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DEVELOPMENT OF AN EMERGENCY NURSING TRAINING CURRICULUM IN GHANA

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Abstract

The formal provision of emergency health care is a developing specialty in many sub-Saharan African countries, including Ghana. While emergency medicine training programs for physicians are on the rise, there are few established training programs for emergency nurses. The results of a unique collaboration are described between a university in the United States, a Ghanaian university and a Ghanaian teaching hospital that has developed an emergency nursing diploma program. The expected outcomes of this training program include: a) an innovative, interdisciplinary, team-based clinical training model b) a unique and low-resource emergency nursing curriculum and c) a comprehensive and sustainable training program to increase in-country retention of nurses.

Keywords

Emergency; Nursing; Sub-Saharan Africa; Training; Ghana; Curriculum

INTRODUCTION

The World Health Organization (WHO) estimates that 1.3% of the world's health workforce resides in sub-Saharan Africa; however, the continent assumes 25% of the global disease burden (WHO, 2004). The most significant shortage of health care workers is among nurses (Munjanja, Kibuka & Dovlo, 2005). Throughout Africa, nurses play a crucial role in the

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provision of health care, providing a variety of critical health services. Increasing the skilled nursing workforce and providing specialty nursing training remains a significant need.

More than 90% of injury related deaths currently occur in low and middle income countries, where traumatic injuries and their related issues are significant contributors to the ongoing cycle of poverty, with related socioeconomic impact on individuals, communities and societies (Gosselin, et al, 2009). The burden of injury in sub-Saharan Africa (sSA) represents a significant public health threat, and underscores the need for skilled health care workers. While recent studies have called for increasing attention to emergency and trauma care, the health sector in Ghana currently lacks training in these areas, resulting in delays in appropriate and timely emergency care, and associated poor clinical outcomes (Brysiewicz, 2011; Ente, Oyewumi, & Mpora, 2010; Hardcastle & Oteng, 2011a; Holliman et al., 2011; Rominski et al., 2011).

Providing effective emergency nursing care is a continuous challenge in Africa; resources are limited in terms of both providers and equipment, while health care facilities are spread across large areas (Wolf, et al., 2012). The emergency nursing role in Africa is identified as particularly challenging secondary to high staff turn-over rates, limited specialty training, and highly stressful patient care environments (Bergman et al., 2008; Hardcastle & Oteng, 2011b; London, 2001). Patients presenting to accident and emergency centers (A&E) with acute medical illness or traumatic injury require nursing and physician providers skilled in triage, acute resuscitation and parallel team-oriented interventions (Wolf, et al., 2012). Addressing critical gaps in emergency nursing education requires an innovative approach, as there are limited numbers of qualified nurse educators with emergency nursing specialty experience.

In Ghana, nurses are recognized as integral members of the emergency medicine team, but they have not, until now, received any specific and targeted emergency nursing training. Presently the provision of emergency care in Ghana is challenging as significant infrastructure issues affect patient care delivery in both pre-hospital and in hospital emergency care (Abiiro & McIntyre, 2012; Carter et al., 2012; Osei-Ampofo et al., 2012; Rominski et al., 2011). Instead of receiving immediate objective prioritization and care by emergency trained nurses, patients may spend hours waiting for a provider to assess them and provide treatment. In the absence of experienced nurse and physician providers to implement a coordinated emergency care response through rapid assessment and concurrent interventions; critically ill adult and pediatric patients with severe injuries or medical illness are often slowly attended to. This is commonly the situation throughout the majority of sub-Saharan Africa (Calvello et al., 2013).

Current nursing education programs in Ghana provide little education about emergency care, and many nursing students graduate with little formal training in the evaluation and management of injury or acute illness (Bell, et al, 2013). This curricular gap in nursing education results in fragmented and inconsistent care, often with poor outcomes. The Accident and Emergency Center is a major provider of care for a wide variety of both traumatic and non-trauma conditions. In some cases it may be the only point of entry for patients into the health care system and requires providers to be prepared to assess and

manage a broad spectrum of acute and chronic conditions. Nurses often are the first point of contact when a patient arrives in the A&E. The role they play in assessment and triage can be crucial in initiating the next steps in the treatment cascade, however, the role of nurses in the department has been unclear, with lack of interdisciplinary communication and outdated yet hierarchical roles among the health care team identified as barriers to effective clinical collaboration within the emergency setting (Brysiewicz, 2011; Rominski et al., 2011; Wolf et al., 2012).

