
Lessons from the Field**Perioperative Nursing Training in Rwanda in Partnership with American Universities: The Journey So Far**Joselyne Mukantwari^{1*,3} , Lilian Omondi^{1,2}, David Ryamukuru¹¹*General Nursing Department, School of Nursing and Midwifery, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda*²*Human Resource for Health, Ministry of Health, Kigali, Rwanda*³*Faculty of Health Sciences, Arthur Labatt Family School of Nursing, University of Western Ontario, London, Ontario, Canada****Corresponding author:** Joselyne Mukantwari. General Nursing Department, School of Nursing and Midwifery, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda. Email: mujoselyne@gmail.com, jmukantw@uwo.ca

Abstract

Nurses within a surgical team play such a fundamental role in the success of a surgery that they require specific training for the purpose. However, in Rwanda, there has been a severe scarcity of perioperative nurses. This article describes the collaborative effort for perioperative nursing training by the University of Rwanda (UR) and the Ministry of Health (MOH) with the Human Resources for Health (HRH) Program and a consortium of American Universities. The goal of the HRH program has been to build up the capacities of health professionals both in academia and clinical settings so as to address the shortage of qualified staff. In that regard, the UR in 2015 started a Masters program in nursing in eight specialties, of which one was perioperative nursing. The aim of this paper is to highlight the training process, success, and challenges of perioperative nursing training in Rwanda.

The training has so far been successful, with the 19 nurses who completed the program working now in academic and clinical teaching institutions. Students in the program have also increased their number of research publications in peer-reviewed journals and international conference presentations. The UR and its partners are investing in the sustainability and excellence of this program. Using the import-of-experts approach to train Rwandans within their country, the program addresses the scarcity of specialists in various disciplines within the nursing profession. As a consequence, countries where the lack of specialized nurses poses challenges may adopt this partnership strategy.

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Introduction

Perioperative nursing has been defined by the American Association of perioperative nurses[1] as “the practice of nursing directed toward patients undergoing operative and other invasive procedures”(p.12). In their perioperative patient-focused model, a perioperative nurse is described as “the registered nurse who, using the nursing process, develops a plan of nursing care and then coordinates and delivers care to patients undergoing operative and other invasive procedures. Perioperative nurses have the requisite skills and knowledge to assess, diagnose, plan, intervene, and evaluate the outcomes of interventions” (p.12). Before surgery, a perioperative nurse will assess and prepare surgical patients by addressing their physiological, spiritual, and psychological reactions toward surgery. Intraoperatively, they are most concerned with a patient’s safety and that surgery runs smoothly. They anticipate surgical and anesthesia needs and prevent possible complications at different patient treatment stages.[2] After surgery, they continue with recovery and rehabilitation care, combining technical competencies with caring roles.[3] Thus, special training is needed to sustain the safety and surgical care continuum of perioperative patients.[4]

Globally, surgically treatable conditions constitute 11% of burden of diseases and are among the top 15 causes of disability that could otherwise be effectively treated or prevented through safe and timely surgical care.[5–8] Nurses play an essential role in facilitating surgical care access [5–8] and reducing morbidity and mortality of patients with surgical conditions and associated disabilities. Nursing interventions not only significantly reduce patients’ disabilities but also contribute to a decrease in surgical expenses, ultimately reducing the burden of health care costs on a country’s economy.[9,10]

Even though more than 234 million surgical procedures are globally performed each year,[6,11] less than 10% of this number are delivered in developing countries. More than 4.8 billion people (67%) within the global population do not have access to surgery, and an estimated 95% of those are from developing countries in Central, Eastern, and Western Sub-Saharan Africa and South Asia. Unfortunately, 143 million surgical procedures are needed each year but not performed in these developing countries.[10]

Rwanda is a small country in sub-Saharan Africa with a population of 13,108,251` inhabitants.[12] A study[13] indicates that 14.8% of the total population has experienced

a surgical disease condition, and a total of 32.9% of household deaths may have been related to operative conditions. Trauma and injuries alone contribute 23.7% [14] to 27.5% [15] of the surgical burden. A safe and timely provision of emergency and essential surgical and anesthesia care is determined by the resources available to and overall flexibility of the healthcare system's workforce and infrastructure in addition to patient-associated factors.[16] Hence, training the surgical staff and establishing suitable infrastructure and equipment will improve access to safe and timely surgery, which remains a significant challenge in developing countries.[5]

About 76.3% of the Rwandan health system workforce is nurses and midwives [17] who actively participate in government health plans' objectives.[18] In surgery, perioperative nurses play an essential role in providing safe and timely emergency and surgical care, preventing perioperative complications and mortality. Specialized perioperative nursing care tends to enhance the quality of surgical procedures and reduce untoward surgical complications, which are also associated with unnecessary expenses.[9]

