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Full Length Research

Economic burden of households affected by cancer among patients attending Jos University Teaching Hospital, Plateau State, Nigeria

Gaji, Luka Dung[1], Ijeoma Okoronkwo[2], Salamatu Ishaku[3*], Anthonia Chinweuba[2], Emmanuel Oyedele[4] and Monica Abua[5]

[1]Plateau State College of Nursing and Midwifery, Vom, Plateau State, Nigeria.
[2]Department of Nursing Sciences, University of Nigeria, Enugu Campus, Enugu, Nigeria.
[3]Kaduna State College of Nursing and Midwifery, Kafanchan, Kaduna State, Nigeria.
[4]Department of Nursing Sciences, University of Jos, Plateau State, Nigeria.
[5]School of Midwifery Calabar, Cross River State, Nigeria.

*Corresponding author. Email: salamaishaku0507@gmail.com; Tel: +234-7037079252.

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ABSTRACT: The economic burden of cancer is very high; health care providers need to provide quality cost-effective care that will shorten the stay of patients in the hospital and reduce the frequency of visit to health facilities. This study provides information about the economic burden of households affected by cancer among patients attending Jos University Teaching Hospital, Plateau State, Nigeria. A cross-sectional descriptive survey design was conducted in 2015, with the sample size of 179 cancer patients drawn consecutively from an estimated population of 276 that used the hospital in one year. A structured questionnaire was used to collect data assisted by two trained research assistants from the oncology clinic. Data were analyzed descriptively using frequencies, percentages, mean and standard deviation while Chi-square was used to test for association. Majority of respondents were ranked among the lower socio-economic group. The direct monthly medical cost of cancer incurred by patients and their household was high; N30,757.95 + 27,325.82. The mean monthly total income of the patients was N65,978.74 $\pm$ 104,036.97, the mean monthly patients' expenditure was N43,916.28 $\pm$ 56,070.33, the mean total annual loss was N217,515.19 $\pm$ 798,708.95, the mean patients' annual loss as a percentage of their mean annual income was 11.38 $\pm$ 19.13% while as a percentage of their mean annual expenditure was 50.06 $\pm$ 421.98 . There was significance difference ($p<0.05$) in the cost distribution among different socio-economic groups; lower, middle and upper with regards to the monthly patient total income, earnings and annual loss of person accompanying the patient, patient loss, accompanying persons' loss, total loss, patients' annual loss, and total annual loss. Cancer management is critical to the survival of the patient, hence, there is need for government to intervene by subsidizing the cost of cancer treatment. There is also need for public enlightenment on regular screening for early detect and prevention of cancer.

Keywords: Adult cancer patients, socio-economic groups, direct medical cost, indirect medical cost, oncology clinic.

INTRODUCTION

Cancer is the second leading cause of death globally, and is responsible for an estimated 9.6 million deaths in 2018 (World Health Organization, 2018). Globally, about 1 in 6 deaths is due to cancer, approximately, 70% of deaths from cancer occur in low-and middle-income countries (World Health Organization, 2018). Cancer accounts for one out of every eight deaths annually. The incidence and death rates from cancer remain significantly higher in the developing world including Nigeria (Boyle and Levin, 2008).

Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells (American Cancer Society, 2011). Cancer can occur in different anatomical sites in the body, its incidence and mortality differ across regions and between sexes (Azubuike et al., 2018). The name of the cancer is given in relation to the part that is affected.

The American Cancer Society (2020) states that, the global economic burden of cancer is unknown, although data are available in some countries, for instance in United States of America (USA), it is estimated at 1.8% of gross domestic product (GDP). The economic burden of cancer is substantial in all countries and reflects health care spending as well as lost productivity due to morbidity and premature death from cancer.

The specific economic challenges relating to cancer control in the developing world are exacerbated by other related phenomena; which include inadequate health systems infrastructure, scarcity of specialized skills and specialists, high diagnostic and treatment costs, and the resulting inability to provide lengthy, complex personalized treatment regimens and follow-up care as necessary (Axios International, 2009). Some of these challenges are caused at least in part by inadequate funding thereby leaving patients, relations and care givers to bear the cost of diagnosis and treatment. Jos University Teaching Hospital (JUTH), is a major centre in Plateau State, with facilities for screening and treatment of cancer.

