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Assessing the Impact of Mentorship on Rwandan Nurses' and Midwives' Knowledge and Self-Efficacy in Managing Postpartum Hemorrhage

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Abstract

Despite recent advances in medical technology and research, postpartum hemorrhage (PPH) remains the top universal cause of maternal morbidity and mortality. Factors underlying PPH include the inconsistency in recognition and timely treatment of women experiencing PPH, which suggests the importance of healthcare professionals' mentorship about PPH. The aim of this study is to assess the impact of mentorship on nurses' and midwives' knowledge and self-efficacy in managing PPH. The pre and post study design recruited 141 nurses and midwives working in the labour and delivery department in selected health centers from the North Province of Rwanda. At post-mentorship, 123 nurses and midwives had completed the study. Using instruments adapted to knowledge and self-efficacy in managing PPH, a paired t-test was applied to estimate differences in scores between pre-and post-mentorship on participants' knowledge and self-efficacy in managing PPH. The results indicate an increase in knowledge scores from 68% prior to mentorship up to 87% (95% CI [15.65, 21.21] and self-efficacy from 6.9 to 9.5 (95% CI [2.3, 3.08] average score out of the maximum score of ten. The correlation between knowledge and self-efficacy was moderately positive at pre-mentorship ($r = .214$; $p = .002$) and strongly positive at post-mentorship ($r = .585$; $p < .001$). The frequency of mentorship visits was associated with post-mentorship knowledge scores ($r = .539$; $p < .001$) and post-mentorship self-efficacy ($r = .623$; $p < .001$) as well. The results from this research will inform further studies and practitioners to develop a model to support knowledge and self-efficacy in managing PPH.

Keywords: Postpartum, Hemorrhage, mentorship, nurses, midwives, knowledge, self-efficacy

The Summary for Lay Audience

Although different measures and technologies have been used for helping women recover after childbirth, vaginal bleeding, also known as postpartum hemorrhage or PPH for short, continues to be one of the world's leading causes of death for women after childbirth. Research has indicated that the main reasons PPH remains a problem include the inconsistency in its recognition by health care workers and the lack of timely and effective treatment for women experiencing it. One way to help this, especially in poorer countries where PPH is much more common, is the use of mentorship for healthcare professionals about PPH. The aim of this study was to assess the impact of educational mentorship on Rwandan nurses' and midwives' knowledge and confidence in managing PPH after childbirth. The study recruited 141 nurses and midwives working in the labour and delivery department in health centres from the Northern Province of Rwanda prior to the educational mentorship. A total of 123 nurses and midwives completed the mentorship and the surveys used in the study were focused on assessing changes in the knowledge and confidence nurses and midwives have in managing PPH after childbirth before and after the mentorship. The mentorship program included monthly visits to the health centres by a trained expert. The study's statistical analysis tested the difference in their scores before and after six-months of mentorship. The results showed an increase in knowledge about PPH management after the educational mentorship, with the scores increasing from 68% to 87%. Their confidence also increased after the mentorship, going from 6.9 to 9.5 on a scale from 1 to 10. The results showed further that there was a moderate relationship between knowledge and confidence before the educational mentorship ($r = .214$; $p = .002$) and this relationship increased after the educational mentorship ($r = .585$; $p < .001$). Furthermore, as the number of educational mentorship

visits that the nurses and midwives attended the more their knowledge and confidence increased. The results from this study will help inform policy makers and educators to develop a sustainable model to support nurses and midwives in Rwanda to better manage women's vaginal bleeding after childbirth.

Keywords: Postpartum, Hemorrhage, mentorship, nurses, midwives, knowledge, self-efficacy

Co-authorship

Marie Grace Sandra Musabwasoni completed this work under the supervision of Dr Mickey Kerr, Dr Yolanda Babenko-Mould and Prof Manassé Nzayirambaho, who will be co-authors on presentations and publications resulting from this thesis.

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Table of Abbreviations

AMTSL: Active Management of Third Stage of Labour

ANC: Antenatal Consultation

AWHONN: Association of Women's Health, Obstetric and Neonatal Nurses

CE: Continuing Education

CI: Confidence Interval

CIHI: Canadian Institute for Health Information

CINAHL: Cumulative Index to Nursing and Allied Health Literature

CPD: Continuous Professional Development

CPE: continuous Professional Education

EBP: Evidence-Based Practice

EmNOC: Emergency Obstetric and Neonatal Care

HHIR: Hospital Harm Improvement Resource

HSSP V: Health Sector Strategy

ICM: International Confederation of Midwives

IRB: Institution Review Board

LLL: Lifelong Learning

MBR: Medical Birth Registry

MDG: Millennium Development Goals

MMR: Maternal Mortality Rate

MNCH: Maternal Newborn and Child Health

n.d: Not Dated

OSCE: Objective Structured Clinical Examination

PPH: Postpartum Hemorrhage

RCN: Royal College of Nursing

SD: Standard deviation

SES: Self-efficacy Scale

SSA: Sub-Saharan Africa

ToT: Trainer of Trainers

TSAM: Training Support Access Model

UR: University of Rwanda

USA: United States of America

USAID: United States Agency for International Development

WHO: World Health Organization

WREM: Western Research Ethics Manager

CHAPTER ONE

INTRODUCTION

Postpartum hemorrhage (PPH) remains a traumatic event and a leading cause of maternal morbidity and mortality worldwide. The world health organization (WHO, 2018, 2012) defines PPH according to its occurrence and specifies that PPH is classified as primary/early or immediate PPH and secondary/late or delayed PPH. Therefore, primary PPH refers to blood loss from the genital tract of 500 ml or more in the first 24 hours after birth while secondary PPH is defined as blood loss from the genital tract of 500 ml or more beyond 24 hours after delivery (WHO, 2012; Flood et al., 2018). Ghalandari et al (2017) indicate that most recorded PPH deaths occur in the first 4 hours after delivery with more than 70% attributable to primary PPH. However, Prata, Bell, and Weidert (2013) and the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN, 2015) define PPH as blood loss of more than 500 ml after vaginal delivery or more than 1000 ml after cesarean section.

The preceding definitions have been problematic in healthcare settings where healthcare professionals can underestimate the amount of blood loss (Otolorin, Gomez, Currie, Thapa, & Dao, 2015). The Canadian Institute for Health Information (CIHI) in collaboration with the Canadian Patient Safety Institute suggest that any blood loss that may cause a hemodynamic instability to women after delivery, should be considered as PPH (Hospital Harm Improvement Resource, HHIR, 2016). Therefore, the most recent definitions of PPH define massive PPH the same as PPH after a cesarean birth (i.e. blood loss ≥ 1000 ml) and confirm the great variability in measuring blood loss that ranges from < 150 ml to almost 700 ml for uncomplicated vaginal delivery (Souza, Durocher,

Blumenthal, & Winikoff, 2018), which challenges the clinical significance of a particular blood loss threshold that can cause maternal deaths.

A report by organizations affiliated to the United Nations (2015) indicated that the number of worldwide maternal deaths was 303,000, with developing countries accounting for 99% of the global maternal deaths. Additionally, the World Health Organization (WHO; 2018) reported that every day, approximately 830 women die from preventable causes related to pregnancy and childbirth. This situation is highly prevalent in Sub-Saharan Africa, which alone accounts for 179,000 deaths from women who die during pregnancy and childbirth (Hanson et al., 2015). The same authors also demonstrated that a woman's lifetime risk for dying from childbirth is one in 36 in sub-Saharan Africa and Asia, compared to one in 4,900 in developed countries. Africa and Asian countries have a higher number of deaths compared to the other continents, thus the maternal mortality rate (MMR) per a hundred thousand live births is high in African and Asian countries. Even though much has been done to decrease this rate women are still dying from PPH in developing countries.

The World Maternal Index of WHO (2018) stipulated that the average maternal mortality rate in Africa is 400 deaths per 100,000 live births and this is forty times higher than the average for industrialized countries (10/100,000 live births). The main cause behind this situation is the inadequate management of maternal bleeding (WHO, 2018). In Rwanda, the average MMR during the 5 years before the year of 2000 stood at 1071 per 100,000 live births and decreased to 750 for the 5 years preceding 2005 (Rulisa, Umuziranenge, Small, & van Roosmalen, 2015). Although, MMR has been declining at a steady rate in Rwanda over the past 20 years, PPH remains an important contributor to maternal mortality. The most recent statistics show that the maternal death rate was

210/100,000 live births (Alkema et al., 2016, Sengoma et al., 2017) and obstetric hemorrhage alone accounted for 39% of total causes (Grunebaum, Mariona, & Mivumbi, 2016). While some progress has been made, further improvement is still needed.

Say et al. (2016) and Mutunga (2015) showed that women are still dying from entirely preventable causes and millions more experience poor-quality care and ill-treatment from health facilities. Traoré et al. (2017) reported that health facilities experience a lack of knowledge about the holistic management of PPH among healthcare staff including nurses and midwives. The staff themselves stipulate a lack of adequate knowledge about PPH management which in turn, hinders their efficacy when it comes to managing PPH (Itote, 2016; Woiski et al., 2015). Wang et al. (2017) indicated that the management of PPH starts from the first injection of the uterotonics and includes knowing exactly how to quantify blood loss to recognize PPH signs and symptoms and to identify the causes so that it can be well managed.

In an attempt to improve the PPH diagnosis and subsequent timely management, nurses and midwives' knowledge regarding quantification of blood loss after delivery is required. This implies measuring blood loss comprehensively; i.e., measuring drapes used before and after instead of simply estimating blood loss (Souza et al., 2018). Notably, some women may bleed more than 500 ml after childbirth yet be clinically well, while others loose less blood and are still at risk of adverse outcome (Souza et al., 2018). This suggests that nurses and midwives need knowledge enabling them to consider the clinical status of pregnant women as part of the classification of PPH severity. Furthermore, as discussed above, diagnosing PPH through estimates of blood loss alone may mislead diagnoses, and create gaps in clinical decisions.

Gaps Identified in Managing PPH

Although, the aforementioned descriptions of PPH are in line with WHO guidelines for managing PPH (Tunçalp, Souza, & Gülmezoglu, 2014), it is important to highlight that assessing only blood loss is not enough to describe PPH; recognizing the signs, symptoms and causes of PPH could contribute much to preventing maternal deaths due to PPH. The WHO notes gaps in using certain interventions and accessing the available information among healthcare providers in managing PPH. Practitioners also lack full appreciation about the numerous potential causes of PPH while caring for women who are about to deliver babies. Uterine atony is classified as the first and the most common cause of PPH, responsible for 80% of total causes (Belfort, 2013). A gap may exist due to improper massage of the uterus after delivery to prevent uterine atony by nurses and midwives. The recommended practice is that women should benefit from active management of the third stage of labor (AMSTL) through the systematic delivery of the placenta (Tunçalp et al., 2014).

The Guidelines to prevent uterine atony using AMSTL recommend the administration of uterotonic drugs, mostly oxytocin, at the delivery of the anterior shoulder with a single baby, controlled cord traction of the cord with counter traction of the uterus to deliver the placenta and uterine massage after delivery of the placenta (Puri et al., 2012). Empirical evidence indicates that AMSTL practice reduces the risk of having PPH by 66% (United States Agency for International Development, USAID, 2015). Three factors are also highlighted as gaps in managing PPH. These are, delay in seeking care which accounts for 32% of PPH cases, not reaching the right health care facility, which accounts for 12% of PPH cases and receiving poor care or low-quality care which accounts for 56% of PPH cases. The third factor, the most common, is caused

by nurses and midwives who are unable to deliver effective care at the right time or were not using the best package of care (Rulisa & Benimana, 2018; Sengoma et al., 2017) after receiving pregnant women.

In developing countries, including Rwanda, the literature reveals a severe shortage of trained health personnel who can deliver and improve quality care (Traoré et al., 2017), thus the knowledge and skills related to the opportune diagnosis and appropriate management of obstetric complications, which include PPH management, are not emphasized. Hanson et al., (2015) note that PPH occurrence is combined with inadequate staffing and lack of skills; suggesting the need to improve the evidence informed practice of these staff, since 50% of PPH related deaths are believed to be preventable. Thus, strategies to improve the health care services related to PPH management are urgently needed.

Health care provision at health centers in Rwanda is mainly performed by nurses and midwives who are in charge of pregnant mothers and delivery. Rulisa & Benimana (2018) revealed a lack of knowledge by these healthcare professionals about managing emergency obstetrics and suggested the use of evidence-informed practices and the use of guidelines to address the issue. Further, Tunçalp et al. (2014) discussed about the nurses' and midwives' inadequate implementation of the guidelines during the management of labour, signifying a disconnect between the recommended and actual practice. Additionally, Feldacker et al.(2017) and Veeramah (2016) noted that nurses and midwives are a critical component of postpartum care including PPH management and thus, it is essential to refresh and equip them with the necessary knowledge and skills. Mentorship is deemed to be one of the most effective strategies to accomplish this improvement (Manzi, Hirschhorn, Sherr, Chirwa, & Baynes, 2017).

