

ORIGINAL RESEARCH

## An audit of Cancers in the Surgical Wards of a tertiary healthcare facility in a resource-limited setting

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### Abstract

**Background:** In Africa, cancer is an emerging public health concern. In Sub-Saharan Africa, data on cancer epidemiology and survival which are necessary for the planning of treatment and control of cancers are scarce.

**Methods:** A retrospective study of all patients who were admitted to the surgical wards in a Nigerian tertiary facility between January 2012 and December 2016 was done. The retrieved data included demographic features, presenting symptoms, mode of presentation, duration of illness, diagnosis, stage of disease, treatment modalities, treatment intention, compliance with treatment, survival, and current status.

**Result:** The 279 patients studied comprised 81 (29.0%) males and 198 (71.0%) females. Cancer of the female breast was the leading malignancy occurring in 59% (165/279) patients; this was followed by colon cancer in 19% (54/279) and prostate cancer in 10% (29/279). The commonest cancer among the females was breast cancer while prostate cancer was the commonest among the males. The stage of the disease was classified as early in 14.7% (41/279), locally advanced in 61.6% (172/279) and metastatic in 23.7% (66/279). Treatment goal was palliative for 57% (159/279) of the patients, curative in 26% while 13.6% (38/279) of the patients received no anti-cancer treatment. Ninety-six patients (34.5%) refused treatment or defaulted from treatment after the commencement of therapy. Although 53 (19%) patients died within the first month of admission, the overall mean duration of survival was 12.71 ± 13.0 months (range of 1-84 months).

**Conclusion:** Late presentation of patients, high treatment default rate, inappropriate management plan and overall poor survival were identified as daunting issues in cancer management in a resource-limited setting.

**Key words:** Cancer, Curative care, Late presentation, Palliative care, Survival rate.

### Introduction

Cancer is a prime cause of chronic diseases all over the world and it is a public health problem affecting all

classes of persons. In 2012, an estimated 14.1 million new cases of cancers were diagnosed.<sup>[1]</sup> Forty percent of cancers occurring all over the world affect the lungs, female breast, colon and rectum, and stomach.<sup>[1]</sup> Cancer is also the prime cause of mortality worldwide and it was responsible for 8.2 million deaths in 2012.<sup>[2]</sup> Over half of cancer mortality is attributable to cancers of the lung, liver, stomach, female breast, colon and rectum. In addition, 53% of cancer mortality and 44% of cancer cases occur in countries with low or medium level Human Development Index (HDI).<sup>[2]</sup>

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In Africa, very few data are available as cancer is still an emerging public health challenge. The International Agency for Research on Cancer (IARC) stated that 715,000 new cases and 542,000 cancer deaths occurred in Africa in 2008. It is also projected that 1.28 million cases and 970,000 cancer deaths will occur by the year 2030. [3] Despite this increasing burden, cancer continues to be a low public health priority in the developing world due to resource limitation and other public health problems such as communicable diseases including Tuberculosis, HIV, and malaria which compete for the available meagre resources. [4] This situation is compounded by late presentation in the hospital, poor health infrastructures, high cost of care, dearth of skilled personnel and equipment required for the management of cancers. [5,6]

There are very few data on cancer epidemiology and survival in Sub-Saharan Africa required for the planning of treatment and control of cancers. [7] Cancer management has undergone tremendous changes over the past years, the world over. These changes include the advent of tissue diagnosis, imaging by X-Ray, Ultrasonography, advanced imaging methods such as Computerized Tomography (CT), Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), Radioisotope scan as well as multiple modalities of treatment including surgery, chemotherapy, radiotherapy, and immunotherapy. Some of these treatment modalities are not readily available in the developing world because of high cost. [4]

In the light of the picture painted above, it is pertinent to review the incidence of cancer and outcome of treatment in a Nigerian facility as this would add to existing literature on cancers in Africa. The aim of this study was to assess the pattern of cancer presentation, treatment intention, treatment modality, outcome and survival in the surgical wards of the Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria.