The Context and Opportunity

Located in West Africa, the Republic of Ghana achieved independence from Britain in 1957. Ghana has been a model of political stability with over six successful, peaceful and democratic elections. There is a growing body of international investment in Ghana, particularly with resources such as gold and oil, showing the promise of contributing to the financial stability of the country. In 2003, a national health insurance scheme was introduced that has improved access to health care for all enrolled (Agyepong & Adjei, 2008).

However, Ghana still remains a significantly impoverished country, with representative health and economic indicators. According to the World Health Organization (WHO, 2006), Ghana has a population of approximately 24 million with a life expectancy of 56 years for males and 58 years for females. With a current gross national per capita income of $1240, Ghana is in the top 30 of the world's poorest countries (World Bank, 2011). Consequently, the health of women and children remains a significant health concern. The maternal mortality ratio in Ghana in 2012 was 350 per 100,000 (World Health Organization, 2012), compared to 12 per 100,000 for the United States (Hoyert, 2007). For every 1,000 children born in Ghana, 112 will die before the age of 5 (World Health Organization, 2006). Health work force issues are significant as well; the ratio of nurses to total population is 1:2024 in some areas (Ministry of Health, 2011). In contrast, the US ratio of nurses to total population is 1:85 (Robert Wood Johnson Foundation, 2010).

Prior to 2009, there was no organized system of emergency medicine in Ghana or sub-Saharan Africa outside of South Africa. Effective triage, or objective decision-making by a nurse, including vital signs, was not systematized in most hospitals in Ghana. There was also no standard protocol for patient evaluation or coordinated trauma response. While the outpatient clinic can be the standard entry to any health care, urgent or not, some facilities possessed a medical and surgical emergency receiving center. Within this system were limited forms of pre-hospital care. Most patients arrived by taxi, private car or foot traffic, with the available ambulances mostly used for transport of patients between facilities rather than for responding to the scene of the incident.

Ghanaian physician leaders and politicians called for the development of a cadre of emergency providers after a soccer stadium disaster in 2001 that resulted in 126 deaths and countless injuries. A unique collaboration was formed between the University of Michigan (UM), which has long standing ties with health education in Ghana, Kwame Nkrumah University of Science and Technology (KNUST) which offers nursing, medicine and public health degrees; the Ministry of Health, the Ghana College of Physicians and Surgeons and Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana, to introduce and build the

specialty of emergency medicine. The mission of the collaboration is to improve the provision of emergency medical care in Ghana through innovative and sustainable physician, nursing and medical student training programs. These programs received funding support from the Fogarty International Center of the National Institutes of Health as part of the Medical Education Partnership Initiative (MEPI). The aim of this initiative is to increase and help retain the number of qualified emergency health care workers in Ghana through increased capacity, retention, research and collaborations.

A modern Accident and Emergency Center opened in Kumasi in 2009 along with an emergency medicine residency program supervised by certified emergency physicians from UM and UK through the Medical Education Partnership initiative (MEPI), only the second emergency medicine program in sub-Saharan Africa at the time. It was quickly noted that in order for the department to reach its full functionality, nurses must be trained in emergency care alongside physicians. A detailed needs assessment of the nurses' skills levels as well as educational desires was conducted in September 2010 (Rominski et al., 2011) and found a deficit in a team-based approach to care in the department, along with a lack of confidence in the clinical skills and knowledge needed to provide emergency nursing care outside of established protocols. A baseline pre-test adapted from the US-based Certified Emergency Nurses (CEN) examination review text (Emergency Nurses Association, 2013) also indicated a substantial deficit in emergency nursing knowledge.

Therefore, the purpose of this paper is to describe the process of developing an emergency nursing specialty diploma program at KATH and KNUST in Kumasi, Ghana.

Expected Outcomes

The expected outcomes of the emergency nursing training program include: 1) an innovative, interdisciplinary, team-based clinical training model, 2) a unique and low-resource emergency nursing curriculum that will strengthen knowledge and improve clinical practice and 3) a comprehensive and sustainable training program to increase in-country retention of nurses.

PROGRAM COMPONENTS

After a context specific needs assessment, and with support from all partners, a twelve-month diploma program that emphasizes low-resource modalities to teach critical skills necessary for emergency nurse training was developed. A detailed curriculum, open educational resources, external emergency nursing faculty support and a train–the-trainers modality are all key aspects in the implementation of the program. The program is aimed at nurses who work in or plan to work in A&E centers in Ghana. The diploma, due to its unique structure, allows its students to continue to work while gaining intensive training in emergency nursing at the same time.

