Original Research Paper

Community Medicine

BREAST CANCER IN WOMEN: A DESCRIPTIVE ANALYSIS OF THE PATIENTS REGISTERED IN HOSPITAL-BASED CANCER REGISTRY OF CENTRAL INDIA

Dr Anamika Soni	Post Graduate Resident Department of Community Medicine Gandhi Medical College Bhopal
Dr Chaitra C M	Post Graduate Resident Department of Community Medicine Gandhi Medical College Bhopal

ABSTRACT **Background:** Breast cancer is now the most common cancer worldwide, contributing 12.5% of the total number of new cases diagnosed and approximately 685,000 women died from breast cancer in 2020. The rising trend has been attributed to various lifestyle factors and demographic characteristics, such as the age of menarche, age at first childbirth, parity, menopause, and family history of malignancy, which have been considered potential risk factors for breast cancer. **Objectives:** To describe demographics and various risk factors, and to study the proportion of various histopathological types of breast carcinoma and their management. **Methods:** A cohort follow-up study of 628 patients [registered at Hospital Based Cancer Registry (HBCR) between 2016-2018] between August 2022 to January 2024, using a predesigned and pretested questionnaire by In-depth interview (IDI) either Telephonically or by home visit. **Result:** Among the 407 traceable breast cancer cases, the mean age was 50.4 ± 11.8 years. Most patients had higher secondary education (26.8%) and were from the upper middle class (36.9%). Most were multiparous (78.1%), with 72.2% having their first child between 20 and 30 years, and 56.5% experiencing menopause between 45 and 55 years. Visual obesity was common, and 21.4% had a family history of breast cancer. The most frequent diagnosis was TNM stage II (43.7%). **Conclusion:** Regular breast cancer screening and early detection are crucial, especially for women in their menopausal years. Awareness about reproductive health, obesity, and family history is vital for prevention and timely intervention.

KEYWORDS :

INTRODUCTION

Breast cancer is an ancient disease, and now the most common cancer worldwide, contributing 12.5% of the total number of new cases diagnosed in 2020 (1). It is the most frequently diagnosed cancer in women overall (2). There are several different types of breast cancer, The most commonly known is ductal breast cancer, which develops in the cells that line the breast ducts. Ductal cell Ca accounts for about 70-80% of all breast cancers (3). Approximately 685,000 women died from breast cancer in 2020, accounting for 16% or 1 in every 6 cancer-related deaths among women. It is predicted that by 2040 the breast cancer burden will increase to more than 3 million new cases per year (an increase of 40%) and more than 1 million deaths per year (an increase of 50%) (2).

In India, breast cancer, from being fourth on the list of most common cancers during the 1990s, has now become the first, The rising trend has been attributed to various lifestyle factors and demographic characteristics, such as the age of menarche, age at first childbirth, parity, menopause, and family history of malignancy, which have been considered potential risk factors for breast cancer (4–6). The National Cancer Registry Program analysed data from cancer registries from 1988 to 2013 for changes in cancer incidence. All population-based cancer registries (PBCRs) have indicated a significant upward trend in the incidence of breast cancer (7) (8). According to the National Cancer Registry Programme report prepared by the National Centre for Disease Informatics and Research, Madhya Pradesh registered 11,501 breast cancer cases in 2020 and mortality due to breast cancer reported was 4,278. In Bhopal, breast cancer is the most prevalent cancer among women, comprising 31.2% of all cancer cases in this group.

Hence, The purpose of this study was to describe demographics and various risk factors and to study the proportion of various histopathological types and their management of breast carcinoma.

MATERIAL AND METHODS
Study Design: Cohort follow-up study

Study Duration: August 2022 to January 2024

Settings and Sample
Sampling- 628 patients [registered at Hospital Based Cancer Registry (HBCR) between 2016-2018].
Study Tools: The subjects were interviewed using a predesigned and pretested questionnaire. Patient's name, age, sex, and contact details were assessed from the data provided by HBCR Bhopal And Sociodemographic factors such as education, income, the number of family members, marital status, parity, breast side involved, clinical staging of the tumour, final diagnosis and clinical data such as risk factors, mode of treatment and metastasis seen or not were assessed by In-depth interview (IDI) either Telephonically or by home visit.
Ethical Approval: The study received approval from the Institutional Ethics Committee at Gandhi Medical College Bhopal.
Statistical Analysis: Collected data were entered in an Excel sheet and analysed using Jamovi version 2.3 software (9).

