Medical Science

pISSN 2321–7359; eISSN 2321–7367

Impact of COVID 19 pandemic on breast cancer management and reconstruction in Saudi Arabia

Anas Abdulqader Fathuldeen[1], **Muhannad Saud Alshammari**[2*], **Rema Ahmed Almarshedi**[3], **Reem Saud Alabedah**[3], **Raghad Ali Alshareef**[3]

To Cite:
Fathuldeen AA, Alshammari MS, Almarshedi RA, Alabedah RS, Alshareef RA. Impact of COVID 19 pandemic on breast cancer management and reconstruction in Saudi Arabia. Medical Science, 2022, 26, ms135e2064.
doi: https://doi.org/10.54905/disssi/v26i122/ms135e2064

Authors' Affiliation:
[1]department of plastic surgery, College of Medicine, University of Hail, Hail, Saudi Arabia
[2]Plastic surgery and burn department, King Salman Specialist Hospital, Hail, Saudi Arabia
[3]college of medicine, university of Hail, Hail, Saudi Arabia

[*]**Corresponding author**
Department of plastic surgery and burn unit at King Salman Specialist Hospital,
Hail, Saudi Arabia
Email: Muhannad.alshammari@hotmail.com

Peer-Review History
Received: 16 January 2022
Reviewed & Revised: 18/January/2022 to 09/April/2022
Accepted: 11 April 2022
Published: 18 April 2022

Peer-review Method
External peer-review was done through double-blind method.

URL: https://www.discoveryjournals.org/medicalscience

ABSTRACT

Background: COVID-19 pandemic was a real challenge to healthcare systems worldwide, particularly in emerging nations; this study aims to provide a vision of the impact of COVID-19 pandemic on breast cancer (BC) management and reconstruction in Saudi Arabia. *Methods: A* cross-sectional study was conducted across health care practitioners; we accumulated data by an online questionnaire from 58 physicians in different specialties about the effect of COVID-19 pandemic on their practice from March 2021 to May 2021. *Results*: About 45% of participants reduced medical practice during Covid-19 pandemic by 10 – 30 %, and 41% reduced medical practice by 31-50%. About half of the participants (48%) treated less than five breast cancer patients infected by Covid-19, and about 36% of patients developed Covid-19 infection under chemotherapy. *Conclusion:* there was a considerable reduction in providing health services to patients affected by breast cancer, yet Saudi Arabia managed to get out of this pandemic with the least damage possible due to governmental efforts. In capable countries and organizations, health authorities should share their expertise and experience to prevent damage to people already suffering from a devastating disease like breast cancer.

Keywords: COVID-19; breast reconstruction; breast cancer; Saudi Arabia

1. INTRODUCTION

In December 2019, several cases of unidentified lung illness were reported in China. The virus was recognized as a new one after these new cases were submitted to the World Health Organization (WHO) headquarters in China. SARS-CoV-2 is thought to be the cause of these cases (Takafumi, 2021). The outbreak was declared a global public health emergency in late January 2020 (Cucinotta and Vanelli, 2020). On February 11, 2020, the WHO formally named the disease (COVID-19). On March 2, 2020, the Saudi Ministry of Health announced the first case of coronavirus infection in a Saudi returning from Iran via Bahrain.

The MOH transferred the infection to the control team as a precaution, who conducted medical and laboratory testing that proved the citizen's viral infection. According to the Saudi Ministry of Health, the current estimate of patients with Covid-19 on March 27, 2021 is 387,794 instances, with 635 serious cases (Alharbi et al., 2021). As a result of the tremendous burden on health-care systems, the care of breast cancer patients must be adjusted. Because there is no clear paradigm of management in such extreme circumstances, (Dietz et al., 2020) formulated an Expert Opinion from Breast Cancer experts to aid BC facilities in navigating this pandemic and reducing patient burden.

