



# Critical care nursing practice and education in Rwanda

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Critical care nursing practice and education in Rwanda is a young specialty. There are very few critical care nurses practising in either hospital or academic settings, and typically nurses taking care of critically ill patients receive only a brief period of informal education prior to practising. Intensive care units are found predominantly in the state tertiary hospitals, located primarily in Kigali city. The purpose of this article is to describe the current state of critical care nursing in Rwanda, including challenges and opportunities faced by these nurses, as well as recent initiatives under way in an attempt to address these difficulties. This article is based on a review of the published and grey literature relevant to the healthcare system and the disease profile of Rwanda, as well as the evolution of critical care nursing in Rwanda. In addition, the experience of the first author in critical nursing in Rwanda helped to guide the development of the article.

*S Afr J Crit Care* 2016;32(2):55-57. DOI:10.7196/SAJCC.2016.v32i2.272

Critical care nursing practice and education in Rwanda is a young nursing specialty. It is defined as the nursing care of patients presenting with life-threatening conditions and illnesses. The nursing of patients who are critically ill takes place in a variety of care settings, including pre-hospital settings, emergency departments, intensive care units (ICUs) and high-dependency care units (HDUs). This area of nursing requires a high level of co-ordination between all healthcare professionals involved in caring for critically ill or injured patients, from admission to follow-up care post discharge.

Critical care nursing in Rwanda is facing multiple challenges related to this country's history, fast-paced economic development and the rapid urbanisation occurring in the country. Before the genocide of 1994, the country lacked a nursing council to regulate the nursing profession, and the highest level of training available for nurses was as an enrolled nurse (A2). These enrolled nurses usually had completed 12 years of education to obtain a high-school certificate and some basic nursing training.<sup>[1]</sup> They then worked in general wards as well as in specialist areas such as HDUs and emergency departments. Only one ICU existed in Rwanda at the time of the genocide. The genocide was a tragic event that destroyed both human resources and infrastructure, and many critical care professionals (doctors and nurses) died or left the country. There are initiatives now under way attempting to address the challenges faced by critical care nursing practice and education sectors,

in order to improve the quality of care by boosting skills and knowledge, launching new clinical facilities and educational institutions, and redefining and creating standards for nursing certification and licensing.<sup>[2]</sup>

The purpose of this article is to describe the current state of critical care nursing in Rwanda, including challenges and opportunities faced by these nurses, as well as recent initiatives under way in an attempt to address these difficulties.

## Rwandan healthcare system and disease profile

This article is based on a review of the published and grey literature relevant to the healthcare system and disease profile of Rwanda, as well as the evolution of critical care nursing in Rwanda. In addition, the experience of the first author in critical nursing in Rwanda helped to guide the development of this article.

The Rwandan healthcare system is a decentralised and multi-tiered health system, designed as a three-level pyramid. At the bottom level are the 24-hour health centres that provide curative, preventive and health promotion services, and which oversee multiple staff who provide immunisation and antenatal care. These health centres supervise the health posts and the community health workers who monitor village-level health and refer sick individuals to the nearest health facility. At the middle level are the district hospitals that provide inpatient and outpatient

care, and at the top level are the provincial and national referral hospitals. The latter provide specialised care, supervise the lower levels in the pyramid and receive patients referred to them.<sup>[3]</sup> Five referral hospitals exist in the country, with four of these located in Kigali, the capital of Rwanda. One of these referral hospitals is, however, dedicated solely to mental health services and therefore does not admit critical care patients. Four of the five referral hospitals are public, while King Faisal Hospital, Kigali (KFH-K) is public-private.

Two levels of adult ICUs exist in Rwanda. The first is the HDU, which is an intermediate unit, between the ICU and the general wards, where patients are closely monitored. The second is the general ICU, which has mechanical ventilators and limited invasive monitoring devices. Most of the ICUs are newer departments within the hospitals. The oldest ICU opened in 1972 at the University Teaching Hospital of Butare, followed by the University Teaching Hospital of Kigali (CHUK) in 1995. The newest ICU was opened in the Rwanda Military Hospital in 2012. The oldest HDU opened at the KFH-K in 2011, and the newest HDU opened at CHUK in 2014. There are a total of 39 adult ICU beds in Rwanda, of which 66.7% ( $n=26$ ) are ICU and 33.3% ( $n=13$ ) HDU. The private sector is increasingly investing in health-related activities in the country as a result of government sensitisation, support and improved collaboration. The private sector, however, focuses primarily on the outpatient care and hospitalisation of medical and surgical patients, with limited ICU services.<sup>[4]</sup>