Unfortunately, in Rwanda, the number of specialized perioperative

nurses is still low given the surgical demand. Hospitals employ nurses with advanced diplomas and a few with bachelor's degrees in general nursing or midwifery. Perioperative skills and knowledge gained from their general nursing and midwifery education are not enough to meet theatre demands and safe surgery requirements.[19] Studies have demonstrated that favourable surgical outcomes are significantly associated with better staffing and nurses' educational preparation.[20] It is in this regard that the Rwandan MOH, HRH, UR, and a consortium of American universities collaborated to train nurses at the master's level in eight nursing specialties, including perioperative nursing, to parallel the growth of nursing, anesthesia, and surgery professions in Rwanda.[21]

Rwanda's government employed a multi-year (2012-2019) training approach using tied-aid model partnerships between academic institutions in high- and low-income countries. The selection criteria were based on previous/ongoing effective working relationships with Rwanda or prior expressed interest in working in Rwanda. These institutions also had established reputations as leaders in global health for their respective disciplines or clinical specialties.[22]

The School of Nursing and Midwifery of the College of Medicine and Health Sciences, UR, therefore, collaborated with Rory Meyers School of Nursing, New York University, to start training in eight specialties, namely nursing education, leadership and management, perioperative, nephrology, critical care and trauma, neonatology, pediatrics, oncology, and medical-surgical nursing. The MOH HRH Program coordinated the partnership for the sake of synchrony and synergy of expertise within the human resource functions within Rwanda.[22]

This article focuses on the perioperative nursing specialty with the intent of describing the specialty training process, its success and associated challenges, and finally, providing recommendations for sustainability.

The perioperative nursing training process

The training process includes theoretical and clinical components structured around four basic domains essential for carrying out nursing roles and functions responsibly within the perioperative field and ensuring patient safety. These include the ability to: (1) create and maintain a physically safe environment, (2) ensure patients' physiological safety, (3)

handle surgical procedures for patients and their families, and (4) maintain patients' individual rights and values.[23,24]

The program predicted that graduates would achieve the following attributes: (1) generate and apply advanced knowledge and skills in addressing complex nursing and health-related issues in the perioperative patient care process through evidence-based nursing interventions; (2) initiate, manage and sustain changes that positively affect health outcomes by providing professional leadership during the perioperative patient care process;(3) evaluate the impact of care delivery on health outcomes based on the contributions to the development of nursing knowledge and practice through education, research, scholarly debates, presentations, and publications.[23,24]

A diverse team of international experts for quality benchmarking and a team of local experts for content and contextualization developed a three-hundred-credit curriculum for the program much earlier as the first step before training initiation. The curriculum included 80 credits for fundamental modules, 210 core modules, and ten credits for elective modules. The research project carried one-third of the total program credits (Table 1).

The formal training activities of the program started in 2015 at the University of Rwanda. Training modality included class attendance three days a week from Monday to Wednesday from 8:00 to 17:00. In their practicum, the students rotated in three referral and teaching hospitals situated in Kigali, the capital city of Rwanda. The practicum focused on anesthesia and intraoperative and post-operative nursing care. For the dissertation, the students did individual research. The

postgraduate studies coordination allocated early in the first semester a senior supervisor (an American or Rwandan holder of a Ph.D.) in pairing with a junior local co-supervisor (MSN graduate) to facilitate students' work on their research proposals, data gathering and analysis, dissertation preparation, and defense in front of a panel. To assess the candidates' performances, the lecturers regularly used individual and group assignments, continuous evaluative tests, and final exams.

Table 1. The curriculum of perioperative nursing training at the UR before review

Modules	Module Credit	Module hours	Semesters
Common modules			
Global Patterns of Health and Illness	20	200	1
Research Design and Biostatistics	20	200	1
Communication & Leadership	20	200	1
Nursing Knowledge: Concepts, Theories, and Practice	10	100	1
Transforming Nursing Practice	10	100	3
Pathophysiology and Clinical Management	20	200	2
Advanced Health Assessment	10	100	2
Clinical and Applied Pharmacology	10	100	2
Specialty modules			
Focused Clinical I	20	200	2
Anesthesia and Post Anesthesia Care	10	100	3
Intraoperative Nursing	20	200	3
Focused Clinical II	20	200	3
Dissertation	100	1000	4
Elective module	10	100	4
14 modules	300	3000	

Achievements of the training

The first cohort comprised 13 candidates, commenced their training on 5th October 2015 and graduated on 25th August 2017. The second cohort of six students also completed their program on 8th November 2019. Eleven out of the 19 graduates work in four university teaching and referral hospitals used for practicums by the University and district hospitals. The remaining seven graduates teach in higher learning institutions, six in the University of Rwanda and one at Ruli Higher Institute of Health. There are eight publications in peer-reviewed journals, eleven abstract presentations in international research conferences from their research dissertations, and other manuscripts are underway.

After two years of implementation and following the graduation of the first cohort trained, the teaching team reviewed the curriculum before the second cohort commenced. In conducting this task, the review team was also informed by the recommendations of the experts on critical care. For example, the credits of the Communication and Leadership module as well as Pathophysiology and Clinical Management module were reduced to ten, and the new ten-credit module of Essentials of Perioperative Nursing was created. An additional ten credits were added to Specialized Clinical Focus module (Table 2). The curriculum review and validation were in accordance with the UR and National Council of Nurses and Midwifery regulations.