## Methods

The Olabisi Onabanjo University Teaching Hospital, Sagamu is a 240-bed tertiary care facility located halfway between the megametroplis of Lagos and Ibadan in South-west Nigeria. The hospital receives patients from the two cities and the surrounding communities. There is a surgical oncology unit supported by a well-established histopathology

service, radio-diagnostic services (equipped with CT scan, Ultrasonography, Mammography, Digital X-Ray with facilities for screening), as well as well-equipped haematology and chemical pathology laboratories. The hospital offers diagnostic and therapeutic services for both solid and haematological malignancies, in form of ablative surgery and chemotherapy but there are no facilities for radiotherapy or separate facility for palliative care.

A retrospective study of all patients admitted into the surgical wards of the hospital on account of cancers confirmed by histopathologic methods between 1<sup>st</sup> January 2012 and 31<sup>st</sup> December 2016, was done. The admission registers on the surgical wards of the hospital were used to identify potential cases and data extraction was done from the retrieved individual records. Paediatric surgical and gynaecological patients were excluded from the study.

The following data were extracted from the hospital records: demographic features (including age, sex, address, educational status, occupation) presenting symptoms, mode of presentation, duration of illness, diagnosis and stage of disease (early - stage I, late - stages II, III or metastatic - Stage IV). Other information included the treatment modalities (surgery, chemotherapy, radiotherapy or referral to better equipped facilities) treatment intention (cure, palliation), compliance with treatment (assessment of prompt acceptance and execution of treatment plan), duration of survival in months, current status (dead, alive or lost to follow-up and unreachable; the latter were presumed dead). The patients with incomplete records were also excluded from further analysis.

The data were entered into a personal computer and analyzed using the SPSS software. Descriptive statistics was used and variables were compared using the Chi-Square test, ANOVA and the Student's t- test. Statistical significance was defined by *P* values less than 0.05.

## Results

A total of 2946 patients were admitted to the surgical wards during the period studied; these comprised 1448 males and 1498 females. Three hundred and eleven patients were admitted for cancer management but 32 of these patients were excluded from further analysis due to incomplete data.

Of the 279 patients studied, 81 (29.0%) were males while 198 (71.0%) were females. The age range of the

patients was 16-90 years with a mean of 52 ( $\pm$  SD 14) years. The mean age of the male patients was 59 ( $\pm$  SD 17) years and 50 ( $\pm$  SD 12) years for the females patients;  $p = 0.000$ ).

The demographic characteristics are as depicted in Table I. The mean age at presentation of each of the cancer groups were as follows: prostate (70.9  $\pm$  9.3 years), breast (49  $\pm$  10.7 years), colon/anorectum (54.6  $\pm$  15.3 years), pancreas (68.7  $\pm$  15.2 years), gastric (51.1  $\pm$  14.6 years), biliary (52.0  $\pm$  18.3 years) and 51.1  $\pm$  14.0 years for the others (soft tissue sarcoma, abdominal malignancy of unknown primary, nasopharyngeal tumour, parotid tumour).

Cancer of the breast occurred in 59% (165/279) of the patients, followed by colon cancer in 19% (54/279) and prostate cancer in 10% (29/279). The commonest cancer among females was breast cancer while prostate cancer was the commonest among males. The other types of cancers recorded in each of the sexes are as shown in Table II.

The commonest symptom at presentation was a lump "somewhere on the body" among 59% (165/279) of the patients; this was followed by pain among 17.2% (48/279) and the others are as shown in Table III. The mean duration of symptoms was 10 ( $\pm$  SD 15.4) months. The mean duration of symptoms among males was 9.4 ( $\pm$  SD 16.4) months and 10.2 ( $\pm$  SD 15.0) months for females ( $p = 0.539$ ). The mean duration of symptoms in each cancer group were as follows: 7.5 ( $\pm$  SD 11) months for prostate cancer, 11 ( $\pm$  SD 16) months for breast cancer, 7 ( $\pm$  SD 7.9) months for colonic/anal cancer, 6.6 ( $\pm$  SD 7.5) months for gastric cancer, 3 ( $\pm$  SD 3.6) months for pancreatic cancer and 18 ( $\pm$  SD 29) months for the other types of cancer (Soft tissue sarcoma, abdominal malignancy of unknown primary, nasopharyngeal tumour, parotid tumour).