Many countries, like Saudi Arabia, have made the painful decision to postpone all elective surgical procedures in order to focus all available staff and resources on COVID-19 patients and the ensuing manpower crisis. These decisions impacted patients with various illnesses by reducing available facilities, people, hospital beds, and operating room capacity.

2. METHODS AND MATERIALS

The present study utilizes information from a questionnaire distributed online, and responses were gathered from 58 participants working in different specialties and hospitals from the period of March 2021 to May 2021.

Data Analysis

We used descriptive statistics such as frequencies and percentages to demonstrate qualitative data and analytic statistics such as the chi-square test to find any statistical association between independent and dependent variables.

3. RESULTS

We gathered information by an online questionnaire from 58 physicians in different specialties and cities about the effect of COVID-19 on their practice. About (57%) of participants were from governmental hospitals, while the rest were from private hospitals (26%) or university hospitals (17%), as indicated in Figure 1.

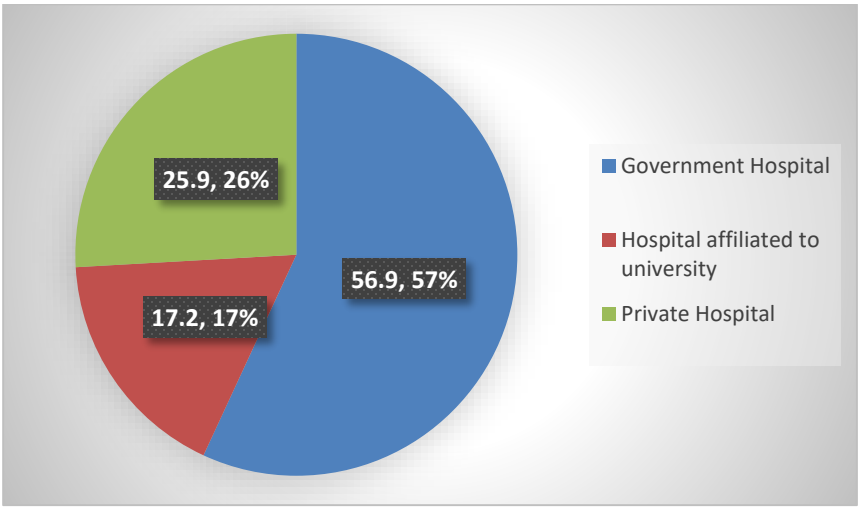

Figure 1 Distribution of participants according to the current facility

Of the 58 physicians, about 38% were plastic surgeons, 36% were general surgeons, 22% were medical oncologists, 2% were gynaecologists, and 2% were radiologists (Figure 2). As it appears in Figure 3, most centers had 100 to 200 cases of breast cancer annually, 29% had 201 to 300 cases, 22% had less than 100 cases, and 12% had 301 to 400 cases. In comparison, only around 2% of centers had more than 400 cases annually.