The curriculum used the University of Michigan Emergency Department orientation manual, and the University of Pretoria Emergency Nursing postgraduate diploma curriculum for guidance. The curriculum development process was supervised by nurse educators and leaders, including the Head of Nursing Department at KNUST, the Director of Nursing

Services KATH, the Accident and Emergency Nurse Manager at KATH, UM School of Nursing faculty and doctoral students. This review process allowed for content as well as face validity. The curriculum was formally submitted for review by the academic board at KNUST, and accreditation was received in August of 2012.

A team of nurses from the University of Michigan, including a School of Nursing professor with international experience in curriculum development and evaluation, two nursing doctoral students and four staff emergency nurses with current clinical experience developed the didactic materials for delivery to Emergency Nursing students at KATH via a classroom based format. Content for skills stations linked to didactic material was also developed, with an emphasis on low-tech, high fidelity simulation resources. In addition, a system for formative and summative evaluation procedures was put in place in order to ensure teaching objectives and the expected outcomes are met. Students also evaluate each module of the program on a monthly basis, and faculty are asked to complete evaluations on their experience as well.

A 30-module systems based program was the result. Modules were standardized so that each module follows a similar format, with critical outcomes, specific outcomes and major topics clearly identified. Outside of specific clinical care, the curriculum includes modules on nursing leadership and communication, disaster preparedness and planning, legal and regulatory issues and patient and family education. Educational delivery modalities include classroom-based didactic lectures, skills stations and clinical practice corresponding to each module. The content of each module builds on the progressively delivered material. Selected modules in pathophysiology and patient assessment were offered as foundational content and then various clinical topics were offered in a systems format. Practice partners in Ghana and South Africa reviewed the curricular content to ensure appropriateness to the clinical setting. Additionally, all lecture materials were developed as open educational resources, where lectures are placed on the Internet for free use and adaptation. See Table 1 for module list.

A ‘sandwich’ delivery model was developed in order to be attractive to health facilities. Using this model, students are given leave by their employers for two weeks out of each month, during which time they are immersed in the educational curriculum. They continue to work in their health institutions where they are employed for the remainder of the month. This model allows nursing administrators to staff their departments around the EN students’ required academic time. The model also allows students to continue to work clinically and draw a salary, requiring less use of the hospital resources. To provide some context, typical postgraduate nursing programs require the students to be fully funded, usually by their employer hospital, while they are at the academic centers being trained. This means they provide no significant clinical service and do not make a salary.

PROGRESS

The first cohort of twenty-five nurses from across Ghana matriculated into the Emergency Nursing education program in November 2012. A formal application process was followed. Senior nursing management at KATH and faculty at KNUST constituted the panel for the

selection of trainees. Twenty-four of these students graduated in October 2013 (one student left for a different specialty without completing the program). These graduates are now providing emergency nursing care in five different hospitals across Ghana. Prior to graduation, graduates sat a rigorous three-part final examination designed to measure both didactic knowledge and clinical skills. The first aspect of the examination was a written exam developed by both Ghanaian and U.S. partners measuring key concepts of emergency-nursing care. The second part was an oral examination based on case studies. The final part was an Objective Standardized Clinical Examination (OSCE) conducted in a skills lab setting, using scenarios and manikins, which students completed under the observation of faculty. Additionally, students logged close to 400 hours of clinical hours in the emergency department. See Table 2 for description of graduation requirements.

Nursing faculty and doctoral students from University of Michigan School of Nursing, emergency medicine faculty and emergency medicine residents from KATH and UM provide the bulk of the didactic lectures two weeks of every month. Emergency nurses from collaborating institutions in the United States precept students in the clinical setting. These clinical experiences as well as skills stations serve to build on the theory learned in the classroom. Where possible, an evidence-based approach is taken. Students are assessed both in terms of didactic content and clinical performance through monthly examinations as well as either written case studies or case presentations, also monthly.

A specific program goal was to collaborate with other upcoming emergency nursing programs in Africa, particularly South Africa, which has a rapidly expanding emergency care framework, and an active group of emergency nursing faculty. This African continent based partnership was enhanced with a formal presentation on the development of the specialty of Emergency Nursing in Ghana given by the KNUST Head of Department and a UM PhD student at the Emergency Medicine Society of South Africa Conference in Cape Town in November 2011. One year later, Ghana hosted the first meeting of the African Federation of Emergency Medicine. These meetings between Ghanaian, South African and American nursing faculty allowed for face-to-face planning on a strategy for faculty and student exchange, research collaboration and most importantly, shared resources for the education of emergency nursing. Faculty and emergency nursing experts from the University of Pretoria and the University of KwaZulu-Natal have since provided key input on aspects of the emergency-nursing program including content review, program delivery, evaluation procedures, learning methodologies and overcoming barriers to implementation.

