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Enhancing Cancer Care in Nigeria: Addressing Gaps and Opportunities in Teaching Hospitals

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Cancer is currently a global health issue and has claimed the lives of many. Cancer used to be a previously more prevalent in high-income countries, but at the moment, 75% of new cancer cases could be from low and middle income countries (LMIC). 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.
Aim: The study took a deep dive into the current state of cancer care in Nigeria to identify gaps and possible opportunities for improvement in cancer care with regard to the clinical outcomes, economic barriers, oncology training and cancer policy from the healthcare worker's policy.
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. There are 50 healthcare workers (doctors, pharmacists, and nurses) in the oncology department of UNTH. We got a 90% response rate, hence making our study sample 45. 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 in handling oncology cases. Most never knew a cancer care policy existed in the country and the national cancer policy has no technical working group to handle each type of cancer.
Conclusion: The study discovered that high treatment costs are a major barrier to effective cancer care in Nigeria. It also revealed significant gaps in oncology training and policy awareness among healthcare professionals, indicating a need for more comprehensive educational and systemic reforms to improve cancer care outcomes**.**

Keywords: Oncology; outcomes; policy; cancer; teaching hospital.

1. INTRODUCTION

Cancer has become a major source of morbidity and mortality globally [1] and if adequate preventive and treatment measures are not implemented, cancer rates will continue to rise due to factors such as increasing life expectancy, environmental factors, and limited access to healthcare. 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].

Also pertinent to consider would be the behavior of Nigerians towards cancer, cancer treatment and cancer patients. Cultural beliefs, misinformation, and economic hardship are major barriers that healthcare workers face when trying to deliver effective care. Some patients believe that orthodox drugs are ineffective for cancer treatments. Some others believe that anyone who comes down with cancer is automatically going to die. They see cancer as a death sentence, while some others think cancer is a spiritual issue and should be handled as such. A lot of patients readily resort to herbal treatment following a cancer diagnosis [12]. Cancer education especially to the patients and their caregivers needs to be prioritized. This is because a study reports some psychosocial issues and mental health disorders in cancer patients because they feel they are a major distress [13]. Another study solidifies this discovery and goes ahead to show that these psychosocial problems in cancer patients are because of the high cost of oncology treatment and economic losses [14].

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 [15]. 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 [16]. 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 [16,17]. 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%) [16,17].

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 see cancer as 'a wealthy people's illness' [18], because of the associated high cost of cancer treatment. There are only about 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 price 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 from 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 strengthen the 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.

Furthermore, healthcare professionals are central to effective cancer care, and their insights into gaps in training and resource availability are crucial for understanding how to improve the system. Teaching hospitals are also centers for research and medical education. This study tries to enhance cancer care by addressing gaps and opportunities in Nigerian Teaching hospitals. This study could also 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.

2. METHODS

2.1 Study Design and Setting

The study was a cross-sectional observational survey amongst the healthcare workers (doctors, pharmacists, and nurses) at the University of Nigeria Teaching Hospital (UNTH). The University of Nigeria Teaching Hospital is one of Nigeria's first generation University Teaching Hospitals. She boasts of having the best hands in the country, with more experienced professionals. The Oncology pharmacy unit has more specialized pharmacists in the oncology specialty. This results in higher patient volume than the hospital's capacity.

2.2 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 that 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 study tool was distributed over 6 weeks from August to September 2024. 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. The questionnaire assessed the clinical outcomes and economic barriers to cancer care outcomes as well as the quality of life assessment, training adequacy, and awareness of the national cancer care policy from the healthcare workers' perspective.

2.3 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, quality of life assessment, and awareness of the national cancer policy were assessed.

3. 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.

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 oncology specialists.

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

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.

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

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		

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		
The cost-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

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 treatment completion	6	13.3	13	28.9	20	44.4	5	11.1	1	2.2

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		

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 for improved cancer care	20	44.4	1	2.2	1	2.2				

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

4. DISCUSSION

Clinical Outcomes: Our study shows 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 which reported that the patients were satisfied with the general treatment and care they received [21]. 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 discovered that most of our respondents have less than 5 years of experience in handling cancer cases. This is in sync with 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 [24]. A study reports that the overall mean cost of cancer treatment was $5306.9 [24]. 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%) [25]. 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 [26]. It also discovered that nurses reported that they do not have any formal education on oncology care or even the handling of chemotherapy [26]. Adebayo et al. also reported slow exposure to oncology training for students in medical colleges [27]. 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 [27]. Another study reported a general inadequate knowledge of palliative care in oncology amongst pharmacists [28]. 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 [28]. 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 to medication profiles and inadequate knowledge of palliative care as major barriers they face in effectively discharging oncology care [28].

The state of oncology training for pharmacists was rated to be very poor and subpar [29]. This also goes for nurses which a study reported that there are not enough nurses who are professionally trained in oncology [29]. However, the training for medical doctors seems to be good but does not have established patterns or modes of training [29]. 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 oncologists 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 above half of healthcare practitioners have access to continuing oncology education [28].

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's 2018 plan but it did not specify the duties of the different stakeholders [30]. 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 [30]. The lag in Nigeria's cancer policy could be because of the insufficient allocation of resources. Out of a country of 229.5 million population, only 5% of the 2024 budget was allocated to healthcare, and 7.9% was allocated to education. It is also necessary to note that the 7.9% includes both basic education, secondary education, and tertiary education. This means that the amount allocated to the training of healthcare professionals would be way less than 7.9%.

Since 2020 till date, about $4 USD has been allocated to subsidize the cost of cancer treatments for people with breast, prostate, and cervical cancers and 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 country's cancer burden [31].

5. CONCLUSION AND RECOMMENDATION

Pharmacoeconomic Recommendations: The study reports that cancer care is quite financially straining to patients and they go through a 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. Enough awareness should be created and the masses should know that this opportunity is available for every one of them to use. Partnerships should also be formed with pharmaceutical industries and distributors to negotiate on how this financial strain could be ameliorated.

Oncology Training: On the issue of medical oncology education, a robust, well-detailed curriculum would go a long way to help prepare doctors, 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 the 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.

National Cancer Policy: Having a well-detailed cancer care policy would help out in this case. This way, healthcare workers have a treatment modality that would be evidence-based. Also, a cancer policy that would outline the responsibilities of all stakeholders would certainly be of utmost importance, from traditional leaders down to church leaders. This way, cancer awareness and education would never cease and mortality could be reduced and cancer care would be improved.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

ETHICAL APPROVAL AND CONSENT

An ethical approval was given and the healthcare workers gave informed consent before filling the study tool.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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