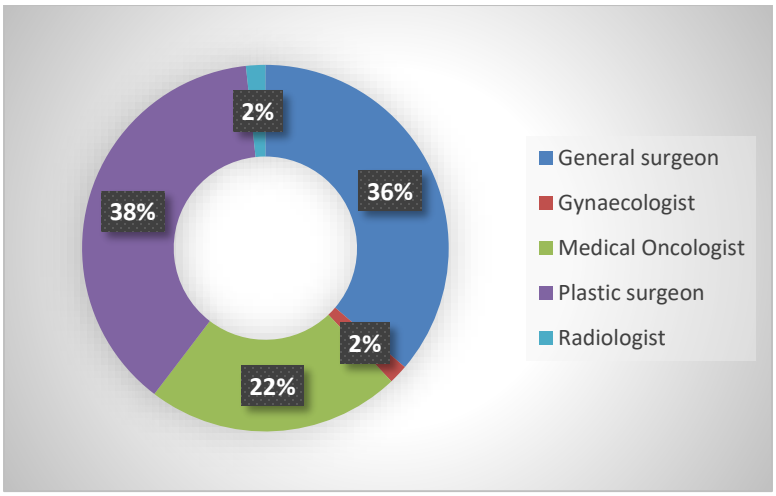

Figure 2 Distribution of participants according to specialty

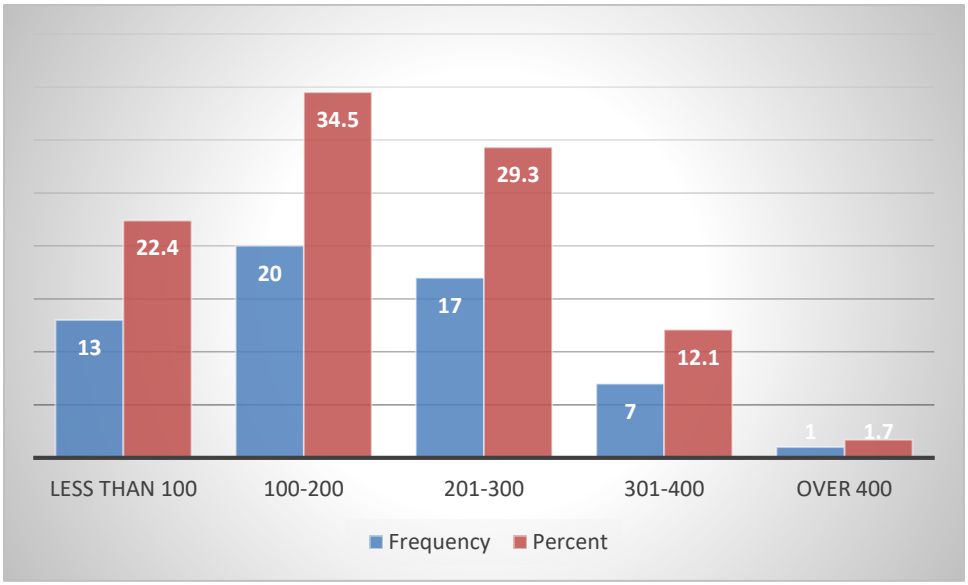

Figure 3 Distribution of participants according to how many cases of primary breast cancer does your center treat per year?

Due to hospitals' regulations and restrictions, about 45% of participants reduced medical practice during Covid-19 pandemic by 10-30 %, and 41% reduced medical practice during Covid-19 pandemic by 31-50% (Figure 4).

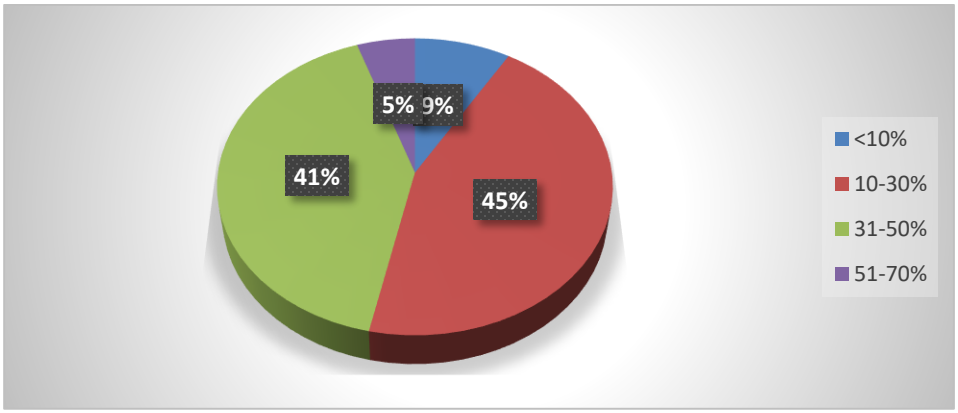

Figure 4 Distribution of participants according to quantifying the reduction of your medical practice during the Covid-19 pandemic?

