









**Table 4:** Primary reasons for not completing chemotherapy sessions among pediatric cancer patients

Reasons for chemotherapy treatment abandonment	n	%
Insufficient funds to pay for treatment package	11	39%
Other unspecified family decision	5	18%
Preference for other treatment plans (e.g herbalist, traditionalist etc)	3	11%
Unknown reasons (could not get in touch with family)	9	32%
	28	

**Table 5:** Staff that conduct pediatric cancer status disclosure

Staff	MBH	MCC/FCB
Oncologist	Yes	Yes
Residents	Yes	Yes
Oncology nurse	Yes	No
Chaplains	Yes	No
Medical Secretary	No	Yes

MBH = Mbingo Baptist Hospital

MCC/CBF = Mother and Child Centre/Chantal Biya Foundation

### Patient status disclosure and follow-up

Oncologists and oncology nurses were mostly responsible for disclosing cancer status to patients and their families in both sites as illustrated in Table 5. Other staff, including residents, psychosocial support staff and chaplains, were occasionally involved in the disclosure process; however, we could not ascertain whether these staff have received training on disclosure of cancer status.

### Data Systems

Both sites had at least one data collection tool, including a cancer service register, monthly reporting forms, and a cancer registry. However, data collection tools were not harmonized, and there was no data reporting scheme for pediatric cancer in both sites.

### Discussion

This study describes the current state of pediatric cancer services in Cameroon, and suggests the need for considerable expansion in reach, type, and specialization of services provided. Nearly two-thirds of current staff in pediatric oncology services have not received prior pediatric oncology capacity building. Pediatric chemotherapy pre-treatment investigations are expensive for the average Cameroonian family. As a result, about 30% of children with cancer abandoned treatment. In addition, the overburdened oncologists were required to conduct patient education and disclosure of cancer status, sometimes in combination with caregivers or parents. Regarding data management, data collection tools were available but not harmonized at cancer

sites, and there was no systematic data reporting scheme for pediatric cancer data. The fact that just two of the nearly 6,000 facilities in Cameroon are offering pediatric oncology services, is an appalling finding, which further re-iterates the negligence that these categories of patients with curable cancers face. To us, this is clarion call to action to address this unmet need for pediatric cancer patients- both to the government and the international donor committee.

These findings suggest that pediatric cancer services in Cameroon need serious and urgent expansion and modernization, which lends support to findings from most parts of Africa. Only about 71% of countries in Africa had a functional national cancer control programme, with substantial variations in cancer services within countries [13]. Therefore, the need to address these service capacity gaps is imminent as these will enable investments in cancer control to prevent premature death. This can be done in a phased approach, progressively expanding pediatric chemotherapy services to targeted regional hospitals and similar structures across the nation, creating and integrating regional cancer control units under the leadership of regional delegations of public health. At the health district level, community health workers need to be trained to identify early warning signs and rapidly detect suspected cases through simple gestures. Adequate human resource capacity is critical for effective and holistic cancer management. However, surveyed cancer treatment centers lacked the human capacity for optimal pediatric cancer care. Furthermore, the University system does not produce sufficient oncologists to match the escalating burden of this disease. Nearly two-thirds of staff involved in pediatric oncology service had not undertaken specialty training in this domain, suggesting the need to design and roll out several human resource interventions for cancer control in the country. This may involve instituting a system for periodically training key staff, including pediatric oncologists, pediatric oncology surgeons, and oncology nurses. Another entails strengthening the capacity of existing staff by rolling out training on the early detection of common cancers and building their capacity on essential concepts of chemotherapy and palliative care. Improving the quality of health personnel in pediatric treatment facilities can play a great role in children’s treatment outcomes [14]. This should include incorporating palliative into all childhood cancer treatment facilities to meet the multidisciplinary needs of children and their families as well as proven approaches to disclose information to patients and their families The latter is important because poor management of information of the disclosure process can result into complications, grief, and poor mental health in children and their surviving families [15]. It is also important to implement systems to provide newly recruited staff with skills to support cancer care and treatment effectively and rapidly. Furthermore, there is a need for continuous human resource gaps assessments and addressing training and retraining needs.

