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Translating Continuing Professional Development Education to Nursing Practice in Rwanda: Enhancing Maternal and Newborn Health

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ABSTRACT

Neonatal asphyxia is the leading cause of neonatal deaths in Rwanda. The Helping Babies Breathe (HBB$^{©}$) course was initiated by the American Academy of Pediatrics (AAP) in 2010 to help in reducing neonatal mortality in resource limited areas. Little is known about nurses' experiences of applying the knowledge and skills acquired from HBB$^{©}$ courses in Rwanda. This study aimed to explore nurses' experiences of translating continuing professional development education utilizing the HBB$^{©}$ course to nursing practice in Rwanda. This study was conducted using a qualitative descriptive design. A convenience sample of 10 nurses participated in individual interviews. Three categories emerged from the analysis: 1) application of competencies acquired from education sessions to practice, 2) benefits of continuing professional development (CPD), and 3) facilitators and barriers to the application of competencies into practice. These study findings underscore a need to attend to the shortages of nurses and lack of neonatal resuscitation materials and equipment in Rwanda.

Keywords: Helping Babies Breathe$^{©}$; clinical education; nursing practice; continuing professional development; maternal, newborn, and child health; Rwanda.

CO-AUTHORSHIP STATEMENT

Yvonne Kasine conducted the research for her master's thesis under the supervision of Dr. Yolanda Babenko-Mould and Dr. Sandra Regan who will be co-authors on the publication of the manuscript resulting from this thesis.

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CHAPTER ONE

In this chapter, the general background information pertaining to neonatal health and neonatal care in general, with an emphasis on developing countries is discussed. Also, an overview of maternal and neonatal health in Rwanda is provided. Moreover, the significance of the study, purpose of the study, and research questions are described. The chapter ends with an overview of the thesis.

Background

Improving maternal and newborn outcomes is one of the goals for leading global health initiatives such as the United Nations (UN) sustainable development goals (SDGs) proposed in 2015 after the Millennium Development Goals (MDGs) were phased out (UN, 2015). Indeed, the SDGs targets by 2030 include a reduction of global maternal mortality ratio (MMR) to less than 70 per 100,000 live births (global MMR was estimated around 216 per 100,000 live births in 2015 (Alkema et al., 2015) and neonatal mortality rate (NMR) to a maximum rate of 12 per 1,000 live births (UN, 2015).

Despite global improvements in overall neonatal outcomes, increased neonatal deaths continue to be a challenge in many developing countries, where about 99% of global neonatal deaths occur (Berkley, Dybul, Godal, & Lake, 2014). In 2012, five of the top ten countries with the highest neonatal deaths worldwide were found in Sub-Saharan Africa (SSA), where Rwanda is located (Lawn et al., 2014). Also, countries in SSA showed the slowest decrease in NMR between 2000 and 2012 with only 28% reduction compared to 65% in Eastern Asia (Lawn et al., 2014). The disparity in newborn survival between developed countries and developing countries is still overwhelming. Despite a 50% increase in the global neonatal mortality average annual reduction rate, if the pace continues to be the same, it would take more than a hundred years for a newborn in

Africa to benefit the same chance of survival at birth as a newborn in North America or Europe (Lawn et al., 2014).

Although positive progress has been made in reducing preventable deaths among children aged five years and under over the last two decades, newborns are still at greater risk of dying compared to children of other ages. Indeed, more than 40% of child deaths happen during the first month of life (Black et al., 2010; Yoshida et al., 2014). Neonatal deaths are often associated with preventable conditions including intrapartum conditions, infections, and preterm birth complications (Bhutta & Black, 2013; World Health Organization [WHO], 2017). Most of these neonatal deaths are also related to maternal deaths and happen as a result of complications during pregnancy and inadequate care during labour, childbirth, or within the first 24 hours after birth (New, Konstantopoulos, Arulkumaran, & Day-Stirk, 2014). Thus, the vital need for improvement in the quality of care that is provided to pregnant women, their foetuses, and newborns during the perinatal period (United Nations International Children's Emergency Fund [UNICEF], 2015). The perinatal period extends from the twenty-second week of pregnancy up to the seventh day after birth (WHO, 2017).

Focusing on positive health outcomes around childbirth could translate to better well-being of children, which could lead to an improvement in human capital, that could potentially result in overall development of nations (Huebner et al., 2016). Evidence demonstrates that newborns who present with difficulties at birth will likely suffer from long-term disabilities including neurological damage and are at greater risk for non-communicable disease conditions such as obesity and associated metabolic disorders later in life, requiring costly specialized care and resulting in reduced productivity in adulthood (Lawn et al., 2014).

High quality facility-based care during the perinatal period is suggested to be the leading solution to reduce neonatal deaths, especially in developing countries (Berkley et al., 2014; Bhutta et al., 2014). Interventions during labor and delivery, with the potential to reduce maternal and neonatal deaths, include regular monitoring of labor using the partograph and assisted vaginal delivery or caesarian section if indicated, among others (Bhutta et al., 2014). For immediate newborn care, affordable life-saving interventions include maintenance of optimum temperature, drying and stimulation of the baby, cord cleaning, early initiation of breastfeeding, and provision of vitamin K (Bhutta et al., 2014). Appropriate facility-based maternal and neonatal care requires the availability of essential commodities, equipment, and sufficient numbers of knowledgeable and skilled health professionals (Gates & Binagwaho, 2014; Samarasekera & Horton, 2014). Strengthening health care systems both in terms of infrastructure and qualified workforce could make a difference regarding maternal and neonatal outcomes in many developing countries (Chou, Daelmans, Jolivet, Kinney, & Say, 2015). Improving the quality of maternal and neonatal care by maintaining health professionals' competencies at adequate levels is essential to reducing deaths among mothers and their newborns (Chou et al., 2015; Gupta et al., 2011).

The availability of a skilled birth attendant (SBA) such as a nurse or midwife and emergency obstetric care such as caesarian section constitute the foundation of improved maternal and newborn outcomes (Kruk, Galea, Prescott, & Freedman, 2007; New et al., 2014). It is estimated that every year about 40 million mothers give birth in the absence of a SBA worldwide (Save the Children, 2014). Inadequate care received by those mothers and their babies during the perinatal period contributes to increased deaths in many developing countries (Gates & Binagwaho, 2014; New et al., 2014).

Nurses and midwives, who constitute the pillar of healthcare delivery in developing countries (Wirth, 2008), provide a great portion of maternal and neonatal services (Sousa, Dal Poz, & Boschi-Pinto, 2013). In most developing countries, midwives and/or nurses are the only available health care providers to help mothers during childbirth (WHO, 2004). Therefore, investing in updating nurses' and midwives' knowledge and skills related to maternal and neonatal care through continuing professional development (CPD) after their initial professional registration is paramount. As old diseases persist and new ones develop, new knowledge is generated, thus the ongoing need for CPD for those who provide patient care (WHO, 2000). The need for updated knowledge and skills is even more required for nurses in this era of ever-changing scientific discovery. Some studies suggest a link between lack of adequate knowledge and skills among health professionals and an increase of maternal and neonatal deaths (Sarfraz & Hamid, 2014; Sharma et al., 2015). If the attainment of well-being for women and their babies is to be achieved by 2030 as stipulated in SDGs, investing in CPD of practicing nurses should be a priority, especially in developing countries.

Overview of Maternal and Newborn Health in Rwanda

Rwanda is one of the low-income countries that significantly improved maternal and neonatal health outcomes over the last two decades (Engmann, Khan, Moyer, Coffey, & Bhutta, 2016). For example, the government of Rwanda has increased mothers' access to SBA by 20 % between 2000 and 2008 (WHO & UNICEF, 2010). Similarly, total fertility rates among women aged between 15 and 49 years decreased from 6.1 in 2005 to 4.6 in 2010, and to 4.2 in 2015 (National Institute of Statistics of Rwanda [NISR], Ministry of Finance and Economic Planning, and Ministry of Health, 2016). The MMR in

Rwanda decreased by 50% between 2000 and 2010 and was estimated around 340 per 100,000 live births in 2010 (NISR et al., 2016). Moreover, the NMRs in Rwanda decreased significantly in numbers from 57 to 20 deaths per 1000 live births between 1990 and 2015 respectively (Musafili et al., 2015; NISR et al., 2016). Despite this remarkable progress, a great deal still needs to be done to further reduce the unacceptable current maternal and neonatal mortality rates in Rwanda.

Helping Babies Breathe[©] Course

The Helping Babies Breathe[©] course is a neonatal resuscitation course developed by the American Academy of Pediatrics (AAP) in 2010 specifically for resource-limited settings. This course is based on low-fidelity technology using an affordable mannequin and simulated scenarios integrating the knowledge and skills pertaining to neonatal resuscitation (Korioth, 2013). To improve the quality of facility-based neonatal care, a series of HBB[©] courses were delivered to nurses, midwives, anesthetists, and physicians working in nine district hospitals located in the Eastern province in Rwanda by the request of the Ministry of Health. The provision of those courses to health professionals was made possible through a Canadian International Development Agency funded Maternal, Newborn, and Child Health (MNCH) in Rwanda project between 2012 and 2013. District hospitals in the Eastern province in Rwanda were selected by the Ministry of Health. The HBB[©] course was delivered in the form of a three-day workshop. The first day consisted of theoretical knowledge pertaining to neonatal resuscitation as per the HBB[©] course curriculum. The following two days focused on *hands-on* neonatal resuscitation skills; nurses had an opportunity to practice resuscitation on manikins. This qualitative study was initiated in 2014 to explore nurses' experiences of applying the

knowledge and skills acquired from HBB$^{©}$ CPD courses into their everyday professional practice.

Significance of the Study

Nurses have a professional responsibility for updating the knowledge and skills related to their area of practice through continuing education (Witt, 2011). Despite the provision of CPD courses pertaining to neonatal resuscitation, including HBB$^{©}$ courses, to nurses in Rwanda, little has been published about nurses' experiences after taking part in those courses. Of the limited published literature regarding those courses, the focus has been toward investigating the quantitative changes in knowledge and/or self-efficacy scores before and after the courses (Musafili, Essén, Baribwira, Rukundo, & Persson, 2013). Thus, this study utilized a qualitative approach to explore nurses' perspectives of the application of knowledge and skills acquired from HBB$^{©}$ courses. Gaining insights about nurses' perceptions of their experiences while attempting to apply the acquired knowledge and skills is crucial for the understanding of the factors that facilitate or impede that application. This study's findings could also inform the revision of existing pre-licensure nursing curricula in neonatal care in general and neonatal resuscitation in particular. Moreover, the findings from this study could inform policies such as those pertaining to even more effective utilization of available nursing human resources in district hospitals in Rwanda. For research, the findings from this study may serve as a foundation for further studies exploring the strategies that could enable nurses working in district hospitals in Rwanda, and possibly other developing countries, to utilize their full expertise to maximize the benefits to newborns.

Statement of Purpose

The purpose of this study was to explore nurses' experiences of translating the competencies gained from HBB$^©$ courses into nursing practice in hospitals in Rwanda.

Research Questions

This study was guided by the following research questions: How do nurses apply knowledge and skills gained from HBB$^©$ courses into practice? What are the contextual factors that influenced the ability of nurses to translate knowledge and skills into practice after involvement in an HBB$^©$ course in Rwanda?