Educational Mentorship about PPH Management in Nursing and Midwifery Practice

Mentorship terminology was first used by Levison and his colleagues (1978) in the business and organizational literature to nurture new staff, raise their morale and reduce turn-over rates. Mentorship was introduced to nursing more than 30 years ago and was projected to improve nurses and midwives' skills and behavior in patients care (Scott-herring, 2017). Since then, scholars have identified mentorship as a strategy that increases knowledge and promotes positive changes in attitudes, making it key to addressing PPH related deaths in the healthcare settings in developing countries (Friesen, Brady, Milligan, & Christensen, 2017). Chen and Lou (2014) studied the effectiveness of mentorship and have shown that mentorship programs are significantly associated with staff retention and job satisfaction for nurses who attended the mentorship by increasing their nursing competence and confidence in performing skilled tasks. Mentorship is therefore defined as a professional relationship in which an experienced person (the mentor) assists a less experienced person (the mentee) in developing specific skills and knowledge that enhance the less-experienced person's professional and personal growth (Gagliardi, Webster, Perrier, Bell and Straus, 2014; Scott & Brysiewicz, 2017).

The Royal College of Nursing (RCN, 2016) studied the effect of mentorship in nursing, and found its importance in ensuring that nursing faculties and nursing students had the necessary skills in practice to deliver high quality, competent and compassionate care to patients compared to those who did not attend the mentorship programs. Similarly, Gagliardi et al. (2014) examined studies conducted on the impact of mentorship on self-reported overall job performance and found that these studies all reported achieving at least some improvement in skills. Apart from the basic

competencies expected from pre-service nursing and midwifery education (Abedian, Charati, Samadaee, & Shahhosseini, 2014; ICM, 2018), mentorship remains a high priority especially in sub-Saharan Africa including Rwanda; where healthcare systems are severely impacted by healthcare professional shortages (Veeramah, 2016). Scott and Brysiewicz (2017) reported on a global mentorship initiative, which was designed to support African emergency nurses, in South Africa, Kenya and Uganda. The authors suggested that mentorship increases clinical confidence and the quality of nursing care. Despite the highlighted benefits of nurse mentorship, there is limited evidence about the impact of mentorship on knowledge and self-efficacy for nurses and midwives in managing PPH in the health centres of Rwanda.

The Rwandan healthcare system is divided into different levels of provision of care, where the level of health centre provides a minimum package of care including uncomplicated labour and delivery management (Rwanda Health Sector Policy, 2015) although PPH cases are typically transferred to hospitals for better management. With revisions to Rwanda's health policy and procedures of task-shifting, the health centre can provide essential maternity care including PPH management. However, the literature suggests gaps in managing PPH by healthcare providers including nurses and midwives, where 61% of maternal deaths are due to inadequate management (Rulisa & Benimana, 2018; Sengoma et al., 2017). The government of Rwanda and its partners are working tirelessly to fight all causes of PPH and hence prevent maternal deaths. Through this effort, the Training Support Access Model (TSAM), a Canadian international development partnership project, with the main mission of improving maternal, newborn and child health (MNCH) in Rwanda, initiated a mentorship model to equip nurses and midwives with the necessary knowledge and self-efficacy about PPH management at the

level of health centres. The mentorship model started in three districts and 68 health centres in Northern of Rwanda. The present study sought to close the gap in the body of knowledge about the effect of mentorship on nurses' and midwives' knowledge and self-efficacy in managing PPH by assessing the impact of the TSAM mentorship on nurses' and midwives' knowledge and self-efficacy in managing PPH.

This thesis encompasses three chapters: (1) the introduction, (2) the main manuscript for publication, (3) summary of results, implications, and recommendations.

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CHAPTER TWO

**ASSESSING THE IMPACT OF MENTORSHIP ON RWANDAN NURSES’
AND MIDWIVES’ KNOWLEDGE AND SELF-EFFICACY
IN MANAGING POSTPARTUM HEMORRHAGE**

Background

Worldwide, there is still controversy about the different causes of maternal deaths. In 2015, Wang et al. (2017) and Hanson et al. (2015) found that postpartum hemorrhage (PPH) accounted for about 86% of all maternal deaths globally; in particular PPH was the principal cause of these deaths for low and middle-income countries. The medical dictionary (n.d) stipulates that the term PPH comes from Greek roots and was defined as the flow of blood from a ruptured vaginal or uterine blood vessel. With time, PPH has been extensively studied and is recognized as the leading cause of death for women after childbirth worldwide (Carnahan et al., 2016; Rulisa et al., 2015; Veeramah, 2016). In sub-Saharan African (SSA) countries, 179 000 women die each year during pregnancy and childbirth (Hanson et al., 2015), and PPH alone accounts for 34% of these deaths (Mutunga, 2015).

In Rwanda, despite determined efforts to address the healthcare challenges, including maternal deaths during childbirth, up to 70% of these maternal deaths, are attributed to PPH (Ghalandari et al 2017) making it the leading cause of maternal mortality in Rwanda. Rwanda, a landlocked, hilly country with an area of 26,338 square kilometers located in East Africa, has a healthcare workforce that is still developing its knowledge and skill base. The last twenty-five years have been spent rebuilding all sectors including the health sector after the devastating 1994 Genocide against the Tutsi. Despite these enormous challenges, Rwanda has achieved many of its Millennium

Development Goals (MDGs) for health when most countries in SSA were unable to achieve their targets. Despite these gains, PPH is still prevalent in Rwanda.

Prata, Bell, and Weidert (2013) define PPH as blood loss of more than 500 ml after a vaginal delivery or more than 1000 ml after a cesarean section. However, the current literature reported great variability in measuring blood loss that ranges from < 150 ml to almost 700 ml for uncomplicated vaginal delivery (Souza, Durocher, Blumenthal, & Winikoff, 2018). PPH is therefore classified into two categories, primary (or early) PPH, which occurs in the first 24 hours after delivery of a baby, and secondary (or late) post-partum hemorrhage, which occurs beyond 24 hours after delivery.

Sayinzoga et al (2016) report that 61% of all maternal deaths due to PPH are attributed to the improper PPH management. To address this challenge, the global commitment to sustainable development goals is to have reduced maternal deaths to less than 70 deaths per 100,000 live births by 2030 (Abbott, Sapsford, & Binagwaho, 2017). As an interim goal, Rwanda has committed to reduce maternal related deaths, including those related to PPH, from 210/100,000 live births to 126/100,000 live births by 2024 (HSSP V, 2018). However, the management of PPH is fostered by how knowledgeable nurses and midwives are about it and how self-motivated they are to employ this knowledge together with the efficacy beliefs to influence their capability (Bandura, 1977). Through mentorship, nurses and midwives can become evidence-informed about current knowledge and skills related to PPH prevention and care.

Mentorship for Nurses and Midwives in Rwanda

Ritchie, Bates, & Deary (2015) revealed that if educational mentorship about PPH management is associated with improvements in general cognitive development, it can help reduce PPH-related maternal deaths, suggesting the positive impact of

mentorship. Similarly, Powell (2018) emphasized improving labour and delivery nurse's knowledge through mentorship that helps them with rapid identification and treatment of PPH. Using a pre and post-test study design, the findings revealed increase in knowledge after the mentorship. The Rwandan healthcare system is composed of health posts, health centres, district hospitals, military hospitals, provincial hospitals and referral hospitals (Sengoma et al., 2017). The health center provides the lowest level of healthcare where pregnant women with an uncomplicated pregnancy can give birth. Nonetheless, women may experience PPH after delivery of the baby at the health center, where there are often only limited resources related to management of PPH. It is from this context that, the Training Support Access Model (TSAM) developed a mentorship model to address this resource and knowledge gap in selected Rwandan health facilities.

TSAM, is a 5-year international development partnership project sponsored through the Government of Canada with a mission of improving maternal, newborn and child health (MNCH) in Rwanda. It achieves its mission through working with local partners to improve maternal, newborn and child health. In Rwanda, there has been very limited use of routine mentorship models to inform nurses and midwives in managing PPH. Therefore, as part of its mentorship program, TSAM used its trained mentors from district hospitals to mentor their colleagues working at the selected health centres in the Gakenke, Rulindo and Gicumbi districts in the Northern Province of Rwanda. Although this study was focusing on TSAM's mentorship to assess the impact it has on nurses' and midwives' knowledge and self-efficacy in managing PPH, the TSAM model was not specific to PPH. Rather, it was designed to address gaps related to maternal newborn and child health more broadly as part of its overall effort in supporting the Government of Rwanda. The researcher of this study expected that the mentorship program would

enhance knowledge and self-efficacy of the attending nurses and midwives relating to the management of PPH. Since the TSAM' mentorship model was designed to address gaps in maternal, newborn and child health care in Rwanda, this mentorship was hypothesized to improve the management of PPH in Rwanda. Thus, the mentorship could inform the extra knowledge and skills of nurses and midwives which would potentially reduce maternal deaths due to PPH. The study results about assessing the impact mentorship program has could inform policymakers on adopting its routine use in the Rwanda context. Further, the study could contribute to the broad literature about the impact of mentorship programs for nurses and midwives on their knowledge and self-efficacy to manage PPH.

Theoretical Framework

Bandura's self-efficacy theory serves to frame this study. Self-efficacy is "*the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations*" (Bandura, 1995 p. 2).

Self-Efficacy and Social Cognitive Theory

Self-efficacy is based on Bandura's social-cognitive theory (SCT) which encompasses behaviorism and cognitive learning theories. Bandura's SCT relies on five assumptions which a person goes through to develop and perform a behavior. (1) learning by observation (Models): a person in this stage is exposed to a facilitation whereby repeating an action; inhibition helps a person to refrain from repeating a bad action and disinhibition leads a person to think something is wrong when it is not. (2) learning as an internal behavior, where a person feels that he/she can do something. (3) cognitive processes in learning and motivation, whereby a person starts challenging and develops a better understanding of the given information. (4) reciprocal causation involves a person,

behavior and environment. The relationships among cognitive, behavioral, and environmental factors influence a person's psychological capacity (1977, 1986). (5) increasing self-regulation where a person develops forethought, self-reflection and performance. Therefore, self-efficacy is a belief in one's ability or capability to complete a task or to perform a behavior. This theoretical model of self-efficacy is chosen for this study as it relates to an important element which explores more about a personal change in behavior after being exposed to a performance. Self-efficacy is one of the two main outcome variables in this study. . Bandura (1997) provides four main sources of self-efficacy (personal mastery, vicarious experience, verbal persuasion and emotional/physiologic states) and relates them to people's everyday activities. Personal mastery determines the capability to succeed or to fail (Bandura, 1977). Nurses and midwives 'self-efficacy to manage PPH depends on how they perform this task. Vicarious learning creates a method of observation through modeling (Bandura,1995). This efficacy belief informs how nurses and midwives demonstrate their capabilities after being exposed to a given practice. Thus, an individual forms belief regarding what actions he/she can perform based on observing others and evaluating the outcomes of his/her own prior actions (Bandura, 1986). Furthermore, people with verbal/social persuasion experience social encouragement when it comes time to perform a skill (Bandura, 1977). Finally, the emotional state or physiological state relates to the positive or negative emotions associated with the performance of given activities (Bandura, 1995). Bandura, (1977) also argues that cognitive process related to self-efficacy can influence personal behavior. A personal behavior is influenced by how the external event is observed and how it will be perceived as a result for future use. Therefore, the self-efficacy model fits with this study as it may ultimately promote collective efficacy and

outcome expectations for nurses and midwives who are more self-oriented in their skills to improve practice (Babenko-mould, 2010; Lent, Ireland, Penn, Morris, & Sappington, 2017b). By implementing this model, nurses and midwives will have a clear understanding of the cognitive factors related to their self-efficacy on pre and post educational mentorship about PPH management. Therefore, knowledge about PPH management is presumed to be the most basic factor needed by an individual who wishes to develop their self-confidence which can lead to self-efficacy in managing this condition.

Literature review

Scholarly articles for this review were searched using the following keywords “mentorship”, “knowledge,” self-efficacy”, “and postpartum hemorrhage (PPH)”. The review was limited to English language, peer-reviewed full-text articles published over the past ten years, i.e., 2008- to date. This timeframe was chosen for empirical studies because the researcher anticipates having the most updated studies as PPH research has changed over the last decade. However, for theoretical and conceptual analysis papers, the time frame related criterion was exempted. To retrieve peer-reviewed papers, the following databases were explored: Medline, CINAHL, ProQuest, SCOPUS, PsycINFO and the Cochrane databases. Additional papers were searched through Google Scholar. After checking the retrieved papers’ titles, abstracts, and full text, the researcher retained 24 articles from which data were extracted and summarized pertaining to educational mentorship about PPH management, educational mentorship and knowledge acquisition in managing PPH, mentorship and self-efficacy in managing PPH and knowledge and self-efficacy in managing PPH. Each of these areas is discussed below.

Mentorship about PPH Management

Mentorship can also be termed continuous professional development (CPD), continuing professional education (CPE), continuing education (CE) or lifelong learning (LLL) (Kasine, Babenko-mould, & Regan, 2018). However, Bissett, Cvach, & White, (2016) has defined the term educational mentorship according to provision of training related to the evidence-based practice (EBP) among nurses and midwives to perform a certain skill. Therefore, educational mentorship is the teaching of EBP from more experienced healthcare personnel to the less experienced so that a give-and-take relationship is created between or among these people; at the end, those who were less experienced become more confident to provide quality patient care, resulting in a reduction in practice variation, and increase nursing autonomy (Bissett et al., 2016). Ritchie, Bates, & Deary (2015) conducted a longitudinal study in Scotland about educational mentorship and cognitive ability on participants (n=1,091) with a measurement of a diverse range of cognitive abilities. The study evaluated if the educational mentorship was associated with the improvements in general cognitive development to reduce PPH's maternal deaths in low-income settings. The results from the study indicated that the education increased general intellectual capacity (Ritchie, Bates, & Deary, 2015), having a positive causal effect on cognitive ability. However, the authors suggest that pre- and post-education measures of ability are required to help in explaining why intelligence and education are related.