In this assessment, Burkitt lymphoma was reported as the most treated pediatric cancer, representing nearly one-quarter of all pediatric cancer patients in Cameroon. This highly aggressive and fast-growing tumour has been previously described as the most common childhood cancer, especially in tropical African countries where malaria is holoendemic [16]. Recent evidence suggests a strong association between malaria and Burkitt lymphoma [16, 17]. However, whether this association is causal remains uncertain, partly because data on the epidemiology of Burkitt lymphoma in sub-Saharan Africa are rare even from the most affected countries like Malawi, Uganda, Nigeria, and Cameroon. In addition, over 80% of Burkitt lymphoma is associated with the Epstein-Barr virus, and Burkitt lymphoma is predominant in boys and children aged 5-9 years.

We found a high abandonment rate for pediatric cancer treatment of about 30%. Specifically, about 12% of children who needed chemotherapy did not get it, and approximately 20% of those on chemotherapy did not complete the required treatment sessions. High treatment abandonment rates have been reported in sub-Saharan African countries ranging from 15-60%. The reasons for treatment abandonment are multifactorial, including a high cost of care, poor awareness, long distances to treatment centers, absence of health insurance coverage, the high toxicity of treatment, long chemotherapy sessions, absence of social support, and fear of the unknown [18-20]. Inequities in treatment options are a major factor in the disparity in treatment between developed and developing, yet this is under-researched and receives little attention when reporting the Sustainable Development Goals [21]. In addition, treatment abandonment rates are associated with failure and poor survival rates [19]. Therefore, there is a need to improve access to chemotherapy by harmonizing protocols, upgrading the technical platforms of specialised structures, ameliorating forecasts, and strengthening financial resource mobilization for procuring cancer products.

Cancer status was mostly disclosed by already overburdened oncologists and oncology nurses in most instances, despite the availability of staff who could handle patients' status disclosure if empowered with the appropriate training. Organizing capacity-building sessions on status disclosure for relevant hospital staff and community health workers could go a long way to improve pediatric cancer patient education, tracking and follow-up.

Data collection and reporting are critical for informed decision-making for enhanced health services. Although both surveyed facilities had data collection tools, data collection was not harmonized in terms of tools for collection and time for collection. In addition, there was no scheme in place for reporting pediatric cancer data to regional and central levels for policymaking. This significantly hinders research and development, warranting developing a harmonized national

data collection tool with selected variables and indicators. In addition, the said indicators could be customized into the national health information software 2 (DHIS2). Furthermore, the data tools could be leveraged in the long term to build a functional pediatric cancer registry.

We found that optimal pediatric oncology care in Cameroon is compromised by limited-service availability and inadequate human resource capacity. In addition, a high proportion of children eligible for chemotherapy abandoned treatment due to high cost of treatment package. Furthermore, the lack of harmonization of data collection tools and the absence of a standard data reporting mechanism hinders informed decision-making. To address all these needs, stakeholders need to develop a national strategy for pediatric cancer care. Our study suggests an urgent need to expand pediatric oncology case identification services and build human resource capacity on treatment initiation, patient education and tracking to minimize dropout rates. In addition, harmonizing pediatric cancer data collection tools and designing a reporting scheme will facilitate the creation of a pediatric cancer registry. Furthermore, synchronizing pediatric cancer data with the national health system software will increase the visibility of pediatric cancer burden across the nation. Once the data has been collected and centralised, sufficiently equipped technical teams must be put into action to develop interventions with a high public health impact. Finally, there is imminent need for the creation of a nation cancer institute which will bring together cancer specialists (oncologists, radiologists, surgeons etc) in a common technical platform.

### Conflict of Interest

All authors declare no conflict of interest. We do not have any reason why any colleagues/authors should not be reached out to review this article prior to publication.

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**Conception and design:** YS, AF, EK, SDC

**Data collection:** BSEM, NMG, AK

**Data analysis and interpretation:** AF, BSEM, JN

**Manuscript writing:** AF, VN, BSEM,

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