-standardized incidence rate that can reach up to 63 per 100,000 population [7, 8]. It also has the highest cancer-related mortality rate in the country, with an age-standardized death rate of 25.5 per 100,000, followed by cervical cancer at 13.2 per 100,000 [9]. One of the key contributors to the high mortality rate from breast cancer in low- and middle-income countries (LMICs) such as Nigeria is delayed diagnosis.[10] Even though the COVID-19 pandemic has claimed more than three million lives as of April 2021, the massive number of cases has suffocated healthcare resources, affecting the implementation and delivery of routine public health initiatives, including population-based screening programs for breast and colorectal cancers, among others (CRC) [11]. In response to the widespread COVID-19 epidemic, several population-based screening initiatives worldwide have been suspended or terminated on their own accord [12]. The long-term consequences of screening delays and the resulting structural and procedural changes in population-based cancer screening are unknown and warrant investigation. Given the complexity of population-based cancer screening, analysing long-term consequences necessitates the development of a systematic approach for determining whether and to what extent the COVID-19 epidemic has disturbed the provision of population-based cancer screening [13]. Because of safety concerns for patients, providers, and employees, the COVID-19 pandemic resulted in an unprecedented decrease in preventative healthcare services used in the spring of 2020 [14]. Cancer screening services, such as mammography, saw some of the most significant declines

[15-17]. Furthermore, the COVID-19 pandemic offered a unique set of obstacles to doctors when treating women with suspected breast cancer requiring periodic mammography, Imaging, and needle biopsy. Due to the combined effect of lockdown, the requirement for social separation, and limited hospital facilities, regular outpatient breast imaging activity has been significantly decreased in many situations. Therefore, it is essential to identify which women in need of urgent or non-deferrable treatment can safely tolerate a reasonable delay or postpone care until after the pandemic subsides [18, 19]. The pandemic has established a new paradigm in which optimum oncological therapy is prioritised to avoid any possible loss of opportunity and additional protection against the danger of SARS-CoV-2 infection [20, 21]. As a result of the pandemic reaction, regular medical care has been abruptly disrupted, including breast imaging for asymptomatic individuals, diagnostic evaluation for symptomatic patients, and the ongoing management of those with breast cancer [18, 19]. However, if left untreated, early-stage breast cancer can be life-threatening, making timely surgery combined with appropriate perioperative therapies essential for favourable outcomes [21, 22].

During the COVID-19 pandemic, many healthcare institutions, cancer treatment centers, and regulatory bodies developed protocols to ensure the safety of both patients and healthcare providers. [23] As part of these protective measures, medical appointments and treatments, including those related to breast cancer were delayed, altered, or re-scheduled to minimize potential exposure to the virus. [24, 25]. In an effort to control the spread of COVID-19, the Nigerian government, like several others, implemented lockdowns in key states and cities. Major urban centers such as Lagos, Ogun, Rivers, Kano, and the Federal Capital Territory (Abuja) experienced complete lockdowns, which significantly hindered patients' ability to access medical care. [26]

This study examines how COVID-19 has affected breast cancer screening and treatment in a tertiary healthcare facility in Nigeria.

2. Materials and Methods

2.1. Study Design

This study adopted a qualitative cross-sectional research design aimed at exploring healthcare professionals' perspectives on how the COVID-19 pandemic affected breast cancer screening and diagnosis at a tertiary healthcare facility in Nigeria. The cross-sectional nature of the study refers to data collected at a single point in time, while the qualitative approach involved the use of open-ended interview questions to gather in-depth, descriptive insights. This design was suitable for capturing immediate experiences, opinions, and observed changes in clinical practice during the pandemic period. The

study design involved qualitative interviews with doctors, laboratory scientists, and laboratory technicians. The study aimed to explore the patterns and challenges of cancer diagnosis during the COVID-19 pandemic in comparison to the pre-pandemic period.

