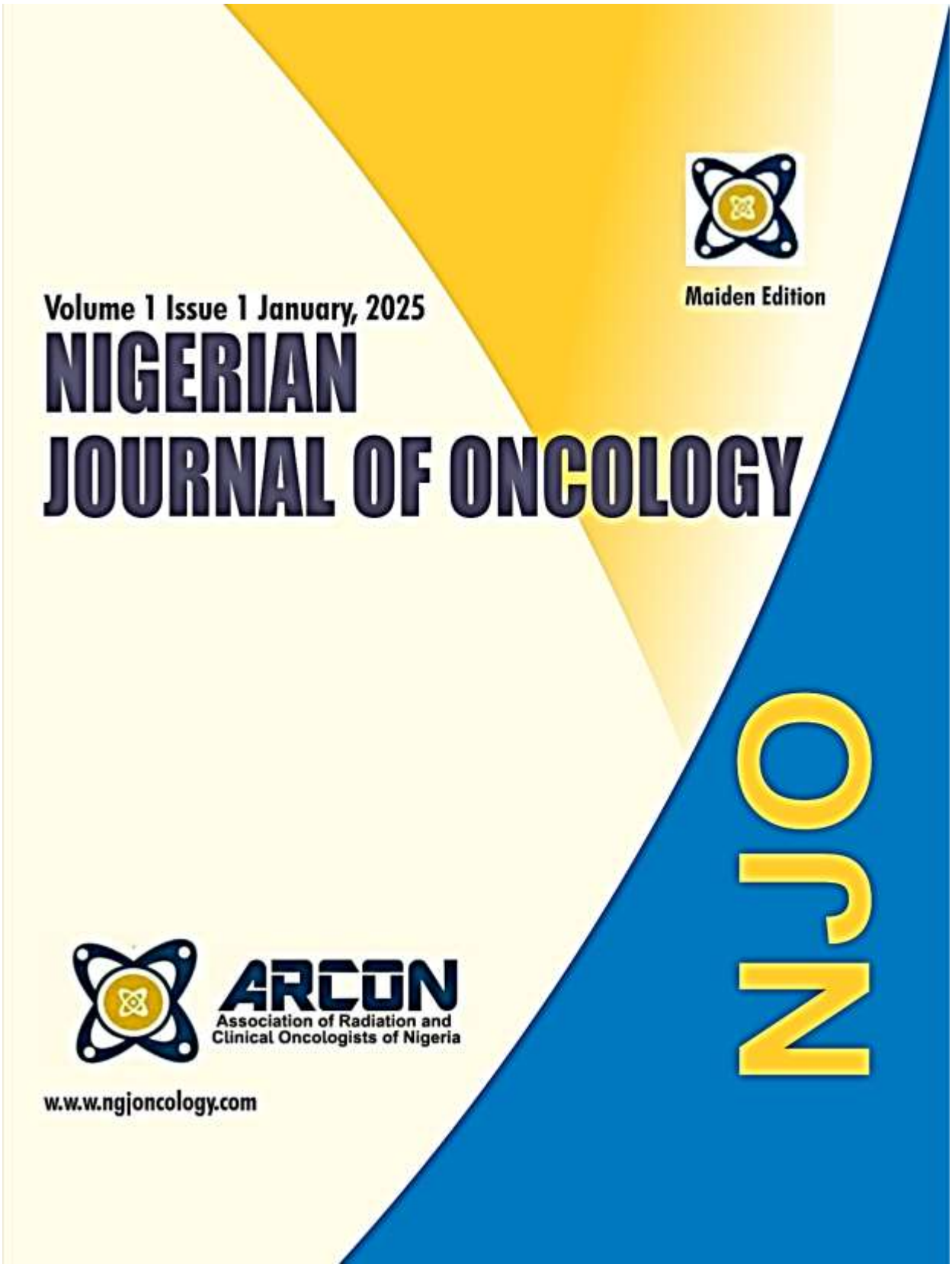
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ASSESSMENT OF DELAYS AMONGST CERVICAL CANCER PATIENTS IN A RADIOTHERAPY FACILITY: A PROSPECTIVE STUDY

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ABSTRACT

Introduction: Globally, cervical cancer is the 8th commonest malignancy and the fourth commonest in females. However, in Sub-Saharan Africa, the incidence and mortality from cervical cancer is second only to breast cancer, and actually highest in some of the countries. Most cases of cervical cancer in Sub-Saharan Africa are diagnosed at advanced stages, largely due to the various delays. These include Presentation, Diagnostic, and Treatment delays; which together constitute Total delay.

Materials and Methods: This was a prospective study conducted amongst cervical cancer patients being managed in a tertiary health facility. Patients' socio-demographic and clinical details were obtained using a semi structured questionnaire and staging was done using the International Federation of Obstetrics and Gynecology (FIGO) 2018 staging system. Each patient was then followed up and their delays were recorded.

Results: A total of 108 cervical cancer patients participated in the study with mean age of 53.7 ± 12.2 years, and 103(95.4%) presenting with advanced disease. The mean Presentation, Diagnostic, Treatment and Total delays were 18.9 ±15.1, 12.9 ±9.5, 10.6 ±9.5 and 42.5 ±21.9 weeks respectively. The use of traditional medication, finance and number of hospitals visited by patients before histology diagnosis; were some of the factors associated with delays.

Conclusion: There were significant delays in cervical cancer patients, with distribution of the various components of delays highlighted along with associated factors. Relevant stakeholders should implement massive health education campaigns, community-based screening, and adequate healthcare financing of cancer treatment to achieve earlier diagnosis and prompt treatment of most of cervical cancer patients.