Declaration of Self

I was educated as a general nurse and nurse educator in Rwanda. I participated in many CPD courses, including HBB$^©$, for practicing nurses in Rwanda. I worked as a clinical instructor for nursing students in Rwanda for about five years. During that time, my job responsibilities included facilitating learning of nursing students in neonatal and maternity units in district hospitals. Some of those hospitals were part of this study. In those units, I experienced firsthand the many challenges nurses were faced with in practice that could influence newborn health. I personally acknowledge that I could benefit from neonatal resuscitation knowledge and skills in order to share that knowledge with my students. As such, I participated in an HBB$^©$ course prior to my graduate studies. Some years later, when the opportunity arose in the Maternal, Newborn, and Child Health Project in Rwanda to research nurses' perceptions of how knowledge and skills acquired from the HBB$^©$ course influenced their professional practice, I knew that my graduate thesis work would be focused on newborn health. Although I had some understanding of the practice environments in Rwandan hospitals, and had once been a learner in an HBB$^©$ course, I was consistently reviewing my analysis to ensure the findings reflected the

perceptions of the participants, and were not unduly influenced by my own experiences. Thus, I conducted this study to explore nurses' experiences while applying the knowledge and skills they acquired from HBB$^©$ course.

Overview of the Thesis

This thesis is composed of three chapters. Chapter one provided the general overview of the topic of neonatal health and neonatal resuscitation in general with an emphasis to the developing world and Rwanda along with an overview of the significance of the study, the study purpose, and the research questions. Chapter two, the manuscript, is the core component of this thesis. In chapter two, the background to the study, literature review, methodology, and findings are described. Chapter three involves a discussion of the study implications and recommendations as they relate to nursing education, practice, research, and policy. Chapter three provides the general conclusions of this thesis.

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CHAPTER TWO

Background

Nurses contribute significantly to the provision of neonatal care and to the reduction of neonatal mortality in developing countries (Sousa, Dal Poz, & Boschi-Pinto, 2013). However, the global neonatal mortality rate (NMR) (the number of newborns who die before or at their 28th day after birth per 1000 live births per year) remains high. Each year, about three million deaths occur during the neonatal period worldwide (World Health Organization [WHO], 2015). Approximately 99% of neonatal deaths occur in developing countries with the highest rates in Sub-Saharan Africa (Berkley, Dybul, Godal, & Lake, 2014; Lawn, Cousens, & Zupan, 2005). Despite a global decline of mortality rates among children aged five years and under, neonatal mortality is either increasing or not changing in many developing countries over time (United Nations International Children's Emergency Fund [UNICEF], 2013). Unlike developed countries where NMRs are low, developing countries show excessive NMRs (Cooper, 2014). For example, in 2013 the NMRs per 1000 live births were estimated around 48.7 in Angola and 18.7 in Rwanda, compared to Denmark and Canada where the NMRs were approximately 2.5 and 3.2 per 1000 live births respectively (World Bank, 2015).

The main causes of global neonatal deaths include intrapartum conditions, also termed as *birth asphyxia*, infections, and preterm birth complications (Bhutta & Black, 2013). In Rwanda, neonatal asphyxia is the leading cause of neonatal mortality accounting for 38% of all neonatal deaths (Republic of Rwanda Ministry of Health, 2012). Birth asphyxia is defined as a deprivation of oxygen to a newborn immediately after birth (De Haan et al., 2006). It has been documented that inadequate knowledge and skills for newborn resuscitation among birth attendants contributes to increased neonatal

deaths in developing countries (Hoban et al., 2013; WHO, 2015). A *birth attendant* is

defined as a health professional educated to manage normal pregnancies and childbirth,

and to provide optimum immediate postnatal care (WHO, 2004). A birth attendant is also

expected to correctly identify complications arising in women and their babies after

delivery and to refer them accordingly for urgent care needs (WHO, 2004).

In an effort to reduce neonatal mortality in resource limited areas, especially in

developing countries, the American Academy of Pediatrics (AAP), in collaboration with

other health partners, instituted the Helping Babies Breathe[©] (HBB) course in 2010

(AAP, 2010). Helping Babies Breathe[©] is a hands-on, short-term continuing professional

development (CPD) course which is delivered through a train-the trainer model. In this

model, experts in newborn resuscitation train local birth attendants through building their

theoretical knowledge and resuscitation skills (AAP, 2010). After HBB© course

completion, the local trainers then train their colleagues in newborn resuscitation

(Korioth, 2013) to further build capacity for newborn resuscitation knowledge and

practice.

Nurses have a professional obligation to update their knowledge and skills to

achieve improved patient outcomes (Ross, Barr, & Stevens, 2013). Continuing

professional development courses constitute an essential avenue for nurses to learn

current and up-to-date practices pertaining to effective nursing care. In the literature, the

conceptualization of developing knowledge through education post-graduation is

expressed by interchangeable terms such as continuing professional development (CPD),

continuing professional education (CPE), continuing education (CE) (Marzlin, 2011), and

lifelong learning (LLL) (Davis, Taylor, & Reyes, 2014). In the context of this study, CPD

is defined as a short-term educational activity that practicing nurses, midwives, and other

health professionals undertake to maintain their competencies and to provide quality

patient care (Nursing and Midwifery Board of Australia, 2010).

There is a shortage of published literature about CPD activities among nurses in

developing countries. This may be associated with the fact that research undertakings and

support received by nurses are still very low in many developing countries (Asuquo et al.,

2013). Unlike most developed countries such as Australia and Canada, where CPD

activities are emphasized by regulatory bodies and regularly undertaken by nurses (Ross

et al., 2013), a limited number of developing countries have mandated CPD activities as

part of the re-licensure process for nurses (Chong, Sellick, Francis, & Abdullah, 2011;

Nsemo, John, Etifit, Mgbekem, & Oyira, 2013). In addition, for many of those

developing countries where CPD is mandatory, CPD activities are often not formally

delivered on an ongoing basis and are seldom researched. For example, in Nigeria, nurses

are required to take part in one CPD course during three years to renew their license

(Nsemo et al., 2013) while Malaysian nurses have to participate in one CPD offering per

year to fulfil the requirements of re-licensure (Chong et al., 2011).

Practicing nurses from most low-income countries face many challenges that

hinder their participation in CPD activities. The barriers frequently cited by nurses

include work commitments, domestic responsibilities, scheduling of CPD activities, and

time and cost constraints (Chong et al., 2011). That being said, regardless of the

contextual impediments that exist for many nurses, nurses continue to report that they are

motivated to participate in CPD to update knowledge in order to provide quality patient

care (Badu-Nyarko, 2013; Uwajeneza, Babenko-Mould, & Evans, 2015).

In Rwanda, from 2013 onward, it has been mandatory for nurses to provide

evidence of 60 credit points earned from CPD activities every three years to renew their

license to practice (Rwanda Medical and Dental Council, National Council for Nurses and Midwives, National Pharmacy Council, Rwanda Allied Health Professions Council, 2013). Non-governmental organizations, including Jhpiego (an international health organization affiliated with John Hopkins University) sponsored by the United States Agency for International Development (USAID), have provided CPD courses to nurses and other health professionals in Rwanda (USAID & ACCESS program/Rwanda, 2009). However, only a few studies about those courses have been published in peer reviewed journals (Musafili, Essén, Baribwira, Rukundo, & Persson, 2013) and of those, the focus was directed toward evaluating the change in knowledge of health professionals after their involvement in CPD activities.

As requested by the Rwandan Ministry of Health, a series of HBB[©] CPD courses were delivered between 2012 and 2013 to nurses, midwives, and physicians through a maternal, newborn, and child health project funded by the Canadian International Development Agency. This study provides a rich description of nurses' experiences of applying knowledge and skills gained from involvement in an HBB[©] course into practice in Rwandan district hospitals and adds to the existing body of published research regarding neonatal resuscitation CPD courses in developing countries.

Review of Existing Knowledge

A review of the literature was conducted by retrieving peer-reviewed articles. The online databases searched included Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Library, PubMed, ProQuest Nursing and Allied Health Source, PsychINFO, and Scopus. Search engines, Google and Google Scholar, were also used to retrieve additional articles. The key words used for the literature search included *Helping Babies Breathe[©], nursing practice, newborn resuscitation, continuing*

professional development, nurses, developing countries, and *Rwanda*. To be included in the literature review, articles had to meet certain criteria: 1) published in a peer-reviewed journal between 2005 and 2016 to highlight the recent published literature around the phenomenon, 2) written in English, 3) focus on CPD for nurses, and 4) address newborn resuscitation in general and particularly in developing countries.

A total of 30 articles were retrieved and 13 articles that fulfilled inclusion criteria were retained for the final review. The search produced three categories of studies about neonatal resuscitation CPD courses: 1) knowledge and skills developed by nurses and other health professionals, 2) clinical impact of neonatal resuscitation CPD courses, and 3) contextual factors influencing the application of knowledge and skills into practice.

Knowledge and Skills Developed by Nurses and other Health Professionals

Nurses, midwives, and other health professionals benefit substantively from participating in CPD courses relating to newborn resuscitation. The most commonly cited neonatal resuscitation CPD courses in the literature include the WHO Essential Newborn Care and Breastfeeding course (Carlo et al., 2010; Chomba et al., 2008; Opiyo & English, 2010) and the Neonatal Resuscitation Program (NRP) developed by the American Academy of Pediatrics (Carlo et al., 2009; Hole, Olmsted, Kiromera, & Chamberlain, 2012). A limited number of studies were found that evaluated the impact of HBB[©] courses on nurses' competencies and neonatal mortality and morbidity in developing countries. Competencies are typically defined as the knowledge, skills, ability and judgment required for a nurse to provide safe and ethical care specific for a particular area of practice (College of Nurses of Ontario, 2014). Generally, there was a substantial increase in knowledge and skills among participants after the training in all the developing countries where HBB[©] courses were conducted including Liberia (Bondoe,

Wraynee, Riner, Allam, & Stephenson, 2014), Rwanda (Musafili et al., 2013), Nepal (Maharjan, Rajbanshi, & Dhungana, 2014), Tanzania (Ersdal et al., 2013), Ethiopia (Hoban et al., 2013), and India (Goudar et al., 2013).

Musafili et al. (2013) conducted a study in Rwanda using a pre-post-test design to evaluate the effectiveness of an HBB$^{©}$ course. This course was delivered to a total of 123 participants comprised of nurses (55%), midwives (31%), nurse anesthetists and physicians in two district hospitals and one tertiary referral hospital. The participants' knowledge and skills were assessed before and after the course. The results from this study demonstrated an increase in post-test knowledge scores immediately after participants were involved in the HBB$^{©}$ course and in the follow-up test three months later. While the knowledge scores remained at high levels (between 80% and 100%) in the post and follow-up tests, practical skills scores reduced considerably at the follow-up test three months later (from 80% - 98% to 67% - 99%). This reduction in practical skills among health professionals presents a potential risk for patient care and suggests the need for refresher CPD courses that would allow for skill enhancement.

