UNIVERSITY of RWANDA

KNOWLEDGE AND SKILLS' RETENTION IN HELPING BABIES BREATHE TRAINING AMONG MIDWIVES AND NURSES IN RWANDA

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DECLARATION

I, KANKINDI Felicite, do hereby declare that this project entitled "**KNOWLEDGE AND SKILLS' RETENTION IN HELPING BABIES BREATHE TRAINING AMONG MIDWIVES AND NURSES IN RWANDA**" Submitted in Partial Fulfillment of the Requirements for the Master Degree in Nursing at University of Rwanda, College of Medicine and Health Sciences, is my original work and was not previously submitted elsewhere. I also do declare that a complete list of references is provided indicating all resources of information quoted or cited.

Date and signature…

Names: KANKINDI Felicite
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DEDICATION

I sincerely dedicate this work:

To my beloved spouse for his care and support during my studies

My daughters for love and patient

My mother for special care and basic education

All my relatives and friends.

Finally to my classmates for the best moments shared

ACKNOWLEDGEMENTS

ABSTRACT

Background: Globally, each year approximately 10 million babies do not breathe immediately after birth. The first minutes following birth are critical to decreasing neonatal mortality. Birth asphyxia (BA) was defined as a deprivation of oxygen to the baby immediately after birth, was classified as the second leading cause of neonatal death worldwide. The current burden of the problem leads to 39% of neonatal death in Rwanda. To reduce neonatal mortality rate related to intrapartum birth asphyxia, country has made an effort by integrating Helping Babies Breathe (HBB) training among healthcare providers. A pre-post and follow-up test has been done to assess the retention of knowledge and skills after HBB training.

Objective: To assess the retention of HBB knowledge and skills after six weeks of training among midwives and nurses working in selected health centers in Kigali.

Methods: The quantitative approach with quasi experimental design was used. Ethical clearance has sought. Knowledge of the trainees was evaluated before, post and follow-up test 6 weeks after the training. A total population sampling was used to select participant nurses and midwives from four selected health centers in Kigali. The training used the second edition HBB curriculum. A post course skills assessment was done on Neo-Natalie mannequin. A descriptive, and inferential statistical analysis; Paired sample T-test and ANOVA were used to compare the mean score of the results from pre- immediate post- and follow-up test after six weeks, relationship between factors and outcomes. Data were presented in the tables, p-value less than 0.05 was considered significant.

Results: Sixty participants completed the course. The analysis of the findings revealed that an improvement was reported six weeks after the training. The overall mean score in assessment of the level of knowledge was 0.82 in pretest, 0.91 immediately after training and 0.96 in follow-up after six weeks. There were improvement observed through OSCE six weeks after the course. The practice has been retained overall mean score of 0.72 to 0.97 six weeks after training. The mean score difference was statistically significant in knowledge and practice as per experience. (P= 0.045 and P = 0.035 respectively)

Conclusion: Midwives and nurses who participated in a training of HBB second edition can significantly improve the level of knowledge and skills for at least six weeks.

Keys words: Helping babies breathe, knowledge, skills, midwives and nurses, retention.

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LIST OF ACRONYMS AND ABBREVIATIONS

APGAR: Activity, pulse, grimace, appearance, respiration

BA: Birth asphyxia

CPD: Continuous professional development

GDA: Global Development Alliance

HBB: Helping baby to breathe

HC: Health center

KS: Knowledge and Skills

LMICs: Lower middle income countries

MCQs: Multiple choice questions

MDGs: Millennium development goals

NGOs: Non-Governmental Organizations

NMR: Neonatal mortality rate

OSCE: Objective Structured Clinical Examination

RA: Research assistant

RAM: Rwanda association of midwives

SD: Standard deviation

RDS: Respiratory distress syndrome

RNP: Neonatal Resuscitation Program

SDGs: Sustainable development goals

UN   : United Nation

UNFPA: United Nations Sexual and Reproductive health Agency

UNICEF: United Nations Children's Emergency Fund

UR: University of RWANDA

USAID: United States Agency for International Development

WHO: World Health Organization

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CHAPTER ONE: INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

Globally, up to 2.7 million babies die in the first 28 days of life and the problem of neonatal mortality rests nearly totally on lower resources settings with an estimated one million newborn deaths happening in Africa Sub-Saharan region every year (UNICEF/WHO/World Bank, 2016). Thirty five percent of these deaths are caused by intra-partum-related hypoxia (Mendehi et al., 2019p16-27).