Keywords: Cervical cancer, Presentation delay, Diagnostic delay, Treatment delay, Total delay

INTRODUCTION

Globally, cervical cancer is currently the 8th commonest malignancy and the fourth commonest amongst females, accounting for 3.1% (604,127) of all cancer incidence and 3.4% (341,831) of mortality from cancers in 2020.[1] There has been steady increase in global incidence of cervical cancer from 500,000 new cases in 2012 to 570,000 in 2018, to 604,127 in 2020.[1-3] The Sub- Saharan Africa has the highest burden of cervical cancer, where it ranks second to breast cancer in overall cancer incidence and mortality in many countries and first in some.[1] In Nigeria, cervical cancer accounted for 12,075 (9.7%) of new cases and 7, 968(10.1%) of deaths from cancer in 2020, making it the third ranking cancer in incidence and mortality after breast and prostate cancer. [5]

The management of cervical cancer involves multi-disciplinary and multi-modality approach. Surgery is the mainstay for early disease while concurrent chemoradiation is the goal standard for locally advanced diseases. [6,7] Patients also require supportive care like blood transfusion, urinary diversion, hemostatic radiotherapy, treatment of infection, nutritional support, pain control, among others.[7]

In response to the growing burden from increasing incidence, prevalence, morbidity and mortality from cancer, most countries in Sub-Saharan Africa developed National Cancer Control Program (NCCP) which has cervical cancer as one of the cancers targeted for control.[8,9] For instance, the Federal Government of Nigeria through the Federal Ministry of Health had a National Cancer Control Program 2018-2022 with goals that include screening of population at risk, early diagnosis and prompt, cost effective and available standard treatments for cancer patients.[10] These goals will inevitably increase the number of cancer cases detected early, the number of cancer patients enrolled for standard treatments and help reduce drastically the delays encountered by cancer patients in presenting to specialized cancer centers for treatment.

However, cervical cancer continues to ravage Sub- Saharan African countries with high incidence, morbidity and mortality.[1,9] Most patients present late with advanced disease due to several factors causing delays.[11,12] Many studies have attempted to characterize these delays, with Sub-Saharan African countries having worse delays[11-13] compared to Northern African Countries,[14,15] North America or Europe regions.[16] These studies, however, were mainly retrospective in nature and assessed only a sub-component of the total delay for the study population.

This study was a prospective study aimed to assess the Presentation, Diagnostic, Treatment and Total delays encountered by cervical cancer patients; as well as factors associated with these delays.

MATERIALS AND METHODS

Study design and Study Area

This was a descriptive cross-sectional study carried in Ahmadu Bello University Teaching Hospital Zaria on histologically diagnosed cervical cancer patients receiving treatment at the Radiotherapy and Oncology Department. Data was collected between April 2020 and June 2021.

Sample Size Determination

From a previous study conducted in Ahmadu Bello University Teaching Hospital Zaria, the prevalence of cervical cancer was 48 cases per 1000 women in the community (0.048).[17]

The minimum sample size was calculated using the formula:

$n = \frac{Z^2.p.q}{d^2}$ [18] Where:

Z is percentage point of normal distribution corresponding to required level of significance (α= 0.05) = 1.96

p is prevalence from previous study (p= 0.048)

q is complimentary probability of p; q= 1- p (q= 0.952)

d is precision/margin of error of 5% (0.05).

Therefore, minimum sample size n = 70.2

Allowing for non- response of 10% of the minimum sample, the final sample size to allow for non- response was n/0.9 i.e.70.2/0.9 = 78.

Eligibility Criteria

All patients with histological diagnosis of cervical cancer who were receiving treatment at the Radiotherapy and Oncology Department, Ahmadu Bello University Teaching Hospital, Zaria, were included in the study after obtaining consent. Patients on follow-up who completed treatment; patients being managed for recurrence and those with life threatening comorbid conditions were excluded from the study.

Data Collection

Data was collected with the aid of semi-structured validated questionnaire which was divided into five sections. Section A assessed socio-demographic characteristics of patients; Section B assessed the clinicopathologic characteristics; Section C assessed Presentation Delay; Section D assessed Diagnostic delay, while Section E assessed Treatment delay. Informed consent was sought before recruiting patients for the study. New patients were first interviewed and relevant socio- demographic details, history of illness and interventions received before presenting to the radiotherapy facility were taken. The details of histology report were also recorded. Patients were then examined at first presentation and staged using the International Federation of Obstetrics and Gynecology (FIGO) 2018 staging system along with radiologic evaluation from abdominopelvic computed tomography scan or ultrasound scan. Each patient was then followed up until commencement of chemotherapy and interval between first presentation and commencement of chemotherapy was recorded. The data collected was carefully saved to guarantee maximal confidentiality. Patients who did not commence treatment within the duration of the study were not included in the study. A total of 108 patients were recruited in the study.

The data collected was inputted 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.

Presentation delay was measured as the time interval between awareness of cancer symptom by patient and first visit to a healthcare provider.[8] Diagnostic delay was measured as the time interval between patient's first visit to healthcare provider and date of definitive histology diagnosis.[8] Treatment delay was the interval between definitive histological diagnosis and date of commencement of definitive treatment (chemotherapy or radiotherapy).[8] Total delay was derived by summing up the Presentation, Diagnostic and Treatment delays.[19] The normality of data was tested using skewness and kurtosis and the values were all within ± 1.0, indicating normal distribution.

