

Current Status of Pediatric Oncology Nursing in Africa: Perspective of African nurses of the International Society of Pediatric Oncology (SIOP Africa)

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June 23, 2022

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Abstract (250 words)

As African countries adopt the global goal of improving childhood cancer survival to 60% by the year 2030, intentional actions are required to improve nursing. This paper provides the perspective and amplifies the voice of African pediatric oncology nurses. It illuminates the room for improvement and provides a reference point for future comparison. First, we document findings from a survey of the perceived strengths and weaknesses conducted in 2017. The main strength was the humanization of care, while the major weakness was lack of training follow up and insufficient evidence to guide practice. Next, we report on nursing-related aspects of a survey to map pediatric oncology services in Africa. Only 21% of respondents in the mapping survey reported having nurses who care for children with cancer at least 75% of their time. Many centres do not have allied health workers like dietitians, play therapists, and psychologists. Furthermore, we share African pediatric oncology nurses' research priorities identified in a 2019 survey. The top research priorities focused on professional practice and psychosocial support. In a Delphi survey to identify topics for a foundational curriculum for nurses new to pediatric oncology, 57 topics areas were identified and grouped into 12 modules. Finally, we report a single-question survey from 2022 to obtain the perspective of African nurses about the state of pediatric oncology nursing across the continent. The African nurses affirm their

dedication to providing compassionate care, however, noting their vulnerability to harm and calling for certified training and better specialization recognition and remuneration.

Key words: Nursing status, Africa, global initiative, childhood cancer, pediatric oncology

Learning points:

1. The main strength of African pediatric oncology nurses is the humanization of care, while the major weakness is insufficient evidence to guide practice.
2. The priority areas for nursing research for pediatric oncology in Africa are professional practice and psychosocial support.
3. African pediatric oncology nurses require more training and certification that allows recognition of their status as specialized nurses.
4. African pediatric oncology nurses need more equipment and policies to guarantee their safety.
5. African pediatric oncology nurses are dedicated to providing compassionate care but are under recognized and inadequately remunerated.

Main text (3981 words)

Introduction

In 2022, the International Society for Pediatric Oncology (SIOP) Africa continental Congress provided the opportunity for pediatric oncology nurses from across the region to meet for the first time since 2019. This Congress has become an opportunity for the African pediatric oncology nursing community to network, collaborate and present a shared voice.

In 2020, the World Health Organisation (WHO), the International Council of Nursing and Nursing NOW, published the first ‘State of the World’s Nursing Report’¹. This was followed in 2021 by the World Health Assembly endorsement of the WHO ‘Global strategic directions for Nursing and Midwifery’, which focused on four policy areas: nursing education, jobs, leadership and service delivery; all are pertinent themes for pediatric oncology nurses across Africa².

In 2018, the WHO announced the start of the Global Initiative for Childhood Cancer to save more than one million lives and improve survival to 60% worldwide by 2030³. According to Denburg and colleagues, “National governments must be convinced of the potential for foundational health system strengthening through attention to childhood cancer care, and the presence and capability of networked actors primed to amplify public sector investments and catalyze change on the ground”⁴. The WHO Global Initiative for Childhood Cancer currently includes three focus countries in the African region: Ghana, Morocco, and Zambia, with Zimbabwe, Senegal and Cameroon at earlier stages of inclusion⁵. Ministries of Health have engaged with WHO and local stakeholders, including non-governmental organizations, parent groups, and hospitals providing childhood cancer care, to perform situational analyses and create strategic plans for strengthening early diagnosis, access to care, sustainable essential medication supply and improved survivorship. None of these goals is possible without competent and reasonably resourced nursing care and a sustainable nursing workforce⁶.

In July 2019, the African Union held a cancer symposium with the Organization of African First Ladies for Development (OAFLAD) in Niger to bring awareness to the increasing cancer burden on the continent and the need for advocacy, financing, and resource development (including workforce resources) at an international, regional and local level⁷. African nurses are critical partners in this effort since they are the single largest workforce, have deep community ties, and, when specialized, have the knowledge and skills to provide the care required for patients with cancer in their region, including children and adolescents. Nursing oncology specialization was supported by a call in 2017, when the WHO passed resolution 70.12, “Cancer prevention and control in the context of an integrated approach,” recognizing cancer as a “. . . growing public health concern” and urging member states to “. . . facilitate cross-sectoral cooperation between health professionals, as well as the training of personnel at all levels of health systems. . .” (p. 4) among other cancer control measures⁸.

