



Florence Nightingale Needs Your Attention: A Framework for Improving Pediatric Oncology Nursing in Low- and Middle-Income Countries

Venkatraman Radhakrishnan¹ Sanjeeva Gunasekera² Catherine G. Lam³ Monnie Abraham⁴ Scott C. Howard⁵

¹ Department of Medical and Pediatric Oncology, Cancer Institute (WIA), Adyar, Chennai, Tamil Nadu, India

² Department of Pediatric Oncology, National Cancer Institute, Colombo, Sri Lanka

³ Health Systems and Asia Pacific Regional Programs, St. Jude Children's Research Hospital, Memphis, Tennessee, United States

⁴ Global Nursing, Global Pediatric Medicine Department, St. Jude Children's Research Hospital, Memphis, Tennessee, United States

⁵ College of Nursing, University of Tennessee College of Health Sciences, Memphis, Tennessee, United States

Address for correspondence Venkatraman Radhakrishnan, MD, DM, Department of Medical and Pediatric Oncology, Cancer Institute (WIA), Adyar, Chennai 600020, Tamil Nadu, India (e-mail: venkymd@gmail.com).

Ind J Med Paediatr Oncol 2022;43:280–284.

Executive Summary

- Children with cancer in low- and middle-income countries (LMIC) succumb to their disease four times more often than those in high-income countries (HIC).¹
- Ninety percent of all pediatric cancers occur in LMIC.²
- In HIC, more than 80% of children with cancer are cured, but in LMIC only 26% survive.³
- Nurses play a vital role in the care of children with cancer.
- Causes of low survival in LMIC include shortage of dedicated pediatric cancer centers, trained pediatric oncology team members, inadequate supportive care, abandonment of treatment, excess relapse due to poor adherence, and lack of understanding as well as capacity to implement complex treatment requirements.
- Pediatric oncology nurses play a key role in mitigating these causes of excess treatment failure.^{1,4}
- Pediatric oncology nursing in LMIC faces a crisis from workforce shortage and lack of standards.

- The shortage of pediatric oncology nurses in LMIC results from low salaries, lack of career progression, lack of training opportunities, limited structured training programs, long irregular working hours, unsafe working conditions, and in some cases lack of respect for the profession.^{5,6}
- Baseline standards for pediatric oncology nursing care are well established, but most hospitals in LMIC do not meet the standards.⁷
- The time for action is now.
- There is an urgent need to ensure that baseline standards for pediatric oncology nurses are met in LMIC to achieve the World Health Organization's (WHO) goal of improving childhood cancer survival in LMIC to 60% by 2030.⁸
- Effective interventions proven to improve pediatric oncology nursing and empower nurses in LMIC include onsite subspecialty oncology nurse education and mentoring, implementation of a career ladder with concrete steps for advancement, and adherence to safety standards for handling of chemotherapy as well as blood products.⁷

Venkatraman Radhakrishnan and Sanjeeva Gunasekera equally contributed to the manuscript (Co-first authors)

DOI <https://doi.org/10.1055/s-0042-1748938>.
ISSN 0971-5851.

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Table 1 Illustrative case of challenges faced by pediatric oncology nurses in low- and middle-income countries

Case: It is a warm and humid summer night in Southern India and Nurse Mary is the nurse on the night shift along with her colleague in the pediatric oncology ward at a cancer hospital in a big city. These two nurses are taking care of more than 50 children during their shift. Mary has 10 years' experience working in pediatric oncology and her colleague is fresh out of nursing school. Over the next 12-hour shift, they will check the vital signs for all the children, administer chemotherapy and supportive care medications, attend emergencies, assist the doctor with patient care, complete their nursing charts, replace fluid bottles, insert cannulas, draw blood samples, and request for lab tests and radiology. Neither Nurse Mary nor her colleague has received formal training in oncology or pediatrics; all their learning has happened on the job. This is a scenario playing out daily in pediatric cancer centers in low- and middle-income countries.