The data was summarized using mean, standard deviation, median and frequency tables as applicable. Test for significant association between variables was done using bivariate Chi-square and linear regression as applicable. Statistical associations with p value ≤ 0.1 were then further analyzed using multi-nominal logistic regression to rule out confounding factors. A confidence interval of 95% was used for the purpose of 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/W30/2020). Informed consent of patients enrolled in this research was obtained and strict confidentiality of data obtained in verbal and written forms. Participation was voluntary and patient could withdraw consent at any point during the study.

RESULTS

A total of 108 participants were recruited in this study with the mean age of 53.7 ± 12.2 years and 67(62.0%) of them were in their fifth and sixth decades of life (Table 1). The overwhelming majority 101(93.5) of the patients did not have health insurance cover and 71(65.7%) of them resided over 100km away from Ahmadu Bello University Teaching Hospital (ABUTH) Zaria (Table 1). Other socio-demographic variables are outlined in Table 1. Also, 46(43%) of the patients were resident in Kaduna State, the host state of the radiotherapy facility where the research was conducted (Figure. 1).

Many of the study population, 64(59.3%), were post-menopausal women with 76(70.4%) of them having abnormal vaginal bleeding as the initial symptom and 103(95.4%) with advanced disease (FIGO stage IIB to IVB) at presentation to the radiotherapy facility (Table 2). Other clinicopathological characteristics of study population are shown in Table 2.

The mean age of sexual debut, and first childbirth were 17.1 ± 3.0 years and 19.4 ± 3.5 years respectively. Twenty-one (19.4%) of the study population had sexual debut at 14 years of age or less while 24(22.2%) had first childbirth at 16 years or less; and 76(70.4%) had more than four live births (Table 3). Other risk factors for cervical cancer are shown in Table 3.

Table 1. Socio-demographic characteristics of study population

Variable (N=108)	Frequency (%)
Age (years)	
≤ 40	13 (12.0)
41 – 50	34 (31.5)
51- 60	33 (30.6)
61- 70	20 (18.5)
71- 80	6 (5.6)
81- 90	2 (1.8)
Marital status	
Married	73 (67.6)
Single	13 (12.0)
Widowed	15 (13.9)
Divorced	5 (4.6)
Separated	2 (1.9)
Education	
None	17 (15.7)
Non-formal	30 (27.8)
Primary	23 (21.3)
Secondary	18 (16.7)
Tertiary	20 (18.5)
Literacy	
Illiterate	49 (45.4)
Literate	59 (54.6)
Occupation	
None	39 (36.1)
Petty trader	43 (39.8)
Civil servant	18 (16.7)
Others	8 (7.4)
Use of health insurance	
Yes	7 (6.5)
No	101 (93.5)
Distance from residence to ABUTH Zaria (Km)	
< 100	37 (34.3)
100- 300	37 (34.3)
> 300	34 (31.5)

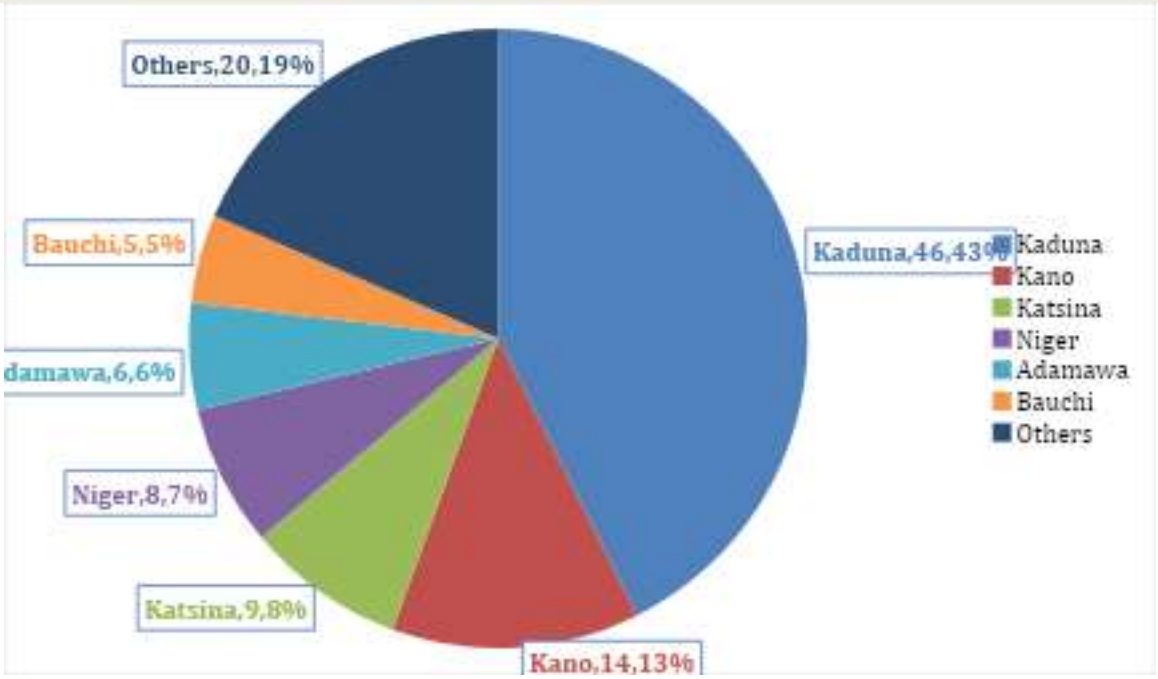

Figure 1. Distribution of study population by state of residence (N= 108)

