Original Research Article

CANCER CARE IN NIGERIA: IDENTIFYING GAPS AND OPPORTUNITY FOR IMPROVEMENT IN TEACHING HOSPITAL SETTINGS.

Abstract

Background: Cancer is currently a global health issue and has claimed the lives of many. Cancer used to be a Western world disease but at the moment, 75% of new cancer cases could be from Low and Middle income countries. Healthcare workers play a vital role in oncology care. Hence, this study was conducted to identify the gaps and opportunities for improving cancer care in a teaching hospital setting from a healthcare workers' perspective..

Methodology: This was a cross-sectional descriptive study conducted among healthcare workers (*n* = 45) working in the oncology department at the University of Nigeria Teaching Hospital, Enugu, Nigeria. Questionnaires were self-administered.

Results: A total of 45 patients were included in this study. The gender distribution is 23 males and 22 females. 87% of healthcare workers agreed that their patients were satisfied with the care they got from the oncology team. Over 80% agreed that their patients go through financial hardship due to the cost of cancer treatments. Just only about 55% agreed that the oncology training is adequately integrated into their medical training. Also, only 42% felt very confident in their skills to handle oncology cases. Most never knew a cancer care policy existed in the country.

Short Conclusion: The study discovered that the costs of cancer treatments are a huge hindrance to cancer care in Nigeria. It also revealed that the education of oncology care professionals should be taken much more seriously than it is currently.

Keywords: oncology, outcomes, policy, cancer, teaching hospital

INTRODUCTION:

Cancer has become a major source of morbidity and mortality globally [1] and if measures are not enforced, it will continue to increase because of many factors. The International Agency for Research on Cancer Global Cancer Observatory reports that by 2030, up to 75% of new cancer cases will be within low-to-middle-income countries (LMICs) [2-3]. Cancer burden has been predicted to double by 2030 in Sub-Saharan Africa, yet the budget for cancer treatments and research is still less than 1% of worldwide medical cancer expenditures [4-6]. Country-specific cancer research is crucial for developing effective cancer interventions in low- and middle-income countries (LMICs) as high-income country research findings often lack applicability in these settings. [7-8]. Cancer is a significant public health challenge in Nigeria, with increasing incidence and mortality rates and women have a higher cancer incidence than men.[9]. Breast

and cervical cancers are the most common forms of cancer in Nigeria and they account for over half of cancer-related deaths [10,11]

Nigeria has 3 cancer registries and 1 in Abuja. The absence of state cancer registries is thought to play a major role in the under-reporting of cancers and their persistence [12]. In 2018, a new policy recognized how important it was for each state to implement the plan and for developing their state level cancer control plans [13]. The goal of the Nigerian cancer policy was to reduce the incidence and prevalence of cancers in Nigeria. This is not as robust when compared to the National cancer Control Plan (NCCP) 2017 in Kenya. Kenya NCCP goal was not just to reduce cancer incidence, but also to reduce morbidity, and most importantly, to reduce mortality and improve the survival rates from cancer in Kenya. It is also not as robust as that of Ghana that has clearer description of the guidelines that are needed for each cancer type. The Ghana cancer plan provided more detailed information about strategies and objectives for specific diseases, such as breast and cervical cancers [13,14]. To enhance surveillance, cancer was designated a notifiable disease. Implementing the Ghana plan required a substantial investment of approximately forty-six million US dollars, with a focus on early detection (23%), prevention (17%), and cancer registry/research (12%) [13,14].

Also pertinent to consider would be the behavior of Nigerians towards cancer, cancer treatment and cancer patients. A lot of patients readily resort to herbal treatment following a cancer diagnosis [15]. Cancer education especially to the patients and their care givers need to be prioritized. This is because a study reports some psychosocial issues and mental health disorder in cancer patients because they feel they are a major distress [16]. Another study solidifies this discovery and goes ahead to show that this psychosocial problems in cancer patients is because of high cost of oncology treatment and economic losses [17].

