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A model for developing postgraduate trauma and emergency nursing capacity in a resource-constrained setting

Judith Bruce, PhD (Professor)[a,*], Shelley Schmollgruber, PhD (Associate Professor)[b]

[a] School of Therapeutic Sciences, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa
[b] Department of Nursing Education, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

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1. INTRODUCTION AND BACKGROUND

The development of nursing in sub-Saharan Africa continues to be dogged by a multitude of factors ranging from high-level political control to the wide scale under-resourcing of nursing, resulting in critical nursing shortages [1]. Low- income, sub-Saharan countries such as Mozambique and Malawi are particularly at risk. Unlike Malawi, growth of the nursing profession in Mozambique is stunted primarily by slow progress towards professional autonomy and the lack of formal study opportunities for nurses and midwives. Barriers to further study opportunities and limited career advancement force many nurses either to leave the proverbial "bedside nursing" to pursue non-clinical/non-nursing careers or to migrate to other countries [1,2]. In the capital, Maputo, the status of nursing and the shortage of training schools for advanced nursing courses significantly influence nurses' desire to change to another career [2] or to pursue advanced education elsewhere. According to the World Bank 18.9% of Mozambican nurses emigrate; top source countries include South Africa and Portugal [3]. Losses due to migration together with the inability of governments and training institutions to produce enough nurses are thus the main contributors to the low nursing numbers required per population.

In this paper, resource constraints refer to low levels or lack of staffing, materials and access to education, which at appropriate standards, are essential for nurses to advance in their career. Mozambique's strategic plans to develop Human Resources for Health (HRH) often acknowledge nurses as central to well-functioning health systems but offer little direction to strengthening nursing systems within it. Most of these plans also emphasize HRH capacity development with or without relying on development partners [4]. The Mozambique HRH development plan for 2008-2015 lays out four strategic packages of which one is increasing postgraduate training and in-service networks that will target specific skills and specializations among health workers [4]. Against this backdrop and informed by the country's health indicators the development of postgraduate capacity in certain nursing specializations became a necessity. The aim of this capacity development project between South Africa and Mozambique attempted to address the postgraduate education needs of nurses in the field of trauma and emergency care. The model we present focuses on historical and contemporary issues in trauma and emergencies and deviates from the usual, non-formal upskilling and scaling-up that Mozambican nurses have become accustomed to.

1.1. Country demographics and health indicators

Mozambique has a population in excess of 25 million people with more than 60% residing in rural areas. The country's characterization as a low-income country and hence, resource-constrained for effective health care provision, is due to a number of factors. According to its 2014 Country Operational Plan, Mozambique faces some of the most critical human resource shortages in the health sector with approximately 24.6 nurses and 5.3 doctors per 100 000 population [5]. Amounting to a density of 0.24 nurses per 1000 population this statistic

* Corresponding author. Faculty of Health Sciences, University of the Witwatersrand, 7 York Road, Parktown, Johannesburg, South Africa. Tel.: +27 11 7172063; fax: +27 11 7172066.
E-mail address: Judith.bruce@wits.ac.za (J. Bruce).

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is much lower than the World Health Organization (WHO) requirement of 1 nurse per 1000 population. The country's burden of disease is mainly due to poverty and infections such as HIV/AIDS, tuberculosis and malaria [5,6] that result in high levels of acuity and mortality. Although there has been encouraging improvements in its health indicators particularly in the reduction of morbidity and mortality rates in mothers and babies [6], much still needs to be done in this category and others such as injury-related deaths. Estimated life expectancy is between 48 and 52 years with an average of 51 years. Although health expenditure has increased substantially over the past 10 years its proportion of the national budget remains low at 9.1%, which is below the 15% espoused in the Abuja Declaration [5,7]. The result is that less than 50% of the population receives health coverage.

1.2. Trauma epidemiology

In recent years there has been a surge in injury-related morbidity and mortality with trauma as the second most common cause of death in the 15 to 59 year age group in Mozambique [8]. Attributable factors are the absence of an active injury surveillance system including the absence of a trauma registry and an underdeveloped emergency medical service [9,10]. Until recently, no formal public ambulance system existed but there has been a government decree in 2015 to set up an emergency medical service, which would include a central ambulance service [10].