Table 2. Clinicopathological characteristics of study population

Variable (N= 108)	Frequency (%)
Histology	
Keratinizing SCC	26 (24.1)
Non- Keratinizing SCC	70 (64.8)
Adenocarcinoma	6 (5.6)
Others	6 (5.6)
FIGO Stage	
IIA	5 (4.6)
IIB	27 (25.0)
IIIA	21 (19.5)
IIIB	33 (30.6)
IVA	17 (15.7)
IVB	5 (4.6)
Menopausal status	
Pre-menopausal	44 (40.7)
Post-menopausal	64 (59.3)
Initial symptoms	
Vaginal bleeding	76 (70.4)
Vaginal discharge	26 (24.1)
Others	6 (5.6)

Comorbidities	
None	59 (54.6)
Hypertension	25 (23.1)
Retroviral disease	17 (15.7)
Others	7 (6.5)
Hospital of histological diagnosis	
ABUTH Zaria	63 (58.3)
Non- ABUTH Zaria	45 (41.7)

SCC- squamous cell carcinoma; FIGO: International Federation of Gynaecology and Obstetrics

Table 3. Some risk factors of cervical cancer in study population

Variable (N= 108)	Frequency (%)
Age at sexual debut (years)	
≤ 14	21 (19.4)
15- 18	58 (53.7)
> 18	29 (26.9)
Age at first childbirth (years)*	
≤ 16	24 (22.8)
17- 24	70 (66.7)
≥ 25	11 (10.5)
Parity	
≤ 4	32 (29.6)
> 4	76 (70.4)
Retroviral disease	
with HIV	17 (15.7)
without HIV	91 (84.3)
Prior awareness	
Yes	38 (34.2)
No	70 (64.8)
Prior Pap smear screening	
Yes	7 (6.5)
No	101 (95.4)
Family history of cervical cancer	
Present	5 (4.6)
Absent	103 (95.4)

*N= 105 as three of the patients were nulliparous

Table 4. Measure of delays in study population

Delays (N= 108)	Mean ± SD (weeks)	Range (weeks)
Presentation delay	18.9 ± 15.1	0.2 – 52.0
Diagnostic delay	12.9 ± 9.5	2.0 -39.0
Treatment delay	10.6 ± 9.5	1.0 – 38.0
Total delay	42.5 ± 21.9	6.0 - 94.0

SD: Standard deviation

Table 4 shows the mean, standard deviation and range for the various components of Total delay in the study population. Over half, 64 (59.3%) had presentation delay while 55 (50.9%) had diagnostic delay of three months and above, respectively (Table 5). Similarly, 76 (70.4%) of study population had Treatment delay beyond one month; and Total delay of 6 months and beyond, respectively (Table 5).

Table 5. Frequency distribution of delays in study population

Variable (N= 108)	Frequency (%)
Presentation delay	
< 13 weeks	44 (40.7)
13 – 26 weeks	32 (29.6)
.> 26 weeks	32 (29.6)
Diagnostic delay	
< 13 weeks	53 (49.1)
13 – 26 weeks	43 (39.8)
.> 26 weeks	12 (11.1)
Treatment delay	
< 2 weeks	4 (3.7)
2 – 4 weeks	28 (25.9)
.> 4 weeks	76 (70.4)
Total delay	
< 26 weeks	32 (29.6)
26 – 52 weeks	39 (36.1)
.> 52 weeks	37 (34.3)

Presentation delay was responsible for 45%, while Systemic (Diagnostic and Treatment) delays accounted for the remaining 55% of Total delay in study population (Figure 2). Most of the Treatment delay (70%) was between definitive histology diagnosis and first presentation to radiotherapy facility while only 30% was from first presentation at radiotherapy facility to commencement of definitive treatment (Figure 3).