This paper is the first to bring the voice of frontline pediatric oncology nurses in Africa to the global movement to improve children’s cancer care. We begin with African pediatric oncology nurse strengths and challenges as documented at the 12th SIOP Africa Congress in 2017. The results of a SIOP Africa mapping exercise data that documented childhood cancer services, including nursing workforce and nursing practice-related data are described. Next, we share pediatric oncology nurse research priorities identified at the 13th SIOP Africa Congress in 2019 and the start of a nursing initiative to create a foundational curriculum for nurses new to pediatric oncology on the continent. Finally, the findings of a survey question to all nurse attendees at the 14th SIOP Africa Congress in 2022 are described.

Methodology

In March 2017, a workshop at the 12th Annual SIOP Africa Congress in Marrakech, Morocco, convened 50 nurses from Francophone and Anglophone Africa (see Figure 1) to identify the strengths and weaknesses of the pediatric oncology nursing workforce in their settings, guided by a projected slide with a table of Strengths/Weaknesses/Opportunities/Threats (SWOT) in English and French for analysis ⁹. Time constraints precluded completion of the exercise, so opportunities and threats were not documented. Two bilingual moderators led the discussion as the nurses’ oral answers were documented on a flip board for the audience to consider. Suggestions supported by >80% of participants were documented.

In 2018, SIOP conducted a mapping exercise by an online survey to identify global childhood cancer services, beginning in Africa¹⁰. The only nurse-specific data was the number of nurses working 75% of their time in pediatric oncology units. However, to demonstrate the burden of care for these nurses, data on allied health professional support available, including psychologist/psychiatrist, dietician/nutritionist, physiotherapist, social workers, pharmacist, and palliative care teams were also extracted from survey responses. Additionally, data regarding spiritual/religious, volunteer and patient/family support groups were extracted, and the presence of dedicated pediatric oncology units and access to pediatric intensive care units.

In March 2019, at the 13th SIOP Africa Congress in Cairo, Egypt, 30 nurses from Egypt, Tanzania, Morocco, Uganda and Cameroon participated in a two-day workshop to identify research priorities for pediatric oncology nurses in Africa. Participants formed small groups and submitted research questions to share with the larger group. Submissions were collected, collated and duplicates removed. Responses were thematically coded using ATLAS.ti version 8. Themes were grouped first by research priorities and second by the target population.

During the same meeting in Cairo, the nurse attendees initiated a project to identify the educational priorities of sub-Saharan nurses caring for children/adolescents with cancer. Following the Congress, an online Delphi Survey in English and French using REDCap was distributed to a convenience sample of nurses from sub-Saharan Africa with experience of at least one year caring for children with cancer¹¹. The sample was recruited with a snowball methodology using existing networks of childhood cancer nurses in both Anglophone and Francophone Africa, as well as an extensive WhatsApp group of 172 members. In the first round, participants were asked to identify a minimum of 10 and a maximum of 20 topic areas for inclusion in a ‘foundation’ level programme for pediatric oncology nurses. In the second round, participants were asked to rate the importance of each topic identified on a five-point Likert scale with the aim of 80% consensus on the topics to be addressed. In round three, participants were presented with a proposed outline framework of a nursing curriculum and asked to express agreement with the wording and grouping of topics into modules to develop an outline curriculum framework.

In 2022, at the 14th SIOP Africa Congress in Kampala, Uganda, approximately 50 nurses gathered once again from Francophone and Anglophone countries. The nurses were asked to write one sentence in English about their priority for pediatric oncology nursing in Africa using an anonymous google form. Comments were collected on a google form, and inductive thematic analysis was conducted using ATLAS.ti ⁹.

RESULTS

SIOP Africa 2017: Strengths and weaknesses of pediatric oncology nursing in Africa

At the 2017 SIOP Africa Congress, the pediatric oncology nurses identified the humanization of care “making the patients feel welcome when arriving and staying at the hospital for childhood cancer treatment” as a strength. The nurses mentioned being close to their patients and sharing their patients’ emotions and feelings during their treatment period. They said they focus on delivering safe care with the patience and courage to face a challenging patient population. Next, the nurses mentioned their strengths in pain assessment and control while caring for children and adolescents with cancer, using validated assessment tools. The nurses believed they were strong in explaining cancer care and treatment to their patients and families. Finally, they mentioned their competence and mastery of nursing practice (professional competency) for this patient population, as well as their desire to improve.