When a patient is diagnosed with cancer, the burden of treatment does not lie on the patient alone. Other family members are affected physically and economically as well. The financial resources of the family may be affected by the loss of ability to work and the needs of well family members may be neglected because of the focus on the ill members (Walsh and Crumbie, 2007).

According to Carrin et al. (2007), the economic burden of health care expenditure on individuals challenged with chronic illness especially where prepayment system is absent is a growing concern. These include direct cost of medical care and indirect cost from productivity losses due to patient's disability and time spent by family members accompanying patients to seek care.

In 2009, cancer accounted for close to one trillion dollars in economic losses from premature death and disability. The loss of working man-hours and life caused by cancer represents the single largest drain on nation’s economies - USA, compared to all other causes of death, including HIV/AIDS, heart disease, infections among others. This shows that, cancer consumes a lot of funds in the developed world where a reasonable percentage of their budget goes to health (John and Ross, 2009). Estimate shows that there were 12.7 million new cancer cases in 2008 worldwide, of which 5.6 million occurred in economically developed countries and 7.1 million in economically developing countries (American Cancer Society, 2011).

The low level of awareness about cancer and the high cost of therapy observed in Nigeria as well as the lifestyle and behavioural risks superimposed on cultural beliefs amplify the chances of developing cancer in high risk patients (Mehta, 2012). Multidisciplinary approach is suggested with multi-faceted treatment protocols which have helped in India, as the way forward. It was further lamented that 70 to 80% report to health facilities at the late stage of the disease when nothing can no-longer be done and this happens only when they must have wasted time at taking alternative treatments to no avail (Mehta, 2012).

There is growing concern about the economic impact of healthcare expenditure on households who face illness, especially where prepayment systems do not exist and households have to pay out of pocket (OOP) for health care when they use health services (Onoka et al., 2011). In Nigeria, private expenditure on health accounts for 69.1% of total expenditure on health, and 90.4% of this expenditure is OOP. The high level of private OOP expenditure implies that health financing policy recognizes the importance of efficiency, fair and sustainable means of health care financing policy. Nevertheless, 4% of households in the country spend over half of their total household expenditures on health care (Onoka et al., 2011).

In USA, bladder cancer is responsible for 70,000 diagnosed cases and over 15,000 deaths. Once diagnosed, patients with non-muscle invasive bladder cancer (NMIBC) are committed to a life time of invasive procedures and potential hospitalization that result in substantial direct and indirect costs amounting to nearly $4 billion per year. In addition, this fiscal burden is further compounded by the indirect impact on psychological health and quality of life of patients and their families (Mossanen and Gore, 2014).

The main approaches for valuing time are the human capital and the willingness-to-pay (WTP) methods. In the human capital approach gender-and age-specific average earnings are combined with time lost from work or years of working life lost due to premature death to estimate unrealized earnings (Yabroff et al., 2011). WTP approaches, in contrast, incorporate both lost productivity and the intrinsic value of life, by estimating the amount an average individual or populations of individuals would be willing to pay for an additional year of life. Because cancer incidence and mortality rates are highest in the elderly, a population less likely to be in the workforce than their younger counterparts, these valid, but conceptually different approaches yield very different estimates of the indirect costs of cancer (Yabroff et al., 2011).

In this study, economic burden means both medical and non-medical costs incurred by cancer patients in the management of their ailment. It is classified into direct and indirect costs. Direct cost related to investigations, diagnoses, treatment, admissions, follow up costs and travel cost while indirect cost are those things that will be forgone for the sake of this illness such as time spent

travelling, waiting time in hospital, time spent out-of-work, time accompanying relative, time lost through premature death or premature retirement. The socio-economic groups were considered in terms of the respondents' socio-economic class; lower, middle and upper.

Given the incidence of cancer and the national government decision to address the disease, a study on how households are affected by cancer will aid in the formulation of policies that may help to prevent households from being pushed into poverty. Therefore, this study was undertaken to determine the economic burden of households affected by cancer.

Research questions

1. What are the direct medical costs incurred by cancer patients and their households in JUTH?
2. What are the indirect medical cost incurred by cancer patients and their households in JUTH?

Hypothesis (H_o)

There is no significant difference in the cost distribution of cancer treatment among different socio-economic groups (lower, middle and upper).

