

Pharmacoeconomic Analysis of Chemotherapy Regimens in Breast Cancer Management; An Oncology Pharmacoeconomical Approach

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ABSTRACT

Background: Pharmacoeconomic evaluation of breast cancer drugs is essential due to their high treatment costs. Comparing therapeutic options and associated expenses supports better decision-making and helps optimize resource utilization. Increased clinician awareness of pharmacoeconomic principles can enhance patient outcomes while reducing overall treatment costs. This study aims to evaluate the pharmacoeconomic aspects of different therapeutic regimens used in the management of breast cancer. **Materials and Methods:** A 12-month prospective observational and economic study was conducted at Bharath Hospital and Institute of Oncology (BHIO), Mysore, Karnataka. A total of 204 breast cancer patients receiving chemotherapy and meeting study criteria were included. Data from patient records and questionnaires were analyzed to evaluate the Pharmacoeconomics of chemotherapy regimens. **Results:** A total of 204 patients (mean age 52±8.9 years) were included. Adriamycin, Cyclophosphamide, and Paclitaxel (Regimen 1) were most prescribed (34.31%). Average management cost was ₹2,93,114.67; direct and indirect costs were ₹6,16,591.7 and ₹8,374.11, respectively. Adjuvant treatment averaged ₹3,25,807, and neoadjuvant ₹15,88,77.5 Regimen 1 showed most cost-effective, with 28.57% excellent and 68.57% moderate quality of life. Costs were significantly higher in adjuvant settings. **Conclusion:** Breast cancer treatment places a considerable economic strain on both patients and healthcare systems. Enhancing health insurance and resource-sharing strategies is crucial to reduce this burden. Additional support services may also be needed to ease patient expenses. Conducting pharmacoeconomic assessments of available treatment options can assist policymakers in allocating healthcare resources more efficiently for cancer management.

Keywords: Chemotherapy, Pharmacoeconomic evaluation, Cost-effectiveness, Breast cancer.

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Received: 02-05-2025;

Revised: 21-07-2025;

Accepted: 12-09-2025.

INTRODUCTION

Cancer is a global health concern with high morbidity and mortality (Torre *et al.*, 2016). Defined as uncontrolled cell growth and metastasis, it caused about 9.6 million deaths in 2018, ranking as the second leading cause of death (NCI, 2021; CDC, 2021). Common cancers in men include lung, prostate, colorectal, stomach, and liver, while in women breast, colorectal, lung, cervical, and thyroid cancers predominate (CDC, 2023).

Breast cancer develops when breast cells divide uncontrollably (Alkabban and Ferguson, 2022). Invasive ductal carcinoma accounts for 70-80% of cases, while lobular carcinoma is less

frequent (Breastcancer.org, 2024; WHO, 2024). It represents over one in ten new cancer cases worldwide, affecting 12.5% of women and 0.5-1% of men (Cancer.Net, 2023; City of Hope, n.d.). Incidence increases with age, from 1.5 per 100,000 in women aged 20-24 to 421.3 per 100,000 at ≥65 years (Cancer.Net, 2023). In 2023, breast cancer caused 43,700 U.S. deaths, including 530 men (Breastcancer.org, 2024; WHO, 2024).

Surgery, either lumpectomy or mastectomy, is the primary treatment, usually followed by radiotherapy or chemotherapy (Cancer Research UK, 2024). Other options include chemotherapy, endocrine therapy, targeted therapy, monoclonal antibodies, and immunotherapy, depending on tumor type and stage (Kumar *et al.*, 2018; Burstein *et al.*, 2014). BCS or mastectomy with axillary staging improves local control in early-stage disease (Giuliano *et al.*, 2017). Radiation lowers recurrence (Whelan *et al.*, 2015). Chemotherapy regimens such as AC, FEC/FAC, TC, and taxanes improve survival (EBCTCG, 2012). HER2-positive disease



DOI: 10.5530/jyp.20250162

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benefits from trastuzumab±pertuzumab (Slamon *et al.*, 2011), while triple-negative responds to pembrolizumab (Schmid *et al.*, 2022). Supportive and palliative care enhance quality of life (Coleman *et al.*, 2014).

Breast cancer also creates major economic burden. Costs include screening, prevention, treatment, surgery, and indirect losses like reduced productivity and premature death (Millar and Millward, 2007). Pharmacoeconomic assessments analyze direct medical, direct non-medical, and indirect costs. Chemotherapy costs vary due to equipment and supply differences (Sohi *et al.*, 2021). In limited insurance settings, high costs restrict care access, making cost-effectiveness analyses vital for selecting affordable regimens with equivalent outcomes (Kashyap *et al.*, 2020). Thus, our study aimed to assess and evaluate the often-overlooked part that is pharmacoeconomic of different regimens used in the breast cancer management.

MATERIALS AND METHODS

This study is a prospective observational and economic analysis conducted over a year duration time at Bharath Hospital and Institute of Oncology Mysore, Karnataka, a multi-specialty center offering comprehensive oncology services.

Study Criteria

Patients aged 18 years or older with Breast Cancer, receiving treatment in the oncology department, and providing written informed consent after explanation of the study procedures were included. Patients under 18, those with unstable medical or psychiatric conditions, or those unwilling to share required information (direct, indirect, or non-medical costs and QoL questionnaire) were excluded.

Sampling techniques and sample size calculation

A prospective random sampling method was applied, and the sample size was calculated to enroll minimum of 204 participants, based on a 5% margin of error, 50% population proportion, 0.05 precision, and a 95% confidence interval, considering a 13% prevalence of breast cancer in India (Mehrotra and Yadav, 2022).

Data collection

Patients meeting the inclusion criteria were enrolled, and data were collected using a structured form covering demographics (name, age, gender, socio-economic status), clinical details, history, prescribed regimen (drug, dose, route, frequency, duration), drug-related problems, and payment mode. Indirect costs were recorded with a validated questionnaire. Health-related Quality of Life (QoL) was assessed using a 25-item validated tool (Cronbach's alpha: 0.883) addressing mobility, self-care, daily activities, pain, and psychological status (File S2). QoL was classified as very poor, poor, moderate, or excellent. Direct

costs came from medical bills, while indirect costs were obtained through patient interviews.

Ethical approval

The study was conducted in accordance with Institutional Human Ethics Guideline. Duly signed of written Informed Consent form (File S3) by patients are involved with no patient's interventions. Ethical approval was obtained from the Institutional Ethics Committee, Bharath Hospital and Institute of Oncology (BHIO), Mysore (File S4).

Data Analysis

Data were verified by the oncologist and entered into Microsoft Excel, then analyzed using SPSS v25.0 (IBM) and JMP Student Edition 18. Categorical variables were summarized as frequencies and percentages, while continuous variables were presented as Mean±Standard Deviation. Direct and indirect treatment costs were compared using the Bonferroni post hoc test and independent sample *t*-test.

RESULTS

Demographics Characteristics of the Patients

A total of 204 female patients were enrolled, mostly aged 41-50 years (35.3%) and 51-60 years (38.2%). 70% were from urban areas and 30% from rural regions. Most belonged to the middle-income group (62.7%), followed by high-income (22.5%) and low-income (14.7%). Payment modes included SAST (53.9%), ECSI (19.6%), cash (17.2%), allied insurance (5.4%), ECHS (2.5%), and railways (1.5%).

Diagnostic methods were mainly FNAC (98.03%), PET-CT (94.11%), IHC (87.25%), and mammography (80.39%). Most patients were diagnosed at Stage IV (26.47%), followed by Stage IIA (20.58%) and Stage IIIA (20.58%), with Stage I being least common (2.94%).

The predominant type was invasive ductal carcinoma (59.80%), followed by metastatic (16.6%), infiltrating ductal (18.62%), and invasive lobular carcinoma (4%). HER2-negative tumors accounted for 62.74%, with ER and PR-negative cases at 55.88% and 57.84%, respectively.

Surgery was the Primary management (70%) followed by Chemotherapy (37%), radiation (27%), targeted therapy (26%), and hormonal therapy (13%). Regimen 1 (paclitaxel, cyclophosphamide, Adriamycin) was most used (34.31%), followed by Regimen 2 (docetaxel, cyclophosphamide; 16.66%), while Regimen 7 (eribulin) was least used (3.92%) see Table 1.

Table 1: Distribution of Demographic Details and Clinical Parameters.

Demographic Details		
Variables	Frequency (n=204)	Percentage
Age		
Less than 40 Years	16	7.84%
41-50 Years	72	35.29%
51-60 Years	78	38.23%
61-70 Years	34	16.66%
Greater than 70 Years	4	1.96%
Gender		
Male	0	0
Female	204	100%
Diagnostics Parameters		
FNAC	200	98.03%
PET CET	192	94.11%
IHC	178	87.25%
Mammogram	164	80.39%
USG-Breast	124	60.78%
Biopsy	46	22.54%
X Rays	42	20.58%
2D Echo	66	32.35%
Types of Breast Cancer		
IDC	122	59.80%
IFDC	34	16.66%
ILC	10	4.90%
MBC	38	18.62%
Stage of Breast Cancer		
Stage I	6	2.94%
Stage IIA	42	20.58%
Stage IIB	28	13.72%
Stage IIIA	42	20.58%
Stage IIIB	24	11.76%
Stage IIIC	8	3.92%
Stage IV	54	26.47%
Type of Treatment		
Surgery	144	70.58%
Chemotherapy	76	37.25%
Targeted therapy	44	21.56%
Hormonal therapy	28	13.72%
Radiation therapy	56	27.45%
Type of Surgery		
MRM	38	18.62%
MRM+AD	68	33.33%
BCS	10	4.90%

Demographic Details				
Variables		Frequency (n=204)	Percentage	
BCS+AD		28	13.72%	
NIL		60	29.41%	
Description of Chemotherapy regimens				
Regimen	Name of Regimen	Composition of Regimen	Frequency n=274	%
1	AC+PACLI	Adriamycin, Cyclophosphamide and Paclitaxel	70	34.31%
2	TC	Docetaxel and Cyclophosphamide	34	16.66%
3	PACLI	Paclitaxel	16	7.84%
4	GEMCI+CARBO	Gemcitabine and Carboplatin	18	8.82%
5	TRASTU	Trastuzumab	28	13.72%
6	PACLI+TRASTU	Paclitaxel and Trastuzumab	10	4.90%
7	ERIBULIN	Eribulin	8	3.92%
8	OTHERS	Zoledronic acid, Fulvestarant, CMF, TC+Pacli	20	9.80%
Details of Economic Status				
Middle-Income Group		128	62.74%	
High-Income Group		46	22.54%	
Low-Income Group		30	14.70%	
Details of Residence				
Urban		142	70%	
Rural		62	30%	
Details of Mode of Payment				
SAST		110	53.92%	
ECSI		40	19.60%	
CASH		35	17.15%	
Allied Insurance Company		11	5.39%	
ECHS		5	2.45	
Railways		3	1.47	

Pharmacoeconomic analysis of Chemotherapy regimens of Breast Cancer

Direct Medical Cost

The mean total direct medical costs came to Rs. 636841.7. Targeted therapy costs accounted for 32.5%, followed by Surgical treatment as primary treatment for breast cancer 19.30% cost radiation therapy costs (19.06%), chemotherapy costs (14.06%), hospitalization costs (6.09%), diagnostic costs (4.7%), chemo-port placement costs (3.17%), and hormonal therapy costs (0.29%) see Table 2.

Direct Non Medical and Indirect Cost

The outcome of the questionnaire applied to the 204 patients Out of which for transport 31.37% spent <500, 37.25% spent 500-1000, 17.64% spent 1000-2000 and 13.72% spent >2000. The

Table 2: Cost Category of Direct Medical Cost.

Cost Categories	Total cost (Rs)	Percentage (%)
Hospitalization cost	38843.13	6.09
Pre-medication cost	4236.39	0.68
Diagnostic cost	30434.8	4.7
Surgical cost	123236	19.3
Radiation therapy cost	121405.55	19.06
Hormonal therapy cost	1830.42	0.28
Chemotherapy cost	89588.6	14.06
Targeted therapy cost	207016.81	32.5
Chemo-port placement cost	20250	3.17
Total Cost	636841.7	100

below table shows the mode of transport to the hospital by using cars 40.19%, buses 44.11%, rented taxis 11.76% and the remaining 3.92% motorbikes. Travel time was <60 min for 33.3% of patients, 60-90 min for 23.5%, 90-120 min for 32.4%, and >120 min for 10.8%. Meal costs were <₹150 for 22.5% of patients, ₹150-300 for 43.1%, and >₹300 for 34.3%. Time at hospital was <3 hr for 34.3%, 4-7 hr for 62.7%, and >8 hr for 2.9%.

Among the subject 80 missed their work due to illness while 124 continued working. Hospital visits were accompanied by a spouse (32.4%), son (40.2%), daughter (15.7%), sibling (8.8%), or relatives (2.9%). Productivity loss was reported by 10.8% of patients, while 89.2% had none. Additional medical costs were <₹5000 for 25.5%, ₹5000-10,000 for 2.9%, ₹10,000-20,000 for 23.5%, and >₹20,000 for 48.0% see Table 3.

Comparison of Total Cost between Different regimen Among Adjuvant Setting

A Bonferroni Post hoc test was used to compare the total cost of adjuvant regimens. Result shows that Regimen 5 which contain trastuzumab has significant more of total cost when compared to other regimens in adjuvant regimens shown in Tables 4 and 5.

Comparison of Total Cost Between Different Regimen Among Neo Adjuvant Settings

A Bonferroni *post hoc* test was used to compare the total cost of neoadjuvant regimens. The results shows that Regimen 6 which contains paclitaxel and trastuzumab has significant more of total cost when compared to other neoadjuvant regimens shown in Tables 6 and 7.

Table 3: Direct Non-Medical and Indirect Costs.

Category	Value	No. of subjects	Percentage (%)
Transportation cost	<500	64	31.37
	500-1000	76	37.25
	1000-2000	36	17.64
	>2000	28	13.72
Mode of Transport	Car	82	40.19
	Bus	90	44.11
	Taxi	24	11.76
	Motor bike	8	3.92
Travel time to hospital	<60 min	68	33.33
	60-90 min	48	23.52
	90-120 min	66	32.35
	>120 min	22	10.78
Cost of meals during hospital visit	<150	46	22.54
	150-300	88	43.13
	>300	70	34.31
Time spent in hospital	<3 hr	70	34.31
	4-7 hr	128	62.74
	>8 hr	6	2.94
Absence from work	Yes	80	39.21
	No	124	60.78
Accompanying person	Spouse	66	32.35
	Son	82	40.19
	Daughter	32	15.68
	Brother or sister	18	8.82
	other	6	2.94
Lost Productivity	Yes	22	10.78
	No	182	89.21
Other expenses	<5000	52	25.49
	5000-10000	6	2.94
	10000-20000	48	23.52
	>20000	98	48.03

Table 4: Types of Treatment Regimens used in Adjuvant Setting.

Type of Regimen	n	Mean cost	Std. Deviation
1	52	290042.4	81886.82
2	28	28775.41	74286.27
3	10	279265.96	52906.4
4	14	272776.09	99868.99
5	18	618112.54	155461.79
6	6	432255.12	161965.3
7	4	378521.46	84766.24
8	12	306712.28	32406.02
Total	144	325807.65	92943.47

Table 5: Comparison of Cost of different regimens among Adjuvant Regimen.

Regimen	Regimen	Mean diff.	Std. Error	t-test	p-value	95% CI lower limit	95% CI upper limit
1	2	2266.99	31918.014	0.07	1	-102390.01	106923.99
	3	10776.44	47018.17	0.23	1	-143392.95	164945.83
	4	17266.31	40999.431	0.42	1	-117168.04	151700.66
	5	-328070.13	37237.683	-8.81	<0.001	-450169.97	-205970.3
	6	-142212.72	58709.482	-2.42	0.515	-334717.12	50291.69
	7	-88479.06	70653.535	-1.25	1	-320147.21	143189.09
	8	-16669.88	58709.482	-0.28	1	-209174.29	175834.53
2	3	8509.45	50163.096	0.17	1	-155971.94	172990.84
	4	14999.32	44571.08	0.34	1	-131146.23	161144.87
	5	-330337.13	41137.244	-8.03	<0.001	-465223.36	-195450.89
	6	-144479.71	61257.091	-2.36	0.604	-345337.55	56378.14
	7	-90746.05	72784.269	-1.25	1	-329400.73	147908.63
	8	-18936.87	61257.091	-0.31	1	-219794.72	181920.97
3	4	6489.87	56378.453	0.12	1	-178371.25	191350.99
	5	-338846.58	53704.949	-6.31	<0.001	-514941.46	-162751.69
	6	-152989.16	70316.285	-2.18	0.937	-383551.48	77573.17
	7	-99255.5	80557.424	-1.23	1	-363397.83	164886.83
	8	-27446.32	70316.285	-0.39	1	-258008.65	203116.01
4	5	-345336.45	48522.846	-7.12	<0.001	-504439.57	-186233.33
	6	-159479.03	66442.644	-2.4	0.545	-377339.95	58381.89
	7	-105745.37	77199.376	-1.37	1	-358876.89	147386.14
	8	-33936.19	66442.644	-0.51	1	-251797.11	183924.73
5	6	185857.42	64189.692	2.9	0.147	-24616.23	396331.06
	7	239591.08	75269.086	3.18	0.064	-7211.15	486393.3
	8	311400.26	64189.692	4.85	<0.001	100926.61	521873.9
6	7	53733.66	87895.356	0.61	1	-234469.25	341936.56
	8	125542.84	78615.996	1.6	1	-132233.68	383319.35
7	8	71809.18	87895.356	0.82	1	-216393.73	360012.09

Table 6: Types of Regimens used in Neoadjuvant Settings.

Type of Regimen	n	Mean Cost	Std. Deviation
1	18	135596.3	33347.69
2	6	89917.32	7209.38
3	6	57894.45	130088.93
4	4	57181.72	7444.82
5	10	309056.27	77730.89
6	4	367485.38	18652.88
7	4	169806.88	86758.38
8	8	84082.04	71243.95
Total	60	158877.50	54059.61

Table 7: Comparison of Total Cost Between Different Regimen Among Neoadjuvant Settings.

Regimen	Regimen	Mean diff.	Std. Error	t-test	p-value	95% CI lower limit	95% CI upper limit
1	2	-3576.98	44134.073	-0.08	1	-163159.48	156005.53
	3	-122298.15	44134.073	-2.77	0.33	-281880.65	37284.35
	5	-124889.73	36925.215	-3.38	0.083	-258406.03	8626.57
	6	-231889.08	51751.788	-4.48	0.006	-419016.15	-44762.01
	7	-34210.58	51751.788	-0.66	1	-221337.65	152916.49
	8	51514.26	51751.788	1	1	-135612.81	238641.33
2	3	-118721.17	54052.98	-2.2	1	-314169.03	76726.68
	5	-121312.75	48346.455	-2.51	0.583	-296126.63	53501.12
	6	-228312.1	60433.068	-3.78	0.033	-446829.44	-9794.76
	7	-30633.6	60433.068	-0.51	1	-249150.94	187883.74
	8	55091.24	60433.068	0.91	1	-163426.1	273608.58
3	5	-2591.58	48346.455	-0.05	1	-177405.45	172222.3
	6	-109590.93	60433.068	-1.81	1	-328108.27	108926.42
	7	88087.57	60433.068	1.46	1	-130429.77	306604.92
	8	173812.41	60433.068	2.88	0.262	-44704.93	392329.76
4	1	-78414.58	51751.788	-1.52	1	-265541.65	108712.49
	2	-81991.56	60433.068	-1.36	1	-300508.9	136525.78
	3	-200712.73	60433.068	-3.32	0.095	-419230.08	17804.61
	5	-203304.31	55387.822	-3.67	0.043	-403578.76	-3029.86
	6	-310303.66	66201.11	-4.69	0.004	-549677.42	-70929.9
	7	-112625.16	66201.11	-1.7	1	-351998.92	126748.6
	8	-26900.32	66201.11	-0.41	1	-266274.08	212473.44
5	7	90679.15	55387.822	1.64	1	-109595.3	290953.6
	8	176403.99	55387.822	3.18	0.13	-23870.46	376678.44
6	7	197678.5	66201.11	2.99	0.204	-41695.26	437052.26
	8	283403.34	66201.11	4.28	0.01	44029.58	522777.1
7	8	85724.84	66201.11	1.29	1	-153648.92	325098.6

Table 8: Comparison of Total Cost Between Adjuvant and Neoadjuvant Settings.

Types of Therapy	n	Mean Total cost	SD	t	p Value
ACT	144	325807.65	92943.47	5.24	0.001*
NACT	60	158877.50	54059.61		

Table 9: Details of Pharmacoeconomic evaluation of breast cancer regimens.

Regimens	Name of Regimens	Cost Effective analysis			Cost outcome analysis					
		Average total direct Cost	Average total indirect Cost	Average overall Cost	Poor QOL	Moderate QOL	ExcellentQOL	Rank	Comment	High QoL
1	AC+PACLI	242624.83	7702.85	250327.69	2.85%	68.57%	28.57%	1 st	High QoL, Low Cost	97.14%
2	TC	253386.8	8164.70	261551.5	0.00%	88.20%	11.76%	5 th	Good QoL, Moderate Cost	99.96%
3	PACLI	259041.65	12210	271251.65	12.50%	75%	12.50%	7 th	Acceptable QoL, average cost	87.50%
4	GEMCI+CARBO	256324	8542.22	264866.2	11.11%	88.88%	0.00%	6 th	High QoL, slightly higher poor outcome	88.88%
5	TRASTU	481674.5	8714.28	490388.78	14.28%	50%	35.71%	8 th	Most expensive, poorest QoL	85.71%
6	PACLI+TRASTU	39947.22	6400	406347.22	20%	80%	0.00%	4 th	Best QoL, higher cost	100%
7	ERIBULIN	266064.17	8100	274164.17	0.00%	100%	0.00%	3 rd	Excellent QoL, slightly higher cost	100%
8	Zoledronic acid, Fulvestarant, CMF, TC+Pacli	241740.7	8480	250220.7	0.00%	100%	0.00%	2 nd	Best QoL, Low Cost	100%

Comparison of Total Cost Between both Adjuvant and Neoadjuvant settings

Independent sample t test displays. The mean cost of Adjuvant Chemotherapy (ACT) was ₹3,25,807.65±92,943.47, which was significantly higher compared to Neoadjuvant Chemotherapy (NACT) at ₹1,58,877.50±54,059.61. Statistical analysis ($t=5.24$, $p=0.001$) confirmed that the difference in cost between ACT and NACT was highly significant, suggesting that ACT imposes a greater financial burden on patients compared to NACT shown in Table 8.

Cost Effectiveness and outcome analysis

The comparative analysis of eight breast cancer treatment regimens highlights Regimens 1 and 8 as the most cost-effective, delivering high-quality outcomes at the lowest costs. Regimen 1 achieved a combined 97.14% of excellent and moderate QOL with a minimal poor outcome (2.85%) at ₹2.5 lakh, while Regimen 8 offered 100% moderate QOL with zero poor outcomes at an even slightly lower cost. Overall, the evaluation supports Regimens 1 and 8 as optimal choices for balancing treatment quality and cost-efficiency see Table 9.

DISCUSSION

Breast cancer is one of the most common cancers in women and leading factor of cancer-related fatalities, placing a heavy financial strain on healthcare systems. This prospective observational study assessed the economic burden of various chemotherapy regimens used in breast cancer treatment (National Cancer Institute [NCI], 2021; Centers for Disease Control and Prevention [CDC], 2021; Breastcancer.org, 2023). A total of 204 patients were included over six months, with an average age of 52±8.9 years. These findings are in line with those of Singh *et al.*, (2013), who reported a mean age of 48.67±8.32 years.

Most of the participants were from middle-income households. Invasive Ductal Carcinoma (IDC) was the predominant type, followed by Metastatic Breast Cancer (MBC), Infiltrating Ductal Carcinoma (IFDC), and Invasive Lobular Carcinoma (ILC).

Eight chemotherapy protocols were identified, with Adriamycin, Cyclophosphamide, and Paclitaxel being the most frequently used combination. This aligns with the report by Roy *et al.*, (2012), who noted better disease control and improved quality of life with this regimen.

The mean direct cost per patient was ₹616,591.7, with targeted therapy accounting for 33.33% of this expenditure and premedication costs being the lowest. Transportation and meal expenses averaged ₹6,530.98 and ₹1,843.13, respectively, and 40.19% of patients primarily traveled by car. Comparable research by Afkar *et al.*, (2021) reported mean direct costs of \$3,960 in public hospitals and \$10,050 in private hospitals. Lidgren *et al.*, (2007) documented costs of 280,000 SEK (\$39,000) for patients

under 65 and 351,000 SEK (\$48,900) during the first year after recurrence. Similarly, Kim *et al.*, (2015) found that the total socioeconomic costs associated with breast cancer increased by 40.7%, from \$668.49 million in 2007 to \$940.75 million in 2010, with direct medical expenses increasing from \$278.71 million to \$399.22 million.

Cost-effectiveness analysis showed that Regimen 1 had an average total cost of ₹250,327.69, with 2.85% of patients reporting low quality of life, 68.75% moderate quality of life, and 28.57% high quality of life (Haidary *et al.*, 2023).

CONCLUSION

This research analyzes the financial implications of breast cancer therapy. The treatment process often leads to significant expenses, with major cost drivers being surgical interventions and targeted medications. Among the regimens reviewed, AC+PACLI was most commonly administered and demonstrated both therapeutic effectiveness and acceptable cost benefits. A notable disparity was identified between Adjuvant Chemotherapy (ACT) and Neoadjuvant Chemotherapy (NACT), where ACT generated higher treatment-related costs. Many individuals managed part of their expenses through government-supported funding schemes, which reduced personal financial pressure. The results underline the need for strategies that reduce the monetary burden on patients and reveal how different chemotherapy approaches influence quality of life. Although moderate QOL was frequently reported, there was wide variation among patients, indicating the necessity for tailored and patient-oriented care plans. Detailed pharmacoeconomic evaluations of available regimens will assist policymakers in distributing healthcare resources efficiently and improving the overall management of breast cancer care.

ACKNOWLEDGEMENT

We acknowledge and appreciate Sri Adichunchanagiri College of Pharmacy, Adichunchanagiri University, BG Nagara and Bharath Hospital Institute of Oncology, Mysore for the cooperation to conduct this study. Also, we thank patients participated in the study for their support.

ABBREVIATIONS

3DCRT: 3-Dimensional Conformal Radiation Therapy; **IMRT:** Intensity-Modulated Radiation Therapy; **LINAC:** Linear Accelerator; **CT:** Chemotherapy; **RT:** Radiation Therapy; **IDC:** Invasive Ductal Carcinoma; **IFDC:** Infiltrating Ductal Carcinoma; **ILC:** Invasive Lobular Carcinoma; **MBC:** Metastatic Breast Cancer; **PETCT:** Positron Emission Tomography-Computed Tomography; **QOL:** Quality of Life; **SAST:** Suvarna Arogya Suraksha Trust; **TNM:** Tumor Node Metastatic; **PR:** Progesterone Receptor; **HER2:** Human Epidermal Growth Factor Receptor-2; **FNAC:** Fine Needle Aspiration Cytology; **IHC:** Immuno-Histo Chemistry; **ACT:**

Adjuvant Chemotherapy; **NACT**: Neoadjuvant Chemotherapy; **MRM**: Modified Radical Mastectomy; **BCS**: Breast Conservation Surgery; **AD**: Axillary Dissection; **ER**: Estrogen Receptor; **ESIC**: Employees State Insurance Corporation; **ECHS**: Ex-Servicemen Contributory Health Scheme; **USG**: Ultrasonography; **SPSS**: Statistical Package for Social Sciences; **MRI**: Magnetic Resonance Imaging; **GEMCI**: Gemcitabine; **CARBO**: Carboplatin; **PACLI**: Paclitaxel; **AC**: Adriamycin, Cyclophosphamide; **TC**: Docetaxel and Cyclophosphamide; **T-DM1**: Trastuzumab Emtansine; **FAC**: Fluorouracil, Doxorubicin, and Cyclophosphamide; **FEC**: Fluorouracil, Epirubicin, Cyclophosphamide.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ETHICAL APPROVAL

The study was conducted in accordance with the Ethical guidelines for biomedical research on human participants without any interventions, after obtaining approval from the Institution Ethics Committee (IEC) vide IEC No: ECM/09/23.

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Cite this article: Haidary BI, Venkataraman R, Pasha I. Pharmacoeconomic Analysis of Chemotherapy Regimens in Breast Cancer Management; An Oncology Pharmacoeconomical Approach. *J Young Pharm*. 2025;17(4):970-9.