2.2. Study Settings

The study took place at LASUTH, a prominent tertiary healthcare institution situated in Lagos, Nigeria. As the nation's commercial capital, Lagos hosts a dense network of public and private health facilities that serve a rapidly growing population. Despite its advanced healthcare infrastructure, the city faces significant public health challenges, including overcrowding, unequal access to care, and high disease burden, which place substantial strain on medical resources and service delivery. [27]

2.3. Study Population

The study included healthcare personnel from LASUTH, such as physicians, laboratory scientists, and technicians from the departments of pathology, oncology, and internal medicine. Interviews were carried out to understand the effect of the COVID-19 pandemic on detecting breast cancer from their perspectives. All selected LASUTH healthcare professionals completed the qualitative interviews, with no refusals or dropouts.

2.4. Sampling Techniques

The study employed a non-probability purposive sampling technique, where participants were intentionally selected based on their professional roles and relevance to the study objectives. This method, which relies on the researcher's judgment rather than random selection, is widely used in qualitative research for its flexibility and focus on targeted expertise. Given that the survey focused specifically on professionals within a medical facility, this sampling technique was deemed appropriate.

2.5. Sample Size

The study involved respondents selected from the pathology, oncology, and general medicine departments, including pathologists, medical laboratory scientists and technicians, oncologists, general physicians, and laboratory administrators. Researchers suggested that sample size in the range of thirty is reliable for qualitative study when the population is not highly heterogeneous [28, 29].

2.6. Data Collection

The study used qualitative interviews to collect information from respondents from LASUTH. The questionnaires were administered to only professionals in the teaching hospital as they could appropriately answer the questions. Participants

were approached one-on-one by the research team to ensure personalized engagement and informed consent, additionally each qualitative interview lasted approximately 15 minutes.

2.7. Inclusion and Exclusion Criteria

This study included pathologists, laboratory technicians, doctors, and scientists employed at LASUTH. Individuals not involved in medical practice, including non-medical personnel and support staff, were excluded from participation.

2.8. Data Analysis

All interview transcripts were imported into QDA Miner, a qualitative data analysis software. Thematic analysis was used to identify recurring patterns and themes within the data. Audio recordings were transcribed verbatim, and transcripts were coded manually by two independent researchers. Initial codes were developed inductively and then collated into potential themes through a comparative and iterative process. Discrepancies in coding were resolved through consensus to enhance credibility and reliability. Themes were then interpreted in the context of the study objectives to provide a rich, detailed account of how the pandemic influenced cancer diagnostic services within the healthcare facility. The software facilitated systematic organization, coding, retrieval, and visualization of emerging themes to ensure the credibility and transparency of findings.

2.9. Ethical Considerations

Prior to the commencement of the study, approval was obtained from Lagos State University Teaching Hospital, along with relevant administrative and health authorities in the study area. Before participation, the research team ensured that all respondents provided informed and voluntary consent. Ethical approval for the study was granted under the reference number LREC/06/10/1913. Before participation, all respondents were confirmed by the research team to have given informed and voluntary consent. Informed consent was obtained using signed forms, and participants were informed that interviews would be recorded and stored securely. Experienced data collectors, familiar with the LASUTH environment, conducted the study and oversaw the data collection process. In addition, all supervisors and note-takers involved in the study were trained in research ethics and informed consent procedures.

3. Results

3.1. Sociodemographic Profile of the Study Respondents

Table 1 presents the sociodemographic characteristics of the 36 respondents. A majority were male (63.9%), while females accounted for 36.1%. Most respondents (47.2%) were

aged 20-30, followed by 36.1% aged 31-40, and 16.7% aged 41-50. Regarding marital status, 66.7% were married and 33.3% were single. Christians made up 88.9% of the sample, while 11.1% were Muslim. In terms of occupation, 16.7% of participants were general medicine practitioners, 8.3% were health administrators, 33.3% were medical laboratory scientists, and 11.1% were nurses, 5.6% oncologists, 11.1% pathologists, and 13.9% physiotherapists. In terms of work experience, 58.3% had 1-5 years, 33.3% had 6-10 years, and 8.3% had over 10 years of experience.

Table 1. Sociodemographic profile of the study respondents.