Additionally, Egenberg et al. (2017) conducted a pre-post training study design in Tanzania about the impact of multi-professional, scenario-based training on postpartum hemorrhage to the nurses, midwives, doctors and medical attendants (n=3308). The effects of the training were measured by comparing patients' outcomes at pre and post

training in terms of blood transfusion units delivered to patients who had delivered and experienced PPH; [A total of 2000 medical birth registry (MBR) files were randomly selected at pre and 2000 MBR files randomly were selected at post training for comparison purposes]. The results of the study show that the incidence of PPH was 0.9% before and 1.3% after training; however, blood transfusion was significantly reduced (53 mothers received 79 units of whole blood at pre-training while 28 mothers received 50 units of whole blood at post training). A 47% reduction in number of mothers who were transfused were statistically significant and this explicates the relevance in using the acquired knowledge in managing PPH after training. However, self-efficacy check-up is suggested to assess healthcare professional's behavior in managing PPH.

In line with the contention from what was reported, a study examining the implementation of evidence-based information by nurses and midwives to inform their practice (n=386) by Veeramah (2016) reveals that among 386 nurses and midwives in the study, 86% of them (n = 172) stated that they were motivated to use EBP in their daily practice. However, the lack of time to search for relevant evidence-based new information during working hours was challenging although, a moderate positive correlation was obtained for the use of research-based information and attitudes towards EBP ($r = .272$; $p < .001$). McDonald, Jackson, Wilkes, & Vickers (2012) and Wilson (2012) assert that the recognition of competency, performativity and transferable skills are not enough for nurses and midwives to manage a condition such as PPH, but also the importance of learning through continuing professional development and lifelong learning are the key to sustain the development and maintenance of personal resilience in managing PPH. Nonetheless, a study about factors influencing high quality care on PPH conducted at a hospital in the Netherlands affirmed the need for professional CPD and

refresher courses (Woiski et al., 2015) among healthcare professionals including nurses and midwives (n=41) who work in the labour and delivery room. The participants were approached individually and in focus groups for interviews to assess the importance of influencing factors for high quality care of PPH. Using a theoretical framework of Grol and Cabana (Woiski et al., 2015), the results show the main obstacles as lack of clarity of the guidelines, lack of knowledge and failing team-communication. It therefore proposed team training about PPH management and available checklist/flowcharts to ease PPH management.

Mentorship and Knowledge Acquisition in Managing PPH

Mentorship has been around for many years and used in nursing education in clinical settings. Although the academic setting is the most common source of stress (Sheppard, 2018) reported that mentorship starts from that environment and continues to in-service. It is to be the most effective strategy to reduce malpractice and to prevent women's deaths due to obstetrical emergencies such as PPH, the leading cause of maternal deaths despite recent medical advances (Gulmezoglu, Souza, & Mathai, 2012). The possible explanation of those deaths is the inconsistent recognition and timely treatment of women experiencing PPH (Powell, 2018). The same author specifies that knowledge acquisition through mentorship has a positive impact on the management of PPH. The situation is acknowledged in India where inadequate pre-service training, lack of systems for CPD to upgrade staff skills and practices, inadequacies in referral ways and poor continuity of care, were all shown to contribute to the gaps in the quality of maternity care at selected healthcare facilities (n=108) (Jayanna et al., 2016). To address this gap, the authors highlight the importance of onsite mentoring among nurses and midwives working in primary healthcare to strengthen efforts in improving women's

health. The effectiveness of the onsite mentoring program was evaluated using a parallel, cluster randomized control study design, delivered by a nurse-midwife mentor to the facilities and the staff therein. The trial incorporated pre- and post-intervention surveys about PPH management components to measure the changes in facility readiness and provider preparedness using six supportive onsite visits during the period of one year. The results of the study revealed the intervention facilities showed significant improvements over control facilities in readiness for managing postpartum haemorrhage (29 vs. 12, OR 3.7, 95% C.I 1.6 to 8.3). Within both arms, significant improvements in nurse's knowledge were observed over time in all parameters. However, the intervention arm performed significantly better than the control arm with respect to knowledge of administration of AMTSL (82.4% vs 35.8%, aOR 10, 95% C.I 5.5 to 18.2), supporting the acquisition and retention of knowledge in the intervention group. Further, Nelissen et al. (2017) emphasized on PPH knowledge' and skills' improvement after education training. Their study was about simulation based-training in prevention and management of postpartum PPH to healthcare professionals including nurses and midwives (n=25) using low-cost low-tech simulator (Mama Natalie, Laerdal Global Health). The goal was to be able to independently manage uncomplicated delivery and be able to manage PPH if occurs. Using a pretest-posttest study design, the results revealed significant increase in knowledge and skills. These findings showed that 38% reduction (from 2.1 before to 1.3% after training) of incidence of PPH following the introduction of training programme.

Mentorship and Self-efficacy in Managing PPH

Different literatures stipulate the value of mentorship to the healthcare professionals. According to Sheppard (2018), mentoring is the source of updating

knowledge, skills and attitudes necessary to handle a certain healthcare issue. However, self-efficacy was seen as being associated with insufficiency knowledge and skills on the one hand, and being shy (i.e. timid) while providing care on the other hand (Egenberg, Karlsen, Massay, Kimaro, & Bru, 2017). It is also recommended that pre-service is not enough to insure holistic care to patients. The literature underlines the importance of CPD for all graduated and licenced to practice nursing professionals especially for new staff (Egenberg, Eggebø, Arsenovic, & Bru, 2016; Lent, Ireland, Penn, Morris, & Sappington, 2017a). These authors also propose a new way to incorporate mentorship about health-related issues to healthcare professionals with the necessary knowledge, skills and behaviors to maximize patients 'healthcare delivery. Therefore, it is of interest to compare self-efficacy and the gained knowledge in managing PPH as knowledge would not be enough if nurses and midwives lack the internal motivation to apply this knowledge.

Knowledge and Self-efficacy to Manage PPH

In many cases, PPH occurrence is preventable. According to Bandura's social learning theory (1977), learning is accomplished when the demonstrated behavior is retained by attention, retention, motivation and motor reproduction. This requires healthcare professionals to improve their behaviors when exposed to a certain skill; however, more information is needed to determine the extent of the professionals' behavior change. Knowledge also has roots from education and may be analyzed in line with the evidence-based information to inform practice (Veeramah, 2016a). Ameh et al. (2016) studied the knowledge, skills and behavior of healthcare providers working in maternity (n=5939) in Sub-Saharan Africa (Ghana, Kenya, Malawi, Nigeria, Sierra Leone, Tanzania, Zimbabwe and Republic of South Africa) and two Asian countries

(Bangladesh, Pakistan). The study involved before and after competency-based training in emergency obstetric (EmNOC) including PPH management and early newborn care, using an objective structured clinical examination (OSCE) and multiple questions to measure change in knowledge, skills and improvement ratio for each country. The results of this study revealed that almost all participants (99.7%; 4,951 of 4,965) demonstrated an improvement in overall score following the EmOC training though the results were not equally the same in all countries. In general, there were statistically significant improvements in knowledge, skills and behaviour for overall scores following training for each selected professional (cadre group) and in each country (cadre $r=.128$ and country $r=.089$; $p<.05$). The authors stipulate the limitations that they did not use a control group, which might have helped support a stronger cause-effect relationship of this training; also, although country and cadre were most strongly associated with the improvement ratio, these factors only explained 12.8% of the variability across the 11 countries.

Furthermore, a descriptive and exploratory study with focus group discussions was conducted by Egenberg, Karlsen, Massay, Kimaro, & Bru (2017) in Tanzania with nurses and midwives, doctors and medical attendants ($n=42$) about PPH management. The findings suggest intrinsic motivation, courage and confidence to cope with the challenges among participants. The participants discussed about how they experienced the training, such as hands-on training on uterine massage and uterine bimanual compression, identification of the cause of bleeding, and a focus on non-technical skills, such as communication, cooperation, and coordination. Participants rate confidence and knowledge to be imbedded in understanding a proper PPH management within the team. In return, they expressed that “*Nothing brings more confidence in work than knowledge*

capacity building. Knowledge is power. When you know what to do, why panic? Page 6”.

They expressed their emotions at pre and post training and reveal personal change when it comes to manage PPH as described again in the following quotation: *“To be frank, I was very much afraid, and a diagnosis of PPH always made me shiver. But now I am strong, and when PPH is diagnosed I cooperate with others to attend and manage the patient very well. Page 8”.* These quotes illustrated the understanding of how participants’ efficacy belief was developed in team-work which reduces the feelings of stress. The mastery of experiences during scenarios in clinical practice were shown to be part of building confidence, which in turn can lead to increased self-efficacy, and thus can be described as contributing factors to the significant reduction in stress level.

Mentoring is therefore advised to be used while informing practices especially in poor resource settings.

In Rwanda, there is only limited evidence in the literature about mentorship or in-service training related to PPH management (Rulisa et al., 2015). Zoungrana et al. (n.d.) in their study about postpartum hemorrhage prevention and management, focused on observations of antenatal consultations (ANC), women in labour, healthcare worker interviews, facility inventory, and clinical records review. The authors found that the observations of pregnant women in ANC (n=310) showed that only 33% of them were given iron/folate on the first ANC and 75% of them were counseled on how to take them. Less than 44% of pregnant women were asked about bleeding during the current pregnancy while 36% were asked about bleeding in previous pregnancies. When it comes to the labor and delivery, the findings showed a lower score of providers’ knowledge about signs of PPH (48%), with only 41% of providers who knew how to assess for uterine atony, and only 40% of providers who knew the steps of managing a retained

placenta. Although 97% of women were given oxytocin during the AMTSL, only 86% of them have received it by the correct route and only 7% of deliveries received all components of AMTSL. Furthermore, only 48% of providers administered the uterotonic drugs within the recommended time. The findings suggest that prevention of PPH using AMTSL needs to be improved through improved provider knowledge and skills, as correct usage of the AMTSL components was found to be very low. Continued training, consistent supervision of providers and effective facility job aids are recommended to improve PPH prevention and prevention measures with ANC in early pregnancy as well (Rulisa et al., 2015; Zoungrana et al., n.d.). The International Confederation of Midwives (ICM) suggests the need for competence with basic midwifery practice where PPH management is well focused (Butler, Fullerton, & Aman, 2018). Given the nature of negative outcomes associated with PPH among women after birth in Rwanda, viewing the target of the Rwanda Ministry of Health for reducing MMR from 210/100,000 live births to 126/100,000 livebirths by 2024 and 76/100,000live births by 2030, there is a clear need to work hard to improve women's health. Since this research aims to assess the impact of the mentorship conducted by the TSAM project, on nurses' and midwives' knowledge and self-efficacy in managing PPH at the selected health centres of Rwanda, the results of the study could help show how mentorship could contribute to helping the country reach its targets mentioned above.

Research Purpose

To assess the impact of a practice-based mentorship model on nurses' and midwives' knowledge about and self-efficacy for management of PPH.

Research Questions

The present study aimed to address the following research questions: Do nurses' and midwives' knowledge scores related to managing postpartum hemorrhage change between pre and post-mentorship? Do nurses' and midwives' self-efficacy scores related to managing postpartum hemorrhage change between pre and post-mentorship?

Statement of Problem

Maternal mortality remains a major challenge to the healthcare systems in developing countries. In Sub-Saharan Africa countries, maternal deaths rates are alarming with 239 per 100,000 live births (WHO, 2018); whereas in developed countries including the USA and Canada, the rates are 26.4 per 100,000 and 7.3 per 100,000 live births respectively (Weychert, 2017). In Rwanda, maternal deaths account for 210 per 100,000 live births (Rulisa et al., 2015). One of the possible explanations for Rwanda's high rate of maternal deaths is the insufficiency of knowledge and skills in relation to management of PPH, especially at the level of health centers (Zoungrana et al., n.d.). Nonetheless, little attention has been focused on examining how mentorship can enhance PPH management in Rwanda. Therefore, the present study assessed the impact of mentorship on nurses and midwives' knowledge and self-efficacy in managing postpartum hemorrhage in selected health centres of Rwanda. The study addressed the gap in the literature through testing hypotheses below.

Research Hypotheses

Based on the preceding review of literature, and the two dependent variables in this study, the following hypotheses were tested and were formulated as follow:

H1: Nurses' and midwives' knowledge for managing PPH will increase from pre- to post-mentorship.

H2: Nurses' and midwives' self-efficacy for managing PPH will increase from pre- to post-mentorship.

H3: Nurses' and midwives' knowledge about PPH management will be associated with their self-efficacy for managing PPH at pre- and post-mentorship.

H4: Nurses' and midwives' post-mentorship knowledge and self-efficacy will increase with the number of mentorship visits attended.