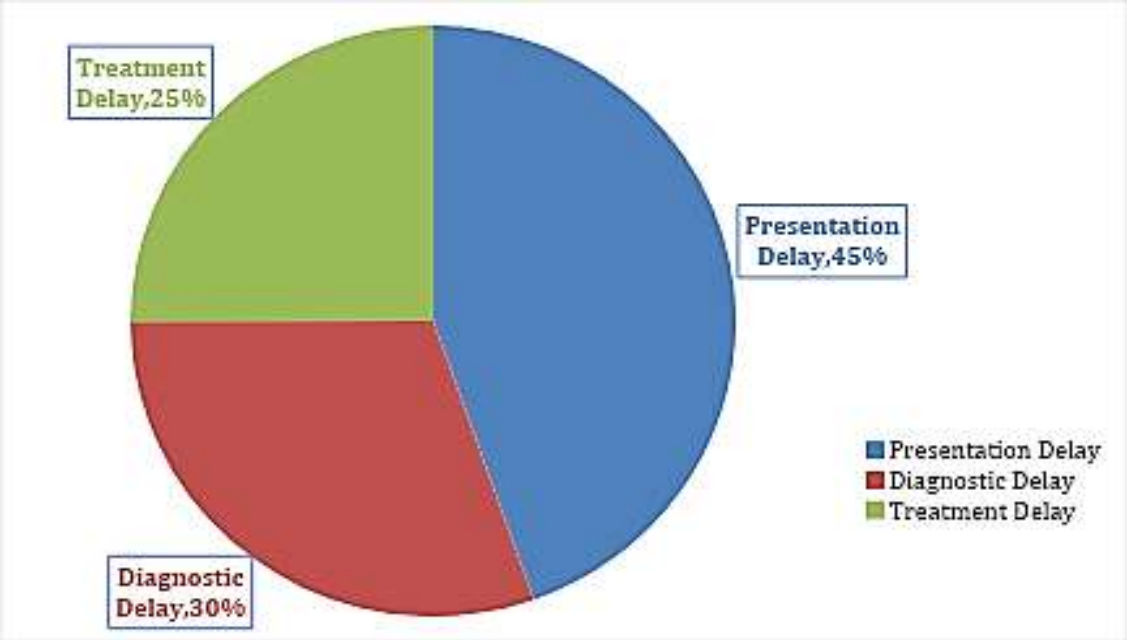

Figure 2. Contribution to Total delay in study population

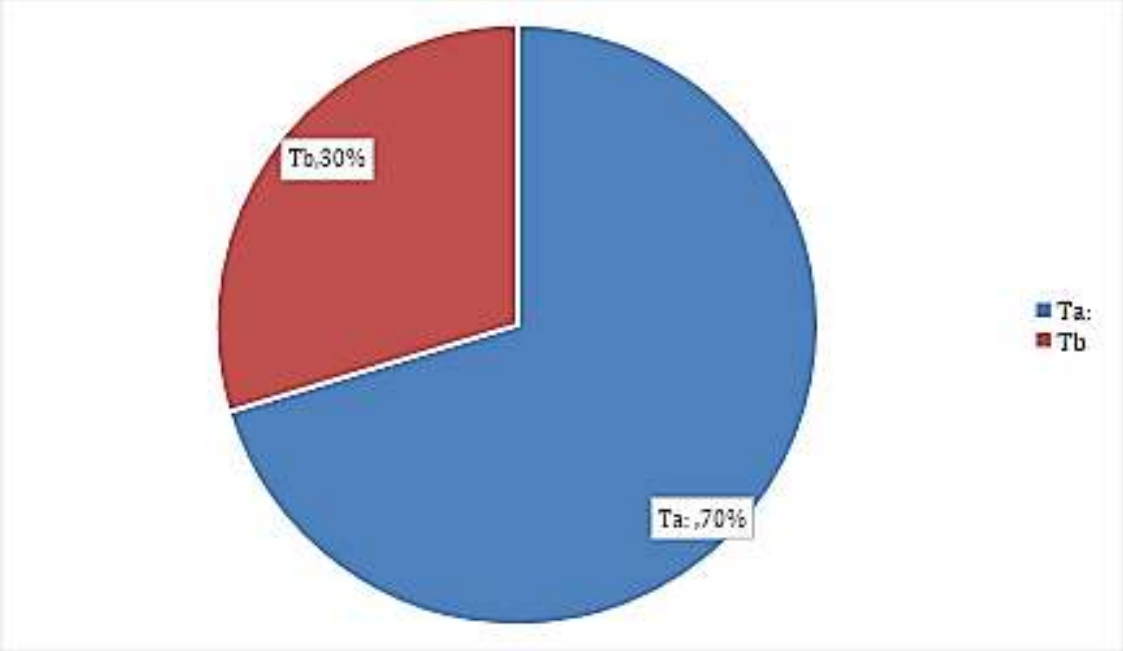

Figure 3: Distribution of Treatment delay in study population
Ta: Interval between histology diagnosis and first presentation to radiotherapy facility (weeks)
Tb: Interval between first presentation to radiotherapy facility and commencement of treatment (weeks)

Except for literacy of study population which was significantly associated with presentation delay on bivariate analysis ($\chi 2$= 9.87, p= 0.0072), none of the socio- demographic variables (age, marital status, education, literacy and occupation) was associated with Presentation, Diagnostic and Treatment delays respectively (Tables 6-8). On bivariate analysis, Presentation delay was significantly associated with use of traditional medicine to treat symptoms ($\chi 2$= 22.87, p= 0.00001) but not associated with prior awareness of cervical cancer, menopause, initial symptom, use of health insurance, duration travelled from residence to first health facility or significant source of funding. On multivariate analysis, literacy of study participants was no longer associated with Presentation delay (p= 0.85) while the use of traditional medicine (p< 0.0001) was still significantly associated with Presentation delay (Table 6).

Similarly, Diagnostic delay was significantly associated with type of hospital first visited ($\chi 2$= 10.24, p= 0.037) and number of hospitals visited before histology diagnosis was made ($\chi 2$= 14.19, p= 0.0067) and financial and logistic constraints ($\chi 2$= 15.53, p= 0.017) on bivariate analysis (Table 7). These remained significant on multivariate analysis (Table 7). Treatment delay was associated with finances, logistics and patients' lack of conviction about diagnosis of cancer, as primary constraints on bivariate ($\chi 2$= 33.20, p= 0.00001) and multivariate (p< 0.0001) analysis (Table 8).