Variable	Frequency (%)
Gender	
Female	13 (36.1)
Male	23 (63.9)
Age	
20 -30 years	17 (47.2)
31-40 years	13 (36.1)
41 - 50 years	6 (16.7)
Marital status	
Married	24 (66.7)
Single	12 (33.3)
Religion	

Variable	Frequency (%)
Christianity	32 (88.9)
Islam	4 (11.1)
Field of practice	
General medicine	6 (16.7)
Health Administration	3 (8.3)
Medical laboratory science	12 (33.3)
Nursing	4 (11.1)
Oncology	2 (5.6)
Pathology	4 (11.1)
Physiotherapy	5 (13.9)
Years of experience	
1 - 5 years	21 (58.3)
6 - 10 years	12 (33.3)
10 years and above	3 (8.3)

Thematic Summary of Key Qualitative Findings

To better visualize the qualitative data, Table 2 below presents major themes that emerged from participant responses, along with representative quotes. This enhances understanding of the nuanced perspectives captured during interviews and aligns with the best practices in qualitative research reporting.

Table 2. Thematic Summary of Key Qualitative Findings.

Theme	Sub-Themes	Representative Quotes
Willingness to Work	Fear of infection, PPE availability	“Fear of returning home to meet family after working with a known or unknown COVID-19 patient.” “I go to work only when PPE is available.”
Safety Measures	Hygiene protocols, vaccination, screening	“Face masks were mandatory. You couldn’t enter without sanitising your hands.” “Education and administration of the COVID-19 vaccine.”
Patient Turnout	Decline in visits, recovery over time	“Initially, patients were unwilling to come to the hospital due to the fear of being infected with COVID-19.” “It did affect the number of patients during the emergence of the pandemic, but presently there is no issue.”
Diagnostic and Treatment Disruption	Fewer appointments, drug shortages	“Some services were scaled down, and oncology staff were redeployed to COVID-19 response.” “There was a supply shortage for essential cancer drugs for several months.”
Testing and Sample Collection	Reduced testing, movement challenges	“During the lockdown, the number of tests done weekly greatly decreased.” “Minimal movements made sample collection difficult.”
Patient Feedback	Mixed perceptions, fear-driven avoidance	“Feedback was good, but patients were scared of contracting the virus.” “Patients preferred the era of coming to the hospital... unlike during the pandemic when diagnoses were late.”

3.2. Impact of COVID-19 on Willingness to Work and Weekly Work Schedule

Participants reported mixed experiences regarding their willingness to work and weekly schedules during the pandemic. Some stated their routines remained unchanged. While many were committed to their duties, some expressed anxiety due to potential exposure risks and concerns for their families. Respondents stated:

"It hasn't affected my willingness to go to work,"

"I am willing to go to work and not reluctant due to the infection control policy."

Others reported reduced motivation and fewer workdays, citing fear of infection and concern for family safety.

"Fear of returning home to meet family after working with a known or unknown COVID-19 patient."

The availability of PPE was also a key factor.

"I go to work only when PPE is available," and another reported,

"A reduced roster was made to reduce the number of staff coming to work in a day."

In summary, while some healthcare workers continued as normal, others experienced reduced willingness and work frequency, influenced largely by infection risk and PPE access.

3.3. Perceived Safety Measures in the Facility During the COVID-19 Pandemic

Most participants agreed that their facility implemented satisfactory safety measures during the pandemic. Common strategies included PPE use, hand hygiene, social distancing, and staff education.

"Face masks were mandatory. You couldn't enter without sanitising your hands."

"Education and administration of the COVID-19 vaccine."

Routine inspections were also reported to enforce compliance.

"The measures include inspecting staff and patients to ensure they adhere to safety practices."

"Patients were also screened at the gate. We tried to separate those with symptoms early."

Overall, most participants viewed the facility's response as adequate, particularly in enforcing hygiene, reducing overcrowding, and maintaining protective protocols.

3.4. Changes in Patient Visit Frequency During the COVID-19 Pandemic

There was a sharp decline in the number of patients visiting the outpatient clinic for breast cancer screening and treatment, particularly during lockdown periods. Both elective and routine care services were scaled down.

Patient turnout is low," while others described the effect as

"negative" or "a whole lot."

This reduction was most evident in outpatient clinics, where one participant stated,

"It results in downsizing the number of patients we book, especially in our outpatient clinics."

Several respondents attributed the drop to fear of infection.