The main mechanisms of injury are road traffic accidents (73.4%), interpersonal violence (66.1%) and falls (61.0%). Falls are common during transportation on open vehicles and bicycles and are unrelated to road traffic accidents [8]; falls are also typical of injuries in children between 0 to 14 years of age in urban Mozambique [11]. Road traffic accidents affect persons mostly between the ages of 21 and 41 years and the majority (57%) involve pedestrians; it is estimated that between 66% and 80% of road traffic accident victims die on the scene [10,12]. Those who do reach a hospital are likely to receive the medical care required but are less likely to receive the level of nursing care required if they are critically ill or injured. Alcohol has become a compounding factor in the mechanism of injury and patient outcomes. Alcohol consumption is on the increase in sub-Saharan Africa - it is nine times more likely to be consumed during sporting and recreational events [10,13] with evidence of consumption in 39% of trauma cases seen at an urban hospital in Mozambique.

Health care provision occurs across four levels of the Mozambican public health system. Levels I and II are peripheral health centres intended for primary health care and for the referral of patients to either a Level III or Level IV hospital as required [14]. Level III comprises provincial hospitals that offer curative, diagnostic and training services, and Level IV hospitals are referral hospitals that provide both curative and specialized care for severely ill and injured patients [14]; however, there are no locally qualified specialist nurses to provide commensurate trauma care that patients require. The largest of three referral hospitals is in the capital, Maputo, which is the only centre equipped to perform advanced surgery [8]. Level II rural health centres provide the most basic health services to rural dwellers in the country. An assessment of the nursing skills mix in Mozambique found that nurses in rural health centres perform essential emergency care (trauma, obstetric care and minor surgery), which they have not been prepared for in their basic nursing or midwifery curricula [7]. Given that the majority of the population resides in rural areas it may be concluded that they neither have access to nor receive optimal emergency medical care when needed.

1.3. Nurse education in Mozambique

Nurse education and training takes place in two pathways (for nurses and midwives) at different levels resulting in great diversity in the careers of nurses [15]. Elementary nurses receive one year of training and work mainly in rural areas providing nursing care without adequate clinical support or medical back-up. They provide the most comprehensive health care, which includes emergency procedures even though they have not been educationally prepared for these procedures. Training of this category of nurse has been recently discontinued. General nurses and mother health nurses (midwives) undergo a 30 to 36-month training period and form a category called medium nurses. Senior nurses possess a four year baccalaureate degree and are also referred to as superior nurses. Beyond these entry-level courses there are no formal education opportunities for nurses to specialize. The lack of further professional training is rated as top out of four reasons why nurses in sub-Saharan countries emigrate [16]. Very few, if any, return to their country of origin exacerbating the shortage of qualified nurses. The lack of appropriately qualified nurse educators and the migration of nurse leadership in search of better employment opportunities contribute to the resource constraints in educating nurses, and the negative impact on health care delivery and patients' health outcomes [17].

2. APPROACH TO POSTGRADUATE NURSING CAPACITY DEVELOPMENT

A general systems approach (input, process and output) was adopted to plan and illustrate the model for developing postgraduate capacity in trauma and emergency nursing (Fig. 1). Unlike other approaches to capacity-building that emphasize the acquisition of skills and practical application, the central assumption of this model is premised on professionalization and scholarship. It means that in developing human capacity for specialist practice in trauma and emergency nursing, the science of nursing is simultaneously developed.

2.1. Partnership values and principles

A partnership was formed between two institutions of higher education - one within the host country namely, *Instituto Superior de Ciencias de Saude* (ISCISA), and another in South Africa for the purpose of developing and implementing a postgraduate course for nursing specialization. The underpinning values for a successful partnership for capacity development are trust, reciprocity, quality and equality [18].

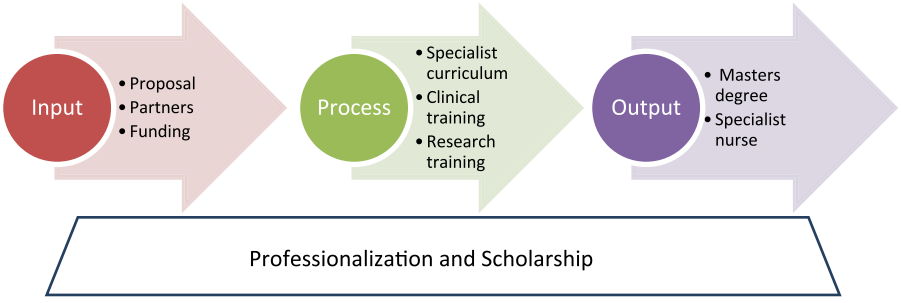

Fig. 1. Model for developing postgraduate nursing capacity.