METHODOLOGY

This is an institutional based cross-sectional study that was carried out among all the in and out patients receiving treatment for cancer at the oncology clinic in JUTH, Plateau State in 2015. Patients attending the oncology clinic were used as population for the study. The sample was drawn from a sampling frame of all the cancer patients attending the oncology clinic in the past one year derived from the clinic register and admission records. A sample size of 163 patients was determined using the formula: $n = N/1+N (e)^2$. Where n = required sample; N = total population (sampling frame) e = error of tolerance which is 0.05 at 95% confidence level and 1 = constant (Yamane, 1967). In order to cater for attrition or non-response, 10% provision was made giving the final sample size approximately 179 patients. Patients were consecutively recruited in the oncology ward as they attended the clinic. Ethical approval was obtained from the ethical committee of JUTH, Plateau State. All participants were fully informed of the objective and design of the study and a written consent was obtained for each participant before participating in the study. Respondents were assured that confidentiality and anonymity will be maintained in all information given. The attendance register was used as sampling frame to select participants who met the inclusion criteria; aged 18 years and above, diagnosed of cancer and are receiving treatment in JUTH for the past 1 year either as outpatient or inpatient or within the period of study, patients who are conscious and are actively involved in the management of their condition, willingness to participate in the study and available at the time of study. The clinic runs from Monday to Friday. Questionnaire was used to source information from the respondents. The questionnaire was developed from literature search on economic burden of cancer patients. The respondents were to choose and tick the options that best described their views on the issue. A consultant physician in oncology unit and three senior lecturers from the Department of Nursing Sciences, University of Nigeria, Nsukka were given a copy of the instrument, purpose of the study and the research questions to assess the relevance of content, clarity of statements and logical accuracy of the instrument so as to establish the content validity. These specialists made various suggestions which were used to modify the questions before administration. To establish the reliability of the instrument, it was pilot tested on 18 cancer patients attending cancer clinic at Bingham University Teaching hospital Jos using split-half method. The data collected was analyzed using Spearman-Brown coefficient which gave a reliability of 0.82. This showed that the instrument was reliable. Two registered nurses working as permanent staff in the oncology unit of the hospital were trained and used as research assistants. The training involves 35 minutes discussion on the objectives of the study, contents of the instrument and how to administer the instrument as well as how to assist the illiterate respondents to fill in their responses. Objectivity and confidentiality on the information gathered were emphasized. The researcher and assistants administered the questionnaire to each participant that met the inclusion criteria as they waited to be attended to in the clinic and in the wards. For those who could not read and/or write, the researcher and the research assistants helped by interviewing the respondents guided strictly by the contents of the instrument and filled in the responses objectively as possible. Data collection lasted for a period of three weeks.

Data analyses

The data were analyzed using descriptive statistics such as frequency, percentages, mean and standard deviation. Chi-square was used to test the association between cost distribution of cancer treatment and the socio-economic groups (lower, middle and upper). All the analyses were done using statistical package for social sciences (SPSS) version 20.0 computer software programme (SPSS inc.IL: Chicago, USA).

RESULTS

As presented on Table 1, the respondents' mean age ±

Table 1. Demographic characteristics of respondents (n = 179).

Demographic characteristics	F	%
Age		
18 – 27 years	9	5.0
28 – 37 years	32	17.9
38 – 47 years	64	35.8
48 – 57 years	40	22.3
58 – 67 years	23	12.8
68 – 77 years	11	6.1
Minimum Age	18	
Maximum Age	77	
Mean ± Std. Dev.	46.02 ± 12.32	
Sex		
Male	70	39.1
Female	109	60.9
Marital status		
Married	115	64.2
Single	25	14.0
Divorced	12	6.7
Widowed	27	15.1
Employment status		
Unemployed	52	29.1
Government employed	64	35.8
Private sector employed	24	13.4
Self employed	26	14.5
Trader	2	1.1
Retiree	9	5.0
Farmer	1	0.6
Menial labour	1	0.6
Highest educational level		
Primary	22	12.3
Secondary	44	24.6
Tertiary	85	47.5
None	28	15.6
Type of cancer		
Breast cancer	72	40.2
Cervical cancer	29	16.2
Prostate cancer	48	26.8
Colon cancer	7	3.9
Lung cancer	5	2.8
Liver Carcinoma	7	3.9
Colorectal cancer	3	1.7
Gastric cancer	4	2.2
Lymph sarcoma	3	1.7
Hand cancer	1	0.6