RESULTS
A total of 628 patients were registered in the cancer registry from 2016-2018. Out of these only 407 (64.8%) cases were traceable. While 221 were unable to trace (Lost to follow-up) due to multiple reasons [105 (16.7%) had an Incomplete address/ Wrong Address/ Address not available, 67 (10.7%) The patient/ patient's attender was not found in the home and 49 (7.8%) were not cooperative].

Table 1: Baseline Characteristics of Breast Cancer Patients

Variable	No of Cases (407)	%
Age Group		
20-30	22	5.4
31-40	64	15.7
41-50	133	32.7
51-60	113	27.8
61-70	52	12.8
>70	23	5.6
Religion		
Hindu	313	76.9
Muslim	89	21.9
Others	5	1.2

Education		
Illiterate	27	6.6
Primary education	74	18.2
Middle School	44	10.8
High School	75	18.4
Higher Secondary	109	26.8
Graduate & Postgraduate	78	19.2
Occupation		
Housewife	372	91.4
Professional	18	4.4
Non-Professional	14	3.5
Student	3	0.7
Socioeconomic Class*		
Upper Class	110	27.0
Upper Middle Class	150	36.9
Middle Class	76	18.7
Lower Middle Class	62	15.2
Lower Class	9	2.2

*A/c to Modified BG Prasad Scale (10)

Table 2: Distribution of Patients According to Risk factors of Breast Carcinoma

Variable	No of Cases (407)	%
Age of Menarche (Years)		
<10	6	1.5
10-16	398	97.8
>16	3	0.7
Marital status		
Unmarried	13	3.2
Married	372	91.4
Widow/ Divorced	22	5.4
Parity		
Nulliparous	52	12.8
Single Child	37	9.1
Multiparous	318	78.1
Age at First Child (Years)	39	10.9
<20	257	72.2
20-30	60	16.9
>30		
Breastfeeding		
Yes	327	91.9
No	29	8.1
Duration of Breastfeeding (Months)		
≥6	272	83.2
<6	55	16.8
History of Abortion		
Yes	110	27.0
No	297	73.0
History of OCP use		
Yes	66	16.2
No	341	83.8
Age at menopause (Years)		
No Menopause	126	31.0
<45	6	1.5
45-55	230	56.5
>55	45	11.1
Visual Obesity*		
5	11	2.7
6	119	29.2
7	151	37.1
8	116	28.5
9	10	2.5
Family History		
Yes	87	21.4
No	320	78.6

* As per the Body Size Guide (BSG) (11)

The demographic characteristics of the study population reveal a diverse age distribution, with the largest group being 41-50 years old (32.7%), with the mean age of the cases registered under the current study being 50.4 ± 11.8 years. The majority of the participants are Hindu (76.9). In terms of education, a significant portion of the population has higher secondary (26.8%) or graduate and postgraduate education (19.2%), Most participants are housewives (91.4%). Socioeconomically, the largest group belongs to the upper middle class (36.9%), followed by the upper class (27.0%).

Regarding reproductive health, the age of menarche predominantly falls between 10-16 years (97.8%). The majority are married (91.4%), Parity shows that 78.1% are multiparous, and 12.8% are nulliparous. Most (72.2%) had their first child between 20 and 30. Breastfeeding is highly prevalent (91.9%), with 83.2% breastfeeding for six months or more. Menopause occurs mainly between 45-55 years (56.5%), with 31.0% not reached menopause yet. Visual obesity is most common in categories 6 and 7, constituting 29.2% and 37.1% of the population, respectively. Finally, 21.4% have a family history of the studied conditions, while 78.6% do not.

Table 3. Distribution of Patients According to Characteristics of Breast Carcinoma

Characteristics of Tumour	No of Cases (407)	%
Patients Initial Complaints		
Palpable lump only	231	56.8
Bulging painful lump	128	31.4
Oozing of blood from the nipple	32	7.8
Change in shape and size of breast	8	2
Inverted nipple with discharge	8	2
Breast side affected		
Left	213	52.3
Right	194	47.7
Topography		
Upper outer quadrant (UOQ)	239	58.7
Upper inner quadrant (UIQ)	34	8.4
Lower outer quadrant (LOQ)	41	10.1
Lower inner quadrant (LIQ)	10	2.5
Central	70	17.2
Whole Breast	13	3.2
Histopathological Type		
Malignant Phylloids	3	0.7
Ductal Cell Ca	304	74.7
Lobular Ca	47	11.5
Invasive Ductal Ca	48	11.8
Mucinous Ca	4	1.0
Sarcomatoid Ca	1	0.2
TNM Staging		
I	42	10.3
II	178	43.7
III	135	33.2
IV	52	12.8