About 72% of participants mentioned that their activity did not relocate to another institution; 29% said that their patients routinely undergo Covid-19 polymerase chain reaction (PCR)test before surgery, 12% mentioned that their patients routinely undergo Covid-19 PCR-test before chemotherapy, near to half of the participants (48%) treated less than five breast cancer patients infected by Covid-19. About 36% of patients who suffering breast cancer; developed Covid-19 infection under chemotherapy or within the two weeks following the last chemotherapy administration.

Only 16% developed Covid-19 infection in the two weeks following surgery; Regarding participants' opinion for breast cancer treatments that are adding a significant risk of COVID-19 infection, 64% mentioned that all treatments had the same risk, 22% mentioned systemic therapy, and 12% mentioned surgery; About 85% of participants mentioned that Covid-19 pandemic has an influence on the threshold to neoadjuvant chemotherapy; 88% expected to treat less breast cancer cases with neoadjuvant chemotherapy during Covid-19 pandemic, as compared to pre-pandemic; 79% of participants change in some cases the chemotherapy regimens due to Covid-19 pandemic while only 21% not changed (Table 1).

Table 1 Covid-19 effect on breast cancer management and reconstructive surgeries

question	Answers	Fr.	%
Did any of your patients develop Covid-19 infection in the two weeks following surgery?	No	49	84.5
	Yes	9	15.5
	Total	58	100.0
Which of the following breast cancer treatments is adding a significant risk of COVID-19 infection to patients, in your opinion?	Surgery	7	12.1
	Systemic therapy	13	22.4
	Radiation therapy	1	1.7
	Same risk	37	63.8
	Total	58	100.0
Does the Covid-19 pandemic have an influence on the threshold to neoadjuvant chemotherapy?	No	9	15.5
	Yes	49	84.5
	Total	58	100.0
Do you expect to treat fewer breast cancer patients with neoadjuvant chemotherapy during the Covid-19 pandemic compared to pre-pandemic?	No	7	12.1
	Yes	51	87.9
	Total	58	100.0
Did you change the chemotherapy regimens due to the Covid-19 pandemic in some cases?	Yes, the use of a drug	5	8.6
	Yes, the number of cycles	9	15.5
	Yes, the sequence of different drugs	8	13.8
	Yes, switching as	10	17.2

	much as possible to oral drugs		
	Yes, prolonging intervals between the cycles	14	24.1
	No	12	20.7
	Total	58	100.0

About 78% of participants mentioned that their institution delayed following a mastectomy, breast reconstruction is performed., the leading causes of delaying included decreased theatre access (74%) and patient preference (26%); 90% of participants were expected that patient choice of breast reconstruction will be affected by Covid-19 pandemic; When it comes to the period between diagnosis and therapy, in the pre-Covid-19 era, 53% mentioned 2-4 week, 33% mentioned < 2 weeks and only 14% mentioned > 4 weeks. There was no statistical association between the current facility and delayed breast reconstruction following mastectomy, p-value 0.5.

4. DISCUSSION

During Covid-19, Saudi Arabia's healthcare system was subjected to extensive protection measures. The covid-19 epidemic impacted the health system, and as a result, it had a significant impact on individuals' health status progression and regression. To combat the pandemic, surgical organizations propose deferring and postponing needless surgeries. This study was carried out to assess the surgical outcomes during this pandemic. This current study gathered replies from a variety of disciplines, including plastic surgery, general surgery; gynecology, radiology, and medical oncology, to see how the covid-19 effect affected breast cancer management and reconstructive surgery. The majority of responders work in government and private hospitals, where they serve a large number of breast cancer patients.

Our result revealed that most participants minimized medical practice during the Covid-19 epidemic. According to another survey Sheng et al., (2020), there was a delay in scheduling procedures for women diagnosed with breast cancer because of institutional strategies to avoid surgeries in COVID-19 and conserve resources. Another survey Sheng et al., (2020) discovered that due to institutional policies to avoid procedures in COVID-19 and conserve resources, there was a delay in scheduling surgery for women diagnosed with breast cancer.