standard deviation was 46.02 ± 12.32 with the minimum age being 18 years and maximum age being 77 years. Majority 109(60.9%) of the sampled respondents were females while 70(39.1) were males. The respondents consisted majorly of married persons 115(64.2%), 25(14%) single, 12(6.7%) divorced and 27(15.1%) widowed. Respondents that were government employed had a higher distribution of 64(35.8%) followed by the unemployed 52(29.1%), private sector employed 24(13.4%), self-employed 26(14.5%), trader 2(1.1%), retiree 9(5%) while respondents that engaged in farming and menial labour were the least 1(0.6%) each. In term of educational level, 85(47.5%) of the respondents had tertiary education as their highest educational level, secondary 44(24.6), primary 22(12.3%) while none was 28(15.6%). A higher frequency 72(40.2%) of the respondents had breast cancer followed by those that had prostate cancer 48(26.8%), cervical cancer 29(16.2%), colon cancer 7(3.9%), lung cancer 5(2.8%), liver carcinoma 7(3.9%), colorectal 3(1.7%), gastric cancer 4(2.2%), lymph sarcoma 3(1.7%) and only 1 (0.6%) respondent had hand cancer.

***Research question* 1: What are the direct medical costs incurred by cancer patients and their households in JUTH**?

As presented in Table 2, the minimum time (months) spent on treatment by a patient is 1 month while the maximum time is 72 months. The mean duration of treatment by a patient is 17.06 ± 14.30 months. However, the duration of treatment for higher percentage 53(29.6%) of the respondents was 6 months and below followed by those whose duration was 7 to 12 months 48(26.8%) respondents. The minimum frequency for check-up appointment by a respondent is weekly while the maximum frequency by a respondent is every four months. The average frequency for check-up appointments among the respondents is monthly.

The average cost of pre-diagnosis tests among the patients was N43,864.91± 34001.25. Over half of the patients 105(58.7%) spent less than N40,000 as cost of pre-diagnosis tests. The minimum monthly cost of managing the illness among the patients was N2,000 while the maximum monthly cost was N180,000. The mean monthly cost of managing the illness among the patients is N30,757.95 ± 27,325.82. Majority 129(72.1%) of the respondents spend less than N40,000 monthly managing the illness.

Only 43 (24%) patients have received treatment from elsewhere. Out of this number, 12 (27.9%) received treatment from private hospitals, 6 (14%) received from herbal centres. It is worth noting that among other patients that received treatment from other places, like different states in Nigeria, 2 (4.7%) received treatment from India. The minimum cost of treatment was N5,000 while the

Table 2. Direct medical cost incurred by cancer patients and their households. (n = 179).

Items	F	%
Duration of Treatment		
≤ 6months	53	29.6
7 to 12months	48	26.8
13 to 18months	11	6.1
19 to 24months	29	16.2
25 to 30months	6	3.4
> 31months	32	17.9
Minimum	1	
Maximum	72	
Mean ± Std. Dev.	17.06 ± 14.30	
Frequency of check-up		
Weekly	23	12.8
Bi-weekly	34	19.0
Three weeks	6	3.4
Monthly	64	35.8
Six weeks	31	17.3
Eight weeks	15	8.4
Quarterly	4	2.2
Four months	2	1.1
Minimum	Weekly	
Maximum	Every Four Months	
Average	Monthly	
Cost of pre-diagnosis Tests		
<N40,000	105	58.7
N40,000 - N79,999	45	25.1
N80,000 - N119,999	23	12.8
N120,000 and above	6	3.4
Minimum	2,000	
Maximum	180,000	
Mean ±Std Dev.	44.91 ± 34.25	
Monthly cost of managing illness		
less than N40,000	129	72.1
N40,000 - N79,999	42	23.5
N80,000 - N119,999	4	2.2
N120,000 and above	4	2.2
Minimum	2,000	
Maximum	180,000	
Mean ± Std. Dev.	31.95 ± 27.82	
Received treatment from elsewhere		
Yes	43	24.0
No	136	76.0
Place of Treatment (n = 43)		
Herbal	6	14.0
Private hospital	12	27.9
Kaduna	2	4.7
Enugu	1	2.3
Nassarawa Gwom	1	2.3
Bauchi	7	16.3
Plateau	3	7.0
Benue	2	4.7
Zaria	2	4.7
FMC Keffi	1	2.3
India	2	4.7
Kano	2	4.7
Calabar	1	2.3
Jigawa	1	2.3
Cost of treatment (n = 43)		
less than N40,000	36	83.7
N40,000 - N79,999	3	7.0
N80,000 - N119,999	1	2.3
N120,000 – N179,000	0	0.0
N180,000 and above	3	7.0
Minimum	5,000	
Maximum	360,000	
Mean ± Std. Dev.	40.38 ± 67.62	

maximum cost of treatment was N360,000. The average cost of treatment was N39,952.38 ± 66,841.62. Majority 36(83.7%) of the patients incurred less than N40,000 as cost of treatment from these other places.