Table 4. Distribution of Patients According to Received Treatment

Variable	Sub variable	No of Cases (407)	%
Treatment	Surgery, Chemotherapy, Radiotherapy	203	49.9
	Surgery, Chemotherapy, Radiotherapy, and Hormonal Therapy	154	37.8
	Surgery only	15	3.7
	Chemotherapy, Radiotherapy	32	7.9
	Hormonal therapy only	2	0.5
	Surgery, Chemotherapy, Hormonal therapy	1	0.2
Completion of Treatment	Yes	240	59.0
	No	144	35.4
	Ongoing	23	5.7

Table 5. Distribution Of Breast Cancer Patients According to History of Metastasis

Metastasis (407)	Patients	%

Yes	132	32.4
No	275	67.6
Site of Metastasis (132)		
All over the body	34	25.8
Bone metastasis	32	24.2
Lung metastasis	34	25.8
Brain metastasis	21	15.9
Other sites	11	8.3

The most common initial complaint was a palpable lump, reported by 56.8% of patients. The majority of cases affected the left breast (52.3%), with the upper outer quadrant being the most common location (58.7%). Histopathologically, ductal cell carcinoma was the most prevalent type (74.7%). Regarding TNM staging, stage II was the most frequent (43.7%), followed by stage III (33.2%). Among treatment strategies, 49.9% of patients underwent surgery, chemotherapy, and radiotherapy. As for treatment completion, 59.0% of patients completed their treatment, 35.4% did not, and 5.7% were still undergoing treatment. Metastasis was present in 32.4% of patients. Among the patients with metastasis, the sites were distributed as follows: metastasis all over the body (25.8%), bone metastasis (24.2%), lung metastasis (25.8%), brain metastasis (15.9%), and other sites (8.3%).

DISCUSSION

Our study shows that the mean age of diagnosis of breast cancer was 50.4 ± 11.8 years. The majority of patients were in the age group 41-50 years (32.7%), and the least were 20-30 (5.4%). Similar findings were observed in the previous two studies, Viral et al (2021), which showed the mean age of diagnosis was 50-51 years (12) and another by Nalliah Manoharan et al (2017) observed 50 years as the median age of diagnosis (13). Mohammed et al. (2024), showed a mean age of 53.7±11.7 years and ranged between 26 and 88 years (14).

The study showed a significant portion of the patients had higher secondary education (26.8%), followed by Graduates/Postgraduates (19.2%) and Only 6.6% were illiterate. Similar findings were noticed in previous studies, Ganesh et al (2008), results showed that 79% of patients were literate and 21% of patients were found to be illiterate (15), the risk of developing breast cancer was significantly higher in the medium and high-education level groups as per Jiang et al. (2023) (16).

As per present study findings, 91.4% were housewives and only 3 (0.7%) were students. Similar results were obtained in a few previous studies, In the study of S Pakseresht et al (2009), reported that 96.5% of cases were housewives (17). In our study, most patients belonged to the upper middle class (36.9%), and only a small fraction (2.2%) were from the lower class, indicating that socioeconomic status may influence access to healthcare and early diagnosis. Lundqvist et al. (2016), observed higher breast cancer incidence (RR 1.25, 1.17–1.32) in Women with higher SES (18). And Choe et al. (2022), show that the lower-income group was diagnosed at the advanced stage of cancer (19).

In our study, the mean age of menarche was 12.5±1.21 years. Baranska, et al (2021), showed the earlier age of menarche (≤12 years) was associated with a statistically significant higher Br Ca risk (p = 0.0016)(20). Our study showed that the mean age of menopause was 50.3±2.45. Similar observations in previous studies by Maurya et al (2023), reported women achieving menopause at age 50 or above, the risk of breast cancer was higher (OR 1.7–2.68) (21). Akoko et al. (2022), showed that attaining menopause above 45 years of age has a 2.6-fold increased risk of developing Breast cancer (22).