Scope of the Problem

- Nurse to patient ratios in most LMICs is well below the recommended rates even by LMICs standards.^{6,9} A nurse to patient ratio of 1:5 is the accepted standard for pediatric oncology wards. However, a survey of 46 LMICs revealed this standard was met only in 28% of centers.⁵
- Forty-eight percent of nurses who work in pediatric oncology centers in LMIC have had no formal training in pediatric oncology before commencing work (see ►Table 1).⁵
- Many nurses are frequently rotated out of pediatric oncology units preventing them from gaining the needed skills and expertise.
- Only 52% of nurses had a formal orientation program before they started in pediatric oncology wards. An orientation program of more than 2 weeks was only experienced 30% of the time.⁵
- In Sri Lanka's public hospital system, nurses are rotated every 4 years preventing them from getting the necessary experience and competence by working for an extended period in a pediatric oncology ward. This is a problem that exists in many other LMICs too.¹⁰
- Trained nurses in India, Sri Lanka, and many other LMICs prefer to migrate to HICs due to economic considerations. This leads to significant manpower and financial loss to the health systems of these countries and discourages governments from investing in training nurses.¹¹

Key Steps Needed to Achieve Baseline Standards for Pediatric Oncology Nursing Care in LMIC

- Make the pediatric oncology nurses' roles more attractive and offer career advancement opportunities that may include nontraditional roles in advanced practice nursing and research.
- Establish training programs and fund the position of "Nurse Educator" in pediatric cancer units to provide continuous training and mentoring as oncology nurses are onboarded and nurtured through the course of their career.
- Encourage twinning and regional exchange programs for capacity building of pediatric oncology nurses.
- Conduct periodical reviews to ensure the success of the above interventions using a validated tool.

Introduction

Nurses make up the largest section of the healthcare workforce.⁸ According to the WHO, there are ~29 million nurses and midwives in the world. The WHO has given due recognition to the nurses by naming the year 2020 "The Year of the Nurses." There was a shortage of 9 million nurses in the World in 2014 and most of the shortages were in LMICs.⁵ The ratio of nurses per 1,000 population varies from 17.5 and 11.1 in Sweden and United States to 1.4 and 2.1 in India and Sri Lanka.^{5,9}

Nurses form the backbone of the healthcare system, especially in the hospital setting. They have the most interaction with patients and caregivers among all healthcare professionals. They play a key role in continuous monitoring of patients' condition, implementing care, and act as a patient advocate.

The Burden of Pediatric Cancers

Eighty percent of the 400,000 new pediatric cancers diagnosed in the world every year occur in LMICs.¹ Compared with 80% survival reported in HICs, the survival in LMICs is significantly inferior and ranges from 10 to 50% based on the country.² Therefore, it is expected that ~160,000 to 200,000 children with cancer will die in LMICs every year. Lack of adequate nursing services can contribute significantly to this deficit.²

Justification for Addressing This Issue

- A systematic review suggests that nurses working in understaffed oncology/hematology units are more likely to suffer from work-related stress and burnout.¹²
- The challenges faced by pediatric oncology nurses in LMICs have been highlighted in ►Table 2.
- Although the study was not specific to oncology settings, a recent systematic review clearly showed the association between a higher number of registered nurses employed and lower mortality in tertiary care hospitals.¹³
- In a study done in South America, building a sustainable model of Pediatric Oncology Nursing education proved both possible and financially feasible.³

Table 2 Challenges with pediatric oncology nursing in low- and middle-income countries

1. High staff attrition, turnover, and mandatory rotations
2. Few dedicated pediatric oncology nursing posts
3. Low salaries
4. Long working hours
5. Lack of training and mentoring
6. Lack of respect and representation in hospital leadership
7. Few opportunities for career progression
8. Migration of specialized nurses to centers in high-income countries in search of better pay, more job security, and improved lifestyle
9. Unsafe working conditions including lack of personal protective equipment, lack of chemotherapy mixing stations with adequate ventilation, exposure to needles as well as blood products, and other potential hazards

Baseline nursing standards in pediatric oncology in LMICs

The International Society of Pediatric Oncology (SIOP) Global Health Nursing Working Group published baseline nursing standards in pediatric oncology.⁶ These are the standards any LMIC needs to strive for and some salient features are as follows.

1. A nurse-to-patient ratio of 1:5 for general pediatric oncology units and 1:2 for critical care and transplant units.
2. Training in the form of formal orientation with learning objectives, including theory and practice for all new nurses joining the pediatric oncology department. Nurses should have the required competencies after completing the orientation program.
3. Continuing education and assessment after induction to maintain skills and knowledge. A minimum of 10 hours of training in a year is recommended.
4. Nurses are recognized as core members of the multidisciplinary team involved with the care of children with cancer.
5. Nurses have resources for providing safe and efficient care.
6. The hospital has an evidence-based policy that guides the delivery of quality nursing care.