Research question 2: What are the indirect medical cost of cancer incurred by patients and their households in JUTH?

As presented in Table 3, the source of income for the higher percentage 74(41.3%) of the respondents is salary, 24(13.4%) family members, business 20(11.2%), farming 19(10.6%), petty trading 11(6.1%), pension 8(4.5%), transporter 2(1.1%), menial job 14(7.8%), friends and relations 3(1.7%), Artisan 3(1.7%) while 1 (0.6%) respondent's earnings is from rent.

The minimum amount earned by a patient is N2000; the maximum amount earned by a patient is N350,000 while the mean amount earned by a patient is N49,587.88 ± 51,809.54. Majority 123(68.7%) of the respondents earn less than N50,000.

Most of the respondents 109(60.9%) have not been absent from work because of the illness. The maximum number of days absent from work is 26 days and the mean number of days absent from work is 7.23 ± 9.78 days.

The employment status of the persons accompanying a higher percentage 75(41.9%) of patients for treatment is civil/public servants followed by the unemployed 63(35.2%) while the least percentage 2(1.1%) are retirees.

Table 3. Indirect medical cost incurred by cancer patients and their households (n = 179).

Items	F	%
Source of income		
Rent	1	0.6
Family members	24	13.4
Salary	74	41.3
Pettytrading	11	6.1
Farming	19	10.6
Business	20	11.2
Pension	8	4.5
Transporter	2	1.1
Menial Job (labour)	14	7.8
Friends and Relations	3	1.7
Artisan	3	1.7
Monthly pay/earnings		
<N50,000	123	68.7
N50,000 - N99,999	34	19.0
N100,000 - N149,999	12	6.7
N150,000 - N199,999	4	2.2
N200,000 - N249,999	2	1.1
N250,000 - N299,999	2	1.1
N300,000 and above	2	1.1
Minimum	2,000	
Maximum	350,000	
Mean ± Std. Dev.	49,587.88 ±51,809.54	
Days absent from work because of illness		
No day	109	60.9
1 - 5 days	16	8.9
6 - 10 days	17	9.5
11 - 15 days	3	1.7
16 - 20 days	34	19.0
Minimum	0	
Maximum	26	
Mean ± Std. Dev.	7.23 ± 9.78	
Employment status of person accompanying for treatment		
Artisan	6	3.4
Civil/Public servant	75	41.9
Teaching	4	2.2
Petty trading	2	1.1
Unemployed	63	35.2
Farmer	12	6.7
Business	15	8.4
Retiree	2	1.1
Income of the person		
Less than N50,000	31	17.3
N50,000 - N99,999	34	19.0
N100,000 - N149,999	7	3.9
N150,000 - N199,999	8	4.5
N200,000 - N249,999	3	1.7
N250,000 - N299,999	6	3.4
N300,000 and above	8	4.5
Do not know	82	45.8
Minimum	2,000	
Maximum	550,000	
Mean ± Std. Dev.	105,159.28 + 108,342.16	
Duration taken to see doctor on appointment date		
30 minutes and below	24	13.4
31 - 60 minutes	50	27.9
61 - 90 minutes	4	2.2
91 - 120 minutes	44	24.6
More than 120 minutes	47	26.3
Not Sure	10	5.6
Minimum	15 min.	
Maximum	360 min.	
Mean ± Std. Dev.	116 ± 80.23 mins.	
Time taken to get to JUTH on appointment		
30 minutes and below	23	12.8
31 - 60 minutes	48	26.8
61 - 90 minutes	6	3.4
91 - 120 minutes	43	24.0
More than 120 minutes	52	29.1
Not Sure	7	3.9
Minimum	10 min.	
Maximum	360 mins.	
Mean ± Std. Dev.	117.24 ± 76.35	

The minimum income for the persons accompanying the patient is N2,000; the maximum is N550,000 and the mean income is N105,159.28 ± 108,342.16. However, a significant number of the patients 82(45.8%) do not know the earnings of the persons accompanying them.