As per our study findings, There was no significant association found between marital status and the risk of breast cancer. Whereas Maurya et al (2023), showed that the odds of developing breast cancer in unmarried women were

2.0 to 5.6 times higher compared to married women (21).

Our study showed that the majority had two children (52.3%). A previous study by Maurya et al (2023), showed that nulliparous women had a higher risk of malignancy compared with parous women (OR 1.4–6.1) (21). Katuwal et al. (2022), show that Parous women had a reduced risk of breast cancer as compared to nulliparous women (23)

Our study results show that in comparison to the 20-30 years age group, women who delivered under 20 are at 2.24 times greater risk of developing breast cancer, whereas no association was observed with the age group over 30, this findings may be because most patients were middle-aged and had crossed 50 years, having married early and had their first childbirth at under 20 years, which may have contributed to the development of breast cancer in the later age group. Contrast findings were observed in the previous study by, Maurya et al (2023), which showed that concerning first childbirth before the age of 20 years, gradual risk increases after the age of 20 (For ages 20 to 21 years had an OR of 1.4–2.0, for >25 years OR was 1.23 to 2.8 and for the age 30 years it ranged from 4.18 to 10.5) (21).

Our study shows 1.26 times more risk of developing Ca Breast, in women who had not breastfed. Maurya et al (2023), showed the total duration of breastfeeding was protective and the odds of developing breast cancer were 2.88 times higher in women with a total duration of breastfeeding of less than 2 years (21).

The study found that only 16.2% had a history of oral contraceptive pills (OCP) use, and mostly for less than 10 months, which may suggest a limited impact on this cohort. Rama S Lodha et al (2011), Results showed that a history of OCP use (OR=2.77) was significantly associated with the occurrence of breast cancer (24).

Obesity was prevalent, with 37.1% having a high visual obesity score of 7, reflecting a potential risk factor for breast cancer. Similar results were obtained in previous studies by Akoko et al. (2022), which showed that the presence of adolescent obesity had a two-fold increased risk (22).

The results indicated that 21.4% of patients had a family history of cancer, among them breast cancer being the most frequently reported type (42.6%). Zhang et al (2023), showed that among all patients, 17.7% had at least 1 female First Degree Relative diagnosed with BC (25). Ebrahimi et al. (2002), found that a positive family history of breast cancer was associated with a significantly increased risk for breast cancer (P = 0.02) (26).

Our findings show that Ductal carcinoma was the most common diagnosis (74.7%). And the majority were diagnosed at stage II (43.7%), followed by stage III (33.2%), highlighting the need for earlier detection. Sistiet al. (2020), showed that the most frequent grade at diagnosis was grade II, and intraductal carcinoma was the most common histological type observed (27). Thakur et al. (2015) conducted a study where it was found that the majority of cases were in stage III (36.67%) or stage II (34.17%). The most commonly observed histopathological type of breast carcinoma was invasive ductal carcinoma, accounting for 87.50% of cases (28).

Our study shows the majority of breast cancer patients, 239 (58.7%), had tumours located in the upper outer quadrant (UOQ), followed by 70 (17.2%) in the central part, 41 (10.1%) and the least, 10 (2.5%), in the lower inner quadrant (LIQ) of the breast. Similar findings observed in previous studies are Sisti et al. (2020), showing the location of the breast cancer was as follows, UOQ (39.50%), UIQ (12.49%), LOQ (8.33%), LIQ (6.65%), the central portion of the breast (6.09%) (27).

Analysis shows that Nearly half (49.9%) received combined surgery, chemotherapy, and radiotherapy and 37.8% underwent surgery, chemotherapy, radiotherapy, and hormonal therapy. Similar findings were reported in a prior study conducted by Abu Zaid et al. (2017) indicating that over half of the cases (55.5%) underwent a combined regimen of surgery, chemotherapy, and radiotherapy (29). Our study showed that Modified Radical Mastectomy (MRM) was the most common surgical procedure performed. Similar findings were observed in previous studies done by Nene et al (2018) and Sandhu et al (2010), which showed that the MRM was the most frequently performed surgery (30,31). As per our findings, 59% of patients completed their treatment, and 35.4% did not. Treatment completion shows a protective effect [OR=0.12 (0.09-0.18, p<0.001)]

The study reported metastasis in 32.4% of patients. This was spread to various sites, with 25.8% of patients experiencing widespread metastasis, and 25.8% having lung metastasis. Bone metastasis was observed in 24.2%, brain metastasis in 15.9%, and other sites in 8.3% of patients. Gogia et al (2019), showed that The most common site of metastasis was visceral metastasis lung, liver, and both fields(32).