The nurses mentioned that pediatric oncology nurses in their settings in Africa were weak in re-evaluating nursing training, e.g., three months after training, to determine if there had been any impact on patient care. Participants believed that reassessing practice after beginning work with children and adolescents with cancer was essential for providing high-quality nursing care. Second, the nurses stated they were weak in knowledge and skills to conduct research and submit manuscripts for publishing. They further noted a severe lack of evidence about nursing practice in their various settings across Africa. Poor documentation of nursing actions was also identified as a weakness. The nurses believed this impacted patient care and was an issue that needed to be addressed across Africa. Participants all stated that the shortage of trained nursing staff was a major cause of their weaknesses. A final weakness identified in this workshop was the lack of knowledge and skills to conduct research and submit manuscripts for publishing.

2018 SIOP Global Mapping Africa

In the initial effort of the SIOP Global Mapping Programme survey¹⁰, a total of 109 responses were received from facilities across 46 African countries. Information about facilities’ physical infrastructure for pediatric oncology is detailed in Table 1. Only nine responses were from nurses (8.3%); the rest were primarily from physicians: heads of division (43.5%), consultants (41.7%), and junior faculty (2.8%). There was one survey question about how many nurses care for children with cancer at least 75% of their time. Twenty-three participants (21%) reported that they had no nurse who cared for children with cancer >75% of the time at their centres, 30 (28%) had 1-5 nurses who did so, 20 (18%) had 6 – 10, and 6 (5%) had 11 – 15. Ten (9%) had 16 – 20 nurses caring for children >75% of the time, while seven (6%) had >20 nurses who do so. For every unit increase in the number of beds, there was a 10% reduction in the number of nurses working for more than 75% of their time in pediatric oncology. This was, however, not statistically significant ($p = 0.313$).

Greater than two-thirds (66%) of the facilities had a dietician/nutritionist, physiotherapist, social worker, or pharmacist. Approximately half (53%) had volunteers, a palliative care team, a psychologist, spiritual/religious support, and patient support groups. One-third or less (28%) had a play therapist/child life specialist, bereavement counsellor or schoolteacher (see Table 2). However, the survey did not ask if these professionals were dedicated only to caring for children with cancer.

SIOP Africa 2019: Research priorities for pediatric oncology nursing in Africa

The nurse participants at SIOP Africa 2019 in Cairo, Egypt, submitted 54 research questions; 46 were retained once duplicates had been removed. Eight main themes for research were identified, with the two most common being professional practice and counselling and psychosocial support (Fig. 1). The principal research population priority was nurses, alongside parents and children (Fig. 2).

Post-SIOP African Conference 2019: Educational priorities for nurses new to pediatric oncology nursing in Africa

Following the 2029 SIOP Africa Congress, 46 nurses from pediatric oncology facilities in across sub-Saharan Africa (Figure 3) participated in a Delphi survey to determine educational priorities for an education programme for nurses new to pediatric oncology.

Fifty-seven topic areas were identified in Round One of the survey with the most common five including

a general introduction to cancer and treatment modalities, chemotherapy administration and side effects, tumour lysis syndrome, palliative care, and infection prevention and control. Two further rounds were carried out, and a consensus was achieved on a modular curriculum framework with 12 core modules encompassing the identified topic areas (Table 3).

SIOP Africa Congress, Kampala, Uganda 2022: pediatric oncology nursing in Africa

Forty-five participants responded to the survey distributed during the 2022 SIOP Africa Congress, providing one sentence each giving their perspective on pediatric oncology nursing in Africa. Four major themes were identified including the general nature of pediatric oncology nursing and nurses in Africa; training and certification; contribution to improved survival; and need for more recognition and support.

Theme 1 : General nature of pediatric oncology nursing and nurses in Africa

Pediatric oncology nursing was defined as a practice that provides professional holistic care as one participant put it:

Participant 23: *“Pediatric Oncology Nursing is a specialized discipline that requires knowledge about pediatric oncology care, passionate, empathetic, loving, caring and hard working. It entails holistic care, including psychosocial, emotional, physical, and spiritual. The Nurse must do their best and hope for the best. All in all, it is not ordinary nursing, so both the Nurse and the patient require psychological care.”*

The nurses reported a high level of commitment and motivation to meeting the care needs of their patients.

Participant 26: *“The most dedicated and caring people full of compassion for the little souls in their hands.”* Participant 29: *“They are determined to serve despite limited resources.”*

However, the nurses lament their vulnerability to harm and discouragement in their practice and advocate for more attention to their needs.