Although Rwanda has made tremendous advances in its economy, it is still listed among the poorest countries in the world.<sup>[5]</sup> The agricultural sector employs about 87% of the working population, producing about 46% of the gross domestic product and generating ~80% of the total rural household revenues,<sup>[6]</sup> which are not sufficient to meet the dietary needs of the Rwandan population. In 2010 – 2011 it was established that a total of 69.7% of the Rwandan population use protected springs as their water source, of which 38.1% used public standpipes, 25.7% piped into the dwelling compound and 5.9% used combined water sources. However, it should be noted that unhygienic sanitary facilities for excreta disposal, poor management of solid and liquid waste, and inadequate hygienic practices are responsible for a large portion of Rwanda's disease burden.<sup>[7]</sup>

In 2014 health facilities received a total of 12 155 380 new cases. Of these, at health centres, acute respiratory infection, malaria, intestinal parasites and other diseases represented a significant proportion (14%). In the hospitals, the main causes of all outpatient visits reported were teeth and gum infections (30%), eye problems (17%), physical trauma and fractures (11%), acute respiratory infection (7%) and gastrointestinal disease (7%).<sup>[8]</sup> A number of these patients required admission and lengthy stays in ICU. This negatively impacts the critical care services, increasing patient mortality rates and resource utilisation for the health system.<sup>[8]</sup>

The leading causes of mortality in Rwandan hospitals, as reported in 2014, were gynaecological and obstetric complications (8%), cardiovascular diseases (8%), respiratory diseases (8%), physical trauma, bone and joint diseases (6%), HIV/AIDS and opportunistic infections (6%).<sup>[9]</sup>

Rwanda has made tremendous strides in the fight against communicable diseases, with remarkable progress in attempting to eliminate preventable maternal and neonatal diseases, as well as in the reduction of malaria-related morbidity and mortality. The epidemiological disease profile of Rwanda is still, however, dominated by communicable diseases, which constitute 90% of the chief complaints in health facilities. Typhus, cholera, measles and meningitis still occur in epidemics.<sup>[10]</sup> The rapid economic growth in Rwanda, coupled with lack of knowledge and unhealthy behaviours, has led to an increase in common non-communicable diseases, including diabetes mellitus, cardiovascular diseases and hypertension, cancers and mental illnesses; these are expected to continue to increase over the next couple of years.<sup>[11]</sup> Rwanda, like other sub-Saharan African countries, also experiences natural and man-made disasters, and emerging and re-emerging diseases such as avian and swine flu. Available data from the Ministry of Disaster Management and Refugees Affairs<sup>[12]</sup> found that 100 people lost their lives as a result of disasters, 3 000 people were injured and 2 308 houses and schools were destroyed in 2011. As a result of these tragedies, interventions to support and assist in the recovery of the injured victims were costly to the healthcare system, and increased the workload of emergency and critical care nurses.<sup>[13]</sup>

In Rwanda, concurrent with the economic growth and urbanisation, there has been a steep increase in the utilisation of motorcycles as a mean of transport. This rapid expansion and utilisation of motorcycles, coupled with the expansion of industrial production without adequate safety measures and appropriate infrastructure, is likely to increase the incidence of injuries.<sup>[14]</sup> Injuries that are critical and life threatening require rapid management and close monitoring, and therefore necessitate admission to an HDU or ICU. A study conducted in four institutions providing emergency care in Kigali reported that in 2015 there were 2 682 deaths: 57% were men, 67% were adults

>18 years, and 16% children <5 years. Injury-related deaths occurred in 22% (593/2 682). The most common injury mechanism was road traffic collisions (a cause-specific mortality rate of 20/100 000). Nearly half of all injury deaths occurred in the pre-hospital setting (47%;  $n=276$ ) and 49% of injury deaths at the university hospital occurred within 24 hours of arrival. Being injured increased the odds of dying in the pre-hospital setting 2.7 times ( $p<0.0001$ ).<sup>[15]</sup>

Pre-hospital emergency care is provided by a range of individuals, including professional staff, lay people and taxi drivers, as pre-hospital service is still limited.<sup>[16]</sup> More than 83% of Rwandans live in a rural setting and individuals from these areas use *ingobyi* (a traditional wooden bed) as a method to transport injured or ill patients in emergency situations when a car is not available.<sup>[17]</sup> Consequently, these patients take more time to reach the health facility, and when they do arrive they are often in advanced stages of illness; this contributes to death or prolonged stay in ICU. Although there has been progress in increasing the number of beds and improving the quality of health facilities in Rwanda, challenges remain regarding accessibility due to the geography of the country. For example, in 2011 it was reported that 27% of the population had to walk for more than 1 hour to reach the nearest health facility (<5 km).<sup>[18]</sup>