"Initially, patients were unwilling to come to the hospital due to the fear of being infected with COVID-19,"

To manage the situation, facilities reduced patient volume intentionally, as one noted:

"It has reduced drastically, by reducing the number of patients in the wards."

Not all participants saw major disruption.

"It did affect the number of patients during the emergence of the pandemic, but presently there is no issue,"

In summary, while early stages of the pandemic saw significant reductions in patient visits due to fear and facility adjustments, some recovery was observed over time.

3.5. Impact of COVID-19 on Breast Cancer Diagnosis and Management

The COVID-19 pandemic had a largely negative impact on breast cancer diagnosis and management within the facility. Most respondents reported reduced patient attendance and fewer diagnosed and treated cases during the period.

Reduced Patient Turnout and Delayed Diagnosis

Many attributed the decline to fear of infection. Most respondents said:

"Only emergency cases were seen and treated,"

"Most patients stayed away and only came when the disease had already spread."

Disruption in Clinical Services

Participants noted that

"Social distancing protocols led to fewer appointments and lower patient volumes".

"Some services were scaled down, and oncology staff were redeployed to COVID-19 response"

"Diagnostic processes were also affected by limited personnel."

Resources and Logistical Challenges

Respondents cited shortages of anticancer drugs and delays in supply delivery due to lockdowns and border closures and insufficient PPE.

"We had to limit care because of inadequate protective gear."

"There was a supply shortage for essential cancer drugs for several months."

"Even those who started treatment defaulted midway due to fear or financial issues."

Mixed Perceptions of Impact

While most participants highlighted challenges, a few believed the impact was minimal or led to more organized care.

"Patients became more aware and came early for screen-

ing when safety was assured.”

Gradual Recoverys

Several respondents observed that services improved over time. As restrictions eased and awareness grew, patient flow began to return to normal. One respondent commented,

“Everything is coming back to normal.”

3.6. Impact of COVID-19 on Weekly Diagnostic Testing

Participants reported that the COVID-19 pandemic affected the number of diagnostic tests conducted weekly, with most describing a reduction during the peak period. Many attributed the decline to reduced patient attendance, fear of infection, and measures such as physical distancing.

“During the lockdown, the number of tests done weekly greatly decreased, but everything returned to normal after the lockdown.”

A few respondents observed minimal disruption, reporting that

“testing volumes remained stable or recovered quickly.”

Others stated that testing began to rise again by 2021, nearing pre-pandemic levels. While some viewed the impact as insignificant, the overall trend indicated a temporary but notable decline in weekly testing during the height of the pandemic.

3.7. Impact of COVID-19 on Timing of Sample Collection

Respondents provided mixed views on how the pandemic affected sample collection timing. Some reported no change,

“It is still the same as pre-COVID.”

Others observed a negative impact, citing reduced collection times and delays. A few described partial or minimal effects, while some were uncertain.

Movement restrictions during the pandemic also posed challenges, as one participant noted,

“Minimal movements made sample collection difficult.”

Conversely, some respondents highlighted improvements, stating that the process became more organized, with scheduled appointments enhancing efficiency.

“Sample collection is more organised as schedules are given to patients.”

Overall, the timing of sample collection was affected in various ways (ranging from no impact to delays or improved organization) depending on individual experiences and facility adaptations.

3.8. Impact of COVID-19 on Turnaround Time for Breast Cancer Diagnosis

Respondents expressed mixed views on the pandemic’s impact on laboratory turnaround time for breast cancer diagnosis. Some indicated no significant change, with com-

ments such as

“It has no impact” and “Not affected.”

Others reported delays, especially during the peak of the pandemic, due to prioritization of emergency cases and reduced patient attendance. As one respondent noted,

“It has negatively affected the hospital as emergency cases were of priority.”

A few participants observed only mild effects, while some reported initial slowdowns that later improved. One stated,

“Turnaround time is now better than during the lockdown.”

Others noted that fear of infection led to fewer patient visits, which indirectly shortened turnaround times due to lower demand.

In summary, the pandemic’s effect on turnaround time for breast cancer diagnosis varied. While some experienced delays, others saw no change or even faster processing due to reduced patient volume.