Goudar et al. (2013) evaluated the effectiveness of an HBB$^{©}$ course in India using a pre-post-test design. This study involved 599 health professionals, including nurses, who provided maternal and newborn care at rural and urban health facilities in India. The results showed a significant increase of knowledge and skills pertaining to newborn resuscitation among birth attendants after their involvement in an HBB$^{©}$ refresher course. The numbers of births were collected prior to (n=4187) and after (n=5411) the course to determine whether the course had any effect on NMR or number of stillbirths. Stillbirths are defined as the proportion of intra-uterine deaths occurring from the 20th week of gestation up until during the labor (Barfield, 2011). While the percentage of stillbirths

significantly decreased after the course, there was no change in NMRs. No results on differences between or among health facilities (urban versus rural) were reported. Considered together, these findings suggest a positive impact of HBB[©] course on health professionals' neonatal resuscitation competencies. However, factors affecting birth attendants' application of knowledge and skills were not investigated. Considering the follow-up information about the decrease in knowledge and skills among health professionals, one could hypothesize that the NMRs could begin to rise over time if knowledge and skills were not refreshed. Expanding the literature in knowledge and skills development and application to practice among nurses who participate in HBB[©] courses is recommended. Understanding the contextual factors, such as availability of equipment and materials and health human resources, influencing that application in developing countries is warranted to be able to act upon appropriately and improve neonatal care.

Using a pre-post-test design, Enweronu-Laryea, Engmann, Osafo, and Bose (2009) evaluated the effectiveness of educational courses about obstetrical care and neonatal resuscitation in Ghana. The study involved 55 nurses, 130 midwives, 18 nurse anesthetists, and 68 physicians who worked in obstetric and neonatal units of primary, secondary, and tertiary health facilities in Ghana. The courses were either two or three days in length. The American experts provided the first training to two local nurses and eight physicians who facilitated the subsequent trainings for their colleagues. The results demonstrated that health professionals who participated in those courses had increased their knowledge and skills for neonatal resuscitation. Nonetheless, professionals from primary health facilities had the lowest knowledge and skills scores. Thus, the need to

provide more training to professionals working in primary health facilities in developing countries.

Likewise, using a cluster-randomized trial in Kenya with a sample of 28 nurses and midwives in an intervention group and 55 nurses and midwives in a control group, Opiyo et al. (2008) found a significant improvement in the performance of pediatric resuscitation in the intervention group. The intervention consisted of providing the theory and practice of pediatric resuscitation emphasizing the airway, breathing, and circulation approach during a one-day educational program. This program was adapted from the United Kingdom resuscitation council training to the Kenyan context by local resuscitation experts. The adapted program was delivered to nurses and midwives in Kenya through a combination of face-to-face lectures and practical scenarios on infant manikins. In particular, Opiyo et al. (2008) assessed participants' practical skills with resuscitation scenarios on manikins immediately after the course. After the pediatric resuscitation course, 66% of participants in the intervention group against 27% in the control group correctly performed the initial resuscitation skills. Midwives who were involved in the course made fewer resuscitation mistakes at post-test as compared to their counterparts who were not involved in the pediatric resuscitation course. These results demonstrate that neonatal resuscitation courses are likely to translate to increased levels of resuscitation skills among nurses and midwives. However, more research is required to explore whether nurses can apply into practice their acquired skills and factors facilitating or hindering this application.

Clinical Impact of Neonatal Resuscitation Continuing Professional Development Courses

Of the studies located for review, there appears to be a positive relationship between the reduction of neonatal mortality and neonatal resuscitation CPD courses for nurses and midwives in developing countries (Carlo et al., 2010). In their multi- site pre-post-intervention study, Carlo et al. (2010) examined the impact on neonatal mortality of educational programs provided to all midwives (n=123) who worked in 18 Zambian public first-level, urban, and community health centers where low-risk deliveries were performed. The intervention educational program consisted of essential newborn care (ENC), which is a standardized newborn resuscitation course developed by the WHO and is used to teach birth attendants about basic evidence-based standards of newborn care during the first week after birth. The provision of ENC was followed by the collection of data on neonatal outcomes, live births, and still-births.

The post-intervention educational programs were conducted in two phases. In the first phase, midwives were re-educated with ENC and data was collected for the second time about frequency of live births and still-births post re-education sessions. In the second phase of the post-intervention educational program, midwives were educated with the neonatal resuscitation program (NRP) developed by the AAP. The NRP consisted of teaching midwives about neonatal resuscitation knowledge and skills. After the NRP, data on live births and still-births were collected for the third time. The results of this study demonstrated that early NMR (the proportion of newborns who die within seven days after birth [WHO, 2006a]) decreased significantly from 11.5 to 6.8 deaths per 1000 live births after the ENC post-intervention program ($p < .001$). The perinatal mortality rate (the total proportions of still-births and neonatal deaths occurring within the first

week of life [Barfield, 2011]), reduced from 18.3 to 12.9 deaths per 1000 live births

(p=.002) following the second ENC offering. It was noted that the decrease of early NMR

following the second offering of ENC was linked to decreased neonatal deaths due to

infections and birth asphyxia.

In a secondary analysis of data from an original longitudinal study, Hole,

Olmsted, Kiromera, and Chamberlain (2012) investigated the impact of an educational

course adapted from the NRP on NMR in one hospital in Malawi using hospital data.

Neonatal death rates, for a period of 15 months prior to the educational course and 15

months after the course were collected and analyzed. Unlike Carlo et al.'s (2010) study,

there was no significant reduction in neonatal mortality following the course in Malawi

despite an increase of knowledge and skills among health professionals who included

four midwives, eight clinical officers, and two physicians. Instead, the NMR of 20.9

neonatal deaths per 1000 lives before the course slightly increased to 21.9 neonatal deaths

per 1000 live births (p = 0.86) after the course. The lack of reduction in NMR was

explained to be associated to the probability that the course had only changed the practice

of a small proportion of the educated health professionals. Also, looking at death rates so

broadly might have missed more granular data where changes in practice occurred in

specific units where the health professionals practiced.

Contextual Factors Influencing the Application of Knowledge and Skills into

Practice

Despite the dearth of literature about CPD in developing countries, the research

that exists notes how nurses and midwives practicing in developing countries continue to

encounter barriers to the translation of competencies they gain through neonatal

resuscitation CPD courses into practice. Only one qualitative study could be found that

explored the barriers and facilitators for newborn resuscitation in one urban hospital in

Malawi (Bream et al., 2005). Thirty-nine nurse-midwives who participated in this study

reported that their rich experience and commitment to their job were facilitators to

performing newborn resuscitation. However, the nurse-midwives identified several

barriers that prevented them from performing newborn resuscitation that aligned with

accepted guidelines. Participants reported that they often missed basic equipment for

newborn resuscitation such as the linen to cover up the baby, warmer table, and the clock

to estimate the APGAR (Appearance Pulse Grimace Activity Respiration) score. Nurse-

midwives also considered understaffing as a barrier to timely newborn resuscitation. For

example, nurse-midwives participating in the study reported in some instances having to

leave the baby unattended to care for the dying mother, which in some cases resulted in

the death of the baby. Participants also reported inadequate communication between the

nursing, administrative, and equipment maintenance staff as a negative factor to newborn

resuscitation. Finally, a lack of posted newborn resuscitation protocols in delivery rooms

constituted a challenge for nurse-midwives to perform effective newborn resuscitation in

Malawi (Bream et al., 2005).

Summary of the Existing Literature

Nurses who constitute the mainstay of the healthcare team in developing countries

(Wirth, 2008) need to be regularly educated in neonatal resuscitation in order to reverse

the current high neonatal mortality rates. The reviewed literature demonstrates that CPD

courses constitute an asset to increase knowledge and skills of nurses, thus contributing to

the reduction of newborn mortality in developing countries. The majority of existing

literature to investigate the effectiveness of CPD courses about newborn resuscitation,

including HBB[©], in developing countries used quantitative methods (Carlo et al., 2010;

Musafili et al., 2013; Singhal et al., 2012). Overall, the results from these quantitative studies demonstrate that newborn resuscitation CPD courses increase nurses' and other health professionals' neonatal resuscitation knowledge and skills. Nonetheless, whether the acquired knowledge and skills are applied or not into practice, and the factors influencing that application, remain largely unexplored.

There is limited literature about nurses' perspectives of translating acquired knowledge and skills gained from HBB[©] courses to practice in developing countries. Only one study was found that investigated barriers that hinder the translation of knowledge and skills into practice for nurse-midwives. These barriers included lack of basic equipment, materials, and a shortage of staff (Bream et al., 2005). Therefore, factors influencing nurses' translation of knowledge and skills gained from HBB[©] courses into practice in developing countries need further exploration. Hence, this study aimed at narrowing those gaps by using a qualitative approach to understand nurses' experiences of applying knowledge and skills gained from an HBB[©] course into nursing practice in Rwanda, and factors that influenced knowledge translation.

Statement of Purpose

The purpose of this study was to explore nurses' experiences of translating the competencies gained from HBB[©] courses into nursing practice in hospitals in Rwanda.

Research Questions

This study was guided by the following research questions: How do nurses apply knowledge and skills gained from HBB[©] courses into practice? What are the contextual factors that influenced the ability of nurses to translate knowledge and skills into practice after involvement in an HBB[©] course in Rwanda?

Methods

Design

This study was guided by a qualitative descriptive design (Sandelowski, 2000). Qualitative description (QD) is best used when little is known about a phenomenon and the goal of the research is to develop a rich description (Neergaard, Olesen, Andersen, & Sondergaard, 2009; Sandelowski, 2010). Qualitative description stems from naturalistic inquiry with the aim of presenting the phenomenon in its natural occurrence (Sandelowski, 2010); the researcher strives to reveal the phenomenon of interest as if it was not under investigation (Lambert & Lambert, 2012). Indeed, while using a qualitative descriptive design, the researcher uncovers the everyday experiences of participants by remaining close to their reported or observed events (Magilvy & Thomas, 2009; Sandelowski, 2000).

Even though HBB$^©$ courses for nurses have been carried out in Rwanda, no known research has been undertaken to explore nurses' experiences of translating the competencies gained from such courses to practice. Therefore, there was a need for this descriptive qualitative study to provide insights into these experiences.

Setting

Rwanda encompasses a landlocked area of 26,338 square kilometers located in East Africa. The total population is 11,274,221 (National Institute of Statistics of Rwanda Ministry of Finance and Economic Planning Ministry of Health, 2016) with a life expectancy of 65 years at birth (WHO, 2014). Rwanda faces a significant shortage of health professionals (WHO, 2006b) which is reflected in a ratio of six nurses per 10,000 people (WHO, 2014). Approximately 90% of practicing nurses are termed as *enrolled nurses* who have been educated with six years of secondary school education. Enrolled

nurses are comparable to personal support workers in Canada or nurse assistants in the USA. About 10% of practicing nurses are either diploma prepared (three years of post-secondary education) or have a baccalaureate degree (four years of university education). A small number of nurses are educated at the master's and doctoral levels (Republic of Rwanda Ministry of Health, 2011).

In Rwanda, there are three levels of healthcare: 1) community health centers which constitute the primary level of healthcare, 2) district hospitals operating at the secondary level of healthcare, and 3) referral and teaching hospitals, serving as the third and highest level of healthcare (Republic of Rwanda, Ministry of Health, 2012). In Rwanda, most of the 'normal' deliveries are performed at community health centers. Consequently, pregnant women who are transferred to district hospitals or referral hospitals commonly present with complicated labor issues, which in most cases leads to difficulties in breathing for their babies at birth. This study was conducted with nurses who practiced in five district hospitals in the Eastern Province of Rwanda and who participated in an HBB© course.