## Critical care nursing practice in Rwanda

Nurses currently practising in the Rwandan healthcare system and working in educational institutions are trained at different levels. Level A2, or enrolled nurses, have a high-school diploma with some basic nursing training; A1, or registered nurses with an advanced diploma have completed 3 years of post-secondary education, and A0 or registered nurses with a bachelor's degree, have completed 4 years of post-secondary education. All of these cadres, however, have insufficient preparation and expertise (including clinical practice) to work in a critical care area.

Generally, enrolled nurses primarily work in district hospitals and health centres; A1 nurses practise at district hospitals or in management positions in various clinical settings. Those working in referral hospitals and in teaching positions frequently have an A0.<sup>[19]</sup> In addition to these cadres, there are a few nurses with master's and PhD degrees in the country. Most of these nurses were trained abroad, with a small cohort of critical care and trauma nurses trained locally.<sup>[20]</sup>

In Rwanda, as in many countries regionally and internationally, nurses are mostly trained to work as general nurses in primary healthcare settings. However, these nurses constitute a large proportion of the staff delivering nursing care for critically ill patients.<sup>[21]</sup> Currently in Rwanda there are ~80 A1 nurses working in ICUs and 34 A0 nurses. Although A2-level nurses are being phased out, 20 still work in ICUs. In addition to these general nurses, there are 10 nurses who are qualified critical care nurses, A0 or with a master's degree working in ICUs. In Rwanda, as in many other countries, a 1:1 nurse-patient ratio is generally considered adequate to meet the needs of critically ill patients. This includes unstable patients requiring several simultaneous nursing activities and complex therapies to support multiple organ failure. A 1:2 or greater nurse-patient ratio is used for stable patients.<sup>[22]</sup>

A study looking at 58 patients admitted to intensive care between August and November 2013 reported that neurological issues related to traumatic brain injuries, trauma-related problems and emergency surgery were the three most common reasons for admission. The mortality rate for the patients during this period was recorded as 45.6%, significantly higher than the 30% experienced in a similar study conducted in South African ICUs.<sup>[23]</sup> This higher rate may be attributed

to a variety of factors, such as lack of resources (including qualified health professionals and equipment), inadequate and limited drugs, and lack of training of the health professionals working in these demanding units.<sup>[24]</sup> In addition, patients are often admitted to these units long after the onset of their illness or injury. Furthermore, limited communication and teamwork skills necessary to work efficiently in a complex and stressful environment such as the ICU constitutes an area of concern. Critical care nurses need to be enabled to think critically through complex patient problems, to foresee needs and to recognise potential and actual complications in the patients they are nursing.<sup>[25,26]</sup>

Most Rwandan referral and district hospitals are undergoing a process of quality improvement through accreditation. During this exercise, critical nursing and other departments within referral hospitals have been renovated and extended. KFH-K is at an advanced stage of this accreditation process. Staff in these hospitals, including critical care nurses, play an important role in designing and implementing policies, guidelines and other prerequisite requirements for the accreditation process undertaken by these facilities.

## Education

The National Council for Nurses and Midwives (NCNM) of Rwanda is still young. It was established by an Act of Parliament No. 25/2008 of 25/07/2008 and proclaimed on 1 November 2008.<sup>[27]</sup> The focus of the NCNM has been the development of standards and scope of practice in general nursing programmes, for enrolled and registered nurses. The role of a critical care nurse, as well as the competencies required to be a nurse specialist, are therefore yet to be defined, and the focus of the current training content is seen to be reactive rather than proactive. As in many countries, there has been very limited research undertaken to assist with determining the numbers and skills set required for critical care nurses in Rwanda. The education and training programme for nurses in general, and critical care nursing in particular, at both the pre-service and post-basic levels, is an area still to be explored and defined.

Until recently, critical care nurse training was predominantly acquired on the job, and through some courses that were offered to general nurses covering topics identified by practising nurses or their departments. These courses were not accredited by any educational organisation or standardised. A few nurses were formally trained in critical care abroad (in Kenya and South Africa), and since 2009 efforts have been made to train critical care nurses in Rwanda. Due to the severe shortage of qualified health professionals, the Rwandan Ministry of Health, in collaboration with the USA government, developed a 7-year project entitled Human Resources for Health (HRH).<sup>[28]</sup> One of the aims of this HRH project is to increase the number, quality and skill levels of Rwandan healthcare professionals and educators in order to advance the quality of care delivered to patients and the community. One of the strategies being used to reach this goal is to 'twin' the HRH faculty with local healthcare professionals in both pre-service and service. USA faculty with extensive nursing experience is expected to mentor and guide the development of the Rwandan faculty affiliated with this programme. Critical care departments are among the clinical areas where this model is currently being implemented.