A survey of nurses from 101 hospitals in 54 countries identified the following factors as predictors of nonachievement of standards mentioned above: low current health expenditure as percentage of gross domestic product, WHO Africa region, United Nations “developing or transition” country classification, countries with fewer than 3 nurses/midwives per 1000 population, and hospitals without bone marrow transplant and/or intensive care units.¹⁴

Stakeholders and Methods

The major stakeholders involved with pediatric oncology nursing are the nurses, pediatric oncologists, nursing councils, nursing colleges, ministries of health, local ministries

involved in education and quality, hospital administrators, recruiters in HICs, and children with cancer and caregivers. This policy brief is the result of input from a policy brief development exercise with the St. Jude Global Nursing and Asia Pacific programs, consultations with the SIOP Global Health Nursing Working Group, discussions with nursing and physician colleagues in India, Sri Lanka, and other LMIC, interactions with international experts, and engagement with the public sector via inputs from CanKids (www.cankidsindia.org). This is the largest pediatric nongovernmental foundation in India dedicated to childhood cancer that provides direct patient support, but also support for training and salary support for key pediatric oncology nurses.

Recommendations to Address These Problems

We propose a framework for improving nurse recruitment, reducing attrition, and providing training to nurses in pediatric oncology (→**Fig. 1**). This framework has been adapted by the authors from the SIOP Global Health nursing working group guidelines^{6,15} and integrating perspectives of the health system.

1. Recognizing pediatric oncology nursing as an important specialty

Pediatric oncology nursing requires a unique skill set and is often more demanding than other nursing disciplines. Therefore, their remunerations should reflect on this increased expertise and greater sacrifices. An established career development plan should be established for all recruits. Nurses working in specialized units like pediatric oncology should be given enough time to develop experience and skills without subjecting them to mandatory rotations. Specialized training in pediatric hematology and oncology nursing should be essential for nurses working in these particular units. The hospital administration should ensure that the nurses with these specific competencies be assigned to pediatric oncology patients. It is important to create pediatric oncology nursing networks and nurses should be encouraged to participate in the network.

The important role they play should be recognized at the local level as well as nationally. This can be done through hospital-based functions or media campaigns using traditional and social media nationally. These steps will not only help to attract more nurses to pediatric oncology but also reduce migration and attrition. Establishing and strengthening dedicated pediatric oncology centers will provide additional opportunities for nurses interested in pediatric oncology and create the context for development, training, and retention of sub-specialty nursing expertise. Increasing the numbers of specialized centers with trained multidisciplinary team members will also improve access to care for children with cancer in underserved regions.