The stage of the disease was classified as early in 14.7% (41/279), locally advanced in 61.6% (172/279) and metastatic in 23.7% (66/279). Only 31 (18.8%) of 165 patients with breast cancer presented with early disease while 6 of 51 (11.8%) patients with colorectal cancer presented early as shown in Table IV.

The treatment goal was palliative for 57% (159/279) of the patients; 31.9% of these had breast cancer, 10.4% had colon/anorectal cancer, 9.3% had prostate cancer and 6% had gastric cancer. The treatment goal was curative for 26% (72/279) of the patients; 18.6% of these had breast cancer, 4.7% had colon/anorectal cancer while 13.6% had no anti-cancer treatment.

**Table I: Demographic characteristics of 279 patients with cancer**

Characteristics	Sex		Total	
	Male	Female		
Age (Years)	$\leq 20$	2 (0.7)	1 (0.36)	(1.1)
	21-30	5 (1.8)	7 (2.5)	12 (4.3)
	31-40	6 (2.2)	40 (14.3)	46 (16.5)
	41-50	11 (3.9)	61 (21.9)	72 (25.8)
	51-60	14 (5.0)	53 (19.0)	67 (24.0)
	61-70	23 (8.2)	26 (9.3)	49 (17.5)
	>70	20 (7.2)	10 (3.6)	30 (10.8)
	Total	81 (29)	198 (71.0)	279(100)
Educational Level	Uneducated	5 (1.8)	34 (12.2)	39 (14.0)
	Primary	15 (5.4)	41 (14.7)	56 (20.1)
	Secondary	27 (9.7)	53 (19.0)	80 (28.7)
	Tertiary	34 (12.2)	70 (25.1)	104 (37.3)
	Total	81 (29)	198 (71.0)	279(100)
Occupation	Unemployed	2 (0.7)	8 (2.9)	10 (3.6)
	Retiree	30 (10.7)	15 (5.4)	45 (16.1)
	Artisan	17 (6.1)	24 (8.6)	41 (14.7)
	Professional	8 (2.9)	40 (14.3)	48 (17.2)
	Traders	10 (3.6)	105 (37.6)	115 (41.2)
	Others	14 (5.0)	6 (2.1)	20 (7.2)
	Total	81 (29)	198(71.0)	279 (100)

Figures in parentheses are percentages of the total number of patients (279).

The latter group comprised 6.8% with breast cancer, 2.2% with colon/anorectal cancer and 1.1% with gastric cancer.

Four percent (10/279) of the patients were referred to other better-equipped facilities (1.8% had breast cancer, 1.1% had colon/anorectal cancer). Surgery was the treatment modality among 48.4% (135/279) patients; 53.3% (72/135) of these were curative while the rest were palliative. Chemotherapy was administered on 59.5% (166/279) of the patients but with curative intention in 35% (58/166) cases while radiotherapy was used in 5% (14/279) of the patients. (Table V) Ninety-six (34.5%) of 279 patients refused treatment or defaulted after the commencement of therapy as shown in Table VI.

Of the 279 patients, 53 (19%) died within the first month of admission; these comprised 9% (25/279) with breast cancer, 3.6% (10/279) with colon/anorectal cancer, 2.2% (6/279) with pancreatic cancer, 0.72% (2/279) each with prostate and gastric cancers and 2.2% from a group classified as others

(abdominal malignancy of unknown primary, renal cell carcinoma and nasopharyngeal cancer). Of these fifty-three patients, 9.4% (5/53) were commenced on chemotherapy while 26.4% (14/53) had some form of palliative surgery.

**Table II: Distribution of cancer types confirmed by histopathology between both sexes**

Cancer types/Diagnoses	Sex		Total
	Male [n (%)]	Female [n (%)]	
Prostate cancer	29 (10.4)	0 (0.0)	29 (10.4)
Breast cancer	0 (0.0)	165 (59.0)	165 (59.0)
Colorectal cancer	34 (12.2)	17 (6.1)	51 (18.3)
Gastric cancer	6 (2.1)	3 (1.1)	9 (3.2)
Pancreatic cancer	4 (1.4)	2 (0.72)	6 (3.2)
Cholangiocarcinoma	0 (0.0)	2 (0.72)	2 (0.72)
Soft tissue sarcoma	2 (0.72)	4 (1.4)	6 (3.2)
Testicular tumour	2 (0.72)	0 (0.0)	2 (0.72)
Lymphoma	0 (0.0)	1 (0.36)	1 (0.36)
Renal cell carcinoma	1 (0.36)	0 (0.0)	1 (0.36)
Abdominal Tumour*	2 (0.72)	3 (1.1)	5 (1.8)
Nasopharyngeal cancer	1 (0.36)	0 (0.0)	1 (0.36)
Total	81 (29.0)	198 (71.0)	279 (100.0)