Helping Babies Breathe (HBB) is an evidence-based program conceived by the American Academy of Pediatrics to reduce neonatal mortality caused by asphyxia associated with birth prossess in lower resource settings (Kamath et al., 2018p573-591). Research indicates that HBB training has expanded adequacy and revealed success in training providers with neonatal resuscitation knowledge and skills (Tabangin M.et. al, 2018p165).Despite effort done to decrease a high number of neonatal mortality related to BA, the ratio of neonatal mortality is still high in lower resources setting. Hence Rwanda through Ministry of health and its partners in collaboration with Rwanda association of midwives (RAM) initiated HBB training among health care providers to diminish the neonatal mortality caused by birth asphyxia, while its remain at 16.5 per one thousand live births (MOH, 2016).

The chapter one discussed the background of the problem, the problem statement, the purpose, objectives, the rationale, research question, and significant of the study, theoretical and conceptual framework, and the scope of the study.

1.2. BACKGROUND TO THE STUDY

Each year, approximately 10 million babies failed to respire directly after birth, six million among them have need of assistance which may not receive on time and lead to severe complications and death (Mendhi,M,M.,Cart mell,KB.,Newnan,S.D.,Premji,S.andPope,C.2019). BA refers to a deprivation of oxygen to a newborn immediately after birth. Worldwide child's risk of dying is high in the first 28 days of life, among the causes of death, in 2017 World health

organization(WHO) estimated that 40 per 1,000 life birth deaths are due to birth asphyxia Approximately, 662,000 deaths occurring every year in low resource settings are caused BA.

In Rwanda, BA is the second top reason of neonatal mortality, its ratio fall gradually from 59.1 deaths per 1,000 live birth in 1968 to 16.5 per 1,000 live (Ashish K.et.al, 2016).

On current trends, more than sixty countries will fail to achieve SDGs target of decreasing neonatal mortality to at least as small as twelve deaths per 1,000 live birth. However there are number of neonatal interventions that healthcare facilities can apply to diminish some of the causes of new born mortalities such as, HBB, KMC, and early initiation of breast feeding(Griffin et al.,2017p3). For instance HBB training has been effective to decreasing preventable newborn deaths to attend a target of 12 newborn deaths per1,000 live births or less by 2030 (UNICEF&WHO, 2016).The Helping Babies Breathe course is a neonatal resuscitation course established by the American Academy of Pediatrics (AAP) in 2010, was intended teaching of appropriate drying, stimulation ,cleaning the air way if necessary and bag –mask ventilation excluding training in advanced techniques such as chest compression in addition to drug use (Kamath-rayne et al., 2018p573-591).

To bring down the number of deaths from BA, effective low cost interventions (HBB) training was proved to reduce a high ratio of neonatal death (Serbanescu et al., 2019p48-67). Sufficient knowledge and skills on HBB is mandatory in order to provide adequate assistance to neonate in need of resuscitation (Ndazima, 2017p52-63).A study done in Nepal showed HBB training of facility birth attendants reduced significantly neonatal mortality. Another study conducted in Tanzania has shown that HBB training among health care providers has reduced neonatal mortality to 47% in the first days of life and 25% in fresh still births within a period of two year (Msemo et al., 2015).

Different studies showed knowledge and skills improved subsequently to HBB training ; yet a study conducted in Nagpur and Belgaum, India and Kenya showed that skills dropped more than knowledge over time and it was recommended that ongoing skills practice and monitoring,

more frequent retesting, and refresher trainings are needed to maintain neonatal resuscitation skills(Bang et al., 2016p81-85).Hence, another study done by Musafiri, 2013 a retesting in three months post training showed that the knowledge was retained but in contrast practical skills had deteriorated among health care providers in two district health and one Tertiary hospital (Musafiri et al., 2013p34-38).