The affordability and accessibility of cancer treatment in Nigeria is also another area that needs to be studied. The National Health Insurance Scheme (NHIS) doesn't totally cover cancer treatment. Because of this, many people with cancer start their treatment from their personal funds and maybe from families and well-wishers. Unfortunately, they would eventually stop because they are not able to afford ongoing cancer care. This has even made more people to see cancer as 'a wealthy people's illness' [18], because of the associated high cost of cancer treatment. There are only ten radiation therapy machines available for all people with cancer across the country [18]. The high cost of cancer treatment would also need to be considered because the prices of chemotherapy isn't what an average Nigerian can afford. It has been estimated that by 2030, about 75% of new cancer cases would be rom Sub-Saharan Africa, which Nigeria happens to be a part of [2,3]. It is therefore pertinent to assess cancer care in Nigeria with a view to identify gaps and opportunities for improvement.

Nigeria, like many developing countries, faces an increasing burden of cancer, with rising incidence and mortality rates. According to GLOBOCAN 2020, Nigeria had over 124,815 new cancer cases and 78,899 cancer deaths in that year alone [19]. The significance of this study lies in its potential to highlight the gaps in cancer care, which, if addressed, could significantly reduce the mortality rate associated with cancer and strengthening healthcare system in Nigeria. Teaching hospitals are pivotal in the Nigerian healthcare system, serving as centers for medical training, research, and tertiary care. However, many of these institutions face challenges such as inadequate infrastructure, limited access to essential cancer medications, and a shortage of specialized healthcare professionals. By identifying these gaps, this study could inform policy and investment decisions that would strengthen the overall healthcare system, making it more responsive to the needs of cancer patients.

Effective cancer care is multidimensional, involving early detection, accurate diagnosis, timely treatment, and palliative care. Unfortunately, many patients in Nigeria present at advanced stages of the disease due to delayed diagnosis and lack of awareness. This study is significant as it aims to identify specific areas within teaching hospitals where improvements can be made, thereby enhancing patient outcomes through better management of the disease.

Nigeria's National Cancer Control Plan (2018-2022) emphasizes the need for a coordinated response to cancer care, including prevention, early detection, treatment, and palliative care [20]. Moreover, resource allocation in Nigeria's healthcare sector is often limited, and ensuring that these resources are used effectively is crucial. By identifying the most pressing gaps in cancer care within teaching hospitals, this study could guide more efficient allocation of resources, ensuring that they are directed towards interventions that will have the greatest impact on patient care and outcomes.

Finally, as teaching hospitals are also centers for research and medical education, this study could inspire further research into cancer care in Nigeria and lead to the development of educational programs that equip future healthcare professionals with the skills and knowledge needed to address the cancer burden in the country. This study is crucial in paving the way for tangible improvements in cancer care within Nigeria's teaching hospitals, ultimately contributing to better health outcomes for the population.

METHOD.

STUDY DESIGN AND SETTING:

The study was a cross-sectional observational study in the University of Nigeria Teaching Hospital (UNTH).Thestudy was carried out among the healthcare workers of the University of Nigeria Teaching Hospital (UNTH).The University of Nigeria teaching Hospital is one of the first generation University Teaching Hospitals in Nigeria and boasts of having the best hands in the country.The University has an oncology unit which offers cancer care to oncology patients.

STUDY POPULATION AND INSTRUMENT:

Cases were healthcare workers in the oncology unit of the University of Nigeria Teaching Hospital (UNTH). The questionnaire was a self-administered knowledge-based questionnaire which assessed the oncology healthcare workers in the hospital to identify from their viewpoint, the gaps and opportunities for improvement of cancer care in teaching hospital settings. The survey tried to achieve this using different approaches like deciphering if they feel they are well trained to handle oncology cases, whether economic issues pose a big problem to their patients not getting treatment etc.

DATA ANALYSIS:

Data were analyzed using the IBM statistical package for Social Sciences (SPSS). Frequencies and percentages as well as other descriptive statistics were computed for necessary socio-demographic characteristics, clinical outcomes, pharmacoeconomic outcomes and quality of life assessment.

RESULTS

Of the 50 questionnaires distributed,45 were completed and returned(90% response rate).There was an almost equal distribution of respondents' gender (51.1% males and 48.9& females). Only about 64% of respondents reported having attended any oncology training and more than 60% have less than 5 years of experience handling cancer patients.Most of our respondents claim to have attended an oncology training and over 60% had less than 5 years of experience handling oncology cases.