Participants and Recruitment

All nurses who had attended HBB© courses (approximately 15 per course) between October 2012 and November 2013 were invited to participate in this study approximately one year after the course was completed. All correspondence to potential participants was in English and Kinyarwanda. An email or telephone message was sent to 45 nurses who had been involved in an HBB© course to invite them to participate in the study. Nurses who received an invitation via email also received an attached study letter of information (see appendix A). Nurses who were contacted by telephone had the letter of information read to them. A reminder email or telephone message was sent

approximately one week after the initial message had been distributed seeking voluntary participation in the study interviews. Written consent (see appendix B) to participate in an interview following involvement in an HBB$^©$ course was originally obtained when nurses first participated in the HBB$^©$ course. To be included in this study, nurses had to be employed full-time in an acute care practice setting, have participated in an HBB$^©$ course, and could speak and read either English or Kinyarwanda. Nurses from different hospitals and with different years of experience, nursing educational backgrounds and nursing roles were purposefully selected to obtain a broad view of experiences. Ten nurses, from twenty-five who volunteered to participate in this study were interviewed.

Data Collection

Data was collected through semi-structured in-depth individual interviews (see appendix C). Participants could choose to be interviewed in either English or Kinyarwanda; all participants were interviewed in-person in the local language (Kinyarwanda). Participants were offered to identify a place they were more comfortable to be interviewed. Some participants were interviewed in their homes, in the hospitals, or in other locations. Ten individual interviews were conducted between July and August 2014. Each interview was approximately 60 to 90 minutes in length and digitally audio-recorded with prior consent of participants. The researcher conducted the interviews and transcribed verbatim the audio-recorded data with names and hospital identifiers removed. Transcripts were then translated from Kinyarwanda to English by two research team members who are fluent in both languages. Demographic data of participants (see appendix D) was obtained using a demographic form during individual interviews.

Data Analysis

In qualitative descriptive research, data saturation has been reported to be obtained after approximately eight to ten interviews (Morse, 2000). For this study, data saturation was achieved after ten participants were interviewed. The ten transcripts used for this study were analyzed using qualitative inductive content analysis, as posited by Hsieh and Shannon (2005), to illuminate categories related to the translation of neonatal resuscitation competencies to use in professional practice. Inductive content analysis is appropriate when existing theory or research literature on the phenomenon is limited (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005). Sandelowski (2000) suggests that qualitative content analysis is a useful strategy when a qualitative description design is used.

Data analysis was concurrently undertaken with data collection and was initiated as soon as the first interview was completed. Data analysis informed the evolution and revision of the questions on the semi-structured interview guide to reflect preliminary findings. Consistent with inductive content analysis, the entire transcript was used as a unit of analysis for this study (Elo & Kyngäs, 2008). Transcripts, as Word documents, were imported into NVivo qualitative software to organize and support the data analysis process. Transcripts were compared to the audio recorded interviews for accuracy. The first step of analysis consisted of reading each transcript repeatedly to be immersed in each participant's comments and obtain a sense of the whole of participants' experiences. Line by line open coding was the next step and consisted of identifying participants' words denoting key concepts or ideas. When qualitative content analysis is used, codes are derived from data and reflect participants' viewpoints (Sandelowski, 2000). Line by line coding was completed for each of the ten transcripts, and each time words or phrases

with similar meaning were encountered by the researcher they were saved under the same open code.

The research team members reviewed identified open codes to find out which ones were similar or different and repeated revisions were made as required. Similar open codes (in participants' words) were grouped together and labelled to a relatively higher level reflecting the researchers' interpretation of what the content was describing; thus, generating initial categories. Categories were refined through an iterative process whereby the research team members repeatedly reviewed initial categories for better fit. As recommended by Elo et al. (2014), the content of initial categories was scrutinized and words were either moved, removed or added to better represent the final categories which were internally homogeneous and as exhaustive as possible. After ten interviews, no new categories emerged and data saturation was achieved.

Evaluative Criteria for Rigor

Evaluative criteria for rigor in qualitative research and qualitative content analysis were used to ensure trustworthiness of the findings from this study. These criteria include credibility, dependability, transferability, and confirmability (Elo et al., 2014). Credibility relates to the extent to which obtained findings correspond to the truth (Shenton, 2004). Credibility was assured through selecting participants suitable to provide insights about research questions. Also peer debriefing and member checking served as strategies to enhance credibility of study findings (Graneheim & Lundman, 2004). Peer debriefing took place during discussions with research supervisors, who are experienced researchers, about each phase of the research process with an emphasis on the emerging categories. Although we were not able to return to participants to get their feedback about the categories (for member checking) due to time and financial constraints, the interviewer

(graduate student) made sure that she had the same understanding as the participants by rephrasing what the participants had said whenever necessary to ensure data reflected participants' perspectives.

Dependability deals with the extent to which data remains constant or changes over time and to any decision the researcher takes during the course of data collection (Graneheim & Lundman, 2004). In this study, we assured that data remained stable by collecting data during a short period, allowing the interviewer to stay closer to the research purpose and to collect data under relatively similar circumstances. Moreover, an open dialogue among the research team members was undertaken to decide on more probing questions at the completion and initial analysis of the first two individual interviews, thus decisions were made together.

Confirmability refers to the extent to which reported findings reflect participants' viewpoints rather than researcher's perspectives (Morrow, 2005). To ensure confirmability, techniques such as analyst triangulation and reflexivity were used (Shenton, 2004). Analyst triangulation involved an agreement between the research supervisors and the graduate student towards emerging categories, thus ensuring not only the confirmability but also the credibility of the study findings. Reflexivity was achieved through a thorough examination of any of the research team beliefs/preconceptions that could influence the conclusions drawn from the data. For example, the interviewer had personally witnessed some of the contextual factors that facilitated or hindered nurses' ability to apply their competencies while she was working as a clinical instructor for nursing students in some of the study settings prior to the study. Therefore, taking into consideration such presumptions was an important aspect to ensure obtained data reflected participants' views about their experienced barriers and facilitators.

Transferability is about the applicability of the findings in other contexts (Morrow, 2005). The research team attempted to attain transferability of the findings by obtaining a rich description of the phenomenon under study. This was done initially by designing sound interview guide questions that enabled the researchers to obtain a thick description of nurses' experiences of translating into practice competencies developed from HBB© courses. The use of probing questions to clarify participants' perspectives during individual interviews also enabled researchers to get detailed data which described the phenomenon under study, thus giving enough information that could be transferred to other similar settings.

Ethical Considerations

Ethical approvals to conduct this study were obtained from Western University's Human Research Ethics Board and the Rwanda National Ethics Committee (see appendices E, F, G, & H). Prior to voluntarily participating in the study, participants were provided with explanations about the study, and signed a consent form. Anonymity and confidentiality were observed throughout the conduct of the study.

Findings

Demographic Characteristics of Participants

This study's findings emanated from a convenience sample of ten participants with diverse characteristics, which contributed to a rich description of nurses' experiences. Four participants were males and six were females. Two participants held secondary school certificates in nursing subjects, five were diploma prepared in nursing, while three had baccalaureate degrees in nursing. Although the majority of nurses in Rwanda have secondary school certificates, district hospitals are moving towards hiring nurses with diploma and baccalaureate degrees in neonatal and maternal care-related

positions. Participants' ages ranged from 24 to 38 years. Work experience in a nursing role for participants was between 2 and 12 years. Seven participants were staff nurses; two were nurse unit managers; and one was a director of nurses and midwives. Unit managers provide support and leadership to nurses at the unit level and they report to the director of nurses and midwives. Directors of nurses and midwives oversee all the nursing and midwifery administrative work at the district hospital level and they report to the director of the hospital. Nurses who participated in this study worked in five district hospitals in the Eastern Province of Rwanda.

Three categories emerged from the analysis, namely 1) application of competencies acquired from education sessions to practice, 2) benefits of continuing professional development, and 3) facilitators and barriers to the application of competencies into practice. These categories included several sub-categories, which will be described.

Category 1. Application of Competencies Acquired from Education Sessions to Practice

It is essential for nurses to develop competencies pertaining to their area of practice. Application into practice of developed resuscitation competencies enables nurses to positively improve patient outcomes (Curran, Fleet, & Greene, 2012). Nurses who participated in this study stated that their tacit and contextual knowledge related to newborn resuscitation was enhanced as a result of participating in an HBB$^{©}$ course. In relation to this study, tacit knowledge refers to the informal and experience-based knowledge (Kothari et al., 2012) that nurses gained from interacting with their trainers and fellow learners during the HBB$^{©}$ course. One participant explained that in the following quote: *"I really learned a lot about the procedure of neonatal resuscitation by*

observing what experienced course instructors and my fellow participants were doing on manikins". Contextual knowledge relates to the specific knowledge and skills (Montani, 2011), applicable to neonatal resuscitation situations in a developing country, that nurses gained from the HBB© course. The learning that took place reflected the up-to-date information pertaining to newborn resuscitation nurses gained from the HBB© course; this up-to-date information often replaced outdated or incorrect information that nurses had previously relied on for newborn resuscitation.

Participants shared how their involvement in the HBB© course enhanced their ability to integrate theoretical knowledge with psychomotor skills related to newborn resuscitation, to their decision-making, and the way this improved their practice. For example, many nurses noted they had learned about how to conduct timely newborn assessment, and why this supported the recognition of newborn emergency situations which necessitate resuscitation: *"we learned that in order to recognize an emergency case, you must have done assessment on time"*. Because newborn resuscitation requires the implementation of specific steps, the knowledge of what to do, when, and how to perform each step of the procedure are essential factors to enable successful resuscitation. Many participants emphasized that using the knowledge of newborn resuscitation by competently applying the resuscitation steps enabled them to save babies' lives. This is highlighted in the following quote: *"because when you correctly follow the steps of the procedure [for newborn resuscitation] it allows you to save the baby during a short period of time"*.

Experiential learning enabled nurses to master competencies gained from involvement in an HBB© course and led to their improved clinical performance; progressing towards the competent stage, in relation to Benner's (1984) model of skill

acquisition. Many nurses realized that several aspects of newborn resuscitation rely on nursing knowledge rather than medical interventions; the medical model has historically formed the foundation of nursing education in Rwanda. Nurses who participated in this study discussed the importance of performing basic resuscitation techniques, such as keeping the newborn warm, and how this was a change from their previous practice when they might not have focused on that critical element. The following quote illustrates that account: "*… I used to disregard keeping the baby warm and I would rush to suction him/her, and the baby would suffer from that…*". Many nurses, prior to taking the HBB©️ course, were unaware of how important the first minute of the life of the newborn is as well as the importance of applying that nursing knowledge. In this regard, one participant reported:

> *"I realized that the first minute is crucial, the same minute I used to spend looking for materials, while I should have gathered materials before and being ready to help the baby instead of helping him/her after two or three minutes after birth when the problem is worse".*

The HBB©️ course increased nurses' awareness that a newborn might be born in a completely different situation than what was expected. For example, a baby can present an abnormal heartbeat translating into difficulties in breathing at birth, a problem that would not be detectable shortly before birth. This can be due to, for example, accidental inhalation of the amniotic fluid and hypothermia (low temperature) resulting from contact with the relatively cold external environment. Knowledge and skills developed allowed nurses to anticipate potential problems and to respond in times of neonatal crisis. Indeed, nurses reported that the HBB©️ course improved their intuitive knowledge related to the crucial importance of predicting a newborn's situation at birth, anticipating negative and

problematic events, and getting ready to act ahead of time (i.e., before the mother is ready to give birth).