Table 2. The current curriculum of perioperative nursing training at the UR (after review)

Modules	Module Credits	Module hours	Semesters
Common modules			
Global Patterns of Health and Illness	20	200	1
Research Design and Biostatistics	20	200	1
Communication & Leadership	10	100	1
Nursing Knowledge: Concepts, Theories, and Practice	10	100	1
Transforming Nursing Practice	10	100	3
Pathophysiology and Clinical Management	10	100	2

Advanced Health Assessment	10	100	2
Clinical and Applied Pharmacology	10	100	2
Specialty modules			
Essentials of Perioperative Nursing	10	100	2
Perioperative Nursing Clinical I	20	200	2
Anesthesia and Post Anesthesia Care	10	100	3
Intraoperative Nursing	20	200	3
Perioperative Nursing Clinical II	30	300	3
Dissertation	100	1000	4
Elective course	10	100	4
14 modules	300	3000	

The current class (2019-2021) comprises three students: two are from referral hospitals in Rwanda, while the remaining one is from a district hospital.

Benefits of the program

Patients undergoing surgery are normally at risk related to the surgical procedure, or/and anesthesia, and the nurses play a critical role in providing patients with care in the perioperative period.[5-8] It is therefore imperative to invest in high levels of trained perioperative nurses to enhance surgical safety and to promote cost-effective care innovations through research and evidence-based practice. The current perioperative nurse training entails nursing care of surgical patients in the various surgical disciplines, i.e., neurosurgery, orthopedic surgery, cardiothoracic

and vascular surgery, and plastic surgery. These disciplines have trained doctors and anesthetists but lack properly trained perioperative nurses and function only with nurses trained on the job. With the advanced training of perioperative nurse specialists, the hospitals in Rwanda will offer safe, specialized services and care. For example, most Rwandans with cardiothoracic and vascular conditions seek treatment abroad, which could be diminished if we invest and exploit specialized training of perioperative nurses to work alongside the trained doctors and anesthetists.

Challenges of the program

The number of candidates attending perioperative training is decreasing progressively. Candidates admitted in the third and the second cohort of students were low compared to the first cohort. The lack of scholarships to meet the escalating cost of

education, and the failure to secure a study leave from the workplace have been the main reasons for reduced numbers. With regard to the trainers, the program relies on expatriates hired through the Ministry of Health and American universities' partnership under the HRH program. Despite the cost spent on their training and the gap in perioperative nursing skills, the graduates who are working in Rwandan hospitals were not considered for promotions in their specialization. The underemployment continues to discourage new candidates from enrolling in training. As long as the health system does not address the underemployment problems of the graduates of the program, it will be challenging to overcome the countrywide gap in specialized perioperative nursing.

Training sustainability

To ensure that the program becomes sustainable, the UR has recruited outstanding graduates from the program to join the staff training the second cohort of master's students. In this regard, the University has adopted the mentorship strategy of pairing local faculty and training experts to equip the mentees with the skills and knowledge needed for practice, research, and improving health care in clinical settings. In addition, to mitigate the challenges,

the University has considered international students' entry into the master's programs, has attempted to look for donors to partner with, and has also engaged in grant applications. The recent grant applications were for DAAD (German Academic Exchange Service) host institutions in-country/in-region scholarship program and Clinton Health Access Initiative (CHAI) program.

The school of Nursing and Midwifery has initiated a Ph.D. program for upward mobility and professional growth of the master's graduates. Some of the faculty members have completed their Ph.D. programs outside and within Rwanda, while others are still training perioperative nurses to sustain the activity and direction for perioperative nursing in Rwanda.

Conclusion and recommendations

Overall, the program has been successful, despite the challenges being encountered. Other teaching institutions from developing countries can also implement such partnerships to address the shortage of specialized nurses. Nevertheless, concerted effort from different entities could contribute to the success of perioperative nurses' training and overcome the gap still existing in delivering perioperative

nursing care and safe surgery. The Ministry of health, hospitals, and other health facilities will need to facilitate the candidates' training in the master's program and promote the graduates into positions that positively change perioperative practices.

Successful and quality surgery depends entirely on the surgical team spirit emanating from all the trained surgical team members as specialists. Thus, perioperative nurses should be involved in decision-making and quality improvement undertakings. The University will require to continue advocacy for funding and scholarship opportunities to assist students in their studies, improve the enrolment rate and thereby contribute to overcoming the country gap of perioperative nurses. Further research to assess the clinical impact of having specialized perioperative nurses in the Rwandan health workforce will shed light on the outcome of the training engagement of perioperative nurses.

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Author's contribution

JM, LO and DR :Curriculum implementation, conception and drafting of the manuscript, review, and approval of the manuscript

Declaration of conflict of interest

This is our experience in the training of perioperative nurses in Rwanda. Therefore, we declare no conflict of interest.

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