[Table 1]SOCIO-DEMOGRAPHICS STUDY RESULTS

SOCIO-DEMOGRAPHICS		**Frequency (f)**	**Percentage (%)**
AGE (years)	<25	13	28.9

	25-30	3	6.7
	31-35	6	13.3
	36-40	5	11.1
	41-45	8	17.8
	=>46	10	22.2
GENDER	Male	23	51.1
	Female	22	48.9
MARITAL STATUS	Single/Never Married	20	44.4
	Married	22	48.9
	Divorced	2	4.4
	Widowed	1	2.2
EDUCATIONAL LEVEL	B.Pharm/PharmD	12	26.7
	Masters	1	2.2
	MBBS	7	15.6
	PhD	4	8.9
	Post-doctoral	5	11.1
	Residency	9	20.0
	RN/Dip. Nurse	7	15.6
PROFESSIONAL DESIGNATION	Nurse	6	13.3
	Oncologist	7	15.6

	Oncology Nurse	9	20.0
	Oncology Pharmacist	4	8.9
	Pharmacist	10	22.2
	Physician	8	17.8
	Surgeon	1	2.2
ATTENDED ANY ONCOLOGY TRAINING	No	16	35.6
	Yes	29	64.4
YEARSOF EXPERIENCE WITH CANCER PATIENTS	<5	31	68.9
	6-10	2	4.4
	>11	12	26.7
RELIGION	Christianity	43	95.6
	Islam	1	2.2
	Traditionalist	1	2.2

CLINICAL OUTCOMES:

Healthcare workers reported that not even up to half of their patients are satisfied with the overall cancer care they receive, even though they have essential cancer services. Just a little above half of our respondents (55%) are strongly convinced that the facility is adequately staffed with oncologyspecialists.

Table 2:CLINICAL OUTCOMES

CLINICAL OUTCOMES	Strongly agree		Agree		Neutral		Disagree		Strongly Disagree	
	f	%	f	%	f	%	f	%	f	%
Patients in your hospital have adequate access to cancer care facilities?	27	60.0	16	35.6	2	4.4				
Essential cancer services, such as diagnosis, treatment, and palliative care are readily available in your hospital?	33	73.3	10	22.2	2	4.4				
Patients are satisfied with the overall cancer care they receive	18	40.0	19	42.2	6	13.3	2	4.4		
Your hospital is adequately staffed with oncology specialists, nurses, and other healthcare professionals	25	55.6	13	28.9	5	11.1	2	4.4		
You have access to the necessary equipment and infrastructure for effective cancer care, such as radiotherapy machines and chemotherapy units	20	44.4	20	44.4	3	6.7	2	4.4		

Pharmacoeconomic Outcomes:

More than 90% of healthcare workers agree that patients face critical financial hardships due to cost of cancer treatment. Some healthcare workers agree that the Insurance Scheme do not take adequate care of cancer treatment and that resources are not properly allocated to cancer care to ensure equitable access and optimal outcomes. Soe of our respondents also agree that the cost-effectiveness of cancer treatments is not adequately considered in decision-making process.

Table 3: Pharmacoeconomic Outcomes

Pharmacoeconomic Outcomes	Strongly agree		Agree		Neutral		Disagree		Strongly Disagree	
	f	%	f	%	f	%	f	%	f	%

Essential cancer medications are affordable for patients in your hospital	10	22.2	20	44.4	12	26.7	3	6.7		
Thecost-effectiveness of cancer treatments is adequately considered in decision-making processes	9	20.0	17	37.8	16	35.6	3	6.7		
Patients experience financial hardship due to the cost of cancer treatment	39	86.7	4	8.9	2	4.4				
Resources are allocated to cancer care in a way that ensures equitable access and optimal outcomes?	10	22.2	16	35.6	15	33.3	3	6.7		
The Insurance Scheme takes adequate care of cancer treatment	6	13.3	13	28.9	11	24.4	13	28.9	2	4.4

Quality of Life Assessment:

Some healthcare workers disagreed that adequate psychological support was provided for cancer patients and their families within the facility and that adequate survivorship care services are available to support patients after treatment completion while 40% agreed that the facility has adequate psychological support for cancer patients and their families.