The Rationale for Hypotheses

It is anticipated that the educational mentorship about PPH management affects both nurses' and midwives' knowledge and self-efficacy in managing PPH. Previous studies provide empirical evidence for these relationships. An example is a research study conducted by Egenberg, Øian, Eggebø, Arsenovic, and Bru (2017) in Norway which stipulated the change in self-efficacy, collective efficacy and patient outcome following mentorship related PPH management. Using a pre and post study design to the midwives, obstetricians and auxiliary nurses (n=106) in a university hospital to test whether the simulation training about PPH management is associated with a reduced blood transfusion rate after birth, the results show that the overall change for all three dependent variables levels, self-efficacy, collective efficacy and team functioning, were significantly increased after training ($F = 5.70, p < .001$). Therefore, based on self-

efficacy theory and supporting empirical evidence, the researcher tested the impact of PPH-related mentorship at selected health centres in Northern of Rwanda.

Methodology

The present study aimed at evaluating whether nurses and midwives who were mentored through the TSAM project at their work place improved their knowledge and self-efficacy in managing PPH. Bandura's social learning theory served as a guide for assessing the impact of mentorship on nurses' and midwives' knowledge and self-efficacy in managing PPH. After outlining the study design and the TSAM mentorship model, this section discusses the study participants, research setting, sample size, instrument description, data collection process, main analysis, and ethical considerations.

Study Design and TSAM Mentorship Model

A pre and post quasi-experimental study design was used to assess the impact of mentorship delivered by the TSAM project. According to Polit and Beck (2017), a pre and post study design is suitable technique that can assess and explore the effect of variables in clinical settings. This research design is also a suitable approach when randomization is not an option (Kontopantelis, Doran, Springate, Buchan, & Reeves, 2015). This study evaluated the impact of the mentorship among trainees for quality improvement, as part of a large mentorship intervention aimed at promoting change in the labour and delivery unit at the selected health centres. The TSAM mentorship model, is based on the notion that most maternal and perinatal deaths could be prevented if skilled healthcare professionals provide effective healthcare measures in a continuum of care, including the perinatal period at the district hospital and health center levels. Mentorship was seen as one of the priority activities to conduct in the assigned districts. The approach started at the national level where the TSAM project trained trainers of trainers

(ToT) to train the cadre of TSAM mentors. The TSAM project invited all hospitals located in districts of Gakenke, Gicumbi and Rulindo to select midwives (mentors) with sufficient experience working in the labour and delivery unit. The selected midwives attended a refresher training of two weeks delivered by the ToT from the national level. The mentors also benefited from a refresher course on EmONC where PPH was emphasized as well as the special training on mentoring (TSAM, 2018). The TSAM project conducted different coordination meetings in the three catchment areas of mentorship (Rulindo, Gakenke and Gicumbi). The district medical directors, chiefs of nursing from district hospitals, the heads of health centres, and TSAM trained mentors at district level, convened to discuss terms and conditions of mentorship including selecting mentees at each health centre. After these series of engagement meetings prior to mentorship, a mentorship schedule was developed along with a list of mentees paired to their mentors.

The mentorship approach was based on monthly schedule where assigned mentors visited each assigned health centre to meet their mentees on the agreed dates. The day of mentorship started at 7 am and ended 5pm. At the health centre, mentors worked with their mentees for real cases when available. In the absence of real cases, they worked on the simulators of PPH with mentees on how they can behave if PPH occurs. This course of action went through six months with one visit per month. However, based on the mentors' availability, some went beyond six visits. The researcher of this study requested permission from TSAM to assess the knowledge and self-efficacy of mentee before the start of mentorship. Further, the TSAM project provided the contact information of mentees and heads of health centres to the researcher. Prior to mentorship, the researcher contacted head of health centres to ask for a date and time that was convenient to

approach mentees at their respective working areas to introduce the study survey and assess baseline knowledge and self-efficacy in managing PPH. The researcher of this study assessed the impact of mentorship on nurses' and midwives' knowledge and self-efficacy in managing PPH immediately at post-mentorship.

Study Sample and Setting

A total of 169 participants were recruited from Health Centres of Gakenke, Rulindo and Gicumbi districts of the Northern province of Rwanda, which constitutes the settings for the TSAM. The researcher secured permission from the TSAM to collect data at the beginning and immediately at the end of their mentorship activities.

TSAM mentorship program covered all 68 health centres of three districts. The researcher of the study achieved 100% coverage (68 selected health centres) at pre and post-mentorship. The researcher utilized a convenience sampling technique to have the sample of nurses and midwives to participate in the study. Inclusion criteria included participants' eligibility to participate if they agree to the study procedures, sign a consent form; being nurses/midwives working in the labour and delivery at the health centre and enrolled in the mentorship program of the TSAM project. Exclusion criteria included any nurse /midwife who is not working in the labour and delivery at the health centre, nurses and midwives who were not enrolled in the educational mentorship of the TSAM project, and anyone who is below 18 years old. The researcher used a G power statistical package to estimate the required sample size. As this study tested the difference between two dependent means, a paired t-test was applied as the main statistical test. The sample size calculation comprised of medium effect size of 0.3, level of significance of 0.05, and with a statistical power level of 0.80 (Faul, Erfeld, Lang & Buchner, 2007). Subsequently, the sample size required for the present study was estimated at 122 participants.

However, to prevent the attrition in this study, all nurses and midwives enrolled in the TSAM mentorship program who were eligible and signed consent to participate were recruited to be participants of the study. The study recruited 141 (83%) participants among 169 participants who enrolled for the TSAM mentorship prior to mentorship. At the time of pre-mentorship assessment, 28 participants were not present and the total number of 141 were considered as the sample size of this study. At post-mentorship this number reduced from 141 to 123 (87%) participants due to absence of 18 participants.

Instrument Description

The development of the study survey or questionnaire for the study was a priority before the educational mentorship started (Appendix A). This study has two dependent variables: Knowledge and self-efficacy. The researcher verified the WHO guidelines about PPH management and added to the Mutunga's PPH scale while considering the context of Rwanda in regard with knowledge questions (Appendix B: permission from Mutunga). The Rwanda context was considered as each country has its own context to manage a condition while abiding to the WHO guidelines. The 19 questions related to PPH recognition and management in the form of choosing the best answer were asked to the nurses and midwives to assess their prior and post-mentorship knowledge about PPH. Each question was scored as either being correct or incorrect. The final knowledge score was expressed as the percentage of correct answers from the 19 questions. To create the self-efficacy variable items, which was adapted from Bandura's self-efficacy scale, the questions were combined according to their focus on PPH management using three main areas; i.e self-efficacy PPH-AMTSL, self-efficacy PPH-management and self-efficacy-PPH causes. Self-efficacy was measured using a Bandura (2006) Self-Efficacy Scale (SES), with a 21-item scale that measures a nurse/midwife's confidence in managing

PPH. All self-efficacy items are rated on a 10-point Likert scale ranging from 0 (not confident at all) to 10 (very confident) and a final score was calculated by averaging all 21 items. For the validity of the instrument, Polit & Beck (2017) suggest different experts in the subject to evaluate the tool and validate it accordingly. Since the Mutunga's and Bandura's scales were adapted to content and context in Rwanda; both variables were checked with some of the trained mentors (four of them) prior to the study who were designated to mentor the selected nurses and midwives. This expert advice team included one medical doctor from Rwanda and one nurse educator holding a PhD in nursing practice from Canada, who reviewed the questionnaire before administering it. Cronbach's alpha testing indicated an overall value of .90 for all 21 items suggesting good internal consistency of the self-efficacy items.

Data Collection Procedure

Participants were approached from the work place and given explanations on the study through the Letter of Information and Consent (Appendix C, Appendix D). After obtaining participants' consent, the pre-test knowledge and self-efficacy instrument was distributed. A sample of 141 participants completed the instrument, which took between 25 to 30min each prior to mentorship intervention. A mentorship program by TSAM took place for six months; 123 participants were assessed for post-mentorship knowledge and self-efficacy. The instrument was distributed by the primary researcher at the completion of mentorship at the participants' work place and during working hours.

Ethical Consideration

The researcher obtained ethics approval from the Western University Human Research Ethics and the University of Rwanda prior to enrollment of the study participants (Appendices E and F). The researcher also sought permission from the health

units at the three district administrations (appendix G) where the selected health centres were located in. Prior to participants' enrolment in the study, the researcher sought their consent through providing them with a letter of information and consent that included explanations of: (1) study, (2) participants' rights and responsibilities, (3) volunteer participation, and (4) confidentiality and anonymity. Specifically, they were informed about their rights to withdraw from the study at any time. Since the study was collecting personal information, the researcher applied the rule of anonymity (using codes instead of using names) and confidentiality. However, for the purpose of follow up, the researcher kept the names and addresses separately for future communication. The researcher ensured the safety of responses to the survey and kept them strictly confidential and securely stored in locked cabinets.

Data Analysis

Data related to the study hypotheses were analysed using the Statistical Software Package for Social Sciences (SPSS) version 25 (Knapp, 2017). Demographics including age, gender (recorded as sex in analysis), marital status, the level of education, educational qualifications and years of experience of working in the labour and delivery were used to describe the sample. The researcher combined the knowledge questions to obtain the final score (i.e. percent correct) and also grouped the items according to their focus on PPH management. This resulted in four subscales for the knowledge tool: Active management of third stage of labour (AMTSL), the management of PPH, the PPH agreement and the PPH causes. The analysis of knowledge was computed using paired-t test to compare the pre-mentorship and post-mentorship mean knowledge for the total from the four main scales and subscales.

The scale of self-efficacy was also divided into three sub-scales; PPH-AMTSL, the management of PPH, and the PPH causes. The scale ranged from 0 (no self-efficacy at all) to 10 (the best self-efficacy possible). The analysis used paired t-test to compare the pre-mentorship and post-mentorship means. Additionally, the analysis used correlation to compare the relationship between knowledge and self-efficacy for both pre- and post-mentorship assessment

Before the running the statistical tests, data were cleaned for out of range values, errors of recording and checked for missing data. Assumptions relevant to a test, like normality, were verified before each test accordingly. Descriptive statistics are expressed as means, frequencies and percentages. P-values of $\leq .05$ on two-tailed test were regarded as statistically significant.

Study Results

At baseline, 169 (100%) of participants attended the mentorship program however, the researcher was able to administer questionnaires for 141 (83%) of nurses and midwives prior to mentorship to assess the baseline knowledge and self-efficacy in managing PPH. Other 28 participants were not present at the time of pre-mentorship assessment due to their own reason. Although the researcher anticipated to evaluate the impact of mentorship on the 141 participants who were assessed prior to mentorship, 18 participants dropped out due to their own reasons. At post-mentorship, only 123 (87% compared to pre-assessment) participants were available for post-mentorship assessment. Analysis of the two-participant group's demographic variables indicated they were not significantly different from one another (Table 1). Thus, post mentorship assessment considered the 123 participants who attended both assessments. In terms of the number of mentorship visits attended, participants attended the mentorship sessions differently due

to variations in their work assignments which were typically posted on the day of mentorship. Many of them attended only four mentorship visits while others attended five to seven times. Very few of them attended only one to three mentorship visits. Most of the reasons for attending less than six visits, viewed as a standard for this mentorship model, related to having more than one-time demand on the day of mentorship. Some were completing reports required by the authorities, others on assigned duty rather than working in maternity due to the absence of those who were supposed to work in the other services (i.e. consultations). In terms of participants' characteristics, most of them were female 68% (n=97) and their mean age was 35.8 years (SD=7.8). Among them, the majority have an advanced diploma 66.7% (n=94) and were registered nurses 61.7 (n=87). In terms of years of experience of working in the labor and delivery, the mean years was 7.2 (SD= 7.7). The level of education was examined and was not related to pre-mentorship knowledge (p= .098) or self efficacy (p= .972) scores.

Table

Demographic Characteristics and Scores on Key Variables

Characteristics	Pre-mentorship	Post-mentorship
Number of participants	141	123
Sex of participants	Female: 68% (n=97) Male: 32% (n= 44)	Female 73% (n=90) Male 26% (n=33)
Mean age	35.84 (SD=7.8)	35.9 (SD=7.7)
Level of education		
A-level	29.1% (n=41)	31.7% (n=39)
Advanced diploma	66.7% (n=94)	65.9% (n=81)
Bachelor	4.3% (n=6)	2.4% (n=3)
Professional qualification		
Registered nurse	61.7% (n=87)	61% (n=75)
Registered midwife	18.4% (n=26)	19.5% (n=24)
Registered nurse-midwife	3.5% (n=5)	4.1% (n=5)
Associate nurse	15.6% (n=22)	14.6% (n=18)
Any other	0.7% (n=1)	0.8% (n=1)
Labour and Delivery working experience	7.2 (SD=7.7)	7.2 (SD=7.5)
Knowledge of participants	68.9(SD=11.98)	87.01(SD=11.07)
Self-efficacy of participants	6.9(SD=1.88)	9.5(SD=0.72)

Regarding the participants' training qualification prior to mentorship, the ANOVA test shows that the overall knowledge is significant between professions ($p= .019$). Midwives outperformed the nurses in knowledge ($p= .005$). Midwives knowledge was ($M= 76.38$; $SD= 8.967$) with a self-efficacy of (7.54 , $SD= 1.351$), while nurses had (68.30 ; $SD=11.587$) with a self-efficacy of (6.90 , $SD=1.711$). Midwives also outperformed the other professions at the pre-mentorship assessment (nurse-midwife and

associate nurse) ($M= 63.29$; $SD= 12.40$) in knowledge ($p= .005$) and self-efficacy (5.76 , $SD=2.319$); $p< .001$.