Table 6. Factors associated with Presentation delay in study population

Variable (N=108)	**<13 weeks**	**13– 26 weeks**	**> 26 weeks**	**Statistical test**		
				$\chi 2$	**df**	***p***
Age (years)						
≤ 50	17 (15.7)	16 (14.8)	14 (13.0)	0.97	2	0.61
>50	27 (25.0)	16 (14.8)	18 (16.7)			
Marital Status						
Married	27 (25.0)	23 (21.3)	23 (21.3)	1.32	2	0.52
Not married	17 (15.7)	9 (8.3)	9 (8.3)			
Education						
None	5 (4.6)	7 (6.5)	5 (4.6)	9.98	8	0.27
Non- formal	9 (8,3)	11 (10.1)	10 (9.6)			
Primary	11 (10.1)	5 (4.6)	7 (6.5)			
Secondary	6 (5.6)	7 (6.5)	5 (4.6)			
Tertiary	13 (12.0)	2 (1.9)	5 (4.6)			
Literacy						
Literate	32 (29.6)	13 (12.0)	14 (13.0)	9.87	2	0.0072
Not literate	12 (11.1)	19 (17.6)	18 (16.7)			***0.85****
Parity						
≤ 4	10 (9.3)	11 (10.2)	11 (10.2)	1.70	2	0.43
>4	34 (31.5)	21 (19.4.9)	21 (19.4)			
Occupation						
None	12 (11.1)	14 (13.0)	13 (12.0)	6.74	6	0.35
Petty trader	17 (15.7)	13 (12.0)	13 (12.0)			
Civil servant	11 (10.1)	2 (1.9)	5 (4.6)			

Others	4 (3.7)	3 (2.8)	1 (0.9)			
Menopausal status						
Pre-menopausal	17 (15.7)	15 (13.9)	12 (11.1)	0.72	2	0.70
Post-menopausal	27 (25.0)	117 (15.7)	20 (18.5)			
Initial symptoms						
Vaginal bleeding	28 (25.9)	25 (23.1)	23(21.3)	1.91	2	0.38
Other symptoms	16 (14.8)	7 (6.5)	9 (8.3)			
Retroviral disease						
with HIV	8 (7.4)	6 (5.6)	3 (2.7)	1.39	2	0.50
without HIV	36 (33.3)	26 (24.1)	29 (26.9)			
Prior awareness						
Yes	20 (18.5)	9 (8.3)	9 (8.3)	3.43	2	0.18
No	24 (22.2)	23 (21.3)	23 (21.3)			***0.67****
Prior Pap smear screening						
Yes	3 (2.8)	3 (2.8)	1 (0.9)	1.05	2	0.59
No	41 (38.0)	29 (26.9)	31 (28.7)			
Family members with cancer						
Yes	10 (12.0)	2 (2.4)	5 (6.0)	2.19	2	0.33
No	27 (32.5)	17 (20.5)	22 (26.5)			
Use of traditional medicine						
Yes	9 (8.3)	22 (20.4)	21 (19.4)	22.87	2	0.00001
No	35 (32.4)	10 (9.2)	11 (10.1)			***<0.0001****
Distance from residence to first hospital						
≤ 60 minutes	40 (37.0)	24 (22.2)	24 (22.2)	4.37	2	0.11
>60 minutes	4 (3.7)	8 (7.4)	8 (7.4)			***0.051****
Health insurance						
Yes	4 (3.7)	1 (0.9)	2 (1.9)	1.09	2	0.58
No	40 (37.0)	31 (28.7)	30 (27.7)			
Primary funding						
Nuclear family	17 (15.7)	13 (12.0)	10 (9.3)	0.68	2	0.71
Other family members	27 (25.0)	12 (17.6)	22 (20.4)			

*p value from multi- nominal regression analysis

Table 7. Factors associated with Diagnostic delay in study population

Variable (N= 108)	<13 weeks	13– 26 weeks	> 26 weeks	Statistical test		
				χ^2	df	*p*
Age (years)						
≤ 50	20 (18.5)	19 (17.6)	8 (7.4)	3.34	2	0.19
>50	33 (30.6)	24 (22.2)	4 (3.7)			***0.069****
Marital Status						
Married	34 (31.5)	30 (27.8)	9 (8.3)	0.68	2	0.71
Not married	19 (17.6)	13 (12.0)	3 (2.8)			
Education						
None	7 (6.5)	7 (6.5)	3 (2.8)	7.33	8	0.50
Non- formal	11 (10.2)	16 (14.8)	3 (2.8)			
Primary	12 (11.1)	9 (8.3)	2 (1.9)			
Secondary	10 (9.3)	7 (6.5)	1 (0.9)			
Tertiary	13 (12.0)	4 (3.7)	3 (2.8)			
Literacy						
Literate	33 (30.6)	20 (18.5)	6 (5.6)	2.49	2	0.29
Not literate	20 (18.5)	23 (21.3)	6 (5.6)			
Occupation						
None	13 (12.0)	23 (21.3)	3 (2.8)	11.04	6	0.09
Petty trader	24 (22.2)	14 (13.0)	5 (4.6)			***0.102****
Civil servant	12 (11.1)	3 (2.8)	3 (2.8)			
Others	4 (3.7)	3 (2.8)	1 (0.9)			
Comorbidities						
Present	27 (25.0)	16 (14.8)	6 (5.6)	1.92	2	0.38
Absent	26 (24.1)	27 (25.0)	6 (5.6)			
Type of hospital first visited						
Private/ PHC	12(11.1)	19 (17.6)	2 (1.9)	10.24	4	0.037
General	21 (19.4)	16 (14.8)	8 (7.4)			***0.002****
Tertiary	20 (18.5)	8 (7.4)	2 (1.9)			
Hospital of histology diagnosis						
ABUTH Zaria	27 (25.0)	27 (25.0)	9 (8.3)	2.91	2	0.23
Others	26 (24.1)	16 (14.8)	3 (2.8)			