Category 2. Benefits of Continuing Professional Development

When asked about the benefits related to being involved in an HBB© course, nurses described several. These encompass benefits for the profession of nursing, newborns and their families, the hospital, healthcare system, and the country.

Sub-category 1. Benefits of CPD for the profession of nursing. The goal of CPD for nurses is the improvement of nurses' knowledge and skills. Improved nursing knowledge and skills lead to quality nursing care, which requires nurses to be confident in their judgement and decision-making. In this regard, many nurses reported that participating in an HBB© course improved their confidence in decision making pertaining to neonatal resuscitation. Nurses participating in this study also affirmed that their improved confidence led to feeling more autonomous when performing newborn resuscitation. Nurses stated that their fear of handling a sick newborn was reduced after gaining knowledge and skills from participating in an HBB© course. Nurses claimed that the HBB© course fostered a transformation in their growth as health professionals. To this end, one participant reported:

> *"...before the course, I used to think that I had to wait for the physician's instructions. If the physician would not be around, I would panic calling for him/her to come and give me instructions. But the course increased my confidence in taking decisions whether the physician is around or not, and providing the required care to the baby".*

Nurses also shared that participation in an HBB© course improved their sense of achievement while making them feel happy, fulfilled, and proud as stated by one

participant: *"I feel very proud and happy that we are saving more babies because of the knowledge and skills we gained from the course* [HBB© course]*"*.

Mentoring is one of the ways through which experienced nurses can coach less-experienced colleagues and socialize nursing students to the profession. Nurses who participated in this study reported that the HBB© course enhanced their knowledge and skills for mentoring their nurse colleagues and nursing students regarding newborn resuscitation. As stated by nurses who participated in this study, peer-teaching and coaching are important aspects for the advancement of the nursing profession. For example, one participant said:

> *"...I can't let my colleague who did not participate in the course continue doing something wrong. Instead, I encourage him/her to change what he/she is used to doing so that we are able to help babies of mothers who come to deliver in this hospital"*.

Professional satisfaction and ongoing professional education are vital elements for nurses to provide quality care to their clients. Indeed, participants shared how they felt as valuable contributors in the provision of neonatal care after participating in an HBB© course. This is so true especially that nurses are the main professionals to assist mothers and their babies during childbirth in hospitals where this study was conducted. Participants also indicated that the HBB© course increased their desire for lifelong learning: *"...with increased knowledge and skills I feel more passionate about my profession and I feel like I want to continue learning to update my knowledge and skills"*.

Sub-category 2. Benefits of CPD for families and newborns. It is important for nurses to know how to provide effective care to newborns and their families. Participants in this study talked about changes in the approach they used to provide newborn care as a

result of participating in an HBB$^©$ course and the way that approach benefited mothers and their families. These nurses' perceived changes in their approach to care included increased communication between nurses, mothers, and family members, increased focus on the family as the unit of care, including teaching families about neonatal care. Participants reported that putting more emphasis on the whole family as opposed to merely caring for the newborn increased mothers' satisfaction with the care provided to them and their babies, and might have contributed to a reduction in newborn mortality. This is because newborns depend on their families for the continuation of care, especially that nurses are not always present whenever care is needed due to shortages of staff in hospitals where this study was conducted. Nurses highlighted the importance of using a family-centered care approach for the success of newborn resuscitation, as illustrated in the following quote:

> *"Before, I used to care for babies without informing the parent and without obtaining her consent. I just did what I had to do while the parent was observing me without giving any information to the parent. But now I engage in communication with the parent and I explain that the baby is having a breathing problem and that I am going to resuscitate him/her... I ask for parent's cooperation in caring for the baby..."*

Positive attitudes toward newborns and their families are as important as enacting tangible procedures, to support a positive experience between patients and healthcare professionals by establishing effective therapeutic relationships. Many nurses who participated in this study stated that their participation in the HBB$^©$ course allowed them to positively change their attitude toward caring for newborns and their families. This is reflected in the following quote: *"you ask yourself, if that was me what would I like them*

to do? If it was my baby I would like to take him/her back home healthy and then you provide all the necessary care so that the baby remains healthy".

Sub-category 3. Benefits of CPD for hospitals, the healthcare system, and the country. While the HBB[©] course was perceived to benefit nurses, the nursing profession, patients and their families, participants also suggested that there could be benefits to the healthcare system at large. Many participants believed that the HBB[©] course benefited hospitals in that the number of neonatal deaths related to inadequate resuscitation was reduced after the course, hence promoting the good image of the hospitals to the public. Indeed, nurses shared how they relied on outdated knowledge to provide neonatal resuscitation prior to HBB[©] course. Nurses also shared that after participating in an HBB[©] course they became more aware of the existing materials for neonatal resuscitation and how to better manage those for optimum neonatal resuscitation outcomes.

When asked about their recommendations for the future, all nurses who participated in the study said that it would be beneficial if the same course was given to all nurses, including those working in community-based primary health care centres. Participants believed that the provision of the HBB[©] course to all nurses could contribute to a further reduction of neonatal mortality because nurses would gain more neonatal resuscitation knowledge and skills that could translate into improved newborn care in all settings. Participants also stated that educating all nurses with HBB[©] course could mitigate the issues of turnover and keep neonatal care at quality standards across the country. This quote is an example of what some nurses stated should be done in the future: *"it would be better if many others had the opportunity to attend this course. That would probably help in reducing mortality. I mean all nurses and midwives including those working in health centers"*.

Category 3. Facilitators and Barriers to the Application of Competencies into Practice

Nurses who participated in this study reported a number of facilitators and barriers that influenced their ability to apply the knowledge and skills they acquired from the HBB© course. On the one hand, facilitators included individual and interprofessional characteristics, and opportunities for ongoing education. On the other hand, barriers included insufficient available material and equipment resources, and inadequate deployment and shortage of health human resources.

Sub-category 1. Facilitators - Individual and interprofessional characteristics.

Individual and nursing team characteristics that were identified as facilitators included nurses' compassion for their patients, enthusiasm in caring for mothers and their babies, commitment to work, adherence to non-maleficence, the team spirit existing in their hospitals, and the establishment of on-going training.

Explaining how compassion for their patients facilitated the application of acquired competencies, many participants stated that the desire to assist a mother who was giving birth, "*trying to imagine myself in her* [the mother] *shoes*" as put by a participant, was something motivating them to provide the best possible care so that the mother and her baby would be safe. Also, many participants said that they became more comfortable in caring for newborns with difficulties in breathing at birth as a result of gaining more knowledge and skills following their participation in the HBB© course. This increase of knowledge and skills enhanced nurses' confidence and enthusiasm for neonatal resuscitation.

Participants further reported that the HBB$^{©}$ course fostered their commitment to the provision of adequate newborn resuscitation. This was believed by many participants to result in the more frequent application of acquired neonatal resuscitation knowledge and skills, and potentially improved care over time. Moreover, many participants in this study reported that their adherence to non-maleficence, as it relates to doing no harm and to providing safe and competent care to patients, was a driving force for them to utilize all their learned neonatal resuscitation knowledge and skills to strive to save all babies they encountered.

Working as a team for the provision of the best possible neonatal care was another important facilitator as one participant reported: *"...my team was very cooperative and they were willing to listen to what I told them about helping the baby to breathe and to change their practice. We all considered the baby as ours. We worked together as a team".* Participants also shared how important it was to know that someone would be there to back them up and/or to remind them about the sequences of neonatal resuscitation procedure.

Although not already in place when this study was conducted, nurses reported that a mechanism for the delivery of ongoing CPD courses regarding newborn resuscitation could be a significant facilitator for updating neonatal resuscitation knowledge and skills. Nurses then suggested an establishment of ongoing training. Explaining this recommendation, one participant said: *"there is a need for regular training and follow up".* A regular CPD program would allow nurses to keep up with the changes in neonatal care and could facilitate the adoption of standardized neonatal resuscitation evidence-based practices into their everyday nursing practice.

Sub-category 2. Barriers - Materials and equipment resources.

For nurses to be able to apply the knowledge and skills acquired in the HBB[©] course, they need to be assisted by adequate infrastructure in their organizations, including sufficient materials and equipment appropriate for newborn resuscitation. For example, some nurses reported that a lack of linen for the newborn might prevent them from maintaining the baby's optimum warm temperature after birth. A lack of linen was in most cases related to poverty and limited financial means which, in some extreme circumstances, could lead to an inability of parents to buy medications required for the care of their newborn. Reflecting on this, on participant said: *"another challenge is the insufficiency of medications for some parents who are unable to buy requested medications to keep their baby improving after resuscitation".*

The scarcity of materials required specifically for newborn resuscitation might negatively impact the outcomes of newborn resuscitation. Having to share the same equipment among different babies limits the attainment of quality newborn resuscitation, thus contributing to increased neonatal mortality. One participant put it this way: *"...for example, you can prepare the equipment for a newborn and it happens that you have more than one birth at the same time and you miss the necessary equipment for each of the babies because you have to share the available materials between the two".*

Sub-category 3. Barriers - Health human resources supply and deployment.

Participants discussed how the shortage of nurses constituted a barrier to the application of knowledge acquired from the HBB[©] course. This is because when there are insufficient human resources, nurses may not be able to follow the guidelines for the best practices in newborn resuscitation. For example, the HBB[©] course requires at least two birth attendants to be available to assist a mother and her baby during delivery, and to

ensure that all the steps for newborn resuscitation are performed correctly. This is often

not possible when there is a shortage of nurses. On the issue of the limited number of

nurses, one participant observed: *"it is recommended that two or more nurses provide*

care during resuscitation. However, the shortage of staff cannot allow this to happen".

Immediate newborn resuscitation usually happens in maternity units. Babies are then

transferred to neonatal units for maintenance and recovery before they are discharged to

pediatric units or to their homes. The limited number of nurses in neonatology units

limits the quality of ongoing care for successfully resuscitated babies, thus increasing

their chances of mortality. This was highlighted by one nurse who worked in neonatology

at the time of the study: *"caring for more than 12 babies* [in a neonatology unit] *by one*

nurse is not easy…"

The shortage of nurses negatively impacts the quality of care provided to mothers

and their babies. Nurses working in areas with a critical shortage of health human

resources, such as those in developing countries, struggle a lot to provide quality care.

The situation becomes more problematic when, for example, only one nurse is available

to assist a mother while giving birth. This is sometimes the case at emergency units in

Rwandan district hospitals, as reported by one participant in this study:

> *"...only one nurse is working on ambulance on a shift. This nurse goes to take an*
> *expectant mother from the health centre to the hospital for better management. It*
> *can happen that the mother gives birth on the way to the hospital. In that case the*
> *nurse will not be having someone else to help him/her".*

Nursing staff rotations across units should consider the expertise of individual

nurses for optimum application of competencies nurses gain from continuing educational

activities. When the decisions are made to shift nurses with specialized knowledge in an

area to an area where they do not have that specialization, there is a loss of expertise on that unit. That was identified as an issue for some nurses participating in this study. For example, some nurses reported that they no longer apply the knowledge and skills gained from the HBB© course because they have been moved to units in the hospital where their newborn resuscitation expertise is not needed. This is reflected in the following quote: *"…I no longer apply the knowledge and skills I gained because I now work in surgical unit".*

Discussion

This qualitative descriptive study explored nurses' experiences of translating knowledge acquired from courses focused on newborn resuscitation into practice in Rwanda. Three categories, specifically, application of competencies acquired from education sessions, benefits of continuing professional development, and facilitators and barriers to the application of competencies into practice, emerged from the analysis.