2. Using pediatric oncology nurses beyond their traditional role

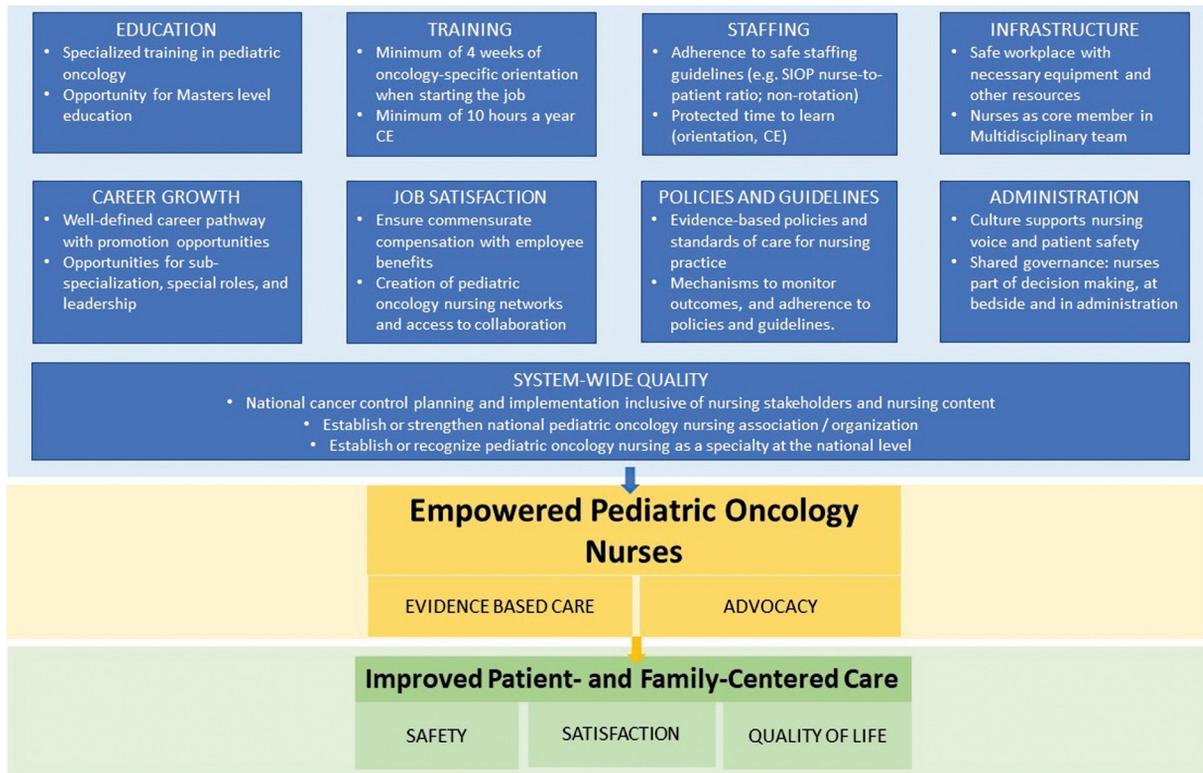


Fig. 1 Framework for empowering pediatric oncology nurses. Category of needs (blue) and outcomes (yellow/green) are shown in capitalized headings, with bullet points of recommendations for success. These can all be affected by support/ interventions at a hospital- and/or national level. CE, continuing education; SIOP, International Society of Pediatric Oncology.

A trained pediatric oncology nurse can work in areas that extend beyond their traditional domain of patient care, counseling, and administration of medicines with supportive care. Some of these areas include research and evidence-based medicine, palliative and end-of-life care, and survivorship.¹⁶

Studies including meta-analysis have shown that oncology nurse-led interventions are effective, lead to better implementation, and improve patient quality of life.^{16,17} Engaging nurses in these roles will not only be more cost-effective for the health system but will also broaden the career prospects of nurses.

3. Establishing a formal nurses training program and the position of a “Nurse Educator” in pediatric cancer units

In 2007, the St Jude Children’s Research Hospital conducted a study where they employed a full-time nurse educator in a pediatric oncology unit in Guatemala.³ The nurse educator was trained here and she provided pediatric oncology education for newly hired nurses, teaching courses in chemotherapy administration as well as central venous line care, and providing continuing education and onsite mentoring. Eighty-six percent of nurses employed in the hospital participated in the chemotherapy course and 93% achieved competency, 57% participated in the central line course, and 79% achieved competency. The nurses completed an average of 26 hours of continuing education yearly. The

cost of employing the nurse educator was \$244/nurse per year and was found to be effective and sustainable for LMICs. A similar study done in a pediatric hematology unit in Tanzania in collaboration with the American Society of Hematology observed that a nurse educator-led training program increased the nurses’ confidence, respect, and participation in interprofessional team decision making.¹⁸

Therefore, a “Nurse Educator” lead in a formal educational program can play a pivotal role in improving nursing services as well as providing new career options to pediatric oncology nurses.

4. Encouraging twinning programs for capacity building of pediatric oncology nurses

Most pediatric oncology nurses in HICs receive extensive training before joining a new job and they continue to receive training while working. Such training is mostly not available to nurses in LMICs and this contributes to the disparity seen in the survival of children with cancer in HICs and LMICs. However, the nurse in HICs can mentor the LMIC nurses to build up competencies, expose them to international best practices, and introduce new technologies. Many such twinning and regional support programs exist in other areas of childhood cancer and can be successfully extended to and sustained for nursing care as well.¹⁹ This will have the added benefit of raising the profile of LMIC pediatric oncology nurses and help in raising the morale of nurses.

5. Re-evaluate periodically the success of the above interventions

The primary objective of the above interventions is to help institutions and countries achieve Baseline Nursing Standards, and empower nurses as part of broader strategies cognizant of needs across the health system, as summarized in ►Fig. 1. A validated instrument to measure achievement of baseline standards for pediatric oncology nursing in LMICs has recently been developed.²⁰ Using this instrument to benchmark the successes of the above interventions will help countries be more efficient in their endeavors.