At present, a second cohort of emergency nursing diploma students entered the program in October of 2013. Three students from the first cohort were selected as trainers, and spent a one-month intensive immersion at the University of Michigan in late 2013, focusing on nursing education and emergency nursing clinical experience. They will begin to assume greater responsibility within the program, including beginning to precept students in clinical and assisting faculty as a form of train the trainer process in order to prepare them for co-teaching of some lectures.

DISCUSSION

Emergency nursing practice is challenging no matter where care is being delivered. It is particularly challenging in Africa, due to the large area that hospitals cover, the limited number of skilled health care providers and equipment available, and lack of standardized protocols and practice guidelines (Wolf, et al., 2012). Additionally as the scope of practice for emergency nurses is not clearly defined in most settings, this leads to frustration amongst nurses when they are expected to provide care and assume duties that fall outside the scope of nursing practice (Carter et al., 2012; Rominski et al., 2011; Wolf, et al., 2012). This program has three core outcomes: developing an interdisciplinary clinical training model, creating a low-resource curriculum, and establishing a comprehensive and sustainable model of training.

Interdisciplinary Team Training Model

The formal practice of emergency medicine is a young endeavor in Ghana. The collaborative that brought about this specialty-nursing program was part and parcel of creating a functional emergency department. In the KATH A&E, nursing students work collaboratively with emergency medicine residents in training and specialists who were trained in country. This unique setting provides a structured environment with a plethora of acutely ill and injured patients. The prior introduction of the emergency medicine training created an opportunity for interdisciplinary training. The department, as it is being developed, is an area of change and unique interactions. The residents are being trained on the importance of a functional team in the efficient delivery of acute care, at the same time the concepts are introduced to the nurses. A strong emphasis at all levels is placed on capturing any teachable moment; the academic environment promotes and nurtures students. During the two weeks that the students are providing clinical service, they are interacting with residents and putting to use their newly acquired knowledge. Supervision by experienced EN faculty from around the world is complemented by interaction with local and visiting EM residents, newly graduated EM specialist, and visiting EM attending physicians. This interdisciplinary focus is foundational to the program success. Interprofessional collaboration and education has been found to improve nursing, medicine and pharmacy students' confidence, interprofessional communiation, teamwork, conflict management and resolution (Luctkar-Flude et al (2010); Baker et al, 2013).

In addition to the clinical interactions between trainees from the programs, there are structured clinical simulation sessions that involve physicians and nurses. In one such session Advanced Cardiac Life Support (Sinz, Navarro & Soderberg, 2011) was taught to both groups in one didactic setting, then practiced in the simulated environment. These types of interactions should lead to greater understanding, mutual respect and improved delivery of organized care in the clinical setting.

Low-Resource Curriculum

Low-resource is described in two facets, in terms of technology and in terms of resource use for the hospital and the students. The didactic curriculum is based entirely online and is open access, meaning anyone can download the training materials for use or adaptation. Students

can access and/or print lecture materials from any device with Internet access. Classes take place at the hospital where students complete clinical rotations, in an existing department classroom. A library with books focusing on emergency nursing and its relevant subjects is also in place at the hospital, providing a place nursing students can study for classes with the latest textbooks. Once local experts are in place and ready to take over leadership, some of the more significant travel costs will be defrayed.

Sustainable Training Model

Our third outcome is establishing a comprehensive and sustainable model of training. Table 1 illustrates the comprehensive curriculum, which is delivered in a modular format every two weeks over twelve months. As the lecture materials are open access, they can be downloaded (and modified as needed) by faculty prior to arrival. The adaptable and free nature of the didactic materials increases the chances of sustainability. The train the trainers' model is a second example of our drive for sustainability. Three program graduates turned trainers are now in place, and actively taking part in lectures, precepting students in the clinical setting, and lesson planning. The ultimate example of the sustainability of this program is rooted in collaboration. The partners in this program have been able to ensure the integration of its products into the existing health system. Graduates will be employed by their sponsoring facilities and these hospitals are part of the government system. The ministry of health in Ghana has a mission to spread emergency care throughout the country. In line with this mission, the graduates, who are employed by the ministry, will serve as human infrastructure towards their aim. In addition, the goal agreed upon by all partners at the outset, was that the program would be locally administered after three to five cycles of students have completed the program. It is believed that after that time there will be enough emergency nursing expertise in terms of number of graduates that could precept students and also length of time for local faculty and trainers to gain mastery over the content of the program. As the second cohort of students is now in place, this plan is moving towards fruition.