Nurses who participated in this study reported experiences of better integration of theoretical knowledge and psychomotor skills pertaining to newborn resuscitation in their practice after taking the HBB© course. The newly developed knowledge and the accompanying skills translated to nurses' improved decision making abilities regarding newborn resuscitation. These findings concur with other studies conducted in developing countries to evaluate the impact of neonatal resuscitation courses among birth attendants (Bondoe et al., 2014; Maharjan et al., 2014; Singhal et al., 2012). In their study evaluating the effectiveness of HBB© courses in Liberia, Bondoe et al. (2014), found a statistically significant increase in newborn resuscitation knowledge scores among participants, including nurses and midwives. Consistently, Maharjan et al. (2014) found

statistically significant increases of knowledge and skills among nurses and other health professionals in Nepal after taking part in HBB$^{©}$ courses.

Nurses who participated in this study also reported improved confidence in performing newborn resuscitation. Although qualitative in nature, this finding relates to what was found by Singhal et al. (2012)'s quantitative study in Kenya and Pakistan, where birth attendants, including nurses, increased their self-efficacy scores for newborn resuscitation after HBB$^{©}$ courses. Enhanced confidence among nurses might have translated into their improved newborn resuscitation practice because, as Bandura (1997) proposed, the more a person feels confident in performing a certain skill, the more they will engage in a skill, and over time, the more competent the person becomes in performance of that behaviour.

The findings from this qualitative study illustrate nurses' perceived benefits subsequent to the delivery of the HBB$^{©}$ course. These benefits include those related to individual nurses, such as descriptions of increased self-esteem, sense of achievement, and the feelings of proudness and happiness. Also, an increase in nurses' autonomy for nursing practice related to newborn resuscitation was reported as an outcome of the HBB$^{©}$ course. Compared to previous quantitative studies (Bondoe et al., 2014; Maharjan et al., 2014; Singhal et al., 2012) mainly investigating increases in knowledge and skill scores after neonatal resuscitation courses, these findings could be considered new to the literature in developing countries; they underscore the crucial role of CPD education to update nurses about the current evidence-based practices pertaining to newborn care.

Although this study focused on nurses' perceptions, participants believed that their newly acquired knowledge and skills would be likely to translate into a reduction of neonatal deaths in their hospitals due to positive changes in their own clinical practice.

However, this finding should be interpreted within the qualitative nature of this study, thus not to be generalizable. Instead, this study finding might be transferable to settings with characteristics comparable to those existing where the study was conducted. This finding suggests the need for further research to evaluate the impact of the HBB$^©$ course on neonatal mortality in the Eastern Province of Rwanda. Neonatal mortality reduction as a result of the HBB© course was observed in a prior study conducted by Msemo et al. (2013). These authors found that there was a 47% reduction of neonatal mortality in the first 24 hours of an infant's life, and a 24% reduction in stillbirths two years after HBB$^©$ courses were conducted in eight hospitals in Tanzania.

There are several conditions required for effective application of newborn resuscitation competencies. The findings from this study highlighted a number of structural conditions needed for neonatal resuscitation competencies to be translated into nursing practice. Nurses who participated in this study emphasized that materials and equipment, sufficient supply of human resources, and effective human resources' deployment are essential elements to fully apply their acquired knowledge and skills. These conditions facilitated nurses' willingness and ability to utilize the competencies they gained from the HBB$^©$ course in order to positively impact neonatal outcomes. In the same regard, Kim et al. (2013) stipulate that successful newborn resuscitation not only relies on the knowledge and skills of birth attendants, but also greatly depends on the availability of basic materials and equipment such as towels for drying the baby, bags, and masks for resuscitation.

Participants in our study specified that lack of basic materials and equipment constituted a significant barrier for the application of acquired competencies related to newborn resuscitation. A similar barrier of inadequate equipment was reported in other

studies conducted in several developing countries including Rwanda (Uwajeneza et al., 2015), Malawi (Bream et al., 2005), Nepal (Nelson & Spector, 2011), and Vietnam (Martinez et al., 2012). In Rwanda, midwives reported that lack of materials, such as delivery kits, heat lamp, and medications, contributed to low quality obstetric care (Uwajeneza et al., 2015). In Malawi, birth attendants reported that they often were unable to effectively care for newborns because of lack of basic equipment such as the linen to cover up the baby, warmer table, and the clock to estimate the APGAR (Bream et al., 2005). In Vietnam, some parents could not afford to buy equipment and medications required for their newborn babies, which limited the care birth attendants could provide to newborns (Martinez et al., 2012).

As indicated by many participants in this study, the shortage of nurses was another barrier that prevented them from performing effective newborn resuscitation. Many nurses said that their limited number did not allow them to follow the guidelines for newborn resuscitation, which recommend two health professionals to be available during resuscitation. As reported in this study, nurses often had to resuscitate a baby alone and this included the ambulance that transfers a mother from the community health center to the hospital. It was believed that such a shortage of staff compromises the outcomes of newborn resuscitation and can lead to maternal and/or neonatal deaths that could be prevented if sufficient staff were available. The challenge of staff shortage among birth attendants is still prevalent in many developing countries. In Malawi, birth attendants reported that they had to leave a baby alone to attend to a dying mother due to the low number of available staff; this could lead to the death of both the mother and the baby in some cases (Bream et al., 2005).

Human resources deployment where nurses are rotated from one unit to another in the same hospital contributed to the loss of newborn resuscitation expertise as indicated by some nurses in this study. This was because, in many hospitals where this study was conducted, nurses could be moved from a unit where their newborn resuscitation competencies are needed to a unit where these competencies were not required. We consider this finding of potential inadequate placement of the available limited human resources in a developing country as new, compared to what was revealed in quantitative studies that concentrated in evaluating the impact of HBB$^{©}$ courses. Little has been discussed in the literature on this issue in developing countries. However, in Western countries concerns about *floating* nurses (nurses who constantly move from one unit to other units in a health facility) has been a point of concern (Ferlise & Baggot, 2009; Good & Bishop, 2011). Floating was linked to low levels of job satisfaction, high levels of job-related stress and high turnover intentions among nurses who worked in an intensive care unit (ICU) in one hospital in the USA (Ferlise & Baggot, 2009). Interestingly, nurses' satisfaction was increased and turnover intentions decreased when a pilot closed-unit model, a model in which nurses had less hours of floating out of their recruiting unit, was implemented in that ICU (Ferlise & Baggot, 2009). This issue of floating, as highlighted by participants, suggests the need for improved management of available health human resources in Rwanda.

Implications for Education, Practice, and Research

The study findings highlight the importance of CPD for nurses and areas that would facilitate and impede the advancement of newborn care and resuscitation in Rwanda. Findings from this study provide preliminary direction for the support of continuous CPD educational interventions designed for nurses to enhance the quality of

care provided to newborns and their families in Rwanda. The findings further suggest that CPD for nurses, particularly HBB$^{©}$ courses, can assist nurses in feeling more competent in neonatal resuscitation and could possibly translate into better neonatal outcomes. Lack of refresher neonatal resuscitation CPD courses for nurses could lead to the use of outdated knowledge and skills, thus compromising neonatal care outcomes. The Rwanda National Council of Nurses and Midwives in collaboration with the Ministry of Health, and the Schools of Nursing could initiate ongoing CPD programs designed to update nurses and midwives in neonatal care and resuscitation.

The need to improve the structural conditions under which nurses provide neonatal resuscitation is a highlighted concern arising from the study findings. Barriers to the full application of knowledge and skills nurses gain from CPD courses need to be addressed. The findings provide some insights about the need to address the issue of insufficient basic equipment and materials for newborn resuscitation, and of nurses' shortage. The continuous lack of resources, including resuscitation equipment and shortage of human resource, could lead to decreased quality of care delivery and potentially increased NMRs. Nurse managers, in collaboration with hospital administrators, could examine human resource deployment that fully utilize nurses' expertise.

This study was conducted in only five out of nine hospitals where the HBB$^{©}$ courses were delivered. This study could be replicated in the remaining hospitals. Lack of evidence for the impact of CPD courses designed to update nurses' knowledge and skills could lead to less funding for future courses. Future studies are warranted to explore the ways through which contextual factors influence nurses' ability to apply into their

professional practice the acquired knowledge and skills, and how barriers to full utilization of competencies could be overcome.

Strengths and Limitations

To our knowledge, this study is the first qualitative study of nurses' experience applying the knowledge and skills gained from an HBB$^©$ course into practice to be conducted in Rwanda. This study used a qualitative descriptive design that provided a rich description of nurses' experiences of translating into practice the competencies acquired from involvement in an HBB$^©$ course, thus, contributing to the current limited body of literature in that area especially in developing countries. Although HBB$^©$ courses were provided to nurses, physicians, midwives and, anesthetists, only the perspectives from nurses were investigated. Therefore, other studies are warranted to explore other birth attendants' perspectives. This study used a convenience sample of ten nurses with the purpose of gaining a deep understanding of nurses' experiences after participating in an HBB$^©$ course. Thus, findings could be transferable to similar settings. Although member checking is recommended in qualitative research to ensure the credibility of the findings, this was not possible in this study due to time constraints. Nonetheless, the interviewer used probing questions and often reframed participants' statements during the interview to ensure that participants' views were accurately captured.

Conclusion

This study explored nurses' experiences of applying knowledge and skills gained from HBB$^©$ courses into their professional practice. Investing in nursing CPD courses can be an important strategy to enhance confidence, professionalism, and to impact nurse and patient outcomes. This study's findings suggest that nurses' perceived confidence in performing neonatal resuscitation improved after taking part in HBB$^©$ courses.

Nonetheless, nurses voiced the existence of conditions in their work environment that hindered their ability to apply the acquired knowledge and skills including insufficient materials and potential inadequate human resource allocation. Collaborative efforts are needed to improve working conditions that enable nurses to effectively utilize competencies acquired from HBB$^©$ courses in developing countries. Further studies could evaluate the strategies to overcome structural conditions that hinder nurses' application of knowledge and skills acquired from CPD courses in Rwanda and other developing countries.

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CHAPTER THREE

IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSION

Summary of Key Findings

This descriptive qualitative study aimed at exploring nurses' experiences of applying the knowledge and skills acquired from Helping Babies to Breathe$^{©}$ (HBB) courses into their professional practice in selected district hospitals in Rwanda. Nurses who participated in this study shared how their knowledge and skills pertaining to newborn resuscitation improved after taking part in HBB$^{©}$ courses. Nurses also voiced that their confidence in providing neonatal care to babies who were born with difficult in breathing was enhanced because of participating in the HBB$^{©}$ courses. Nurses believed that this boost in confidence translated to improved neonatal care and reduction of neonatal mortality. Participants in this study also reported that taking part in HBB$^{©}$ courses increased their willingness to keep updating their knowledge and skills in the future and to mentor their colleagues.