Hypothesis One

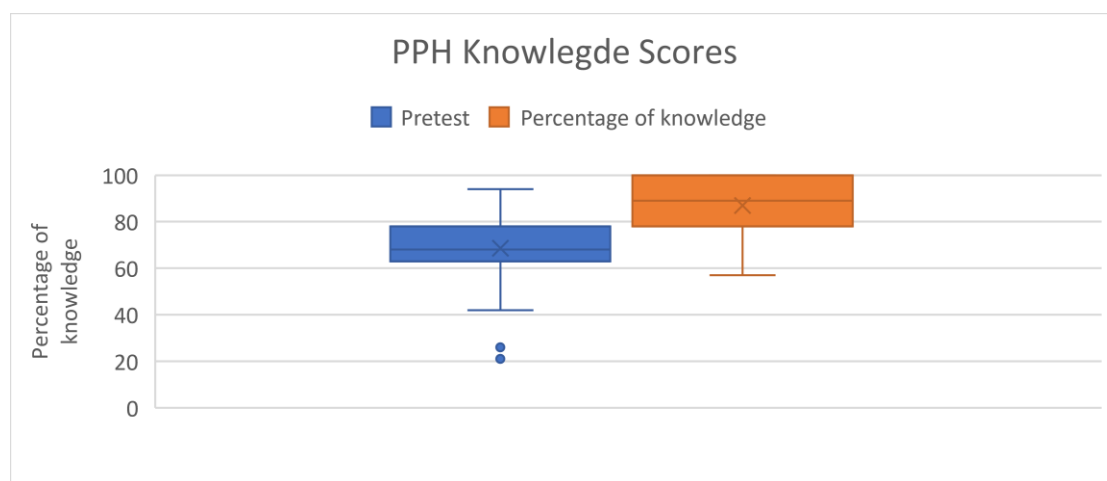
The post-mentorship results reveal a statistically significant increase in nurses' and midwives' knowledge from ($M=68.9$; $SD=11.98$) to a knowledge of ($M= 87.01$; $SD= 11.073$) to those who attended the educational mentorship ($p= .030$). These results support the research hypothesis of a positive change between pre and post educational mentorship on nurses' and midwives' scores on knowledge in managing PPH. The table below shows the results according to the overall knowledge scores for the four different PPH areas and the total overall knowledge assessed at pre and post-mentorship.

The overall knowledge increased from pre to post-mentorship significantly ($M=68.58$ ($SD=12.2$ to 87.01 ($SD=11.1$), $p< .001$. The mean difference revealed an increase of 18.43 percentage points ($SD= 5.1$, $p< .001$). Considering four main areas assessed on PPH knowledge, there was a statistically significant increase in knowledge on PPH AMTSL area ($M= 77.83$ ($SD=11.2$) to 89.34 ($SD=9.2$), $p= .007$. In the area of PPH management, there was significant increase in knowledge from pre to post-mentorship ($M= 60.65$ ($SD=11.1$) to 88.82 ($SD=8.4$); $p< .001$. Of note, the area related to knowledge about PPH causes did not see a significant increase ($M=86.7$; $SD=8.2$) to 89.51 ($SD=5.3$); $p= .075$. Based on the results shown in the table above, the figure below also shows overall PPH knowledge prior to mentorship, and how that knowledge increased after the mentorship.

Table 2

Pre and Post-mentorship Knowledge Scores in Different Areas

Item	Pre-mentorship mean (SD)	Post-mentorship mean (SD)	Mean difference (SD)	95% CI		p-value (0.05)
				Lower	Upper	
PPH AMTSL knowledge	77.83(11.2)	89.34(9.2)	11.51 (7.7)	2.56	15.51	0.007
PPH management knowledge	60.65(11.1)	88.82(8.4)	28.17(9.5)	7.82	0.59	0.001
PPH agreement knowledge	49.65(16.3)	80.74(7.3)	31.09 (11.08)	9.46	25.19	0.001
PPH causes knowledge	86.7(8.2)	89.51(5.3)	2.81 (1.3)	33.26	44.45	0.075
PPH overall knowledge	68.58(12.2)	87.01(11.1)	18.43 (5.1)	15.65	21.21	0.001

*Figure 1: Increase in knowledge after mentorship about PPH management*

While most participants prior to mentorship scored between 60 to 80%, at post-mentorship most of them are between 80 to 100%.

Hypothesis Two

Nurses' and midwives' self-efficacy scores increased significantly between pre and post mentorship in managing PPH. The results of this study show a significant increase for the overall PPH SE score from pre ($M= 6.84$; $SD=1.9$) to post-mentorship self-efficacy ($M= 9.56$; $SD=0.72$) at $p < .001$. The AMTSL self-efficacy also increased from ($M=7.63$ ($SD= 2.21$) to 9.74 ($SD= .57$), $p < .001$). The PPH self-efficacy management increase was notified as ($M=6.8$, $SD= 1.94$) at pre-mentorship to $M=9.59$ ($SD= .73$); $p < .001$ at post-mentorship. The self-efficacy about PPH causes, showed also an increase from pre to post-mentorship ($M=6.84$, $SD=1.9$ to $M=9.56$, $SD= .7$), $p < .001$).

Table 3

Pre and Post-mentorship Self-efficacy Scores in Different Areas

Item	Pre-Mentorship Mean (SD)	Post-Mentorship Mean (SD)	Mean Difference (SD)	95% CI		P-Value (0.05)
				Lower	Upper	
PPH AMTSL Self-Efficacy	7.63 (SD=2.21)	9.74 (SD= .57)	2.11 (.52)	1.7	2.4	< .001
PPH Management Self-Efficacy	6.81 (SD=1.94)	9.59 (SD= .73)	2.79 (.74)	2.4	3.1	< .001
PPH Causes Self-Efficacy	6.02 (SD=2.42)	9.42 (SD= 1.05)	3.4 (.95)	2.9	3.8	< .001
PPH Self-Efficacy Overall	6.84 (1.9)	9.56 (0.7)	2.72 (1.1)	2.34	3.08	< .001

Hypothesis Three

Nurses' and midwives' knowledge about PPH management correlate with their self-efficacy in managing PPH at pre and post mentorship. The table (4) below, presents correlations among different areas assessed on knowledge and self-efficacy.

Table 4

Study Correlations

		Variables or Outcomes					
Variables or Outcomes		1	2	3	4	5	6
1. Age of participants	Pearson Correlation	1					
2. Labor and delivery working experience	Pearson Correlation	.62*	1				
3. Pre-mentorship knowledge	Pearson Correlation	.13	.02	1			
4. Pre-mentorship self-efficacy	Pearson Correlation	.15	.18*	.24*	1		
5. Post-mentorship knowledge	Pearson Correlation	.10	.09	.11	.03	1	
6. Post mentorship self-efficacy	Pearson Correlation	.01	.18*	.03	.04	.58*	1

*. Correlation is significant at the 0.05 level (2-tailed).

The results of this study showed that the overall pre-mentorship knowledge has a moderate correlation with pre-mentorship-self-efficacy ($r = .24, p < .001$) and post-mentorship knowledge has a strong positive correlation with the post-mentorship self-efficacy overall ($r = .58, p < .001$). Additionally, the level of education correlated with pre-mentorship knowledge ($r = .17, p = .03$) and self-efficacy ($r = .27, p = .003$) however, at post mentorship, education of participants failed to correlate with their knowledge ($r = .14, p = .89$) and self-efficacy ($r = .108, p = .98$).

Hypothesis Four

The study tested the significance of the number of mentorship visits for the knowledge and self-efficacy scores. The number of visits influenced the scores of both post-mentorship knowledge and self-efficacy. Participants who attended 5-7 visits scored significantly higher in knowledge (M=92.9, SD=8.15) compared to those who attended 4 visits (M=83.8, SD=8.14, $p<0.001$), and 1 to 3 visits (M=76.1, SD=9.95, $p<0.001$). Similarly, self-efficacy to participants who attended 5-7 visits is significantly higher (M=9.9, SD=0.2) compared to those who attended 4 visits (M=9.4, SD=0.65, $p<0.001$) and 1 to 3 visits (M=8.8, SD=0.96, $p<0.001$). This significant difference is also found for those who attended 4 visits compared to those who attended 1 to 3 visits for both knowledge and self-efficacy.

Table 5

Knowledge and Self-Efficacy Mean Score according to Number of Visits

Number of mentorship visits	The mean of post-mentorship knowledge scores	P-value	The mean of post-mentorship self-efficacy scores	P-value
5-7 visits	92.9 (SD=8.15)	$P<0.001$	9.9 (SD=0.2)	$p<0.001$
4 visits	83.8 (SD=8.14)		9.4 (SD=0.65)	
1-3 visits	76.1 (SD=9.95)		8.8 (SD=0.96)	

Discussion

This is believed to be the first study of its kind to assess the impact of mentorship for PPH management in Rwanda. This study, a quasi-experimental, pre and post study design, reveals a significant increase of knowledge and self-efficacy to the nurses and

midwives who attended the mentorship; and thus, supports the hypotheses of this study. This significant increase in knowledge and self-efficacy to manage PPH is linked with nurses' and midwives' exposure to a six-month mentorship about emergency obstetrics including the management of PPH at their work place. The educational mentorship approach that was developed by the TSAM project, which aimed at "*Building a network of competent and confident health care providers who can provide quality EmONC in health centers, leading to reduction of maternal and newborn deaths, stillbirths and disabilities*" (TSAM Project, 2018), shows a particular focus on strengthening healthcare professionals to maintain maternal newborn health. A pre-mentorship assessment shows that nurses and midwives possess some knowledge about PPH management. Nurses and midwives also possessed a moderate self-efficacy to manage PPH. The post-mentorship results support that nurses and midwives needed this mentorship to increase their knowledge and self-efficacy in managing PPH, as previously suggested by the study of Hagler & Rhodes (2018). The same authors reported on the mentoring outcomes and revealed that mentees had higher self-confidence, engagement and higher grades throughout the components studied.

Assessing and managing a life-threatening condition like PPH requires adequate knowledge and skills. Once nurses' and midwives' knowledge increases from educational bundles, as the results of this study show, and are equipped with skills, their level of self-efficacy increases as well. Bandura's (1977) self-efficacy theory suggests that cognitive processes can influence behaviour. What remains to be seen is how the mentoring experience will be distinguished and if there is any lasting effect as a result. With being in charge of pregnant and delivering women, nurses and midwives need to perform skills effectively while managing PPH, and ensuring they are following the most current

evidence for their interventions (Powell, 2018). Nurses and midwives who were mentored and raised their knowledge and self-efficacy, can now possibly provide more effective maternity care to women in antepartum, intrapartum and postpartum periods in terms of practice change (Kato & Kataoka, 2017). Amatullah (2018) suggests positive changes in knowledge and self-efficacy in healthcare professionals as the result after their mentoring. The results of this study affirm that mentorship enabled nurses and midwives to be able to recall significant skills in a demanding emergency obstetric situation like PPH. Thus, it is possible that participants in our study can now contribute to a positive change in patient outcomes through increased knowledge and self-efficacy about PPH management. According to Bandura (1986), self-efficacy is influenced by four elements; mastery of experiences, vicarious experiences, verbal persuasion and physiological states. The mentorship about PPH management that this study was evaluating, gave to the participants the opportunity to improve their self-efficacy and that was a common clinical challenge for them before mentorship.

The published literature indicate some behaviors that healthcare professionals may exhibit when PPH presents if their knowledge is limited, such as panicked movement instead of calming down, relaxing and calling for help (Stavanger University, 2017). As the results of this study show, nurses and midwives have changed their knowledge and self-efficacy related to PPH. Their performance has not yet been linked to their own achievements, but this can change when they are given a chance to memorize and practice step by step the given procedures with individual encouragement during mentorship. The findings of the study about PPH management, the second area of PPH knowledge assessment, show that nurses and midwives asserted knowing when and how to call for help on assigned tasks (which is the starting point of the scenario) and supports

the findings of the studies that confirmed the increase in confidence on how and when to call for help after the mentorship (Amatullah, 2018; Bergh, Baloyi, & Pattinson, 2015; Green et al., 2015), suggesting a significant potential to increase behavior change.

Furthermore, the results of this study did not find any significant correlation between nurses' and midwives' change in knowledge and self-efficacy with their educational level since mentorship was designed to be delivered to all nurses and midwives who work in the labour and delivery, regardless of their training background. The number of mentorship visits attended influenced nurses' and midwives' knowledge and self-efficacy increase at post-mentorship. However, some nurses and midwives were unable to accomplish or attend the required mentorship visits due to competing assignments during the mentorship days. Despite these challenges faced to accomplish six mentorship visits, all nurses and midwives who attended mentorship visits increased their knowledge and self-efficacy in managing PPH. Although the studies highlighted that knowledge and SE increased, the results reveal that nurses and midwives who attended more than five mentorship visits, had higher knowledge and self-efficacy scores. It is important to note that managing an emergency obstetric condition like PPH, requires nurses' and midwives' knowledge, skills and behaviours to be at a very high level. Since knowledge correlated with self-efficacy in this study, which necessitates a long-term multidimensional teaching strategies (Worthington et al., 2016), this brings hope that nurses and midwives who attend the required mentorship visits are accountable and self-regulated in emergency obstetrics especially in the management of PPH at the health centers of Rwanda.