The minimum duration taken to see a doctor on appointment date is 15 minutes; the maximum duration is 360 minutes. The minimum time taken to get to JUTH on appointment was 10 minutes; the maximum time is 360 minutes.

As presented in Table 4, patients spent a mean time of 117.24 ± 76.35 minutes to JUTH on appointment date. The mean time taken to see the doctor on each appointment date was 116 ± 80.24. The mean number of days absent from work by the patients within a month was 7.27 ± 9.78. The mean monthly patients' total income was N65,978.74 ± 104,036.97 and the mean monthly patients' expenditure was N43,916.28 ± 56,070.33. The mean monthly earnings of persons accompanying patient was N105,159.28 ± 108,342.16.

The mean patients' monthly loss was N10,852.60 ±

Table 4. Indirect medical cost of care (n=179).

Indirect Costs	Mean	Std. Dev.
Minutes taken to get to JUTH on appointment date	117.24	76.35
Time taken to see doctor on each appointment date	116.00	80.24
Days absent from work because of sickness within the last one month	7.27	9.78
Monthly Patients' Total Income	65978.74	104036.97
Monthly Patients' Total Expenditure	43916.28	56070.33
Monthly earnings of Person accompanying patient	105159.28	108342.16
Patient's Monthly Loss	10852.60	52987.13
Accompanying Persons' Monthly Loss	7914.73	20676.63
Total Monthly Loss	18126.27	66559.08
Patient's Annual Loss	130231.25	635845.62
Accompanying Persons' Annual Loss	94976.75	248119.61
Total Annual Loss	217515.19	798708.95
Patient's Annual Loss as % of Annual Income	11.38	19.13
Patient's Annual Loss as % of Annual Expenditure	50.06	421.98

52,987.13; the accompanying persons' monthly loss was N7,914.73 ± 20,676.63; the mean total monthly loss was N18,126.27 ± 66,559.08; the mean patients' annual loss is N130,231.25 ± 635,845.62; the mean accompanying persons' annual loss is N94,976.75 ± N248,119.61 and the mean total annual loss was N217,515.19 ± 798,708.95. The mean patients' annual loss as a percentage of their mean annual income was N11.38 ± 19.13% while as a percentage of their mean annual expenditure was 50.06 ± 421.98.

Findings from Table 5 showed that, monthly patient total income, monthly earnings of person accompanying the patient, patient monthly loss, accompanying persons' monthly loss, total monthly loss, patients' annual loss, accompanying persons' annual loss and total annual loss showed significant difference ($p<0.05$) in the cost distribution among different socio-economic groups; lower, middle and upper. While the minutes taken to get to JUTH on appointment, time taken to see doctor on each appointment date, days absent from work because of sickness within the last one month, monthly patient total expenditure, patients' annual loss as % of annual income and patients' annual loss as % of annual expenditure all showed no significant difference ($p>0.05$) in the cost distribution among different socio-economic groups; lower, middle and upper.

DISCUSSION

Majority of the respondents (79.3%) were ranked among the lower socio-economic group. The direct medical cost of cancer incurred by patients and their household was high; In terms of income and expenditure, the mean monthly total income of the patients was good but the mean monthly patients' expenditure almost consumes the whole income. In addition, the persons accompanying the patient also loss significant among of money and time. This shows that almost all the earnings of the patients and households are utilized toward health care. John and Ross (2009) align with the result of this study by stating that cancer consumes a lot of funds in the developed world where a reasonable percentage of their budget goes to health. In the same vein, the finding of this study further agrees with that of Marti et al. (2015) that, the distribution of cost was skewed with a small number of patients incurring very high costs and added that, significant predictors of out of pocket (OOP) costs included age and socio-economic deprivation

With regard to losses, the mean total monthly and annual losses of the patient was very high, likewise the mean patients' annual loss as a percentage of their mean annual income as well as a percentage of their mean annual expenditure was also significantly high for people in the lower socioeconomic group or an average Nigerian. This shows that the cancer patients and their households find it very difficult to maintain their health care cost, which is also compounded by OOP expenditure. Onoka et al. (2011) opined that payment for health care is catastrophe when it exceeds a defined level of household income and so leads the household to sacrifice the consumption of other goods and services necessary for their well-being. The findings of this study agree with that of Walsh and Crumbie (2007) who observed that, when a patient is diagnosed with cancer, the financial resources of the family may be affected by the loss of ability to work and the needs of the family may be neglected. Moreover, the finding of Zaidi et al. (2012) is also in consonant with this finding that, the financial burden of cancer was perceived as significant by 42% patients and unmanageable by 27% patients. It was concluded that, there is a desperate need for treatment support programmes either by the government or other welfare organizations to support individuals and families who are already facing a difficult

Table 5. Difference in cost distribution among socio-economic groups (n = 179).