Many nurses who participated in this study highlighted factors that facilitated the translation of knowledge and skills acquired from HBB$^{©}$ courses. Factors frequently mentioned included nurses' commitment to the provision of better quality care and team spirit that existed in their workplaces. Nonetheless, participants reported barriers that hampered the full utilization of the knowledge and skills acquired from HBB$^{©}$ courses. The most cited barriers included the shortage of nursing staff, which was coupled with potential inadequate allocation of available human resources, lack of required equipment and materials, and lack of regular continuing professional development (CPD) activities in neonatal resuscitation.

Implications and Recommendations

Nursing Practice

This study's findings shed light on the need for improved workplace environments for nurses to provide quality care to mothers and their newborns in hospitals where the study was conducted. From this study, it was revealed that nurses often experienced heavy workloads associated with insufficient numbers of staff. Researchers have demonstrated that low levels of nurse staffing are associated with increased patient morbidity and mortality, and increased nurse job dissatisfaction and burnout (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). In contrast, the increased number of registered nurses is associated with better patient outcomes (He, Staggs, Bergquist-Beringer, & Dunton, 2016) and an overall reduction in hospital mortality (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007).

It is vital that health authorities in government continue to have strong collaborative relationships with nursing schools and administrators of district hospitals to jointly move forward in increasing the number of nurses in practice to further enhance the quality of neonatal care in health care settings. For example, the Ministry of Health could collaborate with schools of nursing to initiate the recruitment process in the final year before nursing students graduate. To this end, the government could also consider increasing the budget to recruit nurses. Also, nurse managers could continue to consult with staff nurses to ensure that staff deployment is reflective of individual nurses' expertise and that nurses who were educated in the HBB$^{©}$ courses practice in units where their expertise is best aligned to support maternal and newborn care.

For nurses to be able to apply their acquired competencies and for quality neonatal care and resuscitation to occur, it is necessary that the required equipment and

materials are available (Martinez et al., 2012). To this end, government authorities, in collaboration with district hospitals, could revise their budgets to find ways to increase the funds allocated to the purchase of neonatal resuscitation equipment. Also, improving the mechanisms for collaboration with external donors could assist in obtaining funds to cover some of the costs. Nurse managers, in collaboration with staff nurses, could revise the guidelines for utilization and storage to ensure available equipment and materials are effectively maintained. Moreover, nurse unit managers could make sure that those guidelines are placed in the units where every nurse can access them. It is recommended for concerned organizations and individuals to work together to support nurses to apply their acquired competencies if further improvement in neonatal outcomes is to be achieved in district hospitals were this study was conducted.

Nursing Education

It is essential for nurses to keep their professional knowledge and skills updated (Witt, 2001). This study's findings revealed that nurses consider CPD courses to be a valuable means for updating their knowledge and skills pertaining to neonatal resuscitation. Therefore, the National Council of Nurses and Midwives (NCNM) in Rwanda, in collaboration with nurses and midwives' associations, nursing schools, and district hospitals could initiate ongoing CPD courses in neonatal resuscitation for all practicing nurses. Those CPD courses could also be assigned credits so that they could count toward staff nurses're-licensure.

From this study, peer-mentorship among nurses was reported as a benefit resulting from participating in HBB$^©$ courses, and a facilitator for the transfer of knowledge and skills. This could be promoted by nurse managers. To this end, nurses who were educated in HBB$^©$ courses could be allotted protected time to teach their

colleagues who did not have the same opportunity. Also, nurse managers could advocate for regular refresher courses in order to assist nurses to maintain their resuscitation knowledge and skills (Wall et al., 2010).

From this study, it was highlighted that some nurses did not have the appropriate knowledge and skills for neonatal resuscitation, despite working in these units. This underscores the need for the revision of pre-licensure nursing curricula (entry-level basic nursing education) to incorporate the content of the HBB$^{©}$ course. To this end, leaders of nursing schools could work with their faculty and HBB$^{©}$ course instructors to ensure their programs prepare nursing students to deliver skilled care to newborns.

Nursing Research

This study was, to our knowledge, one of the first to investigate nurses' experiences of translating their acquired knowledge and skills into professional practice after participating in HBB$^{©}$ courses in Rwanda. Since the development of the HBB$^{©}$ course in 2010 (American Academy of Pediatrics, 2010), there has been a considerable body of literature evaluating the effectiveness of HBB$^{©}$ course offerings (Bondoe, Wraynee, Riner, Allam, & Stephenson, 2014; Maharjan, Rajbanshi, & Dhungana, 2014; Musafili, Essén, Baribwira, Rukundo, & Persson, 2013). Nonetheless, little emphasis has been dedicated to understanding nurses' perspectives as they relate to the factors facilitating or limiting their abilities to apply the knowledge and skills acquired in developing countries. Consequently, this study contributed to the limited literature about CPD courses in neonatal resuscitation for nurses in developing countries.

This study used a qualitative lens, with the aim of gaining a deep understanding of nurses' perceptions of their experiences. Thus, future studies could utilize a mixed method approach with quantitative and qualitative data. A quantitative approach could be

used to further investigate the clinical impact of HBB© courses on neonatal mortality rates (NMRs) in Rwanda over time. Qualitative studies could explore further nurses' perspectives about the application of knowledge and skills gained from neonatal resuscitation CPD courses and ways to overcome existing barriers that encumber nurses' abilities to apply all their expertise into professional practice. The HBB© courses were delivered to professionals other than nurses including midwives and physicians. Thus, conducting a similar study with those professionals would be beneficial to discover more factors facilitating or limiting the application of acquired knowledge and skills.

Policy

Nursing shortages are typically related to how policies governing healthcare are formulated and enacted in different countries (Buchan & Aiken, 2008). In most developing countries, nurses are rarely involved in policy making pertaining to the provision of patient care and nurses are sometimes unaware of policies that affect their own profession (Ditlopo, Blaauw, Penn-Kekana, & Rispel, 2014). Therefore, nurse managers need to be further empowered to engage in decision making to a greater extent in district hospitals regarding nurse practice in general and neonatal care specifically (Shariff, 2014). This could require the nursing division in government, along with nursing associations, to continue to advocate for an increase in the representation of nurses at the top management levels of district hospitals in Rwanda.

To attend to the shortage of staff nurses, the government of Rwanda could mandate a compulsory immediate deployment of nurses after their graduation. This could be, for example, in a form of paid internship for newly graduated nurses. During that time, new nursing graduates would be working under the guidance of experienced registered nurses. A similar strategy already exists in Rwanda for medical graduates, who

are required to practice in a district hospital for at least a period of one year after their graduation (Homaifar et al., 2013). Further policy action to attend to the nursing shortage could consider means for recruiting and retaining nurses in public health institutions through better staff planning and support. It is not unusual to find unemployed nurses while there continue to be shortages in Rwanda.

The National Council of Nurses and Midwives has mandated a CPD equivalent to 60 points in order for nurses to renew their license every three years (Rwanda Medical and Dental Council, National Council of Nnurses and Midwives, National Pharmacy Council, Rwanda Allied Health Professionals, 2013). Thus, the NCNM, in collaboration with employers and government agencies could ensure that this policy is reinforced. As such, nurses who do not provide evidence of CPD points would be denied licensure.

It is important for all stakeholders to act upon the issues revealed by participants in this study. If no action is taken, the quality of neonatal care and neonatal resuscitation will continue to suffer from the shortage of staff nurses and lack of equipment and materials. A multi-sectoral approach with collaboration between the government, nursing schools, district hospitals, external donors, nurse managers, and staff nurses could assist in further improving the quality of neonatal care. This in turn could, potentially, continue to reduce future NMRs.

Conclusion

As part of the Maternal, Newborn, and Child Health in Rwanda project, nurses practicing in selected district hospitals in the Eastern province were educated in neonatal resuscitation through the HBB© courses, as requested by the Ministry of Health of Rwanda. The primary objective of this qualitative descriptive study was to discover nurses' experiences of applying the knowledge and skills they acquired from attending

HBB$^©$ educational workshops into their professional practice. Participants of this study described several benefits they experienced from the HBB$^©$ courses. These benefits included an improvement in the quality of nursing care pertaining to neonatal resuscitation and a perceived reduction in neonatal mortality. The findings also revealed factors facilitating and those preventing nurses from fully applying into practice their acquired competencies. Facilitators included the teamwork spirit and availability of resources (including materials and equipment). On the other hand, barriers included the shortage of human resources coupled by inadequate allocation of available human resources and insufficiency of equipment and materials. This study's findings could inform CPD module development, nursing educational program revision, and nursing human resource policy and planning to address neonatal resuscitation educational needs and improve the quality of health service delivery related to neonatal resuscitation in district hospitals in Rwanda. These findings could also inform future research regarding strategies to overcome barriers that prevent nurses form fully applying their knowledge and skills acquired from CPD courses.

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APPENDICES

Appendix A. Letter of Information

Western University REB #: 104570
Study title: Translating Continuing Professional Development Education to Nursing
Practice in Rwanda: Enhancing Maternal and Newborn Health
Principal Investigator: Yvonne KASINE, RN, MScN Student, Arthur Labatt Family
School of Nursing, Western University

1. **Invitation to Participate**

You are being invited to participate in this research study evaluating the continuing
professional development (CPD) course because you participated in a CPD course hosted
by the Maternal, Newborn, and Child Health in Rwanda project.   This study is needed to
understand how the CPD course has affected maternal, newborn and child health.

2. **Purpose of the Letter**

The purpose of this letter is to provide you with information required for you to make an
informed decision regarding participation in this research.

3. **Purpose of this Study**

The purpose of this study is to evaluate the effectiveness of the CPD course you attended
and the impact of the course on your practice.

4. **Inclusion Criteria**

Individuals who have participated in one of the CPD courses, are full-time employed, and
who can speak and read either English or Kinyarwanda languages are eligible to
participate in this study.

5. **Exclusion Criteria**

Individuals who have not participated in CPD courses, are not full-time employed, and
are not able to speak and read either English or Kinyarwanda languages are not eligible to
participate in this study.

6. **Study Procedures**

If you agree to participate, you will be asked to participate in a 60-90 minute individual
interview approximately four weeks after the course. The interview will be conducted at a
place convenient to you such as your workplace, home, or other local venue.

7. **Possible Risks and Harms**

There are no known or anticipated risks or discomforts associated with participating in
this study.

8. **Possible Benefits**

The possible benefits associated with participation in this study include informing CPD
module development, health professional educational development, and health human
resources policy and planning that will address maternal, infant, and child education
needs and health service delivery in Rwanda. The potential benefit to society is that
participants involved in the study will have an opportunity to apply the knowledge gained
from the CPD courses directly into client care - particularly for newborns and maternal
health. Health professionals involved in the study can potentially share their new
knowledge with other health professionals, so as to support the enhancement of others'
practice in maternal, newborn, and child health.

9. Compensation

You will not be compensated for your participation in this research.

10. Voluntary Participation

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no effect on your participation in the CPD course.

11. Confidentiality

All data collected will remain confidential and accessible only to the investigators of this study. If the results are published, your name will not be used. If you choose to withdraw from this study prior to initiation of the data analysis phase, your data will be removed and destroyed from our database. Information collected in this study including the instruments and audio recordings will be kept for five years and then destroyed. During the audio-recorded interviews you are asked to refrain from disclosing information that will identify you or others. Should any identifying information be disclosed during the interview, it will not be included in the transcript. Representatives of The University of Western Ontario Health Sciences Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research.