\* Unknown primary site with intra-abdominal spread. Figures in parentheses are percentages of the total number of patients (279).

**Table III: Major symptoms at first presentation in the hospital.**

Symptoms	Sex		Total
	Male [n (%)]	Female [n (%)]	
Pain	30 (10.7)	18 (6.4)	48 (17.2)
Lumps	6 (2.1)	159 (57.0)	165 (59.1)
Weight loss	1 (0.36)	1 (0.36)	2 (0.72)
Weakness	2 (0.72)	1 (0.36)	3 (1.1)
Jaundice	3 (1.1)	2 (0.72)	5 (1.8)
Total	81 (29.0)	198 (71.0)	279 (100)

\* Back pain, urinary retention, vomiting, constipation, abdominal distention and ulceration of mass. Figures in parentheses are percentages of the total number of patients (279).

The overall mean duration of survival was 12.71 (± SD 13.0) months with a range of 1-84 months. The mean duration of survival was longer among women compared to men [12.8 (± SD 14.3) months versus 12.4 (± SD 13.0) months]. The overall survival was also better among patients treated with curative intention with a mean duration of survival of 21.4 (± SD 16.4) months compared with 11.1 (± SD 11.8) months for

patients who were treated with palliative intention. The mean duration of survival for patients who did not receive anti-cancer treatment was 3 (± SD 4.3) months. The overall survival was improved by chemotherapy and surgery with the mean duration of survival of 22.4 (± SD 16.4) months compared with 12.7 (± SD 13.9) months in those who were not treated with surgery and chemotherapy. The mean duration of survival for prostate cancer was 19.5 (± SD 12.3) months; 13.8 (± SD 14.9) months for breast cancer, 9.5 (± SD 10.1) months for colon/anorectal cancer. The cumulative survival patterns with regards to the distribution according to sex, treatment intention, types of cancer, treatment modalities and the overall survival patterns are shown in Figures 1-5.

**Table IV: Stages of cancers at presentation**

Diseases	Stages of Diseases			
	Early	Locally advanced	Metastatic	Total
Prostate cancer	0 (0.0)	21 (72.4)	8 (27.6)	29 (100.0)
Breast cancer	31 (19.0)	97 (58.8)	37 (22.4)	165 (100.0)
Colorectal cancer	6 (11.8)	34 (66.6)	11 (21.6)	51 (100.0)
Pancreatico-biliary cancer	0 (0.0)	6 (75.0)	2 (25.0)	8 (100.0)
Gastric cancer	0 (0.0)	4 (44.4)	5 (55.6)	9 (100.0)
Others	4 (23.5)	10 (58.8)	3 (17.6)	17 (100.0)
Total	41(14.7)	172 (61.6)	66(23.7)	279 (100)

\*Soft tissue sarcoma, abdominal malignancy of unknown primary site, nasopharyngeal tumour. Figures in parentheses are percentages of the total number in each row.

## Discussion

Cancer diagnosis and treatment is facing a lot of challenges in the developing world; this observation can be attributed to poor socioeconomic status, infrastructural deficiencies and lack of education.<sup>[5]</sup> All these are captured in the definition of Human Development Index (HDI) by the World Health Organization (WHO), in which Nigeria is designated as a low HDI country.<sup>[2]</sup> Therefore, it is not out of place to observe some of the challenges of cancer management in this study.

The demographic characteristics of the patients studied in this report were similar to previous observations in other studies,<sup>[8]</sup> and the preponderance of females can be ascribed to the high predominance of breast cancer, a disease of females, in the study population. The mean age of the female patients at presentation was nine years less than that of the male patients with statistical significance.

