

# Breast Cancer Management During the COVID Pandemic

Gulcin Turkmen Sariyildiz<sup>1</sup> and Fikriye Figen Ayhan<sup>2</sup>

<sup>1</sup>Department of General Surgery, Operating Room Services, Vocational School of Health Services, Atilim University, Ankara, Turkiye

<sup>2</sup>Department of Physical Medicine and Rehabilitation, School of Medicine, Atilim University, Ankara, Turkiye

## ABSTRACT

**Objective:** To explore the impact of COVID-19 among both the newly diagnosed patients and patients under follow-up for breast cancer by focusing on patients' accessibility to management and comparing the distribution of them before and during pandemic.

**Study Design:** Single-centric retrospective study.

**Place and Duration of the Study:** Department of General Surgery and Department of Physical Medicine and Rehabilitation, Atilim University, Medicana International Ankara Hospital, Ankara, Turkiye, from March 2018 to 2022.

**Methodology:** The data were collected to analyse numbers and distributions of physician visits regarding breast cancer.

**Results:** The mean age of patients was  $55.98 \pm 12.60$  years. The percentages of newly diagnosed cases showed similarity (7.37% vs. 9.79%) before and during the pandemic ( $p = 0.18$ ). The number of imaging studies decreased by 53.33% in patients under follow-up ( $p = 0.006$ ), despite screening tests showed a similar trend ( $p = 0.145$ ). General surgery visits marked up (+44.6%), in contrast to plastic surgery visits (-42.04%,  $p < 0.001$ ). Patients' admissions decreased in many COVID-19 related clinics (pulmonology, emergency, internal medicine, and intensive care), but cardiology (+96.59%) and rehabilitation (+75%) admissions increased during the pandemic ( $p < 0.001$ ). The number of medical oncology and radiation oncology visits did not change ( $p > 0.05$ ).

**Conclusion:** Total number of physician visits was similar before and during the pandemic despite the changing distribution. While COVID-19 led to markedly rising trends of surgical, cardiological, and rehabilitative management in patients with breast cancer, falling trends were seen in other specialities except oncology which showed a plateau during two years. The falling trends of visits to pulmonology, emergency, internal medicine, and intensive care clinics may be explained by crowded COVID-19 cases.

**Key Words:** Breast cancer, COVID-19, Surgery, Oncology, Rehabilitation.

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## INTRODUCTION

The Coronavirus disease 2019 (COVID-19) caused by the novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) made a sustainable impact on medical health-care worldwide. The pandemic had also significant effects on different aspects of healthcare systems globally, including the management of patients with a variety of oncological diseases.<sup>1</sup>

There were some concerns that these changes may lead to missing and/or delaying diagnostic and therapeutic interventions for life-threatening diseases such as cancer.<sup>1,2</sup> Many studies were published about the profound negative impact of the COVID-19 outbreak on breast cancer care including prevention, screening, diagnosis, and treatment.<sup>3-13</sup> A recent study showed a decrease in screening rates by 16.01% for breast cancer from 2019 to 2020.<sup>14</sup>

However, health systems of different countries showed different responses to the pandemic because of many factors such as capacities of hospital beds and manpower. As an example, breast cancer surgery services were not affected, but medical oncology services declined during the early COVID-19 pandemic period in Turkiye.<sup>12</sup>

Indeed, the breast cancer care continuum consists of prevention, screening, diagnosis, treatment, and rehabilitation. Although there were some systematic reviews about some steps of cancer care in the age of COVID-19,<sup>1,2,15,16</sup> the issue of cancer rehabilitation has no attention. Pain, fatigue, neuropathy, lymphedema, and radiation fibrosis syndrome are common problems of patients admitted to breast cancer rehabilitation programme.<sup>17</sup>

As far as is known, this is the first study evaluating the impact of COVID-19 on breast cancer management including rehabilitation. The present study aimed to investigate the effects of COVID-19 on breast cancer management.

## METHODOLOGY

This study was conducted in the Atilim University, School of Medicine, Medicana International Ankara Hospital, Ankara, Turkiye, Breast Cancer Centre approved by Breast Centres Network. The duration of the study was four years between March 2018 and 2022. Male and female patients with pathologi-

Correspondence to: Dr. Fikriye Figen Ayhan, Department of Physical Medicine and Rehabilitation, School of Medicine, Atilim University, Ankara, Turkiye  
E-mail: figenardic@gmail.com

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cally confirmed breast cancer both newly diagnosed and under follow-up were included. Patients in the remission phase of breast cancer and without pathology reports of breast neoplasm were excluded.