Professional accountability and self-regulation are the cornerstone of evidence-based practice (HHRI, 2016; Traoré et al., 2017). Nurses and midwives who felt that they

are accountable had an interest to self-regulate in terms of attending this mentorship. The content of mentorship was more than just PPH management and this would have helped the participants to improve many other skills for women's need, as they are often called to act as women's advocate and thus better understanding of their problems would add to the caregiver's knowledge and self-efficacy and thus strengthen their overall capability.

According to Jayanna et al. (2016), mentoring improves providers preparedness and facility readiness to deal with institutional births and associated complications. The findings of this study highlight the importance of mentorship among nurses and midwives' knowledge and self-efficacy in managing PPH. This is because the mentorship was not dominated by the provision of knowledge but also practicing the technical skills of dealing with PPH if it occurs. Nurses and midwives who attended this mentorship now have better understanding of their capabilities for PPH management through those two assessments (pre and post) which would give them insight for moving forward and thus help sustain their practices at their work place. It is therefore feasible to improve the quality of institutional births at a large operational scale, without substantially increasing costs if the institutions adopt this model to guide their practices. Even though this study reveals an increase in nurses and midwives' knowledge and self-efficacy in managing PPH, it also identifies that implementing a mentorship model about topics related to the emergency obstetrics requires the commitment of nurses and midwives to achieve a higher level of competency in managing these emergencies.

Implication and Recommendations of the Study

Study Implications

This study meant to assess the impact of educational mentorship on nurses and midwives 'knowledge and self-efficacy in managing PPH at the level of selected health

centers of Rwanda. The study has implications on the following areas: policy, practice and education.

Policy. As notified from the literature, PPH is a leading cause of maternal morbidity and mortality (WHO, 2018). Most pregnant women in Rwanda start their journey of delivery from health centers where adherence to guidelines and recommendations is of greatest importance to reduce PPH related complications and deaths all over the world including Rwanda. However, the literature stipulates a lack of policy that supports the mentorship and its use in the healthcare system especially for the health centers of Rwanda. Some projects like TSAM do this through their mandate and develop a model to help the country through this level of healthcare. Thus, it is important to advocate for continuation of mentorship related to key issues in the healthcare sector, after the TSAM project is completed. This is particularly important at the level of the health center of Rwanda, as this model was seen as to increase knowledge and self-efficacy about the leading cause of maternal mortality in Rwanda, suggesting a practice and behavior change among nurses and midwives who attended the mentorship for healthcare services delivery at this level.

Practice. The notion of evidence-based healthcare has been promoted and adopted globally many years ago (Veeramah, 2016). However, based on the importance of using evidence-based information to inform clinical practice, its implementation remains a significant challenge faced by many healthcare professionals including nurses and midwives (Veeramah, 2016a). There is still limited research on the extent to which nurses make use of different sources of evidence-based information to guide their practice. Consequently, the main reasons why healthcare professionals do not routinely make use of evidence-based information to inform their practice remain a focus for many

researchers (Alghamdi, Horodyski, & Stommel, 2017; Bekru, Cherie, & Anjulo, 2017). This study brings new insight about mentorship led by the TSAM project using the very best evidence-based practice from different perspectives to inform nursing and midwifery practice in terms of managing PPH at the selected health centers of Rwanda. The findings of this study inform quality improvement and affirm that evidence-based mentorship about PPH management enhances the ability of nurses and midwives to recognize the signs and causes of PPH, perform assessments, and manage PPH in a timely manner to prevent complications at their working areas (health centers). Equipping nurses and midwives with the knowledge and self-efficacy required to make suitable decisions and self-confidence in emergency situations is key to improved patient safety and better maternal and child health outcomes (Casey et al., 2017).

Education. Nursing and midwifery education play roles in introducing to new students or staff new knowledge and current evidence about a certain procedure. Ekong & Sun (2017) revealed that mentoring is thought to enhance teachers' competencies, strengthen social abilities, and promote learning and career development. The study suggested that nursing and midwifery educators should develop models or approaches that can strengthen faculty relationships, enhance new nurse educators' teaching capabilities, and attract them into nursing education, academics and research. This interest is also highlighted in-service where caring, connecting and empowering were suggested to implement a nursing mentorship model (Bjerrum & Gladrow, 2017).

Additionally, the same report noted that there has been a disconnection between clinical leadership and expertise at the practice level, which would be resulting in a loss of senior mentoring opportunities for new graduates. These factors may be stressors, particularly for the new graduate and can have a negative effect on the quality and safety of nursing

care. There are many reasons influencing why new graduate nurses struggle when transitioning into confident and competent nurses. Therefore, mentorship programs are one approach to creating a positive and supportive work environment for new graduates to help them transition into practice. Mentorship programs could contribute to the development of social networks and support systems, which are important factors in job satisfaction. Mentorship programs have been shown to improve job satisfaction and increase retention of both new graduates and experienced nurses in the workforce (Bjerrum & Gladrow, 2017).

Recommendations

The evidence from the study supports the use of educational mentorship for healthcare professionals to use new evidence and practice to improve patient care. To support this statement, the following recommendations are proposed:

The Ministry of Health of Rwanda

Among the accountability mechanisms already in place that the government can use bring down the numbers of maternal deaths in Rwanda, are regular death audits, performance contracts, as well as performance-based financing models for health providers (Newtimes, 2018, March 9th <https://www.newtimes.co.rw/section/read/229572>). Upon reviewing the literature about the utility of educational mentorship among healthcare professionals; and after analyzing the results of this study, which was aimed at assessing the impact of mentorship on nurses' and midwives' knowledge and self-efficacy in managing PPH, it is important to advocate for the implementation of this model systematically at the level of healthcare delivery including health centers of Rwanda. Mentorship about emergency obstetrics including PPH management is also a key strategy to employ with the other efforts to reduce MMR in Rwanda. Regular mentorship should

be regulated and conducted to ensure that the nursing and midwifery staff are prepared to handle obstetric emergencies including PPH management.

Nursing and Midwifery Practice

Nurses and midwives play a vital role in the management and prevention of PPH (Casey et al., 2017; Ishaku, Ahonsi, Oginni, Tukur, & Adoyi, 2016). They are typically the first health care providers to arrive at the bedside of the patient in case of an emergency like PPH. Nurses and midwives who are supported through mentorship can be introduced to the latest practices that are essential in addressing problems in the health care sector (Solnes, Roggeveen, Roosmalen, & Smith, 2017). The findings of this study highlighted the importance of mentorship related components about PPH management. Nurses and midwives can now use the information and skills acquired from the mentorship and the knowledge gained to help reduce the morbidity and lower incidence of maternal deaths due to PPH.

Researchers

The findings of this study assert the value of the mentorship on nurses and midwives 'knowledge and self-efficacy in managing PPH. The existing evidence in the literature examining the effectiveness of training programs on improving the knowledge, skills, attitudes, and confidence of nurses to PPH management supports the findings of our study. (Ajeani et al., 2017; Feldacker et al., 2017; Jayanna et al., 2016). However, future research is needed to ascertain if the effects of the educational programs including mentorship informed by different projects, such as TSAM and many others, sustain nurses' and midwives' knowledge, skills and confidence over the long-term after its provision. The current study was implemented at only pre and directly post-mentorship; thus, a longer timeframe (during mentorship and even months following mentorship) is

essential to evaluate the impact of the educational mentorships in the long-run for knowledge, skills, behaviors' sustainability and knowledge retention in managing PPH. Additionally, it is important to better understand how behavior and practice change among the mentored nurses and midwives can help to reduce maternal mortality due to PPH, thus a longer timeframe and more controlled study framework would strengthen the findings of this project, and the outcomes could be used to further improve outcomes of all women at risk of having PPH. Staff satisfaction and turn-over are also highlighted for future research after the mentorship provision.

Limitation of the Study

The quasi-experimental design used in this study does not allow the control of all variables that can affect the knowledge and self-efficacy of nurses and midwives who attended the education mentorship about PPH management (Polit and Beck, 2017). The study also was targeting nurses and midwives working in the labour and delivery, enrolled in educational mentorship by the TSAM project. This gives a limitation of comparing their knowledge and self-efficacy to those working in any other health center that is not in the study settings (District hospitals and Referral hospitals). Although this research is a part of a large study, it was limited to a short time of data collection, pre and post-mentorship for only six months. This timeframe did not allow the researcher to conduct a follow-up assessment of knowledge retention, while previous findings showed the periodic need for refreshment training (Veeramah, 2016).

Conclusion

Maternal morbidity due to PPH is a serious health problem worldwide, and it is responsible for many preventable deaths. It is very important for nurses and midwives to gain more knowledge and practical skills on the management of PPH especially in

developing world where maternal mortality rates are high. The study findings show a statistically significant improvement for nurses' and midwives' knowledge and self-efficacy in managing PPH as demonstrated by the pre and post-mentorship scores. Thus, the study results support the use of mentorship for increasing knowledge and self-efficacy of health professionals, which could then hold the potential for health care delivery improvement.

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CHAPTER THREE

SUMMARY OF RESULTS, IMPLICATIONS AND RECOMMENDATIONS

Summary of the Key Findings

PPH is a leading killer of women in the postpartum period worldwide and most of these deaths are preventable (Durmaz & Komurcu, 2018 and Lori, Stalls, & Rominski, 2015). Many nurses and midwives have limited knowledge about PPH management and thus, their self-confidence has been appraised to be low (Anderson, Family, Residency, Pennsylvania, & Forbes, 2017; Traoré et al., 2017). Bandura's (1977, 1986) theory of self-efficacy was used to frame this study. Bandura's self-efficacy asserts that cognition can affect personal experience, and this may impact behavior. An increase of knowledge and self-efficacy related to PPH from baseline to post-mentorship assessments was observed in this study. This was observed for nurses and midwives who attended a six month- mentorship about PPH management developed by the TSAM project. Nurses and midwives had a basic level of knowledge to manage PPH at baseline and that knowledge was correlated with their self-efficacy in terms of managing PPH. At the baseline, midwives had a higher score on knowledge and self-efficacy than nurses and nurse-midwife or other professions possibly because their job is focused more on pregnant and delivering women. At post-mentorship, the situation was not the same. All of them had positively increased their knowledge and self-efficacy though, nurses and midwives who attended the mentorship more often scored higher for both knowledge and self-efficacy.

Effective communication, providing relevant care and advocacy for women where necessary are all needed to complete the package of management of PPH. Nurses and midwives who attended the mentorship show an increase of knowledge and self-efficacy related informing patients during every step while managing PPH and managing PPH

step by step after determining the cause. They also scored high in knowing how to refer if necessary. Most of them reported being 100% confident that they could now manage PPH if it occurs.

Implications and Recommendations

This study was aimed at assessing the impact of mentorship provided by the TSAM project on nurses' and midwives' knowledge and self-efficacy in managing PPH at the level of selected health centres in Rwanda. The results of the study positively support the continuation of the mentorship model at the level of health centers. Implications and recommendations based on the study results are outlined below.

Policy Makers

Improving care for women around the time of childbirth to prevent and treat postpartum hemorrhage is a necessary step towards achievement of the health targets of Rwanda's Sustainable Development Goals (SDGs) (WHO, 2017). Efforts to prevent and reduce morbidity and mortality associated with PPH can reduce maternal deaths in Rwanda. The findings from this study about the impact of mentorship on nurses' and midwives' knowledge and self-efficacy reflect the need to consider the mentorship for all health centres across the country. The study results from the 68 health centres of Rwanda that were involved with the TSAM mentorship suggests that it might be possible to reduce maternal deaths due to PPH through effective mentorship activity across Rwanda.

The Ministry of Health of Rwanda asserts that the target is to reduce maternal deaths from 210 to 126/100,000 livebirths by 2024. Technology advancement is good but staff knowledge and self-efficacy in performing tasks to prevent maternal deaths is also paramount. To arrive at this target, it requires significant involvement and policy development related to a mentorship model for all healthcare professionals to perform

effectively while preventing maternal related deaths, including those from PPH. Health-care providers, health managers, policy-makers and other stakeholders need to be up-to-date and be informed about the evidence-based recommendations to better influence clinical policies and practices.