No. of hospitals visited before histology diagnosis						
One	20 (18.5)	5 (4.6)	3 (2.8)	14.19	4	0.0067
Two	28 (25.9)	23 (21.3)	5 (4.6)			***0.007****
Three or more	4 (4.8)	15 (13.9)	3 (2.8)			
Duration from biopsy to histology report						
≤ 4 weeks	50 (46.3)	41 (38.0)	11 (10.1)	0.25	2	0.88
>4 weeks	3 (2.8)	2 (1.9)	1 (0.9)			
Health insurance						
Yes	4 (3.7)	2 (1.9)	1 (0.9)	0.40	2	0.82
No	49 (45.4)	41 (38.0)	11 (10.1)			
Reason for Delay						
Finance	11 (10.2)	16 (14.8)	4 (3.7)	15.53	2	0.017
Logistics	18 (16.7)	10 (9.2)	3 (2.8)			***0.007****
Conviction	4 (3.7)	12 (11.1)	2 (1.9)			
Others	20 (18.5)	5 (4.6)	3 (2.8)			

**p* value from multi- nominal regression analysis

Table 8. Factors associated with Treatment delay in study population

Variable (N= 108)	**≤ 4 weeks**	**> 4 weeks**	**Statistical test**		
			χ^2	**df**	***p***
Age (years)					
≤ 50	12 (11.1)	35 (32.4)	0.67	1	0.41
>50	20 (18.5)	41 (38.0)			
Marital Status					
Married	22 (20.4)	51 (47.2)	0.03	1	0.87
Not married	10 (9.3)	25 (23.1)			
Education					
None	4 (3.7)	13 (12.0)	5.54	4	0.24
Non- formal	9 (8.3)	21 (19.4)			
Primary	4(3.7)	19 (17.6)			
Secondary	9 (8.3)	9 (8.3)			
Tertiary	6 (5.6)	14 (13.0)			
Literacy					
Literate	21 (19.4)	38 (35.2)	2.22	1	0.14
Not literate	11 (10.2)	38 (35.2)			***0.98****
Occupation					
None	11 (10.2)	28 (25.9)	1.35	3	0.72

Petty trader	11(10.2)	32 (29.6)			
Civil servant	7 (6.5)	11 (10.2)			
Others	3 (2.7)	5 (4.6)			
Comorbidities					
Present	16 (14.8)	33 (30.6)	0.39	1	0.53
Absent	16 (14.8)	43 (39.8)			
Hospital of histologic diagnosis					
ABUTH Zaria	22 (20.4)	41 (38.0)	2.03	1	0.15
Others	10 (9.3)	35 (32.4)			***0.25****
Health insurance					
Yes	4 (3.7)	3 (2.8)	2.72	1	0.10
No	28 (25.9)	73 (67.6)			***0.86****
Primary funding					
Self/ Husband/Children	15 (13.9)	27 (25.0)	1.22	1	0.27
Other family members	17 (15.7)	49 (45.4)			
Distance from residence to first hospital (Km)					
< 100	11 (10.2)	26 (24.1)	0.24	2	0.89
100 – 300	10 (9.3)	27 (25.0)			
>300	11 (10.2)	23 (21.3)			
Patients' primary constraint					
Finance	1 (0.9)	20 (18.5)	33.20	3	0.00001
Logistics	6 (5.6)	35 (32.4)			***<0.000****
Lack of conviction	2 (1.9)	9 (8.3)			
Others	23 (21.3)	12 (11.1)			

**p* value from multi- nominal regression analysis

DISCUSSION

The mean age of patients from this study was remarkably similar to those from studies in Nigeria [12] and Morocco [14] but was much higher than the mean age from another study on cervical cancer patients in Malawi.[37] The high prevalence of HIV amongst patients in the later study was responsible for the lower age of diagnosis of cervical cancer compared to this study.

This study found the mean Total delay to be 42.5 weeks (10 months) with majority of patients delaying beyond 6 months. Though better than other studies from Sub-Saharan Africa, on cervical cancer, [12, 13] it was worse than another Moroccan studies. [14, 15] This finding implies that most of the patients presented with advanced diseases due to delays. From this study, the contributions of Systemic delay to the Total delay was significant and similar to those obtained from other studies. [12,15] This study demonstrated that Systemic delay contributed more to Total delay than Presentation delay.

The Presentation delay from this study was remarkable in keeping with findings from

numerous studies on delayed presentation of cancer patients in low- and middle-income countries where a lot of time is wasted before patients' first presentation to health facilities.[20-23] There was no significant relationship between Presentation delay and age, marital status, education and occupation of patients. In this study, neither young nor advanced age confer any advantage or disadvantage to Presentation delay which is in keeping with findings from some previous studies.[24, 25] However, this finding is contrary to those of an Indian study [26] on cervical cancer which showed patients above 50 years were more likely to delay presentation compared to those below 50 years of age; and another study in England on young cervical cancer patients that demonstrated that younger age was more associated with Presentation delay.[21]

The lack of significant association between Presentation delay and marital status of patients in this study was supported by previous studies on cervical cancer [21, 27] but contrary to a similar study which showed that being married confers protection against Presentation delay.[26] It is expected that being married would confer more moral, psychological and financial support to the patients which should influence their early presentation compared to patients who were widowed, divorced or single. However, the fact that many of the married patients in this study also relied on other family members as their primary source of funding and support, could explain why being married did not confer the advantage of presenting early.

Education level of study population did not confer advantage towards early presentation to healthcare providers from initial symptoms. This finding was supported by some previous studies [21, 22] on cervical cancer but contrary to others [28-31] where patients with low education were more likely to have Presentation delay compared to their educated counterparts. In this study, education had influence on awareness of cervical cancer but awareness did not translate into increased screening for pre-malignant lesions or improvement in Presentation delay. This observation probably accounted for the lack of significant association between patients' level of education and Presentation delay in this study.