All available data were collected from the Breast Centre and ENZIM<sup>®</sup> hospital information management system (HIMS). Two years before the pandemic, data of 2,346 breast cancer cases (260 males and 2,086 females) were recorded from the digital network via searching by an ICD-code of C50 (malignant neoplasm of the breast), between March 2018 and 2020, yearly. During the 2-year pandemic, data of 2,145 breast cancer cases (218 males and 1,927 females) were also analysed between March 2020 and 2022 using the same procedure.

Breast cancer screening tests (digital tomosynthesis mammography and ultrasonography) and newly diagnosed breast cancer cases (inpatient surgical interventions confirmed by pathology reports) were also collected from Breast-centre and ENZIM<sup>®</sup> HIMS.

Eleven of the main departments for breast cancer management were listed as general surgery, medical oncology, radiation oncology, plastic surgery, breast imaging (radiology), cardiology, rehabilitation, pulmonology, emergency, intensive care, and internal medicine. The consultation physician visits related with breast cancer were also evaluated before and during the pandemic.

All statistical analyses were conducted using IBM SPSS version 21.0 for Windows (SPSS Inc., Chicago, IL, USA). The distributions of variables were assessed using both the Kolmogorov-Smirnov test and the Shapiro-Wilk test. Categorical variables were presented as numbers and percentages, while continuous variables were expressed as mean ± standard deviation, and median (min-max). The comparison of categorical variables was performed using the Chi-square test. Changes in values were calculated and presented as percentages and compared by using the Independent samples t-test and Mann-Whitney U test. The accepted level of significance was set at  $p > 0.05$ .

## RESULTS

The age and gender characteristics of the patients with breast cancer were similar before and during the pandemic. A total of 33,895 physician visits to breast cancer care almost equally occurred for four years despite a slight decrease in the first year of the pandemic. The comparisons of breast cancer management services and physician visits before and during pandemics are shown in Table I and Table II.

While the number of breast cancer imaging studies decreased in patients under follow-up ( $p = 0.006$ ), screening tests showed a similar trend ( $p = 0.145$ ).

Breast cancer surgery visits increased in contrast to plastic surgery visits. While pulmonology, emergency, internal medicine, and intensive care admissions decreased, cardiology and rehabilitation visits increased during the pandemic period ( $p < 0.001$ ). The number of medical oncology and radiation oncology physician visits did not change ( $p > 0.05$ ).

Yearly analysis of physician visits for breast cancer management before and during the pandemic is summarised in Table III and Figure 1.

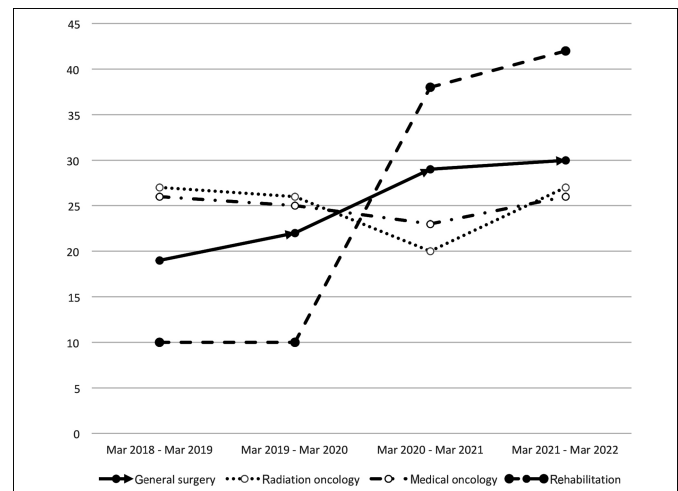


Figure 1: Yearly distribution of main physician visits before (2018 - Mar 2020) and during (2020 - Mar 2022) pandemic in 4,491 patients with breast cancer.

Table I: Comparisons of the demographics and the medical management characteristics in patients with breast cancer for two years before (2018 - Mar 2020) and two years (2020 - Mar 2022) during pandemic.