Nursing Education

According to the curriculum in nursing education, nursing and midwifery students spend 50% of their program learning in practical settings and it is therefore vital that they are appropriately supported during the whole process. In academia, mentorship is perceived as important to attract, train and retain nursing faculty members and maintain high-quality education programs (Nowell, White, Mrklas, & Norris, 2015). The same authors noted that the institutions which have established mentoring programs reported positive outcomes for nursing faculty including but not limited to the improved morale, higher career satisfaction, increased self-confidence, increased professional development, increased publication, obtaining more grants, and quicker promotion for both faculties and students. This is where future leaders are well developed and through mentoring, if well applied, it gives a sustainable model to nurturing new staff or students in systematic way. Although a mentorship model is not well developed in teaching and learning among Rwandan nursing and midwifery schools, evidence on pre-requisites for an effective mentorship program would enhance the implementation process of the curriculum for achieving the desired outcomes in an institution (Ekong & Sun, 2017). Similarly, Noseworthy, (2017) asserted in her study that the mentorship programs for new graduate nurses could be one way to support learning, promote professional growth, and enhance the quality of the nursing practice environment. This framework is important to nursing and midwifery schools, if considered into curriculum, in Rwanda to prepare future

healthcare leaders including those who will be managing pregnant women at the health centres of Rwanda. They should start to be familiar with the model of mentorship at the school level and at clinical sites to develop their capabilities in decision making for quick actions in simulated scenario or real cases of PPH management. Educators are recommended to revise their curriculum each year to adjust for any recommended changes in practice and update the new information about current practices to manage PPH. While developing a model for mentorship about prevention of maternal death, including PPH management, there is a need for collaboration with academic faculties and hospitals to institutionalize the recommendations and new guidelines for managing PPH for pre and in-service nurses and midwives.

Nursing and Midwifery Practice

The role of nurses and midwives in managing PPH is critical. Their knowledge and practice can have limitations and mentorship proposes a way forward to address the issue (Tenaw et al., 2017). The published literature discussed the importance of AMTSL in preventing and managing PPH cases and proposes that it can be improved with appropriate interventions like in-service trainings. Knowing the signs and symptoms and causes of PPH through in-service trainings could improve maternal outcomes. Making use of the knowledge gained from mentorship and changing routine practices for these professionals may improve maternal outcomes.

Recommendations for Future Research

The current research about assessing the impact of the educational mentorship on nurses' and midwives' knowledge and self-efficacy in managing PPH is limited. The changing scene for guidelines about PPH management gives credibility to the health research leaders on mentorship guidance.

- a. Nurse researchers should explore more about the impact of mentorship in nursing and knowledge retention, satisfaction and turn-over in nurses and midwives who were mentored to manage certain conditions including PPH. It is also suggested to conduct a longitudinal study to assert the effectiveness of the mentorship for a longer period.
- b. Educators and researchers are called upon to focus on the theory-based research about knowledge and self-efficacy in nursing students and how those could be interrelated as some may graduate with knowledge but lack self-confidence in performing tasks including managing PPH effectively. Additionally, defining a mentorship model at school level and specify the elements of mentorship program for its effectiveness is noted as paramount recommendation at pre-service. This study indicates that nurses and midwives increased their knowledge and self-efficacy in managing PPH after having a six-month period of mentorship. Further studying this effect, research could determine if this directly relates to lowering maternal deaths due to PPH. This could lead to the improvement and maintenance of strategies that help reduce maternal deaths and thus, respond to the Ministry of Health's target of reducing the maternal death rate in Rwanda.

Conclusion

The findings of the study support the use of the educational mentorship about PPH management to improve nurses' and midwives' knowledge and self-efficacy. The acquired knowledge and the increase in self-efficacy could potentially help to reduce maternal deaths from PPH. It is also a bridge between hospitals and academics since all of them are working for the best maternal outcomes. Therefore, this study addressed the question of whether mentorship could positively impact nurses' and midwives'

knowledge and self-efficacy in managing PPH at the level of health centres of Rwanda. Further research is needed to determine if continuation of the mentorship model could potentially help reduce maternal deaths due to PPH and therefore respond directly to the Rwanda health sector strategic goal to reduce maternal deaths in Rwanda.

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List of Appendices

Appendix A

Guidance to readers: This questionnaire has Three parts: (1) Demographics, (2) Knowledge, and (3) self-efficacy.

- Knowledge main areas are highlighted according to sub-scales. AMTSL in yellow, PPH management in green, PPH agreement in blue and PPH causes in purple.
- Self-efficacy is the same however, PPH agreement was not included in self-efficacy scales.

1. STUDY QUESTIONNAIRE

Code:..... Date.....

Instructions

- Please do not write your name on the questionnaire
- Please tick one most appropriate response on the brackets provided
- Where no responses provided, please write on the spaces provided.

I. DEMOGRAPHIC CHARACTERISTICS

SECTION A: IDENTIFICATION

Q1. What is your age in years?.....Years

Q2. What is your gender?

1. Male

2. Female

Q3. What is your marital status now?

1. Married

2. Single

3. Separated

4. Divorced

Q4. What is your highest level of education?

1. Secondary
2. Advanced diploma
3. Bachelors
4. Masters

SECTION B: TRAINING AND EXPERIENCE**Q5. What is your professional qualification now?**

1. Registered midwife
2. Registered nurse
3. Registered nurse-midwife
4. Associate nurse
5. Any other? specify.....

Q7. How many years have you worked in a labor and delivery?.....years**Q9. Have you ever been trained on the following? (Tick all training attended)**

1. AMSTL- Active management of third stage of labor
2. Bimanual compression
3. Manual removal of the placenta
4. Abdominal aortic compression
5. None of the above
6. All of the above
7. 1, 2 and 3
8. 1 and 2
9. 1 and 3

10. 1 and 4
11. 2, 3 and 4
12. 2 and 3
13. 2 and 4
14. 3 and 4
15. 1, 3 and 4

II. KNOWLEDGE ON MANAGEMENT OF PPH

For questions 10 to 13, on the components of active management of third stage of labor, please indicate true (T), false (F) or I do not know (DK)

Components	True(T)	False(F)	Do not know (DK)
	1	2	3
Q10. Administration of a uterotonic			
Q11. Early cord clamping and cutting			
Q12. Controlled cord traction with counter traction			
Q13. Uterine massage			

Q14 a). Are prophylactic uterotonic agents used in management of third stage of labor?

1. Yes

2. No

b) If no, please give reasons.....

c) If yes, which prophylactic drug of choice is commonly used?

1. Oxytocin

2. Ergometrine

3. Misoprostol

4. Combination

Q15. What is the dose for your choice above.....

Q16. When is the usual dose of the uterotonic drug administered?

1. At delivery of anterior shoulder for single baby

2. Within one minute after delivery of infant

3. After delivery of placenta

4. At the first sign of excessive blood loss

For questions 17 to 21, please indicate your response against the columns provided(tick)

Components	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	1	2	3	4	5
Q17. Newborn suckling on a breast plays an important role in preventing postpartum hemorrhage					
Q18. Active management of 3rd stage of labor is evidence based, effective care					
Q19. Active management of 3rd stage of labor should be routine in low-risk women					
Q20. Physiological management of 3 rd stage of labor should be routine in low-risk women					
Q21. I believe that I can predict which women require active verses expectant management					

Q22. How would you recognize PPH immediately after delivery?

1. Measuring blood loss after delivery

2. Observing maternal vital signs

3. Soaked linen after delivery

4. Any other specify.....

For questions 23 to 26, on causes of PPH please indicate True (T), False (F) OR I do not know (DK)

Causes	True	False	Do not know
	1	2	3
Q.23 Uterine atony			
Q. 24 Trauma/lacerations of the birth canal			
Q.25 Retained products of conception			
Q26. Thrombolytic disorders			

Q27. What would be your first response on diagnosing PPH?

1. Call for help
2. Explore the cause
3. Arrest the bleeding
4. Any other, specify.....

IV. SELF-EFFICACY TO MANAGE PPH

This survey addresses Post-Partum Hemorrhage. Please indicate *how confident you are to manage Post-Partum Hemorrhage about the following behaviours*. Circle the number that best matches your response, e.g. a score of 0 there is no confidence to manage PPH at all, a score of 50 means you are confident at 50% while 100 means that you are 100% confident.

	Post-Partum Hemorrhage management behavior	Not confident at all	Very confident
1.	Administration of uterotonic at appropriate time.	0 10 20 30 40 50 60 70 80 90 100	
2.	Early cord clamping and cutting.	0 10 20 30 40 50 60 70 80 90 100	
3.	Controlled cord traction with counter traction of the uterus.	0 10 20 30 40 50 60 70 80 90 100	

4.	Uterine massage.	0 10 20 30 40 50 60 70 80 90 100
5.	Examine the completeness of placenta.	0 10 20 30 40 50 60 70 80 90 100
6.	Early breast feeding.	0 10 20 30 40 50 60 70 80 90 100
7.	Early vital signs taking.	0 10 20 30 40 50 60 70 80 90 100
8.	Measuring blood loss after delivery	0 10 20 30 40 50 60 70 80 90 100
9.	Recognise signs and symptoms of PPH after delivery.	0 10 20 30 40 50 60 70 80 90 100
10.	Diagnose uterine atony as the cause of PPH after delivery.	0 10 20 30 40 50 60 70 80 90 100
11.	Diagnose trauma as the cause of PPH after delivery	0 10 20 30 40 50 60 70 80 90 100
12.	Diagnose tissue as the cause of PPH after delivery	0 10 20 30 40 50 60 70 80 90 100
13.	Recognise clotting factor as the cause of PPH after delivery	0 10 20 30 40 50 60 70 80 90 100
14.	Action to take if PPH is diagnosed	0 10 20 30 40 50 60 70 80 90 100
15.	Call for help and assign tasks if PPH is diagnosed	0 10 20 30 40 50 60 70 80 90 100
16.	Provide information to the woman	0 10 20 30 40 50 60 70 80 90 100
17.	Bimanual compression to the uterus	0 10 20 30 40 50 60 70 80 90 100
18.	Suturing of vaginal/perineal tears	0 10 20 30 40 50 60 70 80 90 100
19.	Suturing of episiotomy	0 10 20 30 40 50 60 70 80 90 100
20.	Manual removal of retained placenta/fragments	0 10 20 30 40 50 60 70 80 90 100
21.	Time to refer when needed	0 10 20 30 40 50 60 70 80 90 100

Mentorship visits:

Appendix B

Permission to Use Knowledge Tool from Mutunga

Authorization to Sandra to use the questionnaire's thoughts

Good afternoon Sandra, this is the edited letter to authorize you, Go ahead and all the best

Unfortunately, am not in a place where i can scan the document once i sign, hope this will be of help.

Thanks

Elizabeth

Appendix C

Ethical Approval from Western University



Date: 9 August 2018

To: Dr. Mickey Kerr

Project ID: 111863

Study Title: Assessing the Impact of Educational Mentorship for Nurses and Midwives on Knowledge and Self-efficacy to Manage Post-Partum Hemorrhage in Health Centers of Rwanda

Application Type: HSREB Initial Application

Review Type: Delegated

Full Board Reporting Date: August 21, 2018

Date Approval Issued: 09/Aug/2018

REB Approval Expiry Date: 09/Aug/2019

Dear Dr. Mickey Kerr

The Western University Health Science Research Ethics Board (HSREB) has reviewed and approved the above mentioned study as described in the WREM application form, as of the HSREB Initial Approval Date noted above. This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

Documents Approved:

Document Name	Document Type	Document Date
CLEAN STUDY QUESTIONNAIRE ON POSTPARTUM HEMORRHAGE	Paper Survey	26/Jul/2018
Sandra - Final proposal without track changes	Protocol	Received July 26, 2018
Sandra's letter of information and consent form last	Written Consent/Assent	26/Jul/2018

No deviations from, or changes to, the protocol or WREM application should be initiated without prior written approval of an appropriate amendment from Western HSREB, except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University HSREB operates in compliance with, and is constituted in accordance with, the requirements of the TriCouncil Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2); the International Conference on Harmonisation Good Clinical Practice Consolidated Guideline (ICH GCP); Part C, Division 5 of the Food and Drug Regulations; Part 4 of the Natural Health Products Regulations; Part 3 of the Medical Devices Regulations and the provisions of the Ontario Personal Health Information Protection Act (PHIPA 2004) and its applicable regulations. The HSREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000940.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Karen Gopaul, Ethics Officer on behalf of Dr. Joseph Gilbert, HSREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).

Appendix D

Ethical approval from University of Rwanda



CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 10th /07/2018

MUSABWASONI Marie Grace Sandra
School of Nursing and Midwifery, CMHS, UR

Approval Notice: No 253 /CMHS IRB/2018

Your Project Title *"Assessing the Impact of Educational Mentorship for Nurses and Midwives on Knowledge and Self-efficacy to Manage Post-Partum Hemorrhage in Health Centers of Rwanda."* has been evaluated by CMHS Institutional Review Board.

Name of Members	Institute	Yes	Involved in the decision	
			No (Reason)	
			Absent	Withdrawn from the proceeding
Prof Kato J. Njunwa	UR-CMHS		X	
Prof Jean Bosco Gahutu	UR-CMHS	X		
Dr Brenda Asimwe-Kateera	UR-CMHS	X		
Prof Ntagimira Joseph	UR-CMHS	X		
Dr Tumusiime K. David	UR-CMHS	X		
Dr Kayunga N. Egide	UR-CMHS	X		
Mr Kanyoni Maurice	UR-CMHS	X		
Prof Munyamshongore Cyprien	UR-CMHS	X		
Mrs Ruzindana Landrine	Kicukiro district		X	
Dr Gishoma Darius	UR-CMHS	X		
Dr Donatilla Mukamana	UR-CMHS	X		
Prof Kyamanywa Patrick	UR-CMHS		X	
Prof Cordo Urutesi Jeannine	UR-CMHS		X	
Dr Nyirazinyoye Laetitia	UR-CMHS	X		
Dr Nkeramuhigo Emmanuel	UR-CMHS		X	
Sr Maliboli Marie Josee	CHUK	X		
Dr Mudege Charles	Centre Psycho-Social	X		

After reviewing your protocol during the IRB meeting of where quorum was met and revisions made on the advice of the CMHS IRB submitted on 6th June 2018, **Approval has been granted to your study.**

Appendix E: Districts letters approval

REPUBLIC OF RWANDA

Gicumbi 06th September 2018



NORTHERN PROVINCE
GICUMBI DISTRICT

To the Chairperson Institutional Review Board
College of Medicine and Health Sciences, UR

Subject: Your request of data Collection for student.