3.9. Feedback from Patients During the COVID-19 Pandemic

Respondents reported mixed experiences regarding patient feedback during the pandemic. While some described it as satisfactory, others viewed it as inadequate or reduced. A few rated the feedback positively, with comments such as

“feedback was okay” and “it was impressive.”

“Feedback was good, but patients were scared of contracting the virus.”

Fear of infection emerged as a common reason for reduced patient engagement. Several respondents observed that patients avoided hospital visits, leading to delays in diagnosis and decreased opportunities for communication. As one stated,

“Patients preferred the era of coming to the hospital... unlike during the pandemic when diagnoses were late because patients stayed away.”

Others attributed the decline in feedback to limited clinician availability and lower hospital attendance. Terms such as *“less feedback provided”* and *“inadequate feedback”* were used to describe the situation.

Overall, while some respondents viewed the feedback as acceptable, the consensus reflected a decrease in patient engagement and communication compared to pre-pandemic levels.

4. Discussion

The main objective of the study was to examine the impact of COVID-19 on cancer diagnosis. Disruptions to cancer services during the pandemic have been particularly pronounced in low-resource settings, including many African countries and other LMICs [22-25]. Meeting the needs of both patients and staff has become especially difficult for medical oncologists during the COVID-19 pandemic, as early evidence suggests that cancer patients face a significantly in-

creased risk of COVID-19-related complications. [26]. Most participants in this study were males aged 20 to 30, all of whom had completed tertiary education. Most were married with children, practiced general medicine, and had one to five years of professional experience. These selection characteristics may partly explain variations in socioeconomic status indicators.

How the pandemic affected their willingness to go to work and the number of days they worked weekly

According to the findings of this study, while some people believed COVID-19 affected their motivation to go to work and their weekly work hours, this was not the case for most participants. This implies that although some claimed to be resistant to the pandemic, others did not. They were, according to many around them. The results of this survey are consistent with the findings of a study conducted by Mbaba et al. [27] on respondents' perceptions of the dangers of working during the covid-19 pandemic, which revealed that the vast majority of respondents believed they would be at risk of infection if they went to work during the epidemic. Similarly, Ogolodom et al. [28] investigated healthcare personnel's knowledge of and reactions to the covid-19 outbreak. They discovered that HCWs' willingness to work during the COVID -19 pandemic is highly impacted by their perceptions of the hazards.

Having access to PPE also enhanced their incentive to show up for work. These findings are congruent with those of Ibirongbe et al. [29], who discovered that defective equipment was still a major impediment to effectively controlling the COVID-19 outbreak. According to their remarks, a favourable self-risk perception among health workers may impact their confidence to operate in high-risk environments. In a similar line, Okedirian et al. [30] discovered that Health Care Workers (HCWs) participating in the COVID-19 response were anxious about contracting the virus due to a shortage of PPE. As a result, they suggested that healthcare institutions sufficiently supply PPE, which is critical in ensuring a safe working environment for HCWs caring for COVID-19 patients [30].

Safety status in the facility during the COVID-19 pandemic

The participants in this study had favourable perceptions of the facility's safety features, according to the findings of this study. Countermeasures included face masks, hand sanitisers, social seclusion, and immunisations. In light of the COVID-19 pandemic, research participants agreed that their institution had taken enough safety procedures. The findings of this study confirm those of Olivia et al. [31] report on medical staff satisfaction with the degree of safety in their profession. The great majority of people polled were happy with the facility's reaction to COVID-19, according to their results. They called this a critical discovery, stating that well-informed medical personnel are more likely to provide exceptional patient care [32].

Chaka et al. [33] discovered that just 34.9% of healthcare staff were satisfied with the institution's safety status; there-

fore, their findings contradict that. Participants' perceptions of the safety of their facilities differed, they claimed, because national and international guidelines for the use of PPE during a pandemic are subject to frequent changes, and there is a lack of clarity in the information available to participants [33]. Worker safety is critical because high-quality patient care depends on the health and well-being of those who provide it [34], Tegegn et al. [35] discovered that the availability of personal protective equipment, water and hand washing facilities, cleaning and disinfection supplies, and health and safety training favoured healthcare personnel's job safety.