1.3. PROBLEM STATEMENT

Although effort done to reduce neonatal mortality, preventable neonatal mortality rate is still high in low setting countries (Gobezayehu et al.,2014p22-31).Worldwide each year, 2.7 million neonates die within the first four weeks of life, a quarter of them, are due to intra-partum-related hypoxia(Kamath et al.,2018p539).Ten million babies who did not breathe closely at birth ,six million of them have need of basic neonatal resuscitation, 99% of the total deaths occur in low income countries, sub –Sahara African (Drake et al.,2019p51). There is a decline of knowledge and skills in high income countries and few data are available related to HBB training in lower middle income countries .However, poor retention of knowledge and skills after the training represents a significant barrier to improving neonatal mortality worldwide(Reisman et al.,2016p2).

It was reported in the current data for Rwanda neonatal mortality rate was 16.5%, despite effort made to achieve SDGs number three and to fight against death in neonates; the country has been adopted HBB course and midwives and nurses have been trained on HBB (Kasine, 2017p75-81).In In Rwanda, little is documented about retention of HBB knowledge and skills among trained health personnel and especially nurses and midwives working in health centers while they deliver HBB care. The only available study was done on first edition HBB knowledge and skills post training outcome evaluation by Musafili in 2013 in only referral and two district hospitals while this training was settled to help the babies in lower level setting. Therefore this study intends to assess the retention of Knowledge and skills six weeks after HBB training among midwives and nurses working in selected health centers in Kicukiro District.

1.4. AIM OF THE STUDY

The main aim of this study was to assess the retention of knowledge and skills six weeks after HBB training among midwives and nurses working in selected health centers in Kicukiro District.

1.5. RESEARCH OBJECTIVES

1. To assess pre-training knowledge on HBB training among midwives and nurses working in four selected health centers in Kicukiro District.
2. To evaluate immediate post training level of knowledge and skills on HBB among midwives and nurses working in four selected health centers in Kicukiro District.
3. To analyze the level of knowledge and skills retention six weeks after HBB training among midwives and nurses working in four selected health centers in Kicukiro District.

1.6. RESEARCH QUESTIONS

This study was guided by the following research questions:

1. What is the level of knowledge on HBB in pre- HBB training among midwives and nurses working in four selected health centers Kicukiro District?
2. What is the level of knowledge and skills two days post- HBB training among midwives and nurses working in four selected health Kicukiro District?
3. What is the level of knowledge and skills retention six weeks after HBB training among midwives and nurses working in four selected health centers in Kicukiro District?

1.7. SIGNIFICANCE OF THE STUDY

Midwives and nurses are attended to have enough knowledge and skills of basic neonate resuscitation including helping babies to breathe training during performing a delivery in order to reduce neonatal mortality. Though different studies done in some counties like Kenya, Ethiopia, Nepal, Tanzania and Rwanda show that midwives and nurses including others providers, may not have adequate knowledge in term of carrying neonates and providing respiratory support.

The results of this study attend to be a baseline for further studies with aim of defining retention of knowledge and skills on Helping Babies Breathe. This study may help also as a foundation for

further studies exploring the strategies that could enable midwives and nurses post-training retention.

Generally, findings from this study are useful as far as nursing education is concerned. Therefore guide trainers at national level, hospitals and health centers and even regional level in planning effective and successful neonatal health related trainings. With study findings and recommendations, there will be reduction of neonatal mortality rate through education.

The results of this study inform the stakeholders to review the existing nursing curriculum in neonatal care particularly on the side of neonatal resuscitation. Findings from this study are helpful to nursing practice by applying the acquired knowledge and skills toward newborn care to reduce of neonatal mortality. Although this study is beneficial to nursing leadership and management as it will be used for strategic plan towards maternal and neonatal wellbeing.

1.8. DEFINITION OF KEY CONCEPTS/OPERATIONAL DEFINITION

Knowledge: It is an understanding of theoretical or practical components and knowing basics on sequences of protocol (Bingham A.et.al, 2015p62).In this study, knowledge was used for explaining theoretical understanding that nurses and midwives have on HBB.

Skills: Capacity of performing or demonstrating HBB steps adequately with hands on (Bingham A.et.al, 2015).In this study, skills was simultaneously replaced by practice.

Retention: According to Ramusam, retention is the capacity of absorbing and remembering what have been learnt and demonstrated (Ritter, F.E., Baxter, G., Kim, J.W and Sunivasmurth, 2013).In this study, retention was used to show how trainee has kept information in mind.