Dear Sir,

We are pleased to inform you that MUSABWASONI Marie Grace Sandra, a student at University of Rwanda, School of Nursing and Midwifery is permitted to carry out the research data collection for his research entitled *"Assessing the impact of educational mentorship for nurses and midwives on knowledge and self-efficacy to Manage Vaginal Bleeding after Childbirth in all selected health centres of Gakenke, Rulindo and Gicumbi"*.

MPAYIMANA Epimaque
Executive Secretary of Gicumbi District

Cc:

- ✓ Mayor of Gicumbi District
- ✓ MUSABWASONI Marie Grace Sandra

REPUBLIC OF RWANDA

Gakenke, 29/08/2018
N° 442/07.04.02/DHU



NOTHERN PROVINCE
GAKENKE DISTRICT
PO BOX 152 RUHENGERI

✓ Marie Grace Sandra MUSABWASONI
UR/CMHS/School of Nursing and Midwifery /KIGALI
Contact: +250788541285

Re : Study Approval.

Dear Marie Grace Sandra,

Reference is made to your letter of 27th August 2018, requesting an authorization to carry out a study at all health centers in Gakenke district catchment area,

We are pleased to let you know that you are given a go ahead to start your study aiming at assessing the impact of educational mentorship for nurses and midwives on knowledge and self-efficacy to manage vaginal bleeding after childbirth.

Sincerely,

NZAMWITA Deogratia.

Mayor of GAKENKE District



Cc :

- Vice Mayor in charge of Social Affairs/GAKENKE
- Acting Executive Secretary of District/GAKENKE
- Director General of Nemba and Ruli hospital/GAKENKE
- Director of Health Unit/GAKENKE
- Acting Head of health center (All)/GAKENKE.

REPUBLIC OF RWANDA



NORTHERN PROVINCE
RULINDO DISTRICT
Ref:Health Unit

Rulindo 30/8/2018
N°526/07.0401.04

To: Mrs Marie Grace Sandra MUSABWASONI

RE: PERMISSION TO CONDUCT A STUDY

Reference made to your letter requesting a permission to conduct a study entitled "Assessing the impact of educational mentorship for nurses and midwives on knowledge and self-efficacy to manage vaginal bleeding after childbirth" in all health centres of Rulindo district from 30th August 2018 to 15th February 2018. I would like to inform you that you are allowed to conduct the above said study.

I also take this opportunity to request you to provide a copy of a study report to the management of Rulindo district after its completion.

Sincerely,

Emmanuel KAYIRANGA
Mayor of Rulindo District



CC:

- Governor of the Northern Province
- Heads of health centres.....(all)

Appendix F

Letter of Information



Project Title: Assessing the Impact of Educational Mentorship for Nurses and Midwives on Knowledge and Self-efficacy to Manage Vaginal Bleeding after Childbirth of Rwanda

Document Title: Letter of Information and Consent

Principal Investigator:

Dr Michael S. Kerr, PhD
Arthur Labatt Family School of Nursing
Western University
London ON, Canada

Co-Investigator

Marie Grace Sandra Musabwasoni,
Graduate student, MScN candidate, leadership in Nursing education

Member

Dr Yolanda Babenko-Mould, PhD
Arthur Labatt Family School of Nursing
Western University
London ON, Canada

1. Invitation to Participate

You are invited to participate in a study, referred to as “Assessing the Impact of Educational Mentorship for Nurses and Midwives on Knowledge and Self-efficacy to Manage Vaginal Bleeding after Childbirth”, which is being conducted by a team of researchers from Western University, Canada. The purpose of this letter is to provide you with information that will help you to decide whether to participate in the study or not. You are encouraged to read this carefully and ask questions if anything is unclear to you. As a person who regularly takes care of pregnant women, including those who present with significant bleeding after childbirth, we would like to hear from you so that further potential interventions and prevention strategies can be developed.

2. Why is this study being done?

Vaginal bleeding after childbirth is a worldwide problem, which can put women’s lives at risk. In Rwanda, more than 70% of all maternal deaths are attributable to vaginal bleeding after childbirth that typically occurs within four hours of delivering the baby. It is therefore critical for health professionals to be able to provide adequate care to bleeding women, especially nurses and midwives, because four hours after childbirth, women are still in their hands. Failing to

address this issue could result in women continuing to be at risk of dying from childbirth. One potential strategy for reducing deaths related to vaginal bleeding after childbirth is to provide ongoing education and training to the health professionals who provide care to pregnant women during their labour and delivery, especially Midwives and Nurses who are their main caregivers. The purpose of this study is to assess the impact of mentorship on nurses and midwives 'knowledge and self-efficacy to manage vaginal bleeding after childbirth. In this study, you will be asked to complete the study survey before and after mentorship regarding your understanding about vaginal bleeding after childbirth and the level of confidence you possess related to managing vaginal bleeding after childbirth.

3. How long will you be in this study?

This study will be conducted using the following process: after enrolling in the mentorship program conducted by TSAM, you be asked to participate in this study. Then, if you consent to participate in this study, you will be asked questions related to knowledge and self-efficacy about management of vaginal bleeding after childbirth, as well as a short demographic questionnaire that we will use to help describe the study sample. Thereafter, you will be mentored for the period of six months, once a month according to the TSAM program. Immediately, after the last session of mentorship you will also answer the same questions of knowledge and self-efficacy about management of vaginal bleeding after childbirth. The study will compare the pre and post mentorship data to see if there was any change in knowledge or self-efficacy from the mentorship process. The TSAM mentorship program will take place at your work place according to the schedule agreed upon by your employer.

4. What are the study procedures?

For this study, the researcher will collect information from you before and after the educational mentorship at your workplace. A self-administered questionnaire will be used at pre and post educational mentorship. The purpose of the questionnaire will be to compare your knowledge and self-efficacy about management of vaginal bleeding after childbirth before and immediately after the mentorship program. The questionnaire will take about 20 to 25 minutes to complete. The information you provide is for research purposes only. You can choose not to answer questions if you wish. Questionnaires will be asking:

- Information regarding your identification, such as names and we will provide ID code only for the purpose of comparing pre-and-posttest assessment. your age, gender, marital status and level of education. In addition, training and working experience is asked too
 - Knowledge about vaginal bleeding after childbirth and how to manage it
 - Level of confidence while managing vaginal bleeding after childbirth
- You are free to complete the questionnaire in your health facility and return it completed on the same day to the researcher. Even though you may have provided information on a questionnaire, these responses will not be reviewed by anyone from your health care team as only the researchers will have access to this data. The data will be entered into a computer for statistical analyses in such a way that

your information will be anonymous and can not be traced back to you. The TSAM mentorship program will involve 140 nurses and midwives in health centers from three districts of the Northern province of Rwanda. G power calculation gave a number of 71 participants. However, we anticipate that up to 90 trained nurses and midwives will be randomly enrolled in this study to avoid problems related to drop out of the study. Participants are eligible to participate if they agree to the study procedures, sign a consent form, are a nurse/midwife working in labour and delivery at the health centre and enrolled in the educational mentorship program of the TSAM for management of vaginal bleeding after child birth. Exclusion will consist of any nurse /midwife who is not working in the labour and delivery at the health center, nurses and midwives who where not enrolled in the educational mentorship of the TSAM about management of vaginal bleeding after childbirth, and anyone who is below 18 years old will not be eligible to participate.

5. What are the risks and harms of participating in this study?

There are no known risks to participating in this study.

6. What are the benefits of this study?

The TSAM mentorship is intended to improve maternal health outcomes in Rwanda. By participating in this study, you may benefit from having an opportunity to evaluate how knowledgeable you are about maternal bleeding and which level of confidence do you have in managing vaginal bleeding after childbirth. This may help you to move forward with extra knowledge and skills for managing vaginal bleeding after childbirth and encourage your colleagues to attend future educational sessions which aim to improve maternal health outcomes. Further, the study will contribute to the research literature on management of vaginal bleeding after childbirth.

7. Can participants choose to leave the study?

Your participation in this study is voluntary. You may refuse to participate at any time, refuse to answer any questions or you may withdraw from the study at any time.

8. How will participants' information be kept confidential

In this study, code numbers are the most used for every participant. However, names should be needed to ensure the real participant at pre and post educational mentorship assessment. The de-identified data will be accessible by the study investigators only. All identifiable information will be deleted from the dataset collected so that individual participant's anonymity will be protected. Paper copies will be stored in locked cabinets separate from study data and electronic data will be password protected. If the results are published, the data that will be shared on will not contain any information that can identify you and the name of your workplace 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 from the surveys in this study will be kept for seven years and then destroyed.

9. Are participants compensated to be in this study?

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

10. What are the rights of participants?

You do not waive any legal rights by signing the consent form. Volunteering for this study or not participating in it will not affect your enrolment in the TSAM educational mentorship. In addition, this will not interfere with your continuing educational mentorship as a health care provider. You will receive a copy of this letter of information and a consent form to sign. You have a right to know the results of your part in this study. If you would like to receive a copy of the overall results of this study, please put your name on a blank piece of paper and give it to the investigator when you return your questionnaire.

11. Whom do participants contact for the questions?

If you require any further information regarding this research project or your participation in the study you may contact the principal investigator: Mickey S. Kerr, PhD, Western University, London ON, Canada.

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Human Research Ethics at Western University. The Health Service Research Ethics Board (HSREB) is a group of people at Western University who oversee the ethical conduct of research studies there. The HSREB is not part of the study team. Everything that you discuss with them will be kept confidential.

12. Consent

A consent form will be provided for you to sign prior to your participation in the study. *This letter is yours to keep for future reference.*

Appendix G
Consent Form



Participant's Consent form

STUDY TITLE: ASSESSING THE IMPACT OF EDUCATIONAL MENTORSHIP FOR NURSES AND MIDWIVES ON KNOWLEDGE AND SELF-EFFICACY TO MANAGE VAGINAL BLEEDING AFTER CHILDBIRTH

Principal Investigator: Michael Kerr, PhD

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.

Print Name of Participant

Signature

Date (DD-MMM-YYYY)

Print Name of Person Obtaining
Consent

Signature

Date (DD-MMM-YYYY)

My signature means that I have explained the study to the participant named above. I have answered all questions.

Curriculum Vitae

Marie Grace Sandra Musabwasoni
 Graduate Student in Nursing/Leadership in Nursing Education
 Arthur Labatt Family School of Nursing
 Western University
 London, Ontario

EDUCATION

Degree	University	Department	Year
Ongoing master	Western University	Nursing	Up to date
BScN	University of Rwanda	Midwifery	2015
A1	Kibungo School of Nursing and midwifery	Nursing	2009

EMPLOYMENT HISTORY

Rank	University	Department	Year
Tutorial Assistant	University of Rwanda	Nursing and Midwifery	2015-
Head of midwifery Department	University of Rwanda / Kibungo campus	Nursing and Midwifery	2015-2017
Clinical Instructor	University of Rwanda/ Kibungo campus	Nursing and Midwifery	2013-2015
Clinical Instructor	Kibungo School of Nursing and Midwifery	Nursing and Midwifery	2009-2013

HONOURS

Purpose	Location	Year
Master educator in competence-based education (CBE)	Comoros	2017
Trainer of trainers on CBE	The Netherlands	2016
University of Rwanda delegation to Belgium, Representing midwifery department invited by Artevelde Hoge School/Guent	Belgium	2015
Invited by UNFPA (United Nations for Population Funds) on introduction of e-learning material for nursing and midwifery schools	Rwanda	2015
Invited by Management Health Sciences (MHS),	Rwanda	2015

USAID and RHSSA (Rwanda Health Systems Strengthening Project). In 10days workshop on leadership, Management and Governance, representing Rwanda Association of Midwives

Invited in one day Fourth Regional Pain Management Symposium East, Central and Southern African Region By The AGA KHAN University Hospital and Neurological Society of Kenya Rwanda 2016

Invited to facilitate a five-day workshop on emergency Obstetric and Neonatal care by Maternal Newborn and Child Survival Program (MCSP/Jhpiego) Rwanda 2015-2017

Invited by International Confederation of Midwives (ICM) To facilitate competence-based education workshop Univerisite de Santé Public in Moroni Comoros 2017

Teaching Undergraduate (2010-2017)

Module number

Module name/Unit name

Fundamentals of Nursing/Ethics and the Law

Midwifery I

Neonatal and Child health care

Midwifery II

Community midwifery

Clinical placement

PUBLICATIONS AND PRESENTATIONS

Life summary

Manuscripts published
Presentation at professional conference

Number

1
3

Details

Manuscript published

Musabwasoni, S. M. G. & Oudshoorn, A. (2019). Considering Healthcare Insurance to Uninsured Individuals in Rwanda. Rwanda Journal of Medicine and Health Sciences 1(2), 1-3. doi.10.4314/rjmhs.v2i1.10.