Participant 7: *“We are giving it our all and never giving up on our kids; thus, we need all the support out there for the job.”* Participant 32: *“Nurses in Africa will love to see more protective wear/equipment that can be used during chemotherapy to help protect them from too much exposure.”*

Theme 2 : Training and certification

The nurses acknowledge the availability of trained colleagues

Participant 45: *“We have qualified and competent pediatric oncology nurses in Africa.”*

They, however, express the need for more specialized training with certification for better outcomes.

Participant 36: *“To build the capacity of specialists in pediatric oncology nursing in Africa so as to improve the cure rates for children with cancer.”* Participant 1: *“Pediatric oncology nurses need training and certification so that they can be recognized worldwide.”*

Theme 3 : Contribution to improved survival

The nurses believe that despite the limited resources for care at their disposal, they have contributed significantly to saving the lives of children with cancer and are to be relied upon for better survival. They also mention their essential role in palliative care.

Participant 4: *“African nurses are the driving force for pediatric oncology in Africa. Investing in nurses will help Africa quickly reach the 60% by 2030 (GICC).”* Participant 18: *“All pediatric oncology nurses should be introduced to pediatric palliative care because it makes a whole positive difference for the patients and their families.”*

Theme 4 : Need for more recognition and support

The nurses feel that they are not adequately remunerated and call for more recognition of their services and resources to support training and education. Participant 11: *“Pediatric oncology nursing in Africa is*

emotionally draining; therefore, the nurses committed to work in this department need incentives to encourage them to keep at it.” Participant 34: *”Africa nurses need the training in pediatric oncology nursing to better give quality nursing care. They also need to be members of organizations like SIOP, so they are updated regularly on new things. SIOP needs to have a deliberate policy where membership from Africa is exempted from paying membership fees so that they do not pull out. African countries need financial help to be conducting orientation to new nurses in pediatric oncology so as to meet the baseline standards.”*

Discussion:

The WHO GICC is building momentum within the speciality of pediatric oncology nursing. This paper provides the perspective and amplifies the voice of African pediatric oncology nurses and their advocacy to prioritize services for children with cancer at national, regional and international levels.

The most fundamental and essential concepts in pediatric oncology nursing are compassion and compassionate care. Pehlivan and Güner argue that “compassionate behaviour requires understanding others’ value, establishing a relationship with them, and responding in a way that is meaningful for that person”¹². A patient, parent and healthcare provider empirical model demonstrates four key domains in pediatric oncology compassion care (beneficence, human relating, seeking to understand, and attending to needs)¹³. The four domains align with those which nurses described as their strengths during the 2017 SIOP Africa Congress (humanization of care for children, empathy for the patients during their treatment period, pain assessment and control using validated tools and good communication skills) despite the challenges they face in their hospital settings. Sedaghati et al. further report that the majority of oncology nurses have positive attitudes towards empathic behaviour with cancer patients¹⁴.

Educational opportunities such as Project ECHO Seminars for nurses in sub-Saharan Africa, and nurse training activities within the Francophone Africa Pediatric Oncology Group (GFAOP) and the Collaborative Network for Childhood Cancer Care and Research (CANCaRe Africa) have enhanced access to expertise in the care of children with cancer and contributed to enhancing pediatric oncology nurses’ knowledge and skills in Africa^{15–17}. Good communication skills during cancer care and treatment are an important aspect of nursing children and adolescents with cancer and their families; the nurses believed this was also their strong point. For example, Graetz et al. found that “nurses, rather than psychosocial providers, provide most of the counselling and are available to clarify information discussed by the physician” (p. 4) in Uganda¹⁸.

In many settings, nurses take on roles otherwise undertaken by allied health and social care professionals. The SIOP Global Mapping Programme survey of childhood cancer services in Africa provided the first ‘bird’s eye view’ of where services exist and pediatric oncology nurses practice, often in highly challenging circumstances with limited resources¹⁰. The data provided by nurses themselves were limited, echoing the general paucity of publications on the experiences and aspirations of African pediatric oncology nurses. This is compounded by barriers including limited access to training and education, lack of professional resources and the hurdles faced through publication. This is further evidenced by a literature review of pediatric oncology nursing research in LMICs 2008 – 2018, which found only six publications from Africa¹⁹.