How the COVID-19 pandemic affected the number of patients' weekly visits compared to pre-COVID-19

COVID-19, according to the participants, had a considerable influence on patients' frequent hospital visits compared to the period before the pandemic. This might be due to a mix of reasons, including a decrease in the number of patients seen and the fact that some individuals are scared to visit the clinic for fear of contracting the virus. The findings of this study are congruent with those of Hangartner et al. [36] study's on the impact of COVID-19 on outpatient consultation. They said that throughout the first and second waves of the pandemic, the average number of patients hospitalised each week decreased. According to their findings, elective hospital admissions per week were 32% fewer during the outbreak. Hangartner et al [36] hypothesised that the drop in the number of patients visiting the facility each week was due to patients' unwillingness to be hospitalised during this period. This is congruent with the findings of Birkmeyer & Birkmeyer [37], who hypothesised that patients' reluctance to visit the hospital once a week was related to a fear of getting the disease due to hearing about it in the media or obtaining stay-at-home government orders. According to Nnaji & Moodley [38], telemedicine outpatient consultation methods are increasingly being researched to ensure the safety of patients and oncologists during outpatient cancer consultations [24, 39].

How COVID-19 affected the diagnosis and management of Breast cancer in the facility

The findings of this study revealed that the number of instances of breast cancer identified and treated in patients has reduced since the outbreak began. Patients are no longer routinely scheduled for care at the facility; only emergencies are prioritised. According to study responses, patient indifference in seeking breast cancer diagnosis and treatment was connected to fears of catching the virus. As a result, patients with breast cancer may have delayed longer than required to initiate treatment, which may have harmed their health. Some participants agreed that the pandemic influenced breast cancer screening and management at the institution, while others claimed the impact was limited. Participants in this study noted that patients were unwilling to attend the institution for frequent evaluation, treatment, or follow-up because of the risk of developing COVID-19, which is consistent with the findings of Aden et al [5]. This analysis also identified ways COVID-19 influenced medical institutions' ability to identify

and treat breast cancer. Redeployment of cancer healthcare personnel to the frontlines of COVID-19, Anticancer drugs and other critical treatment supplies are in low supply due to movement restrictions and closed national borders. Because cancer patients are more likely to get COVID-19, develop severe disease, and die due to their sickness, the need for oncology therapies has decreased. However, Vohra et al. [40] discovered that patients with breast cancer were more likely than others to be impacted by the pandemic. Breast cancer patients have a compromised immune system due to their disease and anti-tumour medications, rendering them more vulnerable to this fatal virus than the general population, according to the researchers [41]. During the study period, ten out of 206 breast cancer cases (4.9% of those tested) tested positive for COVID-19; this rate was nearly double that of other elective surgeries outside of cancer (2.7% (192/7087), confirming that cancer patients are at significantly higher risk than the general population [40].

How COVID-19 affected the number of tests done weekly, turnaround time and timing of sample collection of a breast cancer diagnosis.

The findings demonstrated that participants' perspectives differed on how the outbreak affected the weekly exams compared to before. There was disagreement over how much of an influence it had; the reduced number of tests might be attributable to individuals being frightened to attend the facility or choosing to deflect focus away from the pandemic. Furthermore, the current study's findings revealed that participants' opinions of the influence of COVID-19 on sample collection scheduling varied greatly. Participants were divided on whether the timing of sample collection made a difference. At the same time, they all agreed that it was difficult to do so during the outbreak due to constraints on people's freedom of movement.

Teglia et al. [42] found a significant effect of COVID-19 on the frequency of weekly breast cancer screenings in their comprehensive examination of the worldwide link of covid-19 pandemic parameters with cancer screening. The researchers discovered a significant association between the number of tests performed for the three cancer types (46.7%, 44.9%, and 51.8% for breast, colorectal, and cervical cancer screening, respectively) and each geographical location during the early phases of the COVID-19 outbreak. Stay-at-home orders, people's fear of the virus, individuals avoiding nonurgent medical treatment and care, limited access to in-person medical exams, and hospital department reorganisation were highlighted as important elements that may have caused this decline [42, 43]. Furthermore, Duarte et al. [44] investigation on the involvement of COVID-19 in cervical and breast cancer confirms similar findings. They detected a considerable decline in the frequency of mammograms, pap smears, and colonisation since the COVID-19 outbreak began. Tsai et al. [45] discovered that fewer women in Taiwan had breast cancer screenings throughout the outbreak. A variety of variables have been attributed to the