Conclusion

There is ample evidence to show that improvement in the pediatric oncology workforce and training can have a positive outcome on children with cancer. There is an urgent need to address the shortage of pediatric oncology nurses and deficient training of pediatric oncology nurses in LMICs. We believe the above steps will go a long way in addressing this deficit.

Conflict of Interest
None declared.

References

- 1 Lam CG, Howard SC, Bouffet E, Pritchard-Jones K. Science and health for all children with cancer. *Science* 2019;363(6432):1182–1186
- 2 Atun R, Bhakta N, Denburg A, et al. Sustainable care for children with cancer: a Lancet Oncology Commission. *Lancet Oncol* 2020; 21(04):e185–e224
- 3 Ward ZJ, Yeh JM, Bhakta N, Frazier AL, Girardi F, Atun R. Global childhood cancer survival estimates and priority-setting: a simulation-based analysis. *Lancet Oncol* 2019;20(07):972–983
- 4 Day SW, Garcia J, Antillon F, et al. A sustainable model for pediatric oncology nursing education in low-income countries. *Pediatr Blood Cancer* 2012;58(02):163–166
- 5 Morrissey L, Lurvey M, Sullivan C, et al. Disparities in the delivery of pediatric oncology nursing care by country income classification: international survey results. *Pediatr Blood Cancer* 2019;66(06):e27663
- 6 Drennan VM, Ross F. Global nurse shortages—the facts, the impact and action for change. *Br Med Bull* 2019;130(01):25–37
- 7 Day S, Hollis R, Challinor J, Bevilacqua G, Bosomprah ESIOP PODC Nursing Working Group. Baseline standards for paediatric oncology nursing care in low to middle income countries: position statement of the SIOP PODC Nursing Working Group. *Lancet Oncol* 2014;15(07):681–682
- 8 World Health Organization Global initiative for childhood cancer. Accessed on April 12, 2022 at: <https://www.who.int/cancer/childhood-cancer/en/>
- 9 Haddad LM, Annamaraju P, Toney-Butler TJ. *Nursing Shortage*. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2020
- 10 Ministry of Health Nutrition and Indigenous Medicine Sri Lanka and WHO. *Health Labour Market Analysis: Sri Lanka*; 2018
- 11 Abebe L, Bender A, Pittini R. Building the case for nurses' continuous professional development in Ethiopia: a qualitative study of the sick kids-Ethiopia Paediatrics Perioperative Nursing Training Program. *Ethiop J Health Sci* 2018;28(05):607–614
- 12 Garner SL, Conroy SF, Bader SG. Nurse migration from India: a literature review. *Int J Nurs Stud* 2015;52(12):1879–1890
- 13 Toh SG, Ang E, Devi MK. Systematic review on the relationship between the nursing shortage and job satisfaction, stress and burnout levels among nurses in oncology/haematology settings. *Int J Evid-Based Healthc* 2012;10(02):126–141
- 14 Kane RL, Shamliyan TA, Mueller C, Duval S, Wilt TJ. The association of registered nurse staffing levels and patient outcomes: systematic review and meta-analysis. *Med Care* 2007;45(12):1195–1204
- 15 Pergert P, Sullivan CE, Adde M, et al. An ethical imperative: Safety and specialization as nursing priorities of WHO Global Initiative for Childhood Cancer. *Pediatr Blood Cancer* 2020;67(04):e28143
- 16 Sullivan CE, Morrissey L, Day SW, Chen Y, Shirey M, Landier W. Predictors of hospitals' nonachievement of baseline nursing standards for pediatric oncology. *Cancer Nurs* 2020;43(04):E197–E206
- 17 Challinor JM, Galassi AL, Al-Ruzzieh MA, et al. Nursing's potential to address the growing cancer burden in low- and middle-income countries. *J Glob Oncol* 2016;2(03):154–163
- 18 Buser JM. The need for hematology nurse education in low- and middle-income countries: a community case study in Tanzania. *Front Public Health* 2017;5:65
- 19 Hopkins J, Burns E, Eden T. International twinning partnerships: An effective method of improving diagnosis, treatment and care for children with cancer in low-middle income countries. *J Cancer Policy* 2013;1(01):e8–e19
- 20 Day SW, Sullivan CE, Morrissey L, et al. Development and content validation of an instrument to measure baseline standards for pediatric oncology nursing in low- and middle-income countries. *J Pediatr Oncol Nurs* 2021;38(04):213–224