Training: The process to improve in job performance, to acquire skills and knowledge to do new jobs, and to continue their career progress in a changing world of work (Sunivasmurth, (2013).Training was used by researchers during data collection in term of providing the theoretical and practical course on HBB second edition.

Helping Babies breathe (HBB): Is a procedure done to resuscitate the newborns who lack to start spontaneous breathing at birth (Arabi et al., 2016p439-442).

In this study, HBB was taken as all kind of procedures done to initiate spontaneous respiration to the baby who failed to breath after birth like drying and rubbing the baby for in helping babies to breathe tactile stimulation; clearing the airway and via bag and mask.

Baby: Newborn of less than 30 min after birth who needs basic care or to be resuscitated (Anderson, R.C and Shifrid, Z, 2017p24).In this study a baby was used the same like a newborn.Neo Nathalie has been named a baby in HBB training.

Nurse: World Health Organization (WHO) defined a nurse as person trained to care for the sick or infirm, especially in hospital. In this study a nurse was given to a licensed person who has general information and skills in providing care in health setting ,no a specialization in midwifery practice.

Midwife: According to WHO definition, a midwife is a trained and licensed health professional who helps women during labor, delivery, and after birth of their babies' .In this study a midwife was used to specify a person with a diploma in midwifery

The Golden minute: time from birth to the ventilation with bag-mask (Academy of Pediatrics, 2010).In this study; the Golden minute was taken as the minimum time (in between 60 second) to start supporting a baby by giving respiratory support by ambu- bag and mask.

1.9. STRUCTURE/ ORGANIZATION OF THE STUDY

This study is made of two key part consists of title page, declaration, dedication, acknowledgement, abstract, table of contents, a list of symbols and abbreviations/acronyms, a list of tables , a list of figures and list of annexes.

The second part consists of chapter one for introduction, chapter two for literature review, chapter three for methodology, chapter four research findings, chapter five the discussion, chapter six for the summary, conclusion, and recommendation, references and appendices.

1.10. CONCLUSION TO CHAPTER ONE

This preliminary chapter of this research work gives a direction of the study that conducted. It shows the background to the study, statement of the problem, research question, the aim and objectives as well as the significance of the study and the definition of concepts that are complemented by the next chapter of the literature review to make a sounding flow of systematic enquiry.

CHAPTER TWO: LITERATURE REVIEW

2.1. INTRODUCTION

A review of relevant literature is conducted to generate a picture of what is known and not known on the topic (Burn &Grove, 2010p 141).This chapter of literature review highlighted the theoretical literature, empirical literature where HBB was discussed in term of knowledge and skills retention by different researchers and then gaps within the literature were identified .

The literature was obtained through using search in Google, Google scholar, PubMed, Hinari and Cochrane data base. The searching key word was "Helping Baby Breathe, HBB knowledge, HBB skills retention". The researcher explored all theoretical and empirical literature written on this topic. The literature reviewed different articles, journals and books provided information's on the knowledge and skills of nurses and midwives in pre, post and after HBB courses done in the different interval and follow-up for retention.

2.2. THEORETICAL LITERATURE

The theoretical literature includes concept, maps, theories, and conceptual frame that support a selected research problem and purpose (Burn & grove, 2010p142).To frame this study the selected theory and framework have been addressed.

Addressing the patient's needs is crucial in providing quality care. Conferring to Henderson, the inimitable role of the nurse is to support a ill and healthy person, emphasizing the importance of increasing the patience's independence for a quick recovery (Yunas et al., 2015p443-450). During HBB, healthcare provider assists the baby to meet the first physiological need of breathing by providing assistance within the golden minute (Ashish et al., 2017).

Virginia's need theory in nursing and midwifery practice is measured near to pragmatism and is adapted in the framework of HBB. This theory enable nurses and midwives to increase the standard of caring by evaluating and addressing the baby's needs to breathe (Ahtisham et al., 2015).

HBB is an American Academy of Pediatrics course, established in partnership through the World Health Organization (WHO), reinforced by the United states Agency for International Development (USAID), Save the Children, Latter-day Saint Charities, Laerdal Global Health, Johnson & Johnson and a number of other global health organizations.