Socio-economic groups	Freq.	Mean	Std. dev.	Sig.
Minutes taken to get to JUTH on appointment date				
Lower	137	12.09	78.22	0.469
Middle	26	10.92	65.99	
Upper	9	13.33	76.65	
Total	172	36.34	22.86	
Time taken to see doctor on each appointment date				
Lower	134	12.40	85.10	0.556
Middle	26	10.73	49.82	
Upper	9	11.67	78.10	
Total	169	34.8	21.02	
Days absent from work because of sickness within the last one month				
Lower	142	7.13	9.63	0.347
Middle	28	9.07	10.81	
Upper	9	3.78	8.57	
Total	179	19.98	29.01	
Monthly patients' total income				
Lower	132	43.50	44.16	0.000
Middle	26	15.87	21.81	
Upper	9	17.78	13.59	
Total	167	77.15	79.56	
Monthly patients' total expenditure				
Lower	136	39.42	58.95	0.083
Middle	27	59.57	41.49	
Upper	9	70.56	59.31	
Total	172	17.55	16.77	
Monthly earnings of person accompanying patient				
Lower	74	82.76	93.63	0.000
Middle	20	17.00	11.99	
Upper	3	28.67	18.81	
Total	97	13.43	12.43	
Patient's monthly loss				
Lower	135	56.35	15.10	0.018
Middle	26	38.54	13.50	
Upper	9	11.33	23.01	
Total	170	11.49	51.61	
Accompanying persons' monthly loss				
Lower	111	55.12	13.93	0.006
Middle	22	13.00	22.99	
Upper	8	27.12	62.43	
Total	141	95.24	99.35	
Total monthly loss				
Lower	111	79.01	25.97	0.011
Middle	21	54.38	15.52	
Upper	8	40.41	80.57	
Total	140	17.8	12.06	

Table 5. Contd.

Socio-economic groups	Freq.	Mean	Std. dev.	Sig.
Patient's annual loss				
Lower	135	68.24	18.22	0.018
Middle	26	45.50	16.05	
Upper	9	14.87	27.08	
Total	170	13.61	61.35	
Accompanying persons' annual loss				
Lower	111	66.49	16.81	0.006
Middle	22	15.01	26.86	
Upper	8	33.45	75.23	
Total	141	11.95	17.9	
Total annual loss				
Lower	111	12.11	30.64	0.011
Middle	21	65.54	18.18	
Upper	8	48.91	96.87	
Total	140	13.56	15.69	
Patient's annual loss as % of annual income				
Lower	135	11.25	19.55	0.594
Middle	26	13.81	18.78	
Upper	9	6.34	13.35	
Total	170	31.4	51.68	
Patient's annual loss as % of annual expenditure				
Lower	135	17.46	50.88	0.057
Middle	26	23.98	11.91	
Upper	9	13.55	25.39	
Total	170	54.99	88.18	

*Significance level = 0.05.

and challenging situation. Similarly, the findings conform to the assertion of Onoka et al. (2011) that, 14.8% households experienced catastrophe at a non-food expenditure threshold of 40%, with 22.6% and 7.6% of the poorest and richest household quintiles experiencing catastrophe. For the first set of variable scenarios, the thresholds for the poorest and richest household quintiles were 5% and 29.6% and levels of catastrophe were 44.7% and 12% respectively, while the overall level was 36.5%. In the second scenario, the thresholds were 6.8% and 40%, and the levels of catastrophe were 42.5% and 7.6%, respectively, while the overall level was 32%. It was concluded that high levels of catastrophic expenditure exist in Nigeria.