RELEVANCE FOR OTHER AREAS OF THE WORLD

Lessons learned from this program can be applied to other areas of the world. Developing a successful collaboration has been the most important lesson learned, and one that can be applied elsewhere. An essential aspect of our program is that it is mutually beneficial for all institutions involved. Likewise, having leadership from each institution as part of the core decision-making team has been invaluable. Improving the health of people in Ghana, as well as in sub-Saharan Africa is dependent on strengthening health education in the region (Kolars, 2012). Forming collaborative partnerships with Western institutions is part of a growing trend in low- and middle-income countries where disparities in resources are an issue (Luo & Omollo, 2013). Developing collaborations and sustainability are the key aspects that can be replicated in other areas. The unique collaboration between UM, KATH and KNUST has allowed for emergency nursing education to be implemented, with the result being 24 graduates specializing in emergency nursing working in the region, where previously there were none. A self sustaining program that creates a cadre of emergency

nurses, who provide leadership, direction and continued advancement of the specialty, is our ultimate goal.

LESSONS LEARNT

Development and implementation of an emergency nursing education program was not without significant challenges. As formal accreditation was viewed as integral to the sustainability of the program, an 18 month review process by KNUST was hampered by strikes of both university and hospital workers. In the interim, loss of potential trainees to other specialties became an issue. Other challenges include recruiting, funding and supporting external faculty who will be willing to spend 2 weeks in country. Finally, finding appropriate mentoring for the newly trained emergency nurses remains a challenge when visiting faculty are not present and in-country emergency nursing experts are limited since this is a new specialty in Ghana. The graduation of the initial class and subsequent training classes has begun to create this cadre of in-country mentors and faculty. This training program is expected to change over time in order for it to more effectively respond to the needs of both the trainees and the community at large.

There are also many challenges identified in relation to professionalism. One study identified a general lack respect for both nurses in general and emergency nursing as a specialty (Wolf, et al., 2012). In Ghana, this primarily involves the fact that emergency nursing is a new specialty. However, with the first cohort of emergency nursing diploma students now practicing, hospitals will hopefully begin to see a direct correlation between this training and improved nursing performance. We also believe that the team environment of the emergency department, combined with interdisciplinary training will also lead to improved respect and acceptance. As emphasized throughout this article, building successful collaborations has been the key lesson learned. Effective and regular communication with the team leaders has been the single most important part of making this program continue to work.

CONCLUSION

A dedicated education program that seeks to advance the skills of emergency nurses through immersing students in an emergency care setting for two weeks each month is a strong point towards beginning to address the growing burden of disease related to injury, especially in Ghana, where emergency care settings are very few. Emergency nurses in Ghana, will not only develop advanced skills immediately applicable in an emergency setting, but also serve as leaders in the developing specialty of emergency medicine in Africa. The use of open educational resources encourages the dissemination of program materials, and the greatest hope of this program would be that it would be replicated in other areas using existing materials adapted for contextual issues such as location and language.

The presence of the emergency medicine residency along with the state-of-the-art Accident and Emergency Center will aid the development of the emergency nursing specialty within Ghana. Sustainability of the program has been ensured by carefully creating partnerships between the accrediting body, the university and the employer in Ghana. It is also the plan

that the graduates will take over the responsibility of teaching and growing the program to embody our core value of sustainability. These graduates will signify the creation of a new cadre of specialty nurses who will be the future educators, researchers and leaders in West Africa.

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Table 1

Emergency Nursing Education Modules

Anatomy and Physiology	Disaster Preparedness and Response	Pain Management in the Emergency Department	Musculoskeletal Emergencies
Nursing Process and Theory to Practice Linkage	Emergency Transport	Obstetric and Gynecological Emergencies	Psychiatric/Psychosocia l Emergencies
Nursing Triage	Environmental Emergencies	Fluid and Electrolyte Management in the ED	Pediatric Emergencies
Cardiovascular Emergencies	Endocrine Emergencies	Burn Emergencies	Genitourinary Emergencies
Communicable and Infectious Diseases	Respiratory Emergencies	Toxicological Emergencies	Neurologic Emergencies
Legal and Regulatory Issues	Hematologic/Oncologic Emergencies	Shock and Initial Resuscitation Efforts	Traumatic Emergencies
Dental/Ear/Nose/Throat Emergencies	Ocular Emergencies	Abdominal Emergencies	Wounds and Wound Management
Professionalism and Leadership	Research and Evidence Based Practice	Nursing and Patient Education	

Table 2

Diploma of Completion conferred after all of following assessment methods completed and passed:

Competency and knowledge assessment at end of each training module
Skill station competency assessment
Clinical skills log completed with required number of clinical and procedural experience
Clinical Log with required number of hours of clinical exposure completed
Oral and Written Examination administered at completion of diploma training program