decrease in hospital visits. The number of people accessing hospitals decreased for two reasons: first, due to hospital visit limitations [46, 47], and second, patients at high risk of developing COVID-19 were triaged to outside visiting areas. Second, many people avoided hospitalisation during the pandemic for fear of contracting the illness. Third, hospitals were less enthusiastic about cancer screening after the epidemic than previously [45].

Feedback from patients during the COVID-19 pandemic

The responses suggested that patient feedback was of varying quality during pandemics. Some respondents thought it was good, while others did not. Fear of contracting the sickness may be to blame for the lacklustre reaction. Heanoy et al [48], discovered results consistent with this investigation. Participants' responses and feedback focused on a variety of topics, including how they felt about the pandemic itself, how concerned they were about the disease and how it might affect their daily lives, how they handled their relationships with others, what their plans were, whether or not they had contracted the virus, and how much money they had lost. They discovered that the seven overarching themes obtained from participant responses helped them understand the problems that COVID patients tend to have. This might be because the pandemic was still causing complications in their daily lives. Heanoy et al. [48] discovered similar results from their open-ended questions: most people were distressed because the pandemic brought a lot of uncertainty about the future, and because of the unknown nature and psychological demand to adjust to the novel situation, people felt fear, helplessness, and so on throughout the Pandemic [4, 49-52].

5. Limitation

Since this study specifically examined the impact of COVID-19 on breast cancer diagnosis within a resource-limited setting, its findings may reflect the unique challenges faced in such contexts. It is conceivable that the findings are not representative of the Nigerian breast cancer community. As a result, future research should focus not just on bigger areas but also on the varying impacts of COVID-19 on breast cancer patients, particularly those with a genetic predisposition to mental health disorders or severe depression.

6. Conclusions

This study assessed how COVID-19 affected breast cancer screening and diagnosis in a resource-constrained tertiary facility in Nigeria. The pandemic led to significant disruptions in cancer care delivery, driven by reduced staff availability, patient fear of infection, and limited PPE and medical supplies. The number of patient visits and diagnostic procedures decreased notably, and both healthcare workers and patients

experienced heightened stress and uncertainty. Despite the implementation of safety protocols, breast cancer services were deprioritized during the peak of the pandemic, leading to delays in diagnosis and treatment. However, a gradual recovery was observed as restrictions eased and awareness increased. To ensure resilience in future public health crises, healthcare systems in low-resource settings must be equipped with adequate funding, trained personnel, essential supplies, and interprofessional collaboration frameworks. Strengthening diagnostic infrastructure and supporting frontline workers will be critical to minimizing service disruptions and safeguarding the timely diagnosis and management of life-threatening conditions such as breast cancer.

Abbreviations

COVID-19	Coronavirus Disease 2019
LASUTH	Lagos State University Teaching Hospital
LMICs	Low- and Middle-Income Countries
PPE	Personal Protective Equipment
CRC	Colorectal Cancer
QDA	Qualitative Data Analysis
HCWs	Healthcare Workers

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Author Contributions

Adesokan Joseph Oluwatobi: Conceptualization, Funding acquisition, Project administration, Resources, Supervision

Olaniyi Felix Sanni: Data curation, Formal Analysis, Methodology, Resources, Software, Supervision, Writing – original draft, Writing – review & editing

Abiodun Olaiya Paul: Funding acquisition, Investigation, Methodology, Resources, Writing – review & editing

Odunlade Adekola John: Investigation, Resources, Validation, Writing – original draft

Chidozie Mbada: Funding acquisition, Investigation, Resources, Visualization

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Data Availability Statement

The data supporting the outcome of this research work was obtained from the Lagos State University Teaching Hospital,

along with relevant administrative and health authorities in the study area. Approval for the study was granted under the reference number LREC/06/10/1913.

Conflicts of Interest

The authors declare no conflicts of interest.

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