USAID uses the term Global Development Alliance (GDA) with the goal of attaining an important reduction in neonatal morbidity and mortality, through consolidation the performance of providers who are able to prevent and manage newborn asphyxia in low-resource setting through partnership model that aims to identify and exploit o++n common or complementary interests among partners that work together to improve social and economic conditions in lower developed countries for achieving SDGs targets three (Arabi et al.,2016p439-442).

HBB course is a neonatal resuscitation course developed by the AAP specifically for resource-limited setting to decrease neonatal mortality rate. It was launched since 2010 and has been implemented in 80 countries around the world and has been established to be low cost and active interventions in improving neonatal health outcome in low setting resources (Kasine, 2017). HBB course uses low-fidelity technology and an affordable mannequin with simulated scenarios integrating the knowledge and skills, HBB course can be also applied at all levels in the health setting (Arabi et al., 2016p44-61).

The quality midwifery practice are coordinated and integrated within the health system to ensure a continuum of essential care provided throughout pregnancy, birth and beyond. At each delivery a skilled birth attendant is responsible to provide the baby's assisting to breathe (Serbanescu et.al, 2019 pp48-67).The AAP has proven the significant role that play a large intervention at lower low-resource settings by developing a simplified tool and method of educational to health care providers about newborn resuscitation through HBB training (Seto,2015p225-232).

The purpose of the review of HBB first edition curriculum is to strength education in order to promote and retain skills for quality care and rise neonate survival rate worldwide .Kamath-Rayne et al., 2018p573-591). Helping Babies Breathe (HBB) has been simplified as an evidence-based science and supporting guidelines, it is the first update since HBB launched in 2010.

 The new curriculum focuses on quality improvement, has objective to reduce new born mortality rate to seven per 1,000 live birth by 2035 for achieving the goal, currently, around 400,000 providers in 77 countries received HBB training and the materials have been interpreted to be understandable for twenty six languages (Msemo et al., 2015p45-56).The revision of the course comprise also a debate on the dangers of unnecessary and persistent suctioning, ;time to clamp cord and initiating ventilation ,and a good assessment of baby's chest for efficacy of ventilation, (KC et al., 2016p104-109).

The Utstein formula provided a framework for HBB second edition curriculum as a way for predicting survival from sudden cardiac arrest. Three model elements hypothesis for survival rates was summarized (figure: 1). The HBB framework uses Medical sciences, Educational Efficiency with a quality simulation and Role play at low dose with high frequency training and Local Implementation (Seto et al., 2015p58)
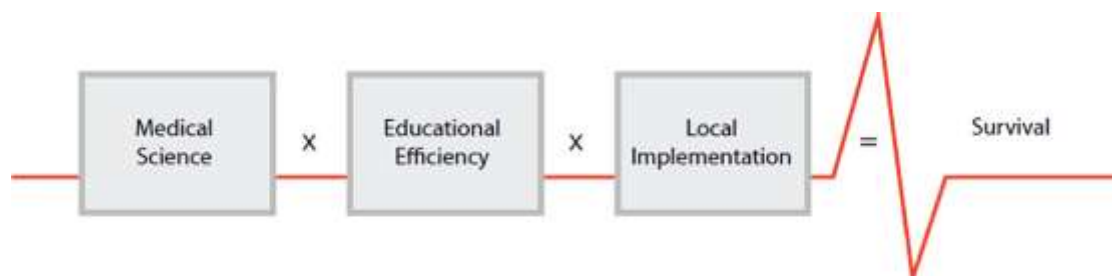
Figure 1. The Utsein Formula for Survival

The revision of HBB first edition curriculum intended to address health providers' gaps in neonatal resuscitation, offers exemplary for educational (Kamath-Rayne et al., 2018p78).

Figure 2. Helping Babies Breathe steps / AAP second edition

According to the AAP(2010), there are four steps of HBB ,in different color ,the first step concern birth preparation whereby a skilled birth attend identified an assistant, revise the emergency plan prepare a place for birth, prepare her or himself then check the ventilation equipment for functioning.

The second step is the routine care where after delivery a skilled birth attendant dry thorough, check for crying, preserve warm ,assess respiration ,then clamp or tie and cut the umbilical cord.