Table 4:Quality of Life Assessment

Quality of Life Assessment	**Strongly agree**		**Agree**		**Neutral**		**Disagree**		**Strongly Disagree**	
	f	%	f	%	f	%	f	%	f	%
Patient-reported outcomes (PROs) are routinely assessed to measure the quality of life of cancer patients	13	28.9	12	26.7	18	40.0	1	2.2	1	2.2
Adequate psychological support is available for cancer patients and their families	9	20.0	9	20.0	22	48.9	4	8.9	1	2.2
Adequate survivorship care services are available to support patients after	6	13.3	13	28.9	20	44.4	5	11.1	1	2.2

treatment completion										

Oncology Training and Readiness to Handle Oncology Cases:

Just about half of our respondents agree that that their medical training prepared them to handle oncology cases. They also agreed that there are adequate opportunities for healthcare opportunities to pursue specialized oncology training. About 60% of healthcare professional reported that they feel adequately prepared to handle oncology cases and about 80% say there are adequate collaboration between the professional to manage oncology cases.

Table 5: Oncology Training and Readiness to Handle Oncology Cases

Cancer/Oncology Training and Readiness to Handle Oncology Cases	**Strongly agree**		**Agree**		**Neutral**		**Disagree**		**Strongly Disagree**	
	f	%	f	%	f	%	f	%	f	%
Oncology training adequately integrated into medical school curricula?	7	15.6	18	40.0	15	33.3	3	6.7	2	4.4
Sufficient CME opportunities available for healthcare professionals in oncology (CME mean Continuing Medical Education)	26	57.8	14	31.1	2	4.4	2	4.4	1	2.2
Adequate opportunities are available for healthcare professionals to pursue specialized oncology training, such as fellowships or residency programs	23	51.1	19	42.2	3	6.7				
You feel well-prepared to handle oncology cases in terms of knowledge and skills	19	42.2	10	22.2	12	26.7	3	6.7	1	2.2
You feel confident in your ability to provide high-quality cancer care	21	46.7	8	17.8	11	24.4	4	8.9	1	2.2
You have access to the necessary resources, such as guidelines, textbooks, and databases, to support your practice in oncology	17	37.8	15	33.3	6	13.3	5	11.1	2	4.4

You feel that there is adequate collaboration among different healthcare professionals involved in cancer care	27	60.0	11	24.4	5	11.1	2	4.4		

National Cancer Policy:

More than half of healthcare professionals do not know that a National care Policy exists.

Table 6 & 7:National Cancer Policy

Do you know about the National Cancer Policy?	Yes		No	
	f	%	f	%
	22	48.9	23	51.1

If yes, to the above table	**Strongly agree**		**Agree**		**Neutral**		**Disagree**		**Strongly Disagree**	
	F	%	F	%	f	%	F	%	f	%
Nigeria has a comprehensive national cancer policy?	12	26.7	8	17.8	2	4.4				
There are adequate funds allocated to cancer care in your country's healthcare budget?	7	15.6	10	22.2	5	11.1				
There are effective cancer screening programs in place for common cancers	13	28.9	8	17.8	1	2.2				
There are policies in place to ensure access to palliative care for cancer patients	8	17.8	14	31.1						
There are adequate systems in place for data collection and research on cancer	12	26.7	8	17.8	1	2.2	1	2.2		
There are sufficient efforts to raise awareness about cancer and advocate	20	44.4	1	2.2	1	2.2				

for improved cancer care										

Discussion:

CLINICAL OUTCOMES:

There are a variety of factors that could be responsible for the increased number of cancer cases in Nigeria and globally. Some of these factors would include cancer policy, financial issues regarding oncology treatment, the readiness of healthcare workers to handle oncology cases, and lots more. Our study sows that over 80% of healthcare workers think that patients are satisfied with the care they get from them. This is in agreement with other studies whichreported that the patients were satisfied with the general treatment and care thy received [21].

Our study reported that the healthcare workers think there is an adequate number of trained oncology personnel available. This is opposed to another study which reports that there are few oncology experts in Nigeria [22]. This could probably be the reason behind the scarcity of diagnosis and treatment options. In a country with a population exceeding 140 million, there are currently only about 100 oncologists and 100 pathologists [22-23]. The healthcare workers reported that there is availability of adequate infrastructure and equipment for cancer care treatment. Another study reports that there are only a few laboratories that could offer pathology services and even where these exist, they are still not accessible because of industrial actions that affect the Nigerian health sector [22]

Pharmacoeconomic Outcomes:

Over half of our respondents report that essential cancer medicines are affordable. However, this is opposed as more than 94% still reported that patients go through financial hardship because of the cost of cancer medications. This is similar to another study where over 87% of patients go through financial stress because of the cost of cancer medications and none of them were under medical insurance of any sort [25]. A study reports that the overall mean cost of cancer treatment

was $5306.9[25]. This is way too high for a country where the minimum wage is about $44 per month. This could be one of the reasons why cancer deaths seem to be on the increase in Nigeria. The minimum wage is less than $45 per month but cancer treatment costs an average of $5306.9.