Results of the global mapping survey demonstrated marked disparities between countries on the continent, where some have highly specialized services while others have none¹⁰. For pediatric oncology nurses to deliver quality nursing care to their patients, they require systems and programs developed to support this. However, more than 74.6% of the centres across Africa had only basic services with very few state-of-the-art services. Sirohi et al. note “Initiatives are being undertaken in LMICs [low- and middle-income countries] to deliver optimal cancer care by developing cancer centres, but many of these initiatives are currently fragmented and uncoordinated. The challenges of quality, value, affordability, and equality that cancer centres in HICs [high-income countries] face are multiplied in LMICs.”²⁰. To improve pediatric cancer outcomes, there is the need to strengthen training and diagnostic capacities, develop cancer registries and establish research databases²¹.

Despite the limited exposure to and participation in research, nurses participating in the 2019 13th SIOP Africa Congress research priorities exercise showed a desire to base their nursing practice on evidence. In

order to build that evidence base, nurses required further training, mentoring and funding to engage in research and generate appropriate evidence for practice in consideration of local, resource-limited practice environments. From the identified thematic areas, the two commonest research areas identified were issues surrounding professional practice and counselling/psychosocial support for patients and families. Pediatric oncology nursing practice is culturally and context-driven and requires locally acquired evidence to support best practices²⁵. African nurses have a key role to play in current and future clinical trials, as evidenced in HICs²⁶, but will require capacity building to be able to do so²⁷. Access to research training, availability of funding and protected time are key steps to guide and motivate clinical nurses as well as academic nurses to participate in research²⁵.

The SIOP baseline nursing standards recommend that pediatric oncology nurses should not rotate in other service units²⁴. However, from the African mapping survey, only 23% of facilities had fixed nurse staffing in pediatric oncology units. The rotation of experienced pediatric oncology nurses away from oncology units means taking away the expertise, knowledge and experience which is integral to successful mentorship and quality care. Rotation, therefore, compromises the quality of care given to pediatric oncology patients and can also be stressful for the nurses. The nature of cancer and the treatment process itself often leaves the children quite ill, requiring critical care in intensive care units (ICU). About 38.0% of the African facilities had no pediatric ICU available; unfortunately, the few facilities with an ICU had limited equipment and personnel with pediatric oncology experience. Only one-fifth of the facilities had a pediatric intensive care unit with all necessary equipment and personnel with pediatric intensive care expertise. According to Zinter et al., “up to 38% of children with cancer require pediatric intensive care unit (PICU) admission within three years of a cancer diagnosis, [even in HIC,] with reported PICU mortality of 13-27% far exceeding that of the general PICU population” (p. 1536)²⁸. The lack of ICU services or specialized staff across Africa may explain the causes of some preventable deaths among children with cancer.

Competencies are fundamental to quality nursing practice and involve the application of critical thinking, knowledge, technical, and interpersonal skills demonstrated in the actual performance of skills in a defined context²⁹. The need for competent pediatric oncology nurses is one aspect of care that is universally acknowledged as essential to all such strategies²⁴. The development of training programmes for specialization in pediatric oncology nursing on the African continent cannot be overemphasized in order to have competent specialists with better outcomes to care as was reinforced in the recent Lancet Oncology Commission on cancer in sub-Saharan Africa³⁰. Having sufficient theoretical, and clinical experience and attitude can be significant in improving the morale of the nurses³¹. The 2019 Delphi survey following the 2019 SIOP Congress in Cairo, Egypt, further underscores the importance of training as revealed by general consensus on priority areas of education vital for nurses new to pediatric oncology nursing that was condensed into a 12-module curriculum framework. This framework was piloted in Ghana in November 2021 and lead facilitators were trained in Malawi, in March 2022.

A good rapport between the Nurse and family enhances the Nurse’s ability to tailor their care to each individual child and helps the Nurse to know what small things they could do for the child that would make a big difference³². During the 2022 SIOP Africa Congress in Kampala, Uganda, a survey regarding impressions of nurses about pediatric oncology nursing in Africa demonstrated the holistic nature of nursing care for children with cancer and high level of commitment and motivation from nurses to meeting the care needs of their patients. Nukpezah et al. stated that “. . . pediatric oncology nurses mustn’t become task orientated. . . and lose sight of the holistic and human aspects of pediatric oncology nursing caring practice” (p. 7)³¹.