CONCLUSION

The comprehensive study on breast cancer among 407 (Among 628 registered patients in HBCR Bhopal) revealed a demographic profile predominantly characterised by middle-aged Hindu housewives, with varying levels of educational attainment, and a majority belonging to upper-middle to upper-class socioeconomic backgrounds. Common risk factors identified included normal age at menarche, married status, and higher parity, while a history of abortion and hormonal therapy were less prevalent among the study participants. Clinical manifestations commonly involved palpable lumps primarily detected in the left breast, with ductal cell carcinoma at stage II being the predominant diagnosis. Treatment protocols typically consisted of surgery, chemotherapy, and radiotherapy, with modified radical mastectomy being the most frequently employed surgical approach.

Strength-In our study, we gathered detailed information on treatment. We later followed up for complications present or not, ensuring a more accurate assessment of potential risk factors and treatment effects. As population-based cohorts were studied in our study, the findings can be highly generalizable to the broader population.

Limitations- Treatment protocols and diagnostic techniques may have changed over long follow-up periods, potentially confounding results. Cases were taken from past years (2016, 2017, and 2018), where both the exposure and outcome variables occurred before the study was initiated. As a result, the measurements may not be very accurate.

Recommendations- Based on the study findings, the following recommendations can be made, Promote Early Diagnosis, Create educational programs to improve health literacy, especially in underserved areas, Implement initiatives to reduce socioeconomic barriers to healthcare, and Strengthen healthcare systems to offer timely and comprehensive treatment. Develop strategies to help patients to complete their treatment regimens.