This, however, is opposed to a similar study done in Ontario, Canada. The study reported that about 26.9% of their respondents felt no financial burden whatsoever, 26.9% slightly felt some financial burden, somewhat (25.1%), significant (16.5%), and unmanageable (3.9%) [26]. This could be explained by the health insurance in Ontario.

Oncology Training and Readiness:

This is a crucial gap that needs to be explored. According to our study, just a little over half of our respondents reported that the training they received from medical school was sufficient. A study reported that Registered Nurses (RN) have no oncology training and they learn about it on the job. In another study done at Obafemi Awolowo University Teaching Hospital (OAUTH), the nurses reported that they do not have any formal education on oncology care or even the handling of chemotherapy. Adebayo et al. also reported slow exposure to oncologytraining for students in medical colleges [28]. This has also made them lose interest in the oncology specialty as the study also reported that medical students decide on a specialty according to the interest they got during their initial phase of medical training [28]. Another study reported a general inadequate knowledge of palliative care in oncology amongst pharmacists [29]. This could probably mean that the curriculum for oncology training really needs to be revised. About 20% of pharmacists had prior oncology training before they started managing cancer patients [29]. While pharmacists understand the scope of their duties in oncology care, a great majority of them seem to be at a loss on how to effectively discharge those duties. Pharmacists have reported lack of access tomedication profiles and inadequate knowledge of palliative care as major barriers they face in effectively discharging oncology care [29].

The state of oncology training for pharmacists was rated to be very poor and subpar [30]. This also goes for nurses which a study reported that there are not enough nurses who are professionally trained in oncology [30]. However, the training for medical doctors seems to be good but does not have established patterns or modes of training [30]. A doctor also reports that "*many are oncologist by just practice not by certification.*" *… my main concern about oncology training is that it is not structured. People are just there based on the fact that there is a team/unit called oncology unit and you are in the team. Of course you will learn some things but there is no structure…people are oncologist by just practice not by certification*"

Regarding opportunities for continuing education; over 80% of our respondents agreed that there are opportunities for further training in oncology. Another study reports that just only above half of healthcare practitioners have access to continuing oncology education [29].

Over 84% of our respondents agree that there is good interprofessional collaboration among healthcare workers in the oncology department, while about 4% disagreed. Adejumo et al. reported that 32.5% of clinicians never met to deliberate oncology cases before discussing with the patients. This could be a hindrance because oncology and medical science in general need the input of all members of the healthcare team.

National Cancer Policy:

More than half of our respondents reported that Nigeria does not have any national cancer policy. This is really problematic because it begs the question of which standardized care guidelines the healthcare workers are using to treat cancer patients. Nigeria's National Cancer Control Plan (2018-2022) emphasizes the need for a coordinated response to cancer care, including prevention, early detection, treatment, and palliative care [20].In comparing the Nigeria National Cancer Policy to other African countries; Ghana has a technical Working group (TWG) for each specific type of cancer, unlike Nigeria 2018 plan but it did not specify the duties of the different stakeholders [31]. Unlike the Ghana Cancer policy, the Kenyan cancer control policy does not also specify the frameworks for specific cancer types; just like the Nigerian cancer

policy, it has more specific plans for the different levels of the stakeholders like the traditional rulers [31].

Since 2020 till date, about $4 USD has been allocated to subsidize the cost of cancer treatments for people with breast, prostate, and cervical cancersand 6 institutions have been involved in the pilot phase (Global health Progress 2021). This could be questioned as our study reveals that patients are financially strained as a result of the costs of cancer medications. However, an explanation for this could be that it is still in the pilot phase and most patients might still not be able to benefit from it at the moment. The National health Insurance Scheme (NHIS) has initiated a 50% subsidy for cancer treatments in seven tertiary hospitals, and out of the 50%, the Scheme pays 30% while the patient, if enrolled pays 20%. This is a welcome development as it would go a long way to curb the cancer burden on the country.