Successful and effective pediatric cancer care and treatment requires quality care delivered by skilled professional Nurses. Professional requirements include not only specialization but psychological support and motivation to uphold an unwavering commitment to meeting the needs children with cancer and their families, and thereby contributing positively to better survival as espoused in the WHO *CureALL* framework of the GICC initiative³³. The need for the expansion of educational programmes, the development of evidence-based practices for health promotion and well-being as well as guidance to enhance and standardize the

nursing care of children with cancer have been recognized as key initiatives for improving pediatric oncology nursing³⁴. The requirement for specialized training with certification was echoed again by SIOP Africa nurses to improve the numbers of available qualified and competent pediatric oncology nurses. However, the high demands of pediatric oncology nursing in resource-limited settings are not appropriately recognized and remunerated. This can be improved by encouraging membership to the relevant professional bodies such as SIOP that engender growth and development in clinical, educational, leadership and research areas that have already been alluded to as requiring investment and growth.

This paper has presented published and unpublished evidence from data gathered over the last five years through a range of activities led by African pediatric oncology nurses themselves. The work provides a baseline of the current situation, articulates professional priorities, and sets goals for moving forward to strengthen pediatric oncology nursing development and improve the care of children/adolescents with cancer and their families in Africa.

Acknowledgements:

All nurses of SIOP Africa

Declaration of interest statement:

The authors have no conflicts of interest to declare.

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Table 1: Details of 109 pediatric oncology facilities reporting on the SIOP Global Mapping Project survey from 46 African countries.

What type of dedicated pediatric oncology programme does your hospital have?

Pilot projects

Some basic oncology

Established oncology programme with most basic services and a few state-of-the-art services

Pediatric oncology programme with all essential services and most state-of-the-art services

State-of-the-art services and some highly specialized services (e.g., proton beam radiation therapy, MIBG therapy, phase I s

Don't know

Dedicated pediatric oncology ward?

No pediatric oncology inpatient ward

Area of the hospital where children with cancer are admitted when possible; frequent overflow to other wards; no fixed staff

Pediatric oncology inpatient ward available to most patients with limited, fixed staff (e.g., oncology nurse permanently assign

Pediatric oncology inpatient ward separate from inpatient units for other patients; sufficient beds such that oncology patient

Subspecialised pediatric oncology wards (e.g., transplant, neuro-oncology, acute myeloid leukaemia)

Don't know

Do children with cancer have access to pediatric intensive care facilities at your hospital?

Intensive care unit present; limited equipment and personnel with limited pediatric experience

Mechanical ventilators, inotropes, central venous access, dialysis; personnel with some pediatric experience

Pediatric intensive care unit with all necessary equipment and personnel with pediatric intensive care expertise

Advanced cardiopulmonary support available (extracorporeal membrane oxygenation)

No

Don't know

Table 2: Presence of allied health workers in 109 facilities in 46 African countries responding to the SIOP Africa Mapping Survey 2018.

Support Services	Have Resource	Don't Have Resource	Don't Know
Pharmacist	91%	8%	1%
Social Worker	81%	15%	4%
Physiotherapist	78%	18%	4%
Dietitian	66%	30%	4%

Volunteers	53%	44%	3%
Patient Support Group	49%	49%	2%
Psychologist	45%	51%	3%
Palliative Care	43%	53%	4%
Spiritual/Religious	40%	53%	7%
School Teacher	33%	63%	4%
Child Life Worker/ Play Specialist	28%	70%	2%
Bereavement	23%	70%	7%

Table 3: Final topic results of sub-Saharan Africa Nurses Network Delphi survey 2019.

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- Module 1:** General introduction to cancer
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- Module 2:** Diagnosis of cancer
 - Module 3:** Cancer treatment modalities
 - Module 4:** Management of chemotherapy side effects
 - Module 5:** Pediatric oncological emergencies
 - Module 6:** Care of the sick child
 - Module 7:** Providing safe care
 - Module 8:** Psychosocial care
 - Module 9:** Nutritional support for children with cancer
 - Module 10:** Palliative and supportive care to a child with cancer
 - Module 11:** Outpatient and follow up care
 - Module 12:** Pediatric oncology nursing and the role of the Nurse
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[CHART]

[CHART]



Figure 1: Priority research topics for pediatric oncology nursing in Africa as identified by nurses participating in the 2019 13th SIOP Africa Congress, in Cairo, Egypt.

Figure 2 : Research targets for pediatric oncology nursing in Africa as identified by nurses participating in the 2019 13th SIOP Africa Congress, in Cairo, Egypt.

Figure 3: Countries of the pediatric oncology nurses participating in the educational priorities for pediatric oncology nurses Delphi survey for sub-Saharan Africa, SIOP Africa meeting 2019, in Cairo, Egypt.