12. Contacts for Further Information

If you require any further information regarding this research project or your participation in the study you may contact Yvonne Kasine.

If you have any questions about your rights as a research participant or the conduct of this study, you may contact the chair of Rwanda National Ethics Committee, Dr. Jean Baptiste Mazarati and the secretary of Rwanda National Ethics Committee, Dr. Laetitia Nyirazinyoye.

13. Publication

If the results of the study are published, your name will not be used and the name of the health facility where you are employed will not be used. If you would like to receive a copy of any potential study results, please provide your name and contact number on a piece of paper separate from the Consent Form on the day of the interview.

14. Consent

A Consent form will be provided for you to sign prior to the interview.

This letter is yours to keep for future reference.

Appendix B. Consent Form

Study title: Translating Continuing Professional Development Education to Nursing Practice in Rwanda: Enhancing Maternal and Newborn Health
Principal Investigator: Yvonne KASINE, RN, MScN Student, Arthur Labatt Family School of Nursing, Western University
I have read the letter of information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.
Participant's name (please print):

_____
Participant's signature: _____
Date:

_____
Person obtaining informed consent (please print):

_____
Signature: _____
Date: _____

Appendix C. Semi-Structured Interview Guide – Nurses. Draft

Western University REB #: 104570

Study title: Translating Continuing Professional Development Education to Nursing

Practice in Rwanda: Enhancing Maternal and Newborn Health

Semi-Structured Interview Guide – Nurses

During the audio-recorded interview you are asked to refrain from disclosing information

that will identify you or others. Should any identifying information be disclosed during

the interview, it will not be included in the transcript.

Questions:

1. In what ways did your participation in the HBB$^©$ course change your knowledge/
   skills/ attitude/ judgment about newborn resuscitation?

2. In what ways did your participation in the HBB$^©$ course influence your problem-
   solving and decision-making skills for neonatal resuscitation/emergency care of
   children?

3. How were you able to use your new knowledge and skills gained from the HBB$^©$
   course in clinical practice?

4. How do you think using your new knowledge and skills gained from HBB$^©$
   course has changed your clinical practice?

5. In what ways have you been able to mentor or coach other nurses, midwives,
   physicians, or students in practice to help improve their knowledge and skills?

6. In what ways has use of your new knowledge and skills been able to change the
   professional relationship you have with women, children, and their families in
   clinical practice?

Appendix D. Demographic Questionnaire

Western University REB #: 104570
Study title: Translating Continuing Professional Development Education to Nursing
Practice in Rwanda: Enhancing Maternal and Newborn Health
Demographic Questions
Please tell us about yourself (this information will only be used for this study)
1. Gender: Female
          Male
2. Age:_____years
3. Level of education:
          High school
          Nursing School (diploma/advanced diploma)
          Nursing School (bachelor's degree)
          Nursing School (master's degree)
          Other (please specify):_____
4. Professional title
          Enrolled nurse
          Enrolled nurse-midwife
          Registered nurse
          Registered nurse-midwife
          Other (please specify):_____

5. Unit where you regularly work
          Maternity unit
          Paediatric unit
          Neonatal unit
          Other (please specify): _____
6. For how long have you been working in your current unit? (please indicate time in
   days, months, or years accordingly) _____

Appendix E

REPUBLIC OF RWANDA/REPUBLIQUE DU RWANDA

NATIONAL ETHICS COMMITTEE / COMITE NATIONAL D'ETHIQUE

July 12, 2014
No. 186/RNEC/2014

Yvonne Kasine
Principal Investigator
(A Student)

Your Project title **"THE IMPACT OF COMPETENCY DEVELOPMENT IN THE AREA OF MATERNAL, NEWBORN OR CHILD HEALTH ON CLINICAL PRACTICE"** has been evaluated by the Rwanda National Ethics committee.

Name	Institute	Involved in the decision		
			No (Reason)	
		Yes	Absent	Withdrawn from the proceeding
Dr.Jean-Baptiste MAZARATI	Biomedical Services (BIOS)		X	
Prof. Eugène RUTEMBESA	National University of Rwanda	X		
Dr.Laetitia NYIRAZINYOYE	National University of Rwanda(school of public Health)		X	
Prof.Alexandre LYAMBABAJE	National University of Rwanda	X		
Ms.Françoise UWINGABIYE	Lawyer at Musanze		X	
Dr. Egide KAYITARE	National University of Rwanda	X		
Sr.Domitilla MUKANTABANA	Kabgayi Nursing and Midwife school	X		

Mr. David K. TUMUSIIME	Kigali Health institute	X		
Dr. Lisine TUYISENGE	Kigali Teaching Hospital	X		
Dr. Claude MUVUNYI	Biomedical Services (BIOS)	X		

After reviewing your protocol during the RNEC meeting of 21 June 2014 where quorum was met, and revisions made on the advice of the RNEC submitted on 09 July 2014, **Approval has been granted to your study.**

Please note that approval of the protocol and consent form is valid for **12 months**.
You are responsible for fulfilling the following requirements:

1. Changes, amendments, and addenda to the protocol or consent form must be submitted to the committee for review and approval, prior to activation of the changes.

2. Only approved consent forms are to be used in the enrollment of participants

3. All consent forms signed by subjects should be retained on file. The RNEC may conduct audits of all study records, and consent documentation may be part of such audits.

4. A continuing review application must be submitted to the RNEC in a timely fashion and before expiry of this approval.

5. Failure to submit a continuing review application will result in termination of the study.

6. Notify the Rwanda National Ethics committee once the study is finished.

Sincerely,

Ethics Committee.

Date of Approval: July 12, 2014
Expiration date: July 11, 2015

<u>C.C.</u>
- Hon. Minister of Health.
- The Permanent Secretary, Ministry of Health.

Appendix F

REPUBLIC OF RWANDA

Kigali, ...
N°................../12.00/2014

MINISTRY OF EDUCATION

Ms. Yvonne Kasine

RE: Approval to conduct research in Rwanda under the project title: "The Impact of Competency Development in the area of Maternal, Newborn or Child Health on Clinical Practice"

I am pleased to attach a copy of research clearance, which has been granted to you to conduct research on the above title.

I wish to remind you that the research permit number should be cited in your final research report; the research should be carried out under affiliation of UR- College of Medicine and Health Sciences, under supervision of Dr. Donatilla Mukamana, UR- College of Medicine and Health Sciences

A copy of the final research report is to be given to the Ministry of Education of Rwanda.

I wish you success in your research.

Cc.
- Hon. Minister of Education
- Hon. Minister of State in Charge of Primary and Secondary Education
- Hon. Minister of State in Charge of TVET
- Permanent Secretary, Ministry of Education
- Dr. Donatilla Mukamana, UR- College of Medicine and Health Sciences

Appendix G

REPUBLIC OF RWANDA

Kigali, ~~~~~~~~~~

N° ~~~~~~~ /12.00/2014

MINISTRY OF EDUCATION

Re: Permission to carry out research in Rwanda - No: MINEDUC/S&T/250/2014

The Permission is hereby granted to **Ms. Yvonne Kasine**, MSc candidate, Arthur Labatt Family School of Nursing, Faculty of Health Sciences, University of Western Ontario, London, Canada, to carry out research on: **"The Impact of Competency Development in the area of Maternal, Newborn or Child Health on Clinical Practice"**.

The research will be carried out in **Nine (9)** districts hospitals in the Eastern Province (Nyamata, Rwamagana, Gahini, Kiziguro, Nyagatare, Ngaruma, Rwinkwavu, Kirehe and Ngoma). The researcher will need to interview Continuing Professional Development (CPD) Trainers and Participants who were selected for training by Maternal, Newborn and Child Health in Rwanda Program Evaluation project team. She will also interview women with children in the Eastern Province identified by Community Health workers.

The period of research is **from 24ᵗʰ July, 2014 to 23ʳᵈ July, 2015**. It may be renewed if necessary, in which case a new permission will be sought by the researcher.

Please allow the **above mentioned researcher**, any help and support she might require to conduct this research

This research clearance certificate replaces the research clearance No:1786/12.00/2014 issued on 18/07/2014. The Later is therefore no longer valid.

Yours sincerely

Appendix H

Western Research

Research Ethics

Use of Human Participants - Initial Ethics Approval Notice

Principal Investigator: Dr. Yolanda Babenko-Mould
File Number:104570
Review Level:Delegated
Protocol Title:Evaluating Continuing Professional Development Education Workshops in Rwanda
Department & Institution:Health Sciences\Nursing,Western University
Sponsor:Canadian International Development Agency

Ethics Approval Date:October 13, 2013 Expiry Date:October 31, 2014
Documents Reviewed & Approved & Documents Received for Information:

Document Name	Comments	Version Date
Instruments	Appendix A1 - Helping Babies Breath (HBB) Workshop Evaluation Form	
Western University Protocol		
Other	Semi-Structured Interview Guide - Formal Leaders-Received Dec 14, 2013	
Other	Semi-Structured Interview Guide - Health Professionals-Received Dec 14, 2013	
Letter of Information & Consent	Nurses, Midwives, Physicians	2014/01/12
Letter of Information & Consent	Formal Leaders	2014/01/12
Recruitment Items	Email or Telephone Script for Recruitment – To Nurses, Midwives, and Physicians	2014/01/12
Recruitment Items	Recruitment Email Script - Formal Leaders	
Instruments	CPD - Pre-Test Knowledge - ETAT-Received Dec 14, 2013	
Instruments	CPD - Post-Test Knowledge - ETAT-Received Dec 14, 2013	
Instruments	CPD Workshop Evaluation Form - ALSO-Received Dec 14, 2013	
Instruments	CPD - HBB Pre-Test and Post-Test Document-Received Dec 14, 2013	

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced revision(s) or amendment(s) on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

The ethics approval for this study shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the University of Western Ontario Updated Approval Request Form.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

The Chair of the HSREB is Dr. Joseph Gilbert. The HSREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000940

Ethics Officer to Contact for Further Information			
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CURRICULUM VITAE

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Conference Presentations

1. In-Service Education for Nurses in Rwanda: Improving Maternal, Newborn, and Child Health. Poster presentation at the Africa-Western Collaboration Day, Western University, London, Ontario, Canada, November 2016

2. Nurses' Application of Neonatal Resuscitation Skills to Practice in Rwanda: Perceived Facilitators and Barriers. Oral presentation at the 27th International Nursing Research Congress, Honor Society of Nursing Sigma Theta Tau International, Cape Town, South Africa, July 2016

3. Translating Clinical to Nursing Practice in Rwanda: Enhancing Maternal and Child Health. Oral presentation at the Sigma Theta Tau International, 43rd Biennial Convention, Las Vegas, Nevada, USA, November 2015

4. Nurses' Experiences of Applying Knowledge and Skills from Education Sessions to Practice in Rwanda. Oral presentation at the 28th Annual Education Research and Leadership Conference, Honor Society of Nursing Sigma Theta Tau International, Iota Omicron Chapter, London, Ontario, Canada, May 2015

5. Continuous Professional Development in Newborn Resuscitation among Nurses in Developing Countries: A Literature Review. Oral presentation at the 6th Annual Robert MacMillan graduate research in education symposium, Western University, London, Ontario, Canada, April 2015