The educational plan for nurses in some health facilities in Rwanda is almost non-existent. In South Africa as well, many ICU nurses study in their own time. 'Studying privately' can be difficult, as it is expensive, requires time away from work or may require moving to another facility. These nurses have to request special permission to study, something that can be problematic in a busy unit. As adult learners, these nurses are often also juggling family responsibilities, work and additional

financial costs.<sup>[29]</sup> This impacts the advancement and retention of critical care nurses, who then leave the critical care area after accumulating substantial experience. Therefore, there is a strong need to design and implement policies to motivate and retain critical care nurses.

## Conclusion

Critical care nursing in Rwanda is still a developing specialty. Although there have been exciting developments that may serve as cornerstones, various challenges remain. These include inadequate preparation of personnel to work in critical care and limited availability of standards and policies regulating this profession. We argue that the engagement and support of nursing leaders, clinicians and educators will positively contribute to the advancement of this growing nursing specialty in Rwanda.

## References

- Mukamana D. The state of nursing and nursing education in Africa: A country-by-country review. In: Kopper H, Uys LR, eds. Rwanda. Indianapolis, USA: Sigma Theta Tau International Honor Society of Nursing, 2012:1-475.
- Rwanda Human Resources for Health Program 2011-2019: Funding proposal. Kigali: Ministry of Health of the Republic of Rwanda, 2011. [http://medicine.yale.edu/intmed/global/sites/413\\_129987\\_Rwanda%20HRH%20Proposal%20FINAL.pdf](http://medicine.yale.edu/intmed/global/sites/413_129987_Rwanda%20HRH%20Proposal%20FINAL.pdf) (accessed 8 January 2016).
- Republic of Rwanda Ministry of Health. Health sector policy: Rwanda 2014. [http://www.moh.gov.rw/fileadmin/templates/policies/Health\\_Sector\\_Policy\\_2014.pdf](http://www.moh.gov.rw/fileadmin/templates/policies/Health_Sector_Policy_2014.pdf) (accessed 12 March 2016).
- Government of the Republic of Rwanda. Rwanda Encourages Private Investments. 2014. <http://www.gov.rw> (accessed 13 November 2015).
- Mbanjuncy G, DeVos E, Pulfrey S, et al. State of emergency medicine in Rwanda 2015: An innovative trainee and trainer model. *Int J Emer Med* 2015;8(20):1-3. <http://dx.doi.org/10.1186/s12245-015-0067-2>
- Ekise EI, Nahayo A, Mirukiro JD, et al. Analysis of the impact of agricultural input subsidies voucher programme on the livelihoods of small scale maize producers in Kirehe District, Eastern Rwanda. *N Y Sci J* 2013;6(9):32-44.
- Republic of Rwanda Ministry of Infrastructure. Water and Sanitation Sector Strategic Plan 2013/14 - 2017/18. [http://www.minecofin.gov.rw/fileadmin/templates/documents/sector\\_strategic\\_plan/Water\\_and\\_Sanitation\\_SSP\\_June\\_2013.pdf](http://www.minecofin.gov.rw/fileadmin/templates/documents/sector_strategic_plan/Water_and_Sanitation_SSP_June_2013.pdf) (accessed 10 October 2016).
- Rwanda Biomedical Center/Rwanda Health Communication Centre Ubuzima: A Healthy People a Wealthy Nation. A publication of the health sector, 2013. [http://www.rbc.gov.rw/LMG/pdf/advert\\_tor\\_all\\_directors\\_position\\_advertised\\_final\\_july\\_2013.pdf](http://www.rbc.gov.rw/LMG/pdf/advert_tor_all_directors_position_advertised_final_july_2013.pdf) (accessed 20 October 2016).
- Republic of Rwanda Ministry of Health. Rwanda Annual Health Statistics Booklet 2014. [http://moh.gov.rw/fileadmin/templates/HMIS\\_Docs/MOH\\_Statistical\\_Booklet\\_2014.pdf](http://moh.gov.rw/fileadmin/templates/HMIS_Docs/MOH_Statistical_Booklet_2014.pdf) (accessed 10 October 2016).