Prior awareness of cervical cancer by patients in other studies was found to reduce Presentation delay probably because their awareness influenced their attitude towards seeking appropriate medical interventions early.[13, 32] However, in this study, awareness was generally low amongst patients prior to onset of symptoms which was in keeping with many studies on awareness of cervical cancer amongst women in general population.[33- 37] Even at that, those who had prior awareness of cervical cancer did not present earlier to the healthcare providers. One of the reasons that can be adduced from this observation is that many of the patients who were aware of cervical cancer prior to onset of symptoms may not have had sufficient knowledge on it to influence their early presentation. It may also be that they had sufficient knowledge from awareness but had poor background health seeking behavior, thereby giving them no advantage in presenting earlier compared to their counterparts who had no prior awareness.

The use of traditional medicine to treat early symptoms in this study was common in keeping with findings from studies on cancer patients.[38, 39] However, unlike a study on cervical cancer patients, [40] there was

significant association with Presentation delay from this study. The study also observed that awareness on cervical cancer did not significantly dissuade patients to resorting to use of traditional medication unlike similar studies [41] where lack of knowledge of cervical cancer was a major risk for use of traditional medication. The finding is a pointer to the preference of utilization of traditional medication to conventional medicine by a significant section of the general population. This practice generally contributed to delayed presentation of patients with advanced disease.

Patients' access to healthcare is a very crucial factor contributing to Presentation delay. Some studies have highlighted the challenges of cervical cancer patients grossly lacking easy access to healthcare facilities where screening, early diagnosis and prompt treatment or referral can be done. [42,43] This study further highlighted this challenge as patients who had to spend over an hour travelling to the first healthcare provider had more tendency towards Presentation delay compared to those who spent less than an hour, though the association was not significant. Those who spent more time likely had to cover more distance to reach the healthcare facility or had to pass through difficult terrains. This could have contributed to their reluctance towards early presentation for assessment of symptoms.

Diagnostic delay is a major contributing factor to Total delay in low- and middle-income countries. [11, 12] Of the literature reviewed, only few assessed Diagnostic delay independently [44] while others assessed it as component of Systemic or Medical delays.[12, 15] This study buttressed the importance of Diagnostic delay as it constituted 30% of Total delay. The cause of this delay was not the interval between tissue biopsy and histology report (mean: 2.79 weeks) as this interval was short compared to the mean Diagnostic delay from the study (12.9 weeks). However, this study found that the type of hospital first visited, and the number of hospitals visited before histology diagnosis influenced the Diagnostic delay significantly. Patients who presented first to tertiary hospitals had lesser diagnostic delay compared to those who presented first to General and other types of hospital. The reason for this observation is that tertiary hospitals have much more skilled manpower, and facilities to diagnose cervical cancer earlier without having to refer to other hospitals. Obviously, the more hospital patients had to visit before histology diagnosis, the more the Diagnostic delays. Referrals may involve patients making journeys of several kilometers, sometimes outside their State of residence to other States. This may have resulted in additional burden of cost and logistics which culminated in worsening Diagnostic delay.

Treatment delay, the interval from definitive diagnosis to commencement of definitive treatment, was as significant as diagnostic delay in this study. Treatment delay was made up of two components: Interval between histology diagnosis and first presentation to Radiotherapy department; and interval between first presentation to Radiotherapy department and commencement of definitive treatment. The former accounted for most of the duration (70%) in Treatment delay. This may be due to the fact that patient may have to travel to the Radiotherapy Department from their residences or initial hospitals of admission with obvious financial and logistic implications. They may also waste time in trying to solicit for financial support from extended families and/or support groups.

Interestingly, the health insurance coverage of patients in this study was very low (6.48%) compared to a similar study in Ghana on cervical cancer patients where 86.84% of the patients had active on National Health Insurance Scheme.[45] Furthermore, patients on health insurance did not have significant improvement in Treatment delay. The fact that only few services in cancer care were covered by the health insurance meant that those enrolled into it had to also make out-of-pocket payments for their treatments like those without health insurance. Catastrophic financing of treatment and logistics involved in ensuring patients received appropriate treatments within acceptable period were major constraints that led to Treatment delay in this study. These findings are a far cry from the vision of National Health Policy 2016 vision, which is universal health coverage for all, and its specific objectives on cancer.[46]

In order to key into the World Health Organizations' strategy towards Elimination of Cervical Cancer by 2030,[47] of which early diagnosis and prompt treatment of cervical cancer patients is a component, integrated and harmonized efforts by relevant stakeholders must be instituted to reduce, to the barest minimum, the various delays faced by cervical (and other) cancer patients.

CONCLUSION

This study assessed Total delay and its components- Presentation, Diagnostic and Treatment delays- along with their associated factors. The delays in cervical cancer patients were quite remarkable with consequential presentation of most of the patients at advanced stages. The study also found low awareness of cervical cancer prior to onset of symptoms, exceptionally low level of cervical cancer screening and very low enrolment of patients to the National Health Insurance Scheme. The use of traditional medicine to treat initial symptom of cervical cancer was associated with Presentation delay while lack of finance and logistics were implicated in Diagnostic and Treatment delay. To achieve the objectives of the National Cancer Control Program, coordinated efforts from the primary to tertiary healthcare levels by relevant stakeholders must be put in place to drastically reduce these delays to allow for adequate screening, earlier diagnosis and prompt treatment of most of cervical (and other) cancer patients, in line with the World Health WHO Global Strategy towards Elimination of Cervical Cancer by 2030.

Conflict of Interest

The authors declare no conflict of interest in this study.

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