Demographics	Mar 2018 - 2020	Mar 2020 - 2022	Change (%)	p-value*
Mean age (SD), year	55.98 ± 12.60	55.71 ± 12.81		0.485
Gender				0.318
Female (%)	2,086 (88.92%)	1,927 (89.83%)		
Male (%)	260 (11.1%)	218 (10.2%)		
	<b>Before pandemic</b>	<b>During pandemic</b>		
The number of patients; n, %	2,346	2,145	- 8.57	
The number of survivors (%)	648 (27.62%)	1,595 (74.36%)	+ 59.37	<0.001
The number of ex-patients (%)	1,698 (72.38%)	550 (25.64%)	- 67.61	
<b>The type of health services</b>				
In-patient treatment, n	576 (24.6%)	503 (23.4%)	- 12.67	0.388
Mean daily stay treatment,	3 (0-56)	3 (0-45)	- 4.49	0.107
Total stay day	6,011	5,741		
Mean outpatient treatment, total day	7 (1-98)	7 (2-67)	- 4.29	0.818
Total stay day	10,799	10,335		

\*Chi-square test for categorical variables, Independent samples t-test and Mann-Whitney U test for continuous variables were used in the comparisons of the percentages, the mean ± SD, and median (min-max) values.

**Table II: The distribution of physician visits in patients with breast cancer for two years before and two years during pandemic.**

	2018 - Mar 2020	2020 - Mar 2022	Change (%)	p-value*
<b>Total visits</b>	17,386	16,579	- 4.64	
<b>The main visits (total visits in each department)</b>				
<b>Each visit represents one case. Each case may apply more than once to a related clinic (Except medical oncology. For medical oncology assessment, total applies were considered).</b>				
General surgery	287 (12.2%)	415 (19.3%)	+ 44.60	<0.001
Medical oncology, total	13,989	13 500	- 3.49	0.123
Radiation oncology	1,537 (66.5%)	1,383 (64.5%)	- 10.02	0.465
Plastic surgery	176 (7.5%)	102 (4.8%)	- 42.04	<0.001
Breast imaging (under follow-up)	45 (1.9%)	20 (0.9%)	- 53.33	0.006
Cardiology	6 (0.3%)	176 (8.2%)	+ 96.59	<0.001
Rehabilitation	69 (2.9%)	269 (12.5%)	+ 75	<0.001
Pulmonology	61 (2.6%)	25 (1.2%)	- 59.02	<0.001
Emergency	432 (18.4%)	234 (1.09%)	- 45.83	<0.001
Intensive care	36 (1.5%)	26 (1.2%)	- 29.73	0.355
Internal medicine	568 (24.2%)	327 (15.2%)	- 42.43	<0.001
<b>The consultation visits (total visits in each department)</b>				
Obstetrics and Gynaecology	51 (2.2%)	19 (0.9%)	- 62.74	<0.001
Endocrinology and metabolism	40 (1.7%)	16 (0.7%)	- 60	0.004
Gastroenterology	37 (1.6%)	22 (1.0%)	- 40.54	0.105
<b>Others (Total visits in each department)</b>				
Orthopaedics and traumatology	10	6		0.410
Chest surgery	6	10		0.237
Rheumatology	6	1		0.127
Haematology	9	6		0.547
Neurosurgery	6	7		0.748
Cardiovascular surgery	3	1		NA
Nephrology	3	2		NA
Infectious diseases	2	0		NA
Ear Nose Throat	2	0		NA
Check-up	2	0		NA
Primary care	0	1		NA
<i>In vitro</i> fertilization	0	3		NA
Home care	0	1		NA
Total visit number	17,386	16,579	- 4.64	0.242
Screening tests	8,663	9,495	+ 9.6	0.145
Newly diagnosed breast cancer	173	210	+ 21.39	0.004

\*Chi-square test for categorical variables, Independent samples t-test and Mann-Whitney U test for continuous variables were used in the comparisons of the percentages, the mean  $\pm$  SD, and median (min-max) values.

**Table III: The yearly analysis of physician visits for breast cancer management before (2018 - Mar 2020), and during (2020 - Mar 2022) pandemic.**