COVID-19 infection screening tests are available at health care facilities before surgery or chemotherapy to help prevent infection. A total of 29% of PCR tests were performed before to surgery, and 12% of PCR tests were performed prior to chemotherapy. Another study Weichman et al., (2021) required two consecutive negative screening tests prior to admission and surgery. Furthermore, the participants revealed that 36 percent of breast cancer cases were infected with Covid-19 while in the hospital, either during or two weeks following chemotherapy. It was lower in surgical management (16 percent). In the Wuhan hospital, 41% of the 138 patients were afflicted (Wang et al., 2020).

In our research, regarding participants' opinion about the significant risk of COVID-19 infection from the breast cancer treatments, 64% mentioned that all treatments had the same risk, compared to a study conducted in Europe in May 2020 (Gasparri et al., 2020) the majority of respondents thought chemotherapy posed the greatest risk of COVID-19 infection. As a result, chemotherapy was used less frequently than surgical treatment. With the exception of a few instances, none of the published guidelines support surgical treatment over preoperative systemic therapy (Breast Resource during COVID-19, 2020). Because 85 percent of our participants recognized that COVID-19 had altered the neoadjuvant chemotherapy threshold, 88 percent of them expected to treat fewer breast cancer cases with neoadjuvant chemotherapy during the Covid-19 pandemic period than during the pre-pandemic period.

Furthermore, according to a recent study (Gasparri et al., 2021), 40.8 percent of physicians prefer to treat patients with neoadjuvant chemotherapy in order to allow patients to convert from mastectomy to partial mastectomy or postpone surgical resection. In comparison to both, specialists believe NACT is the best option only if the tumor is greater than 1 cm, according to a third opinion published in a Brazilian article (Cavalcante et al., 2020). The majority of participants have adjusted their chemotherapy regimens in various cases as a result of the Covid-19 pandemic. The European Breast Cancer Research Association

(Gasparri et al., 2020) found that in luminal-A tumors, about 68 percent of responders were suggested for endocrine treatment to postpone surgery, which is similar to what our participants in this study suggested, with 88 percent suggesting to postpone surgery and begin hormonal therapy until the COVID-19 pandemic's peak has passed in order to reduce the exclusion rate.

Furthermore, 77.5 percent of responders supported upfront surgery for luminal A malignancies and 67 percent for luminal B tumors, according to the Brazilian researchers (Cavalcante et al., 2020). Meanwhile, in this study, there were cases where neoadjuvant chemotherapy was avoided in favour of upfront surgery; for example, 41% mentioned T3 tumors of any subtype, 31% mentioned early stage with high tumor to breast ratio that prevents conservative surgery, and 17% mentioned suboptimal expected cosmetic outcome due to tumor location. The participants were asked about their experiences with their institution's "preferred choice" of breast reconstruction after mastectomy, and the highest percentage was for immediate with autologous reconstruction (24%) followed by immediate tissue expander and delayed implant (17%) and delayed autologous implant (16%). The COVID-19 outbreak influenced physicians' and patients' reconstruction options, according to a survey done by (Gasparri et al., 2020). Due to COVID-19-related issues, extrinsic factors such as shorter operating times or post-surgery recovery times may influence the reconstructive procedures adopted.

5. CONCLUSION

There was a significant drop in the provision of health services to breast cancer patients, both in terms of therapy and reconstruction. Saudi Arabia, on the other hand, was able to escape the pandemic with the least amount of damage to its population because to strong government efforts and unrestricted funding for the healthcare system. However, not all countries around the world have the resources or financial power to confront a threat as large as the COVID19 pandemic, so health authorities in capable countries and organizations should share their expertise and experience to prevent losses and collateral damage to people in low-resource countries.