Table V: Treatment goals and treatment modalities for cancer patients

Treatment modality	Treatment aim and modality				
	Curative (%)	Palliative (%)	None (%)	Referral (%)	Total (%)
Chemotherapy					
Yes	58 (20.8)	104(37.3)	0 (0)	4 (1.4)	166 (59.5)
No	14 (5.0)	55 (19.7)	38 (13.6)	6 (2.2)	113 (40.5)
Total (%)	72 (25.8)	159 (57.0)	38 ((13.6)	10 (3.6)	279 (100)
$\chi^2 = 72.9, p = 0.000$					
Surgery					
Yes	72 (25.8)	61 (21.9)	0 (0)	2 (0.7)	135 (48.4)
No	0 (0)	98 (35.1)	38 (13.6)	8 (2.9)	144 (51.6)
Total (%)	72 (25.8)	159 (57.0)	38 (13.6)	10 (3.6)	279 (100)
$\chi^2 = 122.4, p = 0.000$					
Radiotherapy					
Yes	5 (1.8)	9 (3.2)	0 (0)	0 (0)	14 (5.0)
No	67(24.0)	150 (54.8)	38 (13.6)	10 (3.6)	265 (95.0)
Total (%)	72(25.8)	159 (57.0)	38 (13.6)	10 (3.6)	279(100)
$\chi^2 = 3.23, p = 0.357$					

Table VI: Distribution of treatment goals and pattern of compliance with treatment

Treatment intention	Refusal or default from treatment		Total
	Yes	No	
Curative	15 (5.4)	57 (20.4)	72 (25.8)
Palliative	62 (22.2)	97 (34.8)	159 (57.0)
None	19 (6.8)	19 (6.8)	38 (13.6)
Referral	0 (0.0)	10 (3.6)	10 (3.6)
Total	96 (34.4)	183 (65.6)	279 (100.0)
$\chi^2 = 16.66, p = 0.001$			

Figure 1: Pattern of survival according to treatment intentions

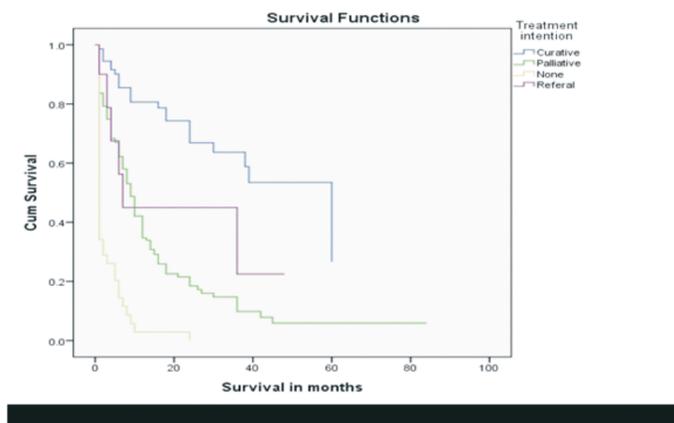


Figure 2: Pattern of survival among patients who received chemotherapy and surgery and those who did not.

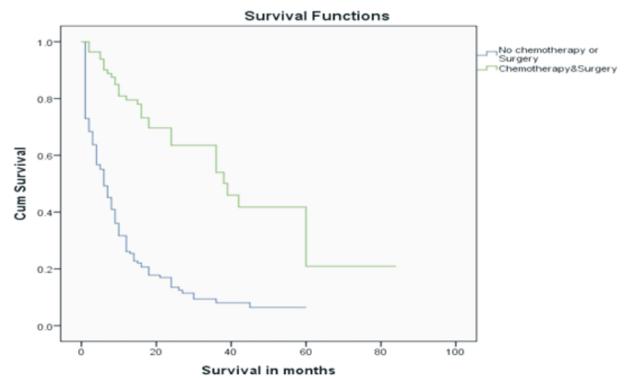


Figure 3: Pattern of survival (months) among patients with the different cancer types