The Golden minute, third step in yellow color, the skilled birth attended will keep baby warm, clear airway and stimulate if necessary and check if the baby is breathing well (Serbanescu et al.,2019p48-67).

The Golden minute is the key concept of HBB; in one minute of birth, a baby should breathing spontaneously or assisted , positioned for beginning ventilation with a bag and mask. (Academy of Pediatrics, 2010). The ventilation will be maintained for normal or abnormal heart rate until the spontaneous breathing, even improved if needed and evaluation of heart beat, activate the

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emergency plan while reassuring the family. As HBB is an emergency procedures always material are kept disinfected and cleaned for the following use and managed properly (Kamath-Rayne et al., 2018).

HBB uses a learner –centered educational as methodology for learning with emphasis on mastery of basic skills. In other to facilitate learning there are graphs, color-coded print materials cheaper and high fidelity to simulate neonatal resuscitation and easy for users in workplace to sustain skills, with target of reduction of neonatal mortality rate (AAP, 2016). According to the literature, learner provides performance improvements in knowledge and practice too slow on first use to become more serviceable and remove mistakes in performance (Kim et al., 2013).HBB can be used as well as in high level and in lower health settings for effective management of preventable causes of death but did not replace neonatal resuscitation program (Tabangin et al, 2018p163-171).

 It is important to understand how acquired knowledge and skills are retained and should be maintained in the longer term through the process of retention (Bloom et al., 2017).According to Bloom's theory of knowledge and skills (KS), educational model is based into six levels: Knowledge, comprehension, application, analysis, synthesis and evaluation. With this hierarchy of Bloom's theory showing that at the advanced stages (dependency) learner will be guided by attained prerequisite knowledge and skills at the lower levels.

2.3. EMPIRICAL LITERATURE
Research examining knowledge and skills retention on HBB were conducted in various settings with different results. This section of literature review describes knowledge and skills retention between health care providers in lower resources setting.

2.3.1. Determining pre-training knowledge and skills on HBB
A study done in Honduras in a community hospital, physician recorded higher score on the pre-test in multiple choice and OSCE, while nurses proven a greater mean difference scores after training (Eblovi et al., 2017p59-70).
Another study conducted in Ugandan among midwives into two cohort from 2013-2014, a written pre-test revealed marks ranging from 32% to 54%, with an average of 52% for the first

cohort against 5% to 70% and average was 40%(Serbanescu et al.,2019p48-67). A large study done in Kenya, Pakistan, showed that prior the training was done only 2 % of learners passed pre-training MCQ (Bang et al., 2016p81-85).

Also, a study done in Sudan between midwives, pretest results were very low (Arabi et al., 2016p439-442).However, a research done in Nepal,2017, disclosed that 41% of the learners passed the "Routine care" scenario pre HBB training, the level of knowledge similar to the study done in Kenya and Pakistan. In the study done in Rwanda by Musafiri in 2013 evaluating the education effectiveness of HBB program of the participants scored low in written test.

Another study conducted in Nepal evaluating HBB quality improvement on retention of neonatal resuscitation, knowledge score was 12.8 ± 1.6 before the training (Eblovi et al., 2017).

2.3.2. Proving training on HBB

HBB training has been shown to diminish newborns and children death under 5 years to at least as low as 12 per 1,000 live births (Ashish et.al, 2017p82-85). The quality midwifery practice are coordinated and integrated within the health system to ensure a continuum of essential care provided throughout pregnancy, birth and beyond. At each delivery a skilled birth attendant is responsible to provide the baby's assisting to breathe (Serbanescu et.al, 2019 pp48-67).

HBB training influence on knowledge and skills retention, in evaluation done months following the training, knowledge test graded 99%, fell to 81% at the completion of the course (KC et al., 2016). According to Bloom's learning theory, training and tutoring are considered to expand knowledge and performance through retention.

2.3.3. Measuring post training HBB knowledge and skills

A study done by Eblovi(2017) discovered that 41% of the learners passed the "Routine care" scenario pre HBB training as compared to 74% post training, 7 months after the one-day courses. In the same direction, a study done to assess birth attendants' knowledge and performance in neonatal resuscitation and newborn care systematically improved from passing knowledge scores in pre-training from 46.1% to 88.6% in the post HBB training (Goudar et al., 2013).