Authors' contributions

Anas Abdulqader Fathuldeen (principal author): approved the final manuscript for publication and contributed to the research design.

Muhannad Saud Alshammari: drafted the manuscript and conceived the theoretical idea.

Rema Ahmed Almarshedi: carried out questionnaire distribution, data analysis, drafted parts of the discussion.

Reem Saud Alabedah and Raghad Ali Alshareef: verified the analytical methods, helped draft the final manuscript, and contributed to the research design.

Acknowledgment

We would like to thank everyone who participated in answering the questionnaire, and to Dr. Moly Joseph, consultant plastic surgeon for her great help in revising and advising this study.

Ethical approval

The study was approved by ethical committee at college of medicine, University of Hail. Approval number: H-2022-20.

Funding

This study has not received any external funding.

Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

REFERENCES AND NOTES

1. Alharbi NK, Alghnam S, Algaissi A. Nationwide Seroprevalence of SARS-CoV-2 in Saudi Arabia. J Infect Public Health 2021; 14(7):832-838.
2. Cavalcante FP, Novita GG, Millen EC, Zerwes FP, de Oliveira VM, Freitas JR. Management of early breast cancer

during the COVID-19 pandemic in Brazil. Breast Cancer Res Treat 2020; 184(2):637-647.

3. Cucinotta CU, Maurizio VA. WHO Declares COVID-19 a pandemic. Acta Biomed 2020; (1):157-160.
4. Dietz JR , Moran MS , Isakoff SJ , Kurtzman SH , Willey SC , Burstein HJ , Bleicher RJ , Lyons JA , Sarantou T , Baron PL , Stevens RE , Boolbol SK, Anderson BO , Shulman LN, Gradishar WJ , Monticciolo DL , Plecha DM , Nelson H , Yao KA. Recommendations for prioritization, treatment, and triage of breast cancer patients during the COVID-19 pandemic. The COVID-19 pandemic breast cancer consortium. Breast Cancer Res Treat 2020; 181(3):487-497
5. Gasparri ML, Gentilini OD, Lueftner DI, Kuehn TH, Kaidar-Person OK, Poortmans PH. Changes in breast cancer management during the Corona Virus Disease 19 pandemic: An international survey of the European Breast Cancer Research Association of Surgical Trialists (EUBREAST). Breast 2020; 52:110-115.
6. Illmann CF, Doherty CO, Wheelock MA, Vorstenbosch JO, Lipa JE, Zhong TO & Isaac KV. The Impact of the COVID-19 Pandemic on breast reconstruction: a Canadian perspective. Plastic surgery Oakville Ont 2021; 29(4): 287–293.
7. Sheng JY, Santa-MA, Cesar AM, Mangini NA, Norman HB, Couzi RC, Nunes RT, Wilkinson MJ, Visvanathan, KB, Connolly RM, Roussos ET, Fetting JH, Armstrong DK, Tao JJ, Jacobs LB, Wright JL, Thorner ED, Hodgdon CA, Horn SA, Wolff AC, Stearns VA, Smith KL. Management of breast cancer during the COVID-19 pandemic: A stage- and subtype-specific approach. JCO Oncol Practice 2020; 16 (10): 665-674.
8. Takafumi SO. Impact of the coronavirus pandemic on family well-being: A rapid and scoping review. Open J Nurs 2021; (11): 12-21.
9. Wang DA, Hu BO, Hu CH. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. *JAMA* 2020; 323(11):1061–1069.
10. Weichman KE, Lam G, Wilson SC, Levine JP, Allen RJ, Karp NS, Choi M, Thanik VD. The Impact of Two Operating Surgeons on Microsurgical Breast Reconstruction. Plastic reconst surg 2017; 139 (2), 277-284.
11. Zhonghua LU, Xing BI, Za ZH. Epidemiology working group for NCIP epidemic response. Chin center dis control prevent 2020; 41(2):145-151.