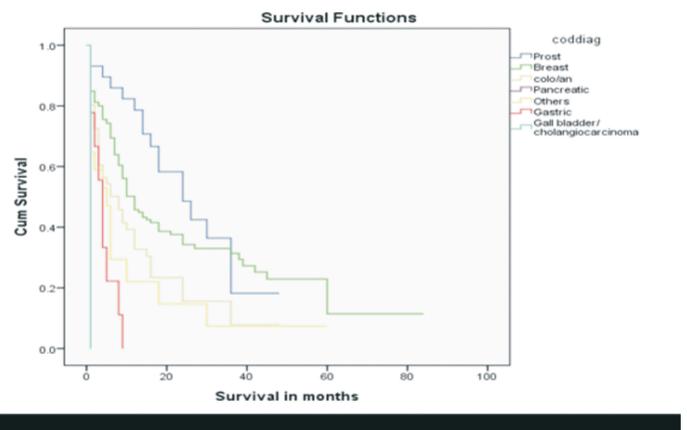


Figure 4: Pattern of survival (months) between the sexes

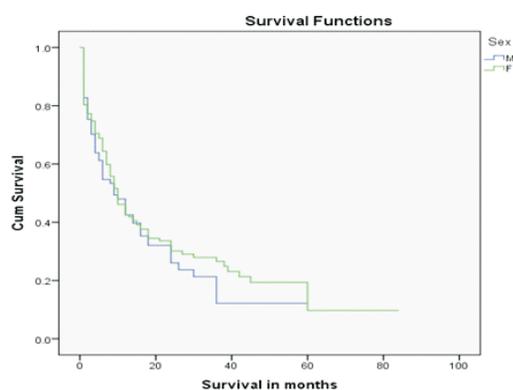
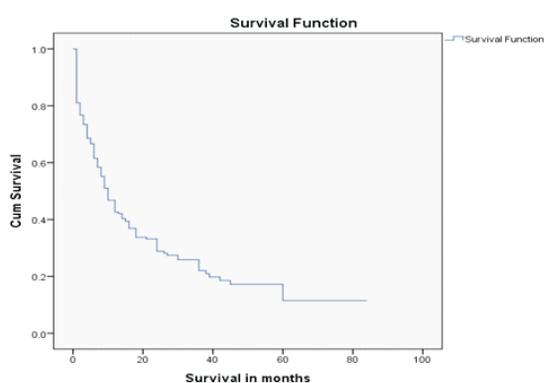


Figure 5: Pattern of overall duration of survival among patients with cancer



This observation could be due to the preponderance of breast cancer cases, which present at younger ages compared with patients with cancer of the prostate which is the predominant cancer among the males in this study.

Breast cancer was the commonest cancer disease in the present study followed by colorectal cancer and prostate cancer in that order. This pattern is not unexpected as the study population consisted of admissions on a surgical ward where common malignancies associated with infectious agents like primary liver cell carcinoma and cervical cancer were excluded. The preponderance of breast, colorectal and prostate cancers in this cohort may signpost emerging epidemiological transition, propelling the increase in the incidence of these cancers in the low HDI environment like Nigeria.<sup>[9]</sup> It is important to emphasize, that in the present study, breast cancer was the leading female cancer while prostate cancer was the leading cancer among males for the aforementioned reasons.

Late presentation with symptoms being present for more than six months, as observed in this study, has

been reported in similar studies in the low HDI countries.<sup>[10]</sup> This pattern of late presentation was observed to apply to the entire spectrum of cancer types in the studied population. Only 14.7% of the patients presented with early stage diseases while the rest had either locally advanced or metastatic disease. Many reasons have been adduced for this observation, including ignorance, poor financial status, inaccessibility or non-affordability of health facilities, socio-cultural and religious beliefs which hinder appropriate care-seeking behaviours.<sup>[10]</sup> In addition, the absence of pain until very late in some of the cancers may preclude early presentation.

The treatment goal, which is determined by the stage of the disease in each cancer group, is curative when there is complete extirpation of the local lesion with prevention of distant metastasis. On the other hand, the treatment goal is palliative when the lesion is metastatic or locally advanced with occult metastasis with no chance of complete extirpation. The treatment goal was curative in 26% of the patients in this study; this proportion was higher than the number of cases who presented with early disease, as some patients with advanced disease were treated with both surgery and chemotherapy with curative intention.