Conclusion and Recommendation:

Cancer is a global health issue and should be tackled using any means possible. Our study shows some gaps identified in cancer care in a teaching hospital and how it can be ameliorated. Our study reports that cancer care is quite financially straining to patients and they go through financial crisis to be able to meet up with treatment. The NHIS has made a good move to subsidize cancer treatment costs to 50%. This is a great development in making cancer care accessible and affordable. On the issue of medical oncology education, a robust, well-detailed curriculum would go a long way to help prepare doctor, pharmacists and nurses and make them confident enough in their skills to handle oncology patients. A detailed training should also be conducted annually or at least bi-annually to oncology healthcare workers. Again, to qualify as an oncology caregiver, healthcare workers should be subjected to a thorough drilling and examination to ascertain their skillset. Oncology pharmacy is a pharmacy specialty and most pharmacists working in Oncology do not go through this training. It must be made mandatory that all pharmacists, nurses and doctors must go through a specialized oncology specialty program as recommended by their governing bodies before they are certified to work as oncology specialists. There should also be some kind of enlightenment for healthcare

workers on the issue of the National cancer policy. This is because if they do not know it exists, then their modus operandi would always beg the question of how they have been handling the cancer cases. Our study revealed great collaboration in oncology department. However, this could be improved by having some sort of weekly or biweekly medical conference or meeting where notable cases are discussed within the team consisting of doctors, pharmacists and nurses. This way, everybody gives their input and a point which was never even considered could make a whole lot of difference.

REFERENCES:

1. Sylla BS, Wild CP. A million africans a year dying from cancer by 2030: What can cancer research and control offer to the continent? *Int J Cancer.* 2011

2. The Lancet. GLOBOCAN 2018: counting the toll of cancer. Lancet 2018;**392**:985. doi:10.1016/S0140-6736(18)32252-9pmid:30264708

3. Bray F, Ferlay J, Soerjomataram I, *et al*. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2018;**68**:394–424

4. Olaleye O, Ekrikpo. Epidemiology of cancers in Sub-Saharan Africa. In: Adedeji OA, ed. *Cancer in Sub-Saharan Africa: current practice and future*. Cham: Springer International Publishing, 2017: 3–19

5. Mostert S, Njuguna F, Olbara G, *et al*. Corruption in health-care systems and its effect on cancer care in Africa. Lancet Oncol 2015;**16**:e394–404.doi:10.1016/S1470-2045(15)00163-1pmid:http://www.ncbi.nlm.nih.gov/pubmed/26248847

6. Harford JB. Barriers to overcome for effective cancer control in Africa. Lancet Oncol 2015;**16**:e385–93.doi:10.1016/S1470-2045(15)00160-6pmid:http://www.ncbi.nlm.nih.gov/pubmed/26248846

7. Oluwasanu M, Olopade OI. Global disparities in breast cancer outcomes: New perspectives, widening inequities, unanswered questions. *Lancet Glob Health.* 2020;8:e978–e979

8. Vogel AL, Freeman JA, Duncan K, et al. Advancing cancer research in Africa through early-career awards: The BIG Cat Initiative. *J Glob Oncol.* 2019;5:1–8.

9. Jedy-Agba E, Curado MP, Ogunbiyi O, et al. Cancer incidence in Nigeria: a report from population-based cancer registries. Cancer Epidemiol 2012;36:e271–8.

10. Awodele O, Adeyomoye AA, Awodele DF, et al. Cancer distribution pattern in south-western Nigeria. Tanzan J Health Res 2011;13:125–31.

11. Ishola F, Omole O. A vision for improved cancer screening in Nigeria. Lancet Glob Health 2016;4:e359–60.

12. Rabiu I, Isah, JA, Muhammad A. Insights Into the Rising Cases of Cancer in Nigeria. Int J Cell Sci & Mol Biol. 2023; 7(3): 555712. DOI:10.19080/IJCSMB.2023.07.555712

13. Atuwo D. Nigeria National Cancer Control Plan 2018 – 2022. Abuja: National Cancer Control Programme;2018

14. Dakpalla G, Yarney J, Sai FT. NATIONAL STRATEGY FOR CANCER CONTROL IN GHANA2012 - 2016. Accra: Ghana Ministry of Health; 2011-07 2011.