REFERENCES

1. https://www.wcrf.org/cancer-trends/worldwide-cancer-data/. In.
2. Arnold M, Morgan E, Rumgay H, Mafra A, Singh D, Laversanne M, et al. Current and future burden of breast cancer: Global statistics for 2020 and 2040. The Breast. 2022 Dec;66:15–23.
3. https://www.cancer.org/cancer/understanding-cancer/what-is-cancer.html. In.
4. Jones S, Turton P, Achuthan R. Impact of family history risk assessment on surgical decisions and imaging surveillance at breast cancer diagnosis. annals. 2020 Oct;102(8):590–3.
5. Lee K, Kruper L, Dieli-Conwright CM, Mortimer JE. The Impact of Obesity on Breast Cancer Diagnosis and Treatment. Curr Oncol Rep. 2019 May;21(5):41.
6. Harris HR, Terry KL. Polycystic ovary syndrome and risk of endometrial, ovarian, and breast cancer: a systematic review. Fertil Res and Pract. 2016 Dec;2(1):14.
7. Takiar R, Srivastav A. Time trend in breast and cervix cancer of women in India - (1990-2003). Asian Pac J Cancer Prev. 2008;9(4):777–80.
8. National Cancer Registry Programme. Three-year report of the population-based Cancer Registries, 2012-2014. Indian Council of Medical Research, Bangalore. 2016. In.
9. The jamovi project (2022). jamovi. (Version 2.3) [Computer Software]. Retrieved from https://www.jamovi.org.
10. Kumar Pentapati S, Debnath D. Updated BG Prasad's classification for the year 2022. J Family Med Prim Care. 2023;12(1):189.
11. Oldham M, Robinson E. Visual body size norms and the under detection of overweight and obesity. Obesity Science & Practice. 2018 Feb;4(1):29–40.
12. Viral P, Pavithran K, Beena K, Shaji A, Vijaykumar DK. Ten-year survival outcome of breast cancer patients in India. J Carcinog. 2021;20:1.
13. Manoharan N, Nair O, Shukla N, Rath G. Descriptive Epidemiology of Female Breast Cancer in Delhi, India. APJCP [Internet]. 2017 Apr [cited 2024 Jun 9];18(4). Available from: https://doi.org/10.22034/APJCP2017.18.4.1015
14. Mohammed MA, Mokhtar S, Osama E, Sherif O. Retrospective descriptive analysis of the demographic and clinicopathological presentation of breast cancer patients in Kasr Al-Ainy Hospital over 5 years. The Egyptian Journal of Surgery. 2024 Apr;43(2):515–23.
15. Ganesh B, Talole SD, Dikshit R, Badwe RA, Dinshaw KA. Estimation of survival rates of breast cancer patients--a hospital-based study from Mumbai. Asian Pac J Cancer Prev. 2008;9(1):53–7.
16. Jiang R, Wang X, Sun Z, Wu S, Chen S, Cai H. Association of education level with the risk of female breast cancer: a prospective cohort study. BMC Women's Health. 2023 Mar 7;23(1):91.
17. Pakseresht S, Ingle G, Bahadur A, Ramteke V, Singh M, Garg S, et al. Risk factors with breast cancer among women in Delhi. Indian J Cancer. 2009;46(2):132.
18. Lundqvist A, Andersson E, Ahlberg I, Nilbert M, Gerdtham U. Socioeconomic inequalities in breast cancer incidence and mortality in Europe—a systematic review and meta-analysis. Eur J Public Health. 2016 Oct;26(5):804–13.
19. Choe SA, Roh M, Kim HR, Lee S, Ki M, Paek D, et al. Income Disparity in Breast Cancer Incidence and Stage at Presentation: A National Population Study of South Korea. J Breast Cancer. 2022;25(5):415.
20. Barańska A, Błaszczuk A, Kanadys W, Malm M, Drop K, Polz-Dacewicz M. Oral Contraceptive Use and Breast Cancer Risk Assessment: A Systematic Review and Meta-Analysis of Case-Control Studies, 2009–2020. Cancers. 2021 Nov 12;13(22):5654.
21. Maurya A, Brahmachari S. Association of hormonal and reproductive risk factors with breast cancer in Indian women: A systematic review of case–control studies. Indian J Cancer. 2022;0(0):0.
22. Akoko LO, Rutashobya AK, Lutainulwa EW, Mwanga AH, Kivuyo SL. The effect of reproductive, hormonal, nutritional and lifestyle on breast cancer risk among black Tanzanian women: A case control study. Doku DT, editor. PLoS ONE. 2022 Feb 9;17(2):e0263374.
23. Katuwal S, Tapaninen J, Pukkala E. Multivariate analysis of independent roles of socioeconomic status, occupational physical activity, reproductive factors, and postmenopausal hormonal therapy in risk of breast cancer. Breast Cancer Res Treat. 2022 Jun;193(2):495–505.
24. Lodha RS, Nandeshwar S, Pal DK, Shrivastav A, Lodha K, Bhagat VK, et al. Risk Factors for Breast Cancer among Women in Bhopal Urban Agglomerate: A Case-Control Study.
25. Zhang Y, Wang QL, Zeng E, He W, Czene K. Analysis of Breast Cancer Family History, Estrogen Receptor Status, and Breast Cancer Outcomes in Sweden. JAMA Netw Open. 2023 Jun 1;6(6):e2318053.
26. Ebrahimi M, Vahdaninia M, Montazeri A. Risk factors for breast cancer in Iran: a case-control study. Breast Cancer Res. 2002 Oct 1;4(5):R10.
27. Sisti A, Huayllani MT, Boczar D, Restrepo DJ, Spaulding AC, Emmanuel G, et al. Breast cancer in women: a descriptive analysis of the national cancer database. Acta Bio Medica Atenei Parmensis. 2020 May 11;91(2):332–41.
28. Thakur N, Humne A, Godale L. Delay in presentation to the hospital and factors affecting it in breast cancer patients attending tertiary care center in Central India. Indian J Cancer. 2015;52(1):102.
29. Abu Zaid LZ, Nuzhat A, Rafique M. Factors affecting survival of women with breast cancer in King Fahad Medical City, Saudi Arabia. Int J Community Med Public Health. 2017 Mar 28;4(4):910.
30. Nene BM, Selmouni F, Lokhande M, Hingmire SJ, Muwonge R, Jayant K, et al. Patterns of Care of Breast Cancer Patients in a Rural Cancer Center in Western India. Indian J Surg Oncol. 2018 Sep;9(3):374–80.
31. Sandhu D, Sandhu S, Karwasra R, Marwah S. Profile of breast cancer patients at a tertiary care hospital in north India. Indian J Cancer. 2010;47(1):16.
32. Gogia A, Deo SVS, Sharma D, Thulkar S, Kumar R, Malik PS, et al. Clinicopathologic Characteristics and Treatment Outcomes of Patients With Up-Front Metastatic Breast Cancer: Single-Center Experience in India. JGO. 2019 Dec;(5):1–9.