The number of physician visits	2018 - Mar 2019, n (%)	2019 - Mar 2020, n (%)	2020 - Mar 2021, n (%)	2021 - Mar 2022, n (%)	Total, n
General surgery	136 (19.37)	151 (21.51)	203 (28.92)	212 (30.20)	702
Medical oncology	7,038 (25.61)	6,951 (25.29)	6,299 (22.91)	7,201 (26.19)	27,489
Radiation oncology	777 (26.61)	760 (26.03)	593 (20.31)	790 (27.05)	2,920
Plastic surgery	90 (32.37)	86 (30.93)	88 (31.65)	14 (5.04)	278
Breast cancer imaging (under follow-up)	28 (42.42)	17 (25.75)	12 (18.18)	9 (13.63)	66
Cardiology	4 (2.2)	2 (1.1)	25 (13.73)	151 (82.97)	182
Rehabilitation	33 (9.57)	36 (10.43)	130 (37.68)	146 (42.32)	345
Emergency	100 (16.10)	332 (53.46)	114 (18.36)	75 (12.08)	621
Internal medicine	57 (6.37)	511 (57.09)	206 (23.02)	121 (13.52)	895
Others	153 (30.54)	124 (24.75)	72 (20.56)	118 (23.55)	467
Total visit number	8,416 (24.83)	8,970 (26.46)	7,742 (22.84)	8,837 (26.07)	33,965
Screening tests	3,962 (21.82)	4,701 (25.89)	3,462 (19.06)	6,033 (33.23)	18,158
Newly diagnosed	73 (19.06)	100 (26.11)	92 (24.02)	118 (30.81)	383

Note: The yearly trends of physician visits for breast cancer management are also shown in Figure 1 before and during the pandemic.

## DISCUSSION

The total number of physician visits was similar before and during the pandemic despite changing distribution in the present study. While COVID-19 led to markedly rising trends of surgical, cardiological, and rehabilitative management in patients with breast cancer, falling trends were seen in other specialities including plastic surgical interventions. The falling trends of patient admissions in pulmonology, emer-

gency, internal medicine, and intensive care admissions may be explained by the overload of cases of COVID-19 in these departments. As expected, oncology visits showed a stable manner in admission numbers despite a very slight, but statistically insignificant decrease in the first year of the pandemic. These experiences demonstrated that individuals with breast cancer were not affected negatively by the pandemic.

It has been previously reported that the COVID-19 pandemic has impacted many areas of healthcare and is associated with impaired health services such as cancer screening, diagnosis, and management.<sup>1,2,15</sup> However, any negative impact was not found in breast cancer screening studies and management contrary to previously reported short-term and/or small sample-size studies.<sup>2-10,14,18</sup> Different capabilities of health systems such as manpower of physicians and health professionals, or the number of intensive care and hospital beds may be responsible for differences seen in breast cancer management among countries during the pandemic.

A marked increase in cardiology and rehabilitation admissions was also found in patients with breast cancer, in the present study. Possible complications of COVID-19 such as decreased physical activity, increased obesity, and cardiopulmonary and musculoskeletal involvement may explain this rising trend.<sup>19,20</sup> Obesity-related increase in lymphoedema may also be responsible for the increased number of rehabilitation visits.

In contrary to the presented results, Dauti Isiklar *et al.* reported that medical oncology services declined during the early COVID-19 pandemic period in Turkiye.<sup>12</sup> There were no changes in medical oncology and radiation oncology visits in the present sample.

The major limitation of this study was that all of these findings were based on the single hospital's data. Therefore, these results could not be generalised to all communities.

The main strength of this study was the high number of cases of breast cancer managed by an expert team for two years before and two years during the pandemic. As far as is known, this study is the first study evaluating the impact of COVID-19 on breast cancer management including main and supportive services including rehabilitation for four years. It was another strength of this study.

## CONCLUSION

There was stability in breast cancer management during COVID-19 at the Atılım University, Medica International Ankara Hospital, Ankara, Turkiye. These 4-year results of 4,491 patients showed increased surgical, cardiological, and rehabilitative visits to breast cancer management services during the pandemic. The visits to cardiology and rehabilitation increased markedly during the pandemic, possibly related to outdoor exercise restrictions, increased weight gain, and long lockdown periods.

### ETHICAL APPROVAL:

An approval was obtained from the Ethical Review Committee of the Medica International Ankara Hospital, Ankara, Turkiye.

### PATIENTS' CONSENT:

Written informed consent was obtained from all the patients during admission to the hospital.

### COMPETING INTEREST:

The authors declared no conflict of interest.

### AUTHORS' CONTRIBUTION:

GTS: Concept, design, data collection, analysis, interpretation of data, revision for intellectual contents, drafting, looking through results, and critical revision.

FFA: Data collection, review of literature, drafting of work, interpretation of results, and revising it critically for important intellectual content.

Both authors approved the final version of the manuscript to be published.

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