Moreover, in a study done in Nagpur, Belgaum, India Eldoret and Kenya, results showed knowledge tests enhanced from 74 to 99% knowledge and skills. However 5% are able for properly ventilation a newborn mannequin properly prior to be trained, 97% delivered the post-initial ventilation training test against 99% for OSCE (Bang et al., 2018).

The study done in countryside Ghana on retention and use of newborn resuscitation skills succeeding a series of HBB training for midwives, directly following training, the mean OSCE score was 17.1/18 (94.9%).Another study conducted in Nepal evaluating of HBB quality improvement of neonatal resuscitation skills, on 137 care providers were joined in the study knowledge scores were developed follow-on HBB training (Ashis KC et al., 2017p103).

2.3.4. Evaluating Knowledge and skills retention six weeks after HBB training

A study done in South Africa showed that if prior HBB training was given, the knowledge score for midwives were extended from 63% to 97% ,has concluded that no associations amid midwives' training and qualification, but the researcher found relationship with prior knowledge and years of experience (Ndzima-Konzeka, 2017p65-69).

Another study conducted in Nepal, Knowledge scores were greater nearly following the HBB training, 16.4 ± 1.4 compared to 12.8 ± 1.6 before (out of 17), and the knowledge was retained six months after the training 16.5 ± 1.1(Ashish et al.,2017p84).

HBB training successfulness may depend on two sides; as one individual (trainer and trainees) and facility characteristics; lack of individual motivation and adherence of the staff contribute negatively to knowledge and skills retention after HBB training (KC et al., 2016p96). Despite many researchers found knowledge, skills and insufficient resources are complained as cause of inadequate knowledge and skills retention after training, it was also found that provider's neglect and resistance to change is a main cause (Kim et al., 2013p107-109).

HBB training considerably improved HBB knowledge and skills, however skills weakened further than knowledge within the time; to monitor, to retest, and to refresh regularly are desirable to preserve up HBB knowledge and skills (Bang et al., 2016p86).Adherence to HBB

training protocol in post training period is very important to maximize provided care and to achieve to good neonatal outcome. Though, sometimes as trained persons practice their common routines in health settings and delay to act in the golden minute.

A study done in Malawi to assess Midwives' observance to HBB guidelines after training was done, found that only eight out of 19 resuscitation steps were followed by midwives (Bang et al., 2016). The study done in Nepal showed that weekly review and reflection meetings facilitated the health care providers to retain 7.4% of their knowledge and skills on HBB.

A study done in three districts of Uttar Pradesh , India found that after one year of HBB training the retention in knowledge scores was lower than the skill score level among doctors and nurses. The study concluded that it might be due to the methodology of training (Das et al., 2018p89).
In the study done in India assessing retention of knowledge and skills of birth attendants in newborn care and resuscitation after 1 year in clinical practice, there was a major improvement in knowledge scores between doctors: 42% -85% and nurses:35%-86% and skills scores 15%-89% for doctors to 15%-90% for nurses after training. In this study there was significant retention of knowledge the part of doctors 58% against 52%.

Another study done in Botswana, Lesotho, Malawi, and Swaziland, follow-up was performed at three and nine to twelve months post-training and showed a significant loss in knowledge. Although knowledge-skills gaps observed later after one year (Wang et al, 2018). The author concludes that the difference in retention could be attributed to the training methodology and opportunity of refresher course through the skill laboratory (Das et al., 2018pp90).

Furthermore a study done to assess HBB what happens to knowledge and skills over time, there is deterioration of skills to the side of birth attendants from tertiary care facilities, no prior resuscitation training, and also the timing of training. The author conclude that HBB training improved significantly HBB knowledge and skills , but there is a decline of skills compared to the knowledge over the time, to that refresher trainings are suggested to retain knowledge and skills up to date (Ashish et al.,2017p103).

2.4. CRITICAL REVIEW AND RESEARCH GAP IDENTIFICATION

After reviewing literatures on HBB second edition on knowledge and skills retention, little was documented about HBB skills and retention on second edition. Most of researches found are on the 1st edition. Various literatures were conducted in different countries in Africa and in other lower resources countries, