ORIGINAL ARTICLE

ASSESSMENT OF COMPLIANCE TO CHEMOTHERAPY AMONGST BREAST CANCER PATIENTS IN A RADIOTHERAPY FACILITY: A PROSPECTIVE STUDY

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ABSTRACT

Background: Breast cancer is a leading cause of cancer-related deaths worldwide, particularly in Sub-Saharan Africa, where late-stage presentation and poor compliance with therapy are prevalent.

Objective: To assess the level of compliance with chemotherapy among breast cancer patients and identify factors associated with compliance in a tertiary hospital in Northern Nigeria.

Methods: A prospective cross-sectional study was conducted from February 2023 to February 2024 among 100 breast cancer patients receiving chemotherapy at Ahmadu Bello University Teaching Hospital, Zaria. Data were collected using structured questionnaires and patient interviews. Statistical analysis was performed using SPSS v25.0. Chi-square tests and logistic regression were applied to identify associations.

Results: The mean age was 49.3±12.2 years. A total of 67 (67%) and 33 (33%) were compliant and non-compliant with their chemotherapy regimen, respectively. Non-compliance was mainly attributed to financial constraints (32%), severity of disease (11%), and feeling well (1%). Stage at diagnosis (p=0.0002), indication for chemotherapy (p=0.00001), chemotherapy-related anaemia (p=0.007), monthly income (p=0.015), and psychological satisfaction (p=0.00001) were significantly associated with compliance.

Conclusion: Non-compliance with chemotherapy is high among breast cancer patients, driven by financial, disease-related, and psychological factors. Addressing these barriers is crucial to improving outcomes.

Keywords: Breast cancer, chemotherapy, compliance, non-compliance

INTRODUCTION

Cancer ranks as the leading non-communicable disease cause of death and an important barrier to increasing life expectancy in many countries.[1,2] According to estimates from the World Health Organization (WHO) in 2019,[2] cancer is the first or second leading cause of death before the age of 70 years. Cancer's rising prominence as the leading cause of death partly reflects a marked decline in the mortality rates of stroke and coronary heart disease relative to cancer, in many countries.[2]

Female breast cancer is the second leading cause of global cancer incidence in 2022, with an estimated 2.3 million new cases, representing 11.6% of all cancer cases.[2] It is the fourth leading cause of cancer mortality worldwide with 666,00 deaths.[2] Among women, breast cancer accounts for 1 in 4 cancer cases and for 1 in 6 cancer deaths, ranking first in incidence for the vast majority of countries (159 of 185 countries) and mortality in 110 countries.[2]

The incidence rate of breast cancer in sub-Saharan Africa rapidly increased between the mid-1990s and the mid-2010s by > 5% per year in Malawi (Blantyre), Nigeria (Ibadan), Seychelles, and by 3% to 4% per year in South Africa (Eastern Cape) and Zimbabwe (Harare).[2] The mortality rates in this region have increased simultaneously and are ranked the world's highest. Low survival rates from breast cancer in Sub-Saharan Africa are largely attributable to late-stage presentation, with 77% of all staged cases presenting at stage III/IV at diagnosis.[3] In Nigeria, breast cancer cases were historically low but are now increasing as a result of urbanization and lifestyle changes.[4] According to GLOBOCAN 2022, there are 32,278 new cases of breast cancer in Nigeria, accounting for 25.3 % of all cancers, with a mortality of 20.5 % (16,332).[5]

Chemotherapy is the use of cytotoxic drugs, hormones, and targeted therapy in the treatment of cancer.[6] It is a systemic therapy that kills cancer cells that may be circulating in the body. Chemotherapy plays an important role in the management of cancers as the knowledge of tumour kinetics, principles of combination chemotherapy, as well as the use of premedications guides the oncologist in achieving the maximal effect of tumour control with minimal toxicity to the normal tissues.[6] Chemotherapy is used in combination with other modalities like surgery, radiotherapy, in the management of early-stage, locally advanced, and metastatic breast cancers, either in Neoadjuvant, Adjuvant, or palliative settings.[7]

Treatment compliance is defined by the World Health Organization (WHO) (2003) as "the extent to which a person's behaviour—taking medication, following a diet and/or executing lifestyle changes, corresponds with agreed recommendation from a health care provider".[8] Compliance is a multidimensional phenomenon, and according to the WHO, is influenced by patient-related factors, therapy-related factors, disease-related factors, health care system-related factors and socioeconomic factors.[8]

Compliance with treatment in cancer patients becomes a serious burden due to various factors associated with their belief in the diagnosis, hope, and expectations of the treatment, the cost of cancer treatment, and the availability of facilities for treatment.[8]

Several studies assess compliance with drug treatment in many branches of medicine;

however, there are limited studies in clinical oncology, and those available are more in developed countries.[9]

MATERIALS AND METHODS

Study Area

The study was conducted in the Department of Radiotherapy and Oncology, Ahmadu Bello University Teaching Hospital, Zaria, which is one of the first-generation federal tertiary hospitals in Nigeria and the first in Northern Nigeria. Zaria is an ancient city in Kaduna State of Nigeria, located on latitude 11.11 and longitude 7.72 and situated 644 meters above sea level, covering a total area of 563 km^2 and an estimated population of 1,138,246 people as of 2023, as estimated by UN World Urbanization Prospects.[10]

Duration of Study

The data was collected within a period of one year from 10th February 2023 to 10th February 2024 as stated in the approval of the Scientific and Health Research Ethics Committee of the Ahmadu Bello University Teaching Hospital, Zaria.

Study Design

The study was a prospective cross-sectional study.

Sample Size Determination

From a previous study conducted in Ahmadu Bello University Teaching Hospital, Zaria, the prevalence of breast cancer was 12.6%[11] (0.12).

The minimum sample size was calculated using the Leslie Kish formula:

[12] where:

Z (α= 0.05) = 1.96, **p=** (0.12), **q**=1-p (0.88), **d** = (0.05)

Therefore, the minimum sample size is n=162

But from unpublished data from the registry of the Radiotherapy and Oncology Department of Ahmadu Bello University Teaching Hospital, Zaria, the number of breast cancer cases per year is 200.

Therefore, the minimum sample size using a finite population correction:

$n = N/ 1+N/N^o$ [12]

n= Final Sample Size, N= Sample size = 162, N^o= estimated sample size for a population of less than 10,000

n= 90

Allowing for non-response of 10% of the minimum sample size, the final sample size to allow for non-response is n/0.9, i.e., 90/0.9= 100.

Eligibility Criteria

Inclusion Criteria

All patients with histologically confirmed breast cancer and an immunohistochemistry profile who are on treatment at the radiotherapy and oncology department.

Exclusion criteria

Patients with the following were excluded from the study.

1. Patients with poor clinical performance status, ECOG 2 and above.
2. Patients who could not get four cycles of chemotherapy within the study period.
3. A patient who had a change in the line of chemotherapy during treatment.
4. Patients who cannot accurately recall events surrounding their symptoms and who have no relatives who can do so on their behalf.

Data Collection

Data was collected from patients' case notes and interviews of patients via administered questionnaires. The questionnaire was validated in a multi-step approach, running

pilot tests on 10 patients (10% of the calculated sample size), and checking for internal consistency.

Total population sampling was done with all breast cancer patients who met the inclusion criteria and gave consent. The patients were interviewed, and relevant socio-demographic details, history of illness, and the interventions received were recorded. The patients were clinically examined and relevant investigations, including among others radiological evaluation from chest x-ray, chest computed tomography scan, Abdominopelvic Computed tomography, ultrasound scan, and then properly staged using the AJCC/TNM 8th edition staging system. The indications for chemotherapy, chemotherapy regimen, dosages, and the date the patient commenced chemotherapy were recorded from the first cycle to the last cycle during the study period in a semi-structured questionnaire.

Data Analysis

The data collected was imputed in a secured and passworded computer using Statistical Packages for Social Sciences (SPSS) version 25.0, manufactured by the International Business Machines Corporation (IBM), California. Patients were considered compliant if they completed the recommended number of chemotherapy cycles within the planned treatment duration plus an allowable extension of 25% of the total planned time, while Non-compliance was defined as failure to meet this criterion.[13] Other relevant data collected were analysed and presented using tables, figures, and charts as applicable. The magnitude of the patients' compliance with chemotherapy was computed, and their associations with the study variables were assessed using the Chi-square. A logistic regression model was used for regression analysis to rule out confounders. A 95% confidence interval was used for this research.

Ethical Considerations

Ethical approval was obtained from the Scientific and Health Research Ethics Committee of Ahmadu Bello University Teaching Hospital, Zaria (ABUTHZ/HREC/01/02/2023).

RESULTS

A total of 100 breast cancer patients participated in the study, with a mean age of 49.3±12.2 years (Age range 25-77 years), a median age of 50 years, and a modal age group of 51-60 years. Other socio-demographic variables are outlined in Table 1.

The majority of the patients, 94 (94%), had invasive ductal carcinoma, and 100 (100%) presented with a breast lump. Many of the patients, 71 (71%), presented with locally advanced (stage III) disease. Triple negative 49 (49%) was the commonest molecular subtype. Other clinicopathological characteristics of the study are shown in Table 2.

Sixty-seven (67%) of the patients were compliant with chemotherapy, and thirty-three (33%) were non-compliant, as shown in Figure 2. Reasons for non-compliance were financial constraints 32 (32.0%), severity of the disease 11 (11.0%), and felt well 1 (1.0%). The various factors associated with compliance are shown in Table 3.

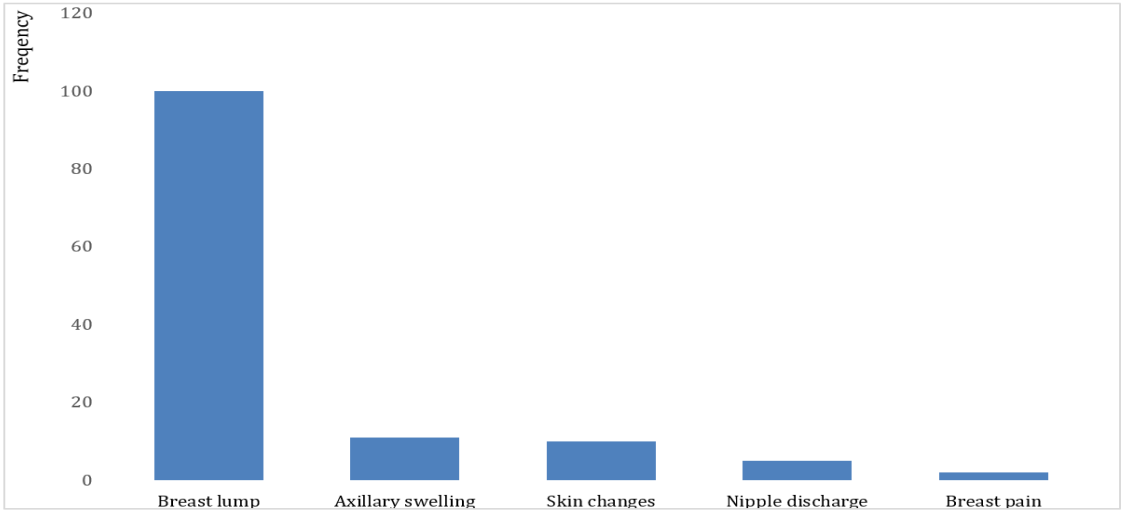

Figure 1. Patient's symptoms at presentation

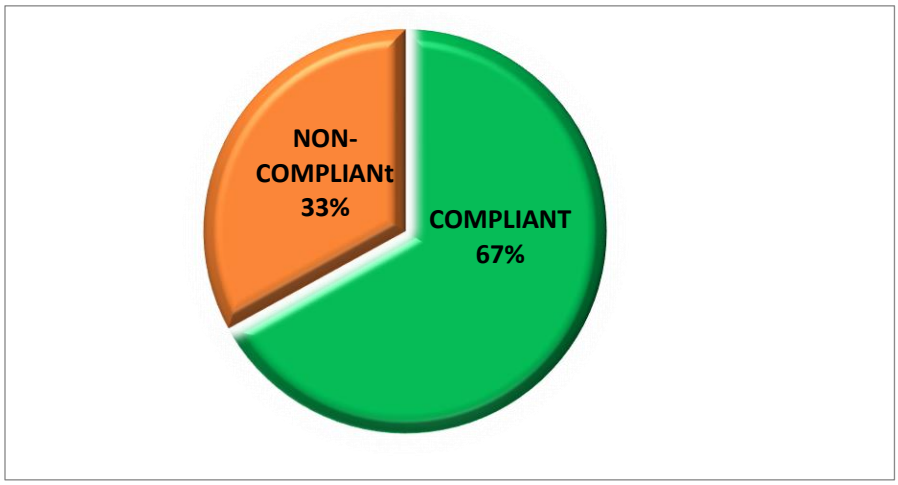

Figure 2. Level of Chemotherapy Compliance

Table 1. Sociodemographic characteristics of the study population

Variable (N=100)	Frequency (%)
Age (years)	
≤ 40	28 (28.0)
41-50	25 (25.0)
51-60	30 (30.0)
61-70	15 (15.0)
71-80	2 (2.0)
Sex	
Male	1 (1.0)
Female	99 (99.0)
Marital status	
Married	86 (86.0)
Single	4 (4.0)
Widowed	8 (8.0)
Divorced	2(2.0)
Educational level	
Non-formal	35 (35.0)
Primary	7 (7.0)
Secondary	18 (18.0)
Tertiary	40 (40.0)
Literacy	
Illiterate	35 (35.0)
Literate	65 (65.0)
Occupation	
Unemployed	40 (40.0)
Self-Employed	34 (34.0)
Retired	6 (6.0)
Employed	20 (20.0)
Use of health insurance	
Yes	20 (20.0)
No	80 (80.0)
Distance from residence to ABUTH Zaria (km)	
<100	55 (55.0)
100-300	27 (27.0)
>300	8 (18.0)

Table 2. Clinicopathological characteristics of the study population

Variable (N=100)	Frequency (%)
Histology	
Invasive ductal carcinoma	94 (94.0)
Invasive lobular carcinoma	2 (2.0)
Mucinous carcinoma	1 (1.0)
Medullary carcinoma	1 (1.0)
Metaplastic carcinoma	1 (1.0)
Papillary carcinoma	1 (1.0)
Stage at presentation	
IA	3 (3.0)
IIA	3 (3.0)
IIB	6 (6.0)
IIIA	32 (32.0)
IIIB	30 (30.0)
IIIC	9 (9.0)
IV	17 (17.0)
Molecular subtype	
Luminal A	26 (26.0)
Luminal B	14 (14.0)
HER-2 over expressed	11 (11.0)
Triple negative	49 (49.0)
SBR grading system	
Grade 1 (3-5)	13 (13.0)
Grade 2 (6-7)	44 (44.0)
Grade 3 (8-9)	43 (43.0)
Menopausal status*	
Premenopausal	40 (40.0)
Perimenopausal	5 (5.0)
Postmenopausal	54 (54.0)

Table 3. Socio-demographic factors associated with compliance

Variables (N=100)	Compliant	Non-compliant	Statistical test χ^2	df	P
Age					
≤ 40	20 (18.8)	8 (9.2)	1.84	3	0.61
41-50	14 (16.9)	11 (8.3)			
51-60	21 (20.1)	9 (1.0)			
≥61	12 (11.4)	5 (5.6)			
Marital status					
Married	57 (57.6)	29 (28.4)	1.14	1	0.70
Not married	10 (9.4)	4 (4.6)			
Education					
Non-formal	17 (23.5)	18 (11.6)	9.5	3	0.23
Primary	6 (4.7)	1 (2.3)			
Secondary	12 (12.1)	6 (5.9)			
Tertiary	32 (26.8)	8 (13.2)			
Literacy level					
Literate	48 (43.5)	17 (21.3)	3.93	1	0.47
Not literate	19 (23.5)	16 (11.5)			
Occupation					
Unemployed	25 (30.8)	21 (15.2)	8.32	2	0.17
Self-employed	24 (22.8)	10 (11.2)			
Employed	18 (13.4)	2 (6.6)			
Distance from residence to ABUTH Zaria (km)					
< 100	34 (36.9)	21 (18.2)	1.75	2	0.414
100-300	19 (18.1)	8 (8.9)			
>300	14 (12.1)	4 (5.9)			

Table 4. Disease related factors associated with compliance.

Variables N=100	Complaint	Non-compliant	Statistical Test χ^2	df	P
Stage at diagnosis					
I-II	10 (8.0)	2 (4.0)	26.9	4	0.0002
IIIA	28 (21.4)	4 (10.6)			
IIIB	21 (20.1)	9 (9.9)			
IIIC	5 (6.0)	4 (3.0)			
IV	3 (11.4)	14 (5.6)			
Molecular subtype					
HER-2 overexpressed	9 (7.4)	2 (3.6)	5.89	3	0.117
Luminal A	21 (17.4)	5 (8.6)			
Luminal B	7 (9.4)	7 (4.6)			
Triple negative	30 (32.8)	19 (16.2)			
Comorbidities					
Present	21 (19.4)	8 (9.6)	0.54	1	0.46
Absent	46 (47.6)	25 (23.4)			
ECOG performance status					
0	56 (42.9)	8 (21.1)	33.8	1	0.00001
1	11 (24.1)	25 (11.9)			

ECOG- Eastern cooperative Oncology Group.

Table 5. Socio-economic factors associated with compliance.

Variables (N=1000	Compliant	Non-compliant	Statistical test χ^2	df	p
Monthly Income					
≤ 30,000	26 (33.5)	24 (16.5)	13.0	2	0.015
31,000-100,000	21 (19.4)	8 (9.6)			
101,000-250,000	20 (14.1)	1(6.9)			
Use of health insurance					
Yes	16 (13.4)	4 (6.6)	1.91	1	0.167
No	51 (53.6)	29 (26.4)			
Use of cancer health fund					
Yes	12 (14.1)	9 (6.9)	1.17	1	0.280
No	55 (52.0)	24 (26.1)			
Patients support					
Self					
Yes	17 (13.4)	3 (6.6)	3.66	1	0.56
No	50 (53.6)	30 (26.4)			
Husband					
Yes	46 (46.2)	23 (22.8)	0.01	1	0.92
No	21 (20.8)	10 (10.2)			
Other family members					
Yes	28 (26.8)	12 (13.2)	0.27	1	0.60
No	39 (40.2)	21 (19.8)			

Table 7. Multi-variate analysis of factors associated with compliance

Variables	p-value
Stage at diagnosis	0.001
ECOG performance status	<0.001
Monthly income	<0.001
Indication for chemotherapy	<0.0001
Dose according to BSA	0.001
Prior counselling on chemotherapy	<0.0001
Anaemia	<0.007
Psychological satisfaction	<0.001
Treatment outcome	0.001

Table 6. Treatment related factors association with compliance

Variables	Compliant n (%)	Non-Compliant n (%)	χ^2	df	p-value
Indications for chemotherapy			26.6	2	0.00001
- Neoadjuvant	32 (24.1)	4 (11.9)			
- Adjuvant	3 (11.4)	14 (5.6)			
- Definitive/Induction	32 (31.5)	15 (15.5)			
Dose according to BSA			10.9	1	0.010
- Optimal	64 (59.0)	24 (29.0)			
- Suboptimal	3 (8.0)	9 (4.0)			
Recommended number of cycles			1.94	1	0.163
- 4	21 (18.1)	6 (8.9)			
- >4	46 (48.9)	27 (24.1)			
Targeted therapy			0.045	1	0.832
- Yes	7 (6.7)	3 (3.3)			
- No	60 (60.3)	30 (29.7)			
Prior counselling on compliance			8.97	1	0.027
- Yes	65 (61.0)	26 (30.0)			
- No	2 (6.0)	7 (3.0)			
Nausea and vomiting			5.59	1	0.180
- Yes	32 (37.5)	24 (18.5)			
- No	35 (29.5)	9 (14.5)			
Skin hyperpigmentation			0.331	1	0.565
- Yes	63 (62.3)	30 (30.7)			
- No	4 (4.7)	3 (2.3)			
Anaemia			7.35	1	0.067
- Yes	18 (24.1)	18 (11.9)			
- No	49 (42.9)	15 (21.1)			
Neutropenia			0.83	1	0.362
- Yes	13 (11.4)	4 (5.6)			
- No	54 (55.6)	29 (27.0)			
Thrombocytopaenia			1.570	1	0.208
- Yes	1 (2.0)	2 (1.0)			
- No	66 (65.0)	31 (32.0)			
Psychological satisfaction			48.88	1	0.00001
- Unsatisfied / Very unsatisfied	3 (17.4)	23 (8.6)			
- Satisfied / Very satisfied	64 (49.6)	10 (24.4)			
Treatment outcome			78.69	2	0.00001
- Complete response	1 (1.3)	1 (0.7)			
- Partial response	62 (42.2)	1 (20.8)			
- Progressive disease	3 (22.1)	30 (10.9)			
- Stable disease	1 (1.3)	1 (0.7)			

BSA- Body Surface Area., ECOG- Eastern Cooperative Oncology Group, BSA- Body Surface Area

DISCUSSION

In this study, a total of 100 breast cancer patients participated. The mean age of the patients was 49.3±12.2 years, which conforms to the findings of other studies done in breast cancer patients in this environment. Similarly, this is remarkably like studies done in Ethiopia[14] and Enugu,[15] but is, however, higher than a study done in Indonesia.[16] It was also shown that the majority of the participants are in their 5th and 6th decades of life, though about 28 (28%) were seen a decade younger. This finding conforms to the global statistics.[2] Majority of patients, 86 (86%), were married, while 14 (14%) were unmarried; this is similar to the findings in studies done in Ethiopia[14] and Indonesia.[17]

The literacy level of the patients was high, 65 (65%), 18 (18%), and 40 (40%) of the patients attended secondary and tertiary institutions, respectively. This is a similar finding in a study done in Enugu[15] and Ile-Ife[18] but different from a study done in Indonesia, where 64.5% attended elementary school.[17]

The most common histological diagnosis is invasive ductal carcinoma 94 (94.0%), with the triple negative subtype being the most common 49(49.0%). A similar finding was seen in a study conducted in Ethiopia, where invasive ductal carcinoma was the commonest histological diagnosis.[14] Majority of the patients, 88(88%), presented with more advanced stages (stage III and IV) of the disease. This is comparable to findings in Ethiopia[14], Ile-Ife[18], and Indonesia.[17]

Concerning compliance with chemotherapy in breast cancer patients, this study found that most of the patients were compliant with chemotherapy, 67(67%), while 33(33%) were non-compliant. For example, a study conducted in Sweden among breast and colorectal cancer patients aged 34 to 82 years, mostly diagnosed at advanced stages (III–IV), reported a compliance rate of 91% and non-compliance of 9%.[19] The study population in Sweden benefited from a universal healthcare system and structured follow-up, which may contribute to the higher compliance rates.

Similarly, a study in Indonesia reported 84% compliance among women with breast cancer and 16% non-compliance.[16] The average age of participants in this study was 49 years, with the majority having at least secondary education. Higher education level and better access to healthcare facilities may have influenced treatment compliance.

In Ethiopia, a prospective study among 210 breast cancer patients aged 26–72 years at Tikur Anbessa Specialized Hospital found a compliance rate of 83.5% and a non-compliance rate of 16.5%.[14] Most patients in that cohort were in Stage II or III, and compliance was reportedly higher among urban dwellers and those with family support.

Likewise, a retrospective review from Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, involving women aged 31 to 50 years with locally advanced and metastatic breast cancer (Stages III and IV), reported compliance and non-compliance rates of 80.9% and 19.1%, respectively.[18] Unlike the present study, many patients at OAUTHC were enrolled in institutional support programs and had better access to subsidized chemotherapy.

These variations across regions may be attributed to differences in sociodemographic

characteristics such as age, educational attainment, urban vs. rural residence, and healthcare access, as well as clinicopathologic factors like disease stage and treatment regimen. The relatively lower compliance in the present study may reflect systemic challenges such as out-of-pocket treatment costs, poor health insurance coverage, and sociocultural beliefs surrounding chemotherapy. Therefore, strengthening patient education, financial support systems, and treatment accessibility could play a critical role in improving compliance rates in similar settings.

A study conducted in Zaria on patients with diverse cancers showed a low level of compliance, 49.3% compared to the finding of this study.[20] This low level of compliance in the previous study could be because it wasn't cancer type specific.

The findings in this study showed no significant association between compliance and the age, marital status, educational level, literacy level, and occupation of the patients. In this study, neither young nor advanced age is associated with compliance or non-compliance. However, this is contrary to a study in Toronto,[9] Canada,[21] where increasing age was associated with greater compliance, and in Sao Paulo, where younger age was associated with greater compliance.[22] A Study in Toronto[9] and Sao Paulo[22] showed that being unmarried was associated with greater compliance. It is expected that a high level of education may be associated with greater compliance; however, this study showed a lack of significant association between compliance and the level of education of the patients. This is contrary to studies conducted in Toronto,[9] Canada,[21] Sao Paulo,[22] and Indonesia[17] where a high level of education was significantly associated with compliance.

This study showed that there is a significant association between patients' stage at presentation, performance status, tumour grade, and compliance. This is in keeping with findings from the research conducted in India13 and Bharath.[23] Molecular subtype and patients' comorbidities were found to have no significant association with compliance.

This study found a significant association between the indication for chemotherapy, whether neoadjuvant, adjuvant, or definitive/ induction, and the level of compliance of the patients. Few studies considered the indication for chemotherapy as a factor for compliance; a study conducted in Toronto showed a significant association between patients who received adjuvant chemotherapy and compliance.[9] It was also noted in this study that some patients' chemotherapy dosage is either optimal or suboptimal according to the patients' body surface area (BSA), and it was shown that there is a statistically significant association between the dose according to BSA and compliance. Most of the literature reviewed did not consider dose according to BSA as a factor in determining patients' compliance.

A higher number of recommended chemotherapy cycles was found to be associated with poor compliance in studies conducted in Toronto,[9] Ethiopia,[14] and Ile-Ife.[18] These findings do not conform to the findings of this study, which showed no statistically significant association between compliance and the recommended number of chemotherapy cycles.

Chemotherapy-related side effects have been shown to affect patients' compliance in many studies. Studies conducted in Canada,[21] Sweden,[19] Ile-Ife,[18] and the UK[24] showed that chemotherapy side effects like myelosuppression, skin hypopigmentation, and alopecia were significantly associated with compliance. However, this study showed a significant association between anaemia and compliance, but other side effects like nausea and vomiting, skin hyperpigmentation, neutropenia, alopecia, and thrombocytopaenia have no significant association with compliance.

Patients' access to health facilities can play a vital role in their compliance with treatment, as shown in a study conducted in Indonesia, where patients who live closer to the health facility showed a greater compliance.[17] However, this is contrary to the finding of this study, which showed no significant association between distance to the health facility and the patients' compliance.

Patients' level of income and source of health care financing play a significant role in their compliance. This study showed that there was a significant statistical association between the patients' monthly income and their compliance; patients with a higher level of income showed greater compliance, which conforms to findings in studies conducted in Canada,[21] Enugu,[15] Ile-Ife,[18] Indonesia[17], and Singapore.[25] It was shown in this study that the major reason for non-compliance in most of the patients was due to financial constraints (31.1%).

Contrary to the findings of studies in Indonesia[16] and Ethiopia,[15] where they found a significant association between health insurance enrolment and compliance, this study showed no significant association between health insurance enrolment and compliance. This finding could be due to limited coverage of the chemotherapeutic agents by the health insurance, as such patients had to pay out of pocket for their treatment, like those without insurance. The study also attempted to establish an association between enrolment in the cancer health fund and compliance; however, it was found that there is no significant association between cancer health fund enrolment and patients' compliance.

Patients' psychological satisfaction with their treatment could also affect their compliance with treatment. This study found a statistically significant association between the patients' level of satisfaction with their treatment and compliance, as patients who are very satisfied or satisfied have greater compliance.

Patients' compliance may affect their disease outcome. This study showed a significant association between compliance and Patients' disease outcome, as those who comply with their chemotherapy showed better tumour response at the end of their recommended cycles of chemotherapy. However, other factors other than compliance which are outside the scope of this study may also affect the outcome.

CONCLUSION

There is a high proportion of non-compliance with chemotherapy treatment among breast cancer patients at Ahmadu Bello University Teaching Hospital, Zaria. The different factors that affect compliance include stage at diagnosis, tumour grade, and performance status, indication for chemotherapy, treatment side effects, and monthly income of the patients.

To improve compliance with chemotherapy among breast cancer patients, it is essential to promote early detection through widespread community awareness and regular screening programs. Financial support or subsidized treatment should be provided for low-income patients to reduce the economic burden of care. Additionally, integrating psychosocial counselling and effective side-effect management into routine oncology services can enhance patients' ability to cope with treatment. Strengthening patient education and fostering better doctor–patient communication is also crucial in addressing misconceptions and encouraging treatment adherence.

Strengths of the Study

The study was a prospective one, which guaranteed more accurate data collection compared to a retrospective study.

In this study, Compliance with chemotherapy was assessed on a homogeneous group of patients, and the various factors affecting Compliance were assessed, thereby giving a more comprehensive assessment of compliance among breast cancer patients.

Limitations of the Study

This study was conducted in a single institution, which may limit the generalizability of the findings; a multi-center study would have provided broader representation and more robust conclusions. The relatively small sample size also restricts the statistical power of the analysis. Additionally, the exclusion of certain patient subgroups—particularly those with poor performance status (ECOG ≥2)—may have introduced selection bias, as these patients could represent a unique subset with distinct compliance behaviors. Furthermore, the cost of chemotherapy was analyzed as a single variable without accounting for variations in regimens, dosages, and premedications, which may have influenced the financial burden and subsequent treatment compliance differently across patient groups.

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