- World Health Organization, Regional Office for Africa. WHO country cooperation strategies. Rwanda: 2009 - 2013. [http://www.who.int/countryfocus/cooperation\\_strategy/listofccs/en/](http://www.who.int/countryfocus/cooperation_strategy/listofccs/en/) (accessed July 2015).
- Ministry of Health. Annual report July 2012 - June 2013, 2012. <http://www.moh.gov.rw/index.php?id=2> (accessed 29 October 2015).
- Micomiza JM. MIDIMAR calls on students and lecturers to conduct research oriented on disasters management. 2015. <http://www.cass.ur.ac.rw> (accessed 17 November 2015).
- National Institute of Statistics. Statistical Yearbook Rwanda. 2014. <http://www.statistics.gov.rw> (accessed 11 October 2016).
- Nserere E, Brysiewicz P. Injury surveillance in a central hospital in Kigali, Rwanda. *J Emerg Nurs* 2010;36(3):212-216. <http://dx.doi.org/10.1016/j.jen.2009.07.020>
- Kim WC, Byiringiro JC, Ntakiyiruta G, et al. Vital statistics: Estimating injury mortality in Kigali, Rwanda. *World J Surg* 2016;40(1):6-13. <http://dx.doi.org/10.1007/s00268-015-3258-3>
- Wilson A, Hillman S, Rosato M, et al. A systematic review and thematic synthesis of qualitative studies on maternal emergency transportation in low- and middle-income countries. *Int J Gynaecol Obstet* 2013;122(3):192-201. <http://dx.doi.org/10.1016/j.ijgo.2013.03.030>
- Vukoja M, Riviello E, Gavrilovic S, et al. A survey on critical care resources and practices in low- and middle-income countries. *Global Heart* 2014;9(3):337-342. <http://dx.doi.org/10.1016/j.gheart.2014.08.002>
- Huerta MU, Källestäl C. Geographical accessibility and spatial coverage modeling of the primary health care network in the Western Province of Rwanda. *Int J Health Geogr* 2012;11(1):40. <http://dx.doi.org/10.1186/1476-072X-11-40>
- Anatole M, Magge H, Redditt V, Karamaga, et al. Nurse mentorship to improve the quality of health care delivery in rural Rwanda. *Nursing Outlook* 2013;61(3):137-144. <http://dx.doi.org/10.1016/j.outlook.2012.10.003>
- Thuss ME. Nursing Clinical Instructor Experiences of Empowerment in Rwanda: Applying Kanter's and Spreitzer's Theories. University of Western Ontario - Electronic Thesis and Dissertation Repository. 2014. Paper 2180. <http://ir.lib.uwo.ca/etd> (accessed 26 January 2016).
- Scribante J, Schmollgruber S, Nel E. Perspectives on critical care nursing: South Africa. *CONNECT. World Crit Care Nurs* 2004;3(4):111-115.
- Scribante J, Bhagwanjee S. National audit of critical care resources in South Africa - nursing profile. *S Afr Med J* 2007;97(12):1315-1318.
- Riviello ED, Weinkauf JL, Kiviri W, et al. Epidemiology, Outcomes, and Prognostication for ICU Patients in Rwanda: Preliminary Results. 2014. <http://www.atsjournals.org/doi/abs/10.1164/ajrccm-conference.2014.189.1> (accessed 26 January 2016).
- Calvello EJ, Tenner AG, Broccoli MC, et al. Operationalising emergency care delivery in sub-Saharan Africa: Consensus-based recommendations for healthcare facilities. *Emerg Med J* 2016;33(8):573-580. <http://dx.doi.org/10.1136/emmermed-2015-204994>
- Wolf L, Brysiewicz P, LoBue N, et al. Developing a framework for emergency nursing practice in Africa. *Afr J Emerg Med* 2012;2(4):174-181. <http://dx.doi.org/10.1016/j.afjem.2012.09.001>
- Harerimana A, Mtshali NGF, Mukamana D, Mugarura J. Historical overview of nursing and midwifery education and nursing workforce in Rwanda. *Br J Med Health Res* 2015;2(12):1-10.
- Binagwaho A, Kyamanywa P, Farmer EP, et al. The human resources for health program in Rwanda: A new partnership. *New Engl J Med* 2013;369(21):2054-2059. <http://dx.doi.org/10.1056/NEJMsrl302176>
- Beer J, Brysiewicz P, Bhengu BR. Intensive care nursing in South Africa. *S Afr J Crit Care* 2011;27(1):6-10.