It is important to highlight the 14% of the patients who received no anti-cancer treatment and should, probably, not have been admitted into the surgical wards if there was a palliative care facility. Palliative care, which focuses on symptom control and improvement in the general quality of life of the patients, seldom requires surgical management except for situations when some surgical procedures are required to improve the quality of life and relieve distress. The absence of palliative care facilities is one of the challenges confronting cancer care in the low HDI countries, Nigeria inclusive.<sup>[11]</sup>

Refusal of treatment or default during treatment is one of the impediments to successful cancer treatment in the low HDI countries, as observed in the present study, in which about 34.5% of the patients refused treatment or absconded during treatment.<sup>[12]</sup> The reasons for this attitude to care may include ignorance, cost of drugs, fear of surgery, particularly, socio-cultural and religious beliefs about the illness and the required surgery, experienced drug toxicity and currently observed poor outcome of cancer treatment in the environment.<sup>[13]</sup> Therefore, the provision of social welfare services, such as health insurance, is necessary to improve access to good and affordable cancer treatments.

In this study, 19% of the patients died within the first month of hospitalization. This was due to the advanced stage of the disease at presentation; five of these early fatalities had chemotherapy while the remaining 14 had some form of palliative surgery. Chemotherapy in the last month of life is not recommended in cancer care,<sup>[14]</sup> and extensive palliative surgical procedures may also contribute to mortality.<sup>[15]</sup> These patients who died within the first month of hospitalization may have been better served by management in a palliative care unit.

Treatment with curative intention, which is recommended for early stages of cancer disease, is expected to produce better survival rates as observed in this study. This therapeutic step is aimed at complete extirpation of the cancer and prevention of both local and systemic recurrence. Curative treatment employs various methods including surgical extirpation, local radiotherapy and chemotherapy to achieve the desired goals.

Survival was better among patients who had surgery or chemotherapy or both than those who had neither modality of care, since both are aimed at local extirpation and control of both local and systemic disease.

The best overall survival in this study was recorded among patients with breast cancer followed by patients with prostate cancer and colorectal cancer. This observation is probably due to the fact that some of the patients with breast cancer presented early and therefore, had more aggressive treatment with curative intention. On the other hand, all the patients with prostate cancer and other cancers presented late, and had palliative treatment. Survival was generally poor among both sexes but it was better among females. Most of the patients in both sex groups presented with advanced diseases, hence they received palliative treatment. However, some of the patients with breast cancer, who were all females, presented in the hospital early. Early presentation with early stage disease is one of the most important prognostic factors for favourable treatment outcome in cancers.<sup>[16]</sup>

The overall survival rate in the present study was very low with less than 15% of the patients surviving for more than five years. This observation may be a direct consequence of late presentation for appropriate management coupled with the high treatment default rate. This is contrary to the reported rates from the developed world where the five-year

survival rates for common cancers (reported in the present study such as female breast cancer, prostate cancer and colon cancer) are known to be much better as contained in the CONCORD-2 report.<sup>[17]</sup> The CONCORD-2 is a study of data obtained from population-based registries of selected countries in both the developed and developing parts of the world. The available estimates for cancer survival for some developing countries are much better than what was observed in the present study.<sup>[17]</sup>

The hospital-based nature of the present study, with data limited to the surgical wards, is acknowledged as a limitation to the study. There is uncertainty about the time of onset of the illness and difficulty with the definition of survival period, which is said to span through the time of diagnosis to the time of death or loss to follow-up. The relatively short period of follow-up for the last year and the lack of post-mortem analysis of the deaths are also recognized as limitations to the study.

## Conclusion

The study highlights the challenges facing cancer treatment in a low HDI setting such as late presentation, high treatment default rate, inappropriate management plans and overall poor survival. There is a need for overall improvement in the socio-economic status, quality and frequency of health education programs, organization of cancer screening programs for cancer early detection and the provision of affordable and accessible health care. There is a need for the establishment of Tumour Boards to plan treatment strategies in health facilities. It is also important to supplement the existing cancer care services with palliative care services.

**Authors' Contributions:** ABA conceived and designed the study. All the authors participated in case management, data collection, analysis and interpretation. All the authors participated in drafting the manuscript and approved the final version of the manuscript.

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