Findings from this study showed that the indirect cost incurred by patients and their household include the time they get to the hospital, 10 to 360 minutes as well as the time taken to see a doctor on days of appointment which ranges from 15 to 360 minutes respectively. Edelson (2007) supported the finding of this study by noting that patients spend long hours seeking and undergoing treatment. He observed that most patients spent an average of 99 hours getting care during illness, while others may spend about 488 and 512 hours of care. In addition, Ogunfowokan and Mora (2012) also supported the finding of this study that, the long patient-clinic encounter time was accounted for mainly by the waiting time to see the doctor which was a median of 1 hour (range 0-5.6 hours) and time spent at the medical records with median of 0.5 hours (range 0-5 hours). It was concluded that patient satisfaction is an important outcome which reflects the quality of health care of which patient waiting time is an important component.

The maximum number of days absent from work on account of the illness by majority of the respondents was twenty-six days; this is commendable, even though it is an indirect cost. American Cancer Association (2019) agree with the finding of this study that, cancer treatment can cause family members to lose time at work and in some cases, all or part of their salary. In line with this finding is the assertion by Torrey (2019) that, patients are often frustrated that they make an appointment for a certain time, they arrived on time, yet they are kept in the waiting room for too long a time before they see the doctor.

Furthermore, Tangka et al. (2013) also supported this finding by estimating that, the state–level median number of days of absenteeism per year among employed cancer patients was 6.1 days and that annual state-level cancer absenteeism costs ranged from $14.9 million to $915.9 million (median =$115.9 million) across states in 2010.

In this study, the monthly patient total income, monthly earnings of person accompanying the patient, patient monthly loss, accompanying persons' monthly loss, total monthly loss, patients' annual loss, accompanying persons' annual loss and total annual loss showed significant difference ($p<0.05$) in the cost distribution among different socio-economic groups (lower, middle and upper). While the minutes taken to get to JUTH on appointment, time taken to see doctor on each appointment date, days absent from work because of sickness within the last one month, monthly patient total expenditure, patients' annual loss as percentage of annual income and patients' annual loss as percentage of annual expenditure all showed no significant difference ($p>0.05$) in the cost distribution among different socio-economic groups (lower, middle and upper). This finding is supported by that of Kim et al. (2017) that, for gastric cancer, there is a greater association between income and endoscopic mucosal/submucosal resection (EMR) treatment rate among men than among women, although medical insurance began covering EMR treatment in 2011 in Korea, patients of the lowest level of income are still less likely to receive treatment with EMR. Similarly, the finding of DiMartino et al. (2017) also supported this finding that, cancer survivors with < high school education had a lower probability of reporting a discussion than survivors who had a college education $p<0.05$. However, even after controlling for income, cancer survivors with financial hardship had a greater probability of reporting a discussion than survivors with no financial hardship ($p<0.05$). It was concluded that socio-economically disadvantaged cancer survivors are at risk for not having follow-up care discussions with providers, particularly those who report lower income and education.

Implications for public health practice

1. The economic burden of cancer patients in this study is very high for the patients. This would lead to increasing poverty and poor rate of development as the productive age group is mostly affected within this region. The disease will progress rapidly in the patients with attendant poor quality of life, increase morbidity, mortality and productivity loses.
2. Medical technology is increasingly costly in most fields of clinical medicine. Oncology has not been spared from issues related to cost, in part resulting from the tremendous scientific progress that has led to new tools for diagnosis, treatment and follow up of patients. Health workers represent a critical link among patients, support groups and insurance companies. Thus, it is imperative for them to understand the role and value of cancer therapies and help remove financial barriers for patients. An understanding of the basics of cost analysis is an essential tool in the struggle to impact health-care and policy change.
3. Health workers have the obligation to act as patients' best advocate to seek individual funding where it can be found.

Conclusion

Majority of the respondents were in the lower socio-economic group. The time taken by the respondents to go to the hospital ranges from 10 to 360 minutes. It also takes the respondents 15 to 360 minutes to see the doctor. The mean monthly income of the respondents was good. However, the total annual loss as a percentage of annual income as well as the expenditure was very high for a patient in low socio-economic group.

Recommendations

Since majority of the respondents are poor and in order for them to cope with the cost of their treatment, there is need for Government to intervene by subsidizing the cost of cancer treatment. It is also suggested that there is need for the formation of a strong cancer association in Plateau State so that cancer patients could pool their resources together as a strong social support to help themselves. Since prevention is better than cure, there is need for more public enlightenment on regular screening for early detect and prevention of cancer.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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