15. Peltzer K., Pengpid S. The use of herbal medicines among chronic disease patients in Thailand: a cross-sectional survey. *Journal of Multidisciplinary Healthcare.* 2019;12:573–582. doi: 10.2147/jmdh.s212953.

16. Abdelhadi OA, Pollock BH, Joseph JG. Psychological distress and associated additional medical expenditures in adolescent and young adult cancer survivors. *Cancer* 2022;28:1523–31.

17. Van Beek FE, Wijnhoven LMA, Holtmaat K, Custers JAE, Prins JB, Verdonck-de Leeuw IM, Jansen F. Psychological problems among cancer patients in relation to healthcare and societal costs: A systematic review. Psychooncology. 2021 Nov;30(11):1801-1835. doi: 10.1002/pon.5753. Epub 2021 Jul 6. PMID: 34228838; PMCID: PMC9291760.

18. Cancer care in Nigeria: A call to Action – TC Health. https://www.tchealthng.com/thought-pieces/cancer-care-in-nigeria-a-call-to-action.

19. Global Cancer Observatory (GLOBOCAN). (2020). "Nigeria Cancer Fact Sheet." (https://gco.iarc.fr/today/data/factsheets/populations/566-nigeria-fact-sheets.pdf).

20. Nigeria National Cancer Control Plan (2018-2022). (2018). Federal Ministry of Health. (https://www.health.gov.ng/doc/NCCP.pdf).

21. Samant, R., Cisa-Paré, E., Balchin, K. *et al.* Assessment of Patient Satisfaction Among Cancer Patients Undergoing Radiotherapy. *J Canc Educ* **37**, 1296–1303 (2022). https://doi.org/10.1007/s13187-020-01950-8

22. Eguzo K, Camazine B. Beyond Limitations: Practical Strategies for Improving Cancer Care in Nigeria [Internet]. Vol. 14, Asian Pacific Journal of Cancer Prevention. Asian Pacific Organization for Cancer Prevention; 2013. p. 3363–8. Available from: http://dx.doi.org/10.7314/APJCP.2013.14.5.3363

23. Eguzo K, and Camazine B (2012). Cancer care in resource limited settings: a call for action. J Cancer Sci Ther, 4, 223-6.

24. Kolawole AO (2011), Feasible cancer control strategies for Nigeria: mini-review. Am J Tropical Med & Public Health, 1, 1-10.

25. Mustapha MI, Ali-Gombe M, Abdullahi A, Adenipekun A, Campbell OB. Financial Burden of Cancer on Patients Treated at a Tertiary Health Facility in South West Nigeria. J West Afr Coll Surg. 2020 Oct-Dec;10(4):23-29. doi: 10.4103/jwas.jwas_4_22. Epub 2022 Jun 8. PMID: 35814963; PMCID: PMC9267039.

26. P.O. Adejumo, K.F. Akinyemi, A. Anarado, *et al.* State of oncology nursing training and practice in a southwestern Nigerian teaching hospital. J Nurs Educ Pract, 11 (9) (2021), p. 68, 10.5430/jnep.v11n9p68

27.

28. Joseph AO, Balogun OD, Akinsete AM, Awofeso OM, Bashir AM, Salako O, Onitilo AA. Oncology Education in the Nigerian Medical Curriculum: A Cross-Sectional Review. Niger Med J. 2022 Apr 26;62(3):127-132. PMID: 38505192; PMCID: PMC10937060.

29. Adisa R, Anifowose AT. Pharmacists' knowledge, attitude and involvement in palliative care in selected tertiary hospitals in southwestern Nigeria. BMC Palliat Care. 2019 Nov 29;18(1):107. doi: 10.1186/s12904-019-0492-8. PMID: 31783834; PMCID: PMC6884848.

30. Adejumo PO, Oluwasanu MM, Ntekim A, Awolude OA, Kotila OA, Aniagwu T, Brown BJ, Dzekem BS, Duncan S, Tito-Ilori M, Ajani O, Lee SM, Babalola CP, Ojengbede O, Huo D, Hammad N, Olopade OI. Oncology Training Needs Assessment Among Health Care Professionals in Nigeria. JCO Glob Oncol. 2022 May;8:e2200017. doi: 10.1200/GO.22.00017. PMID: 35594507; PMCID: PMC9173573.

31. Ministry_of_Health. NATIONAL CANCERCONTROL STRATEGY 2017-2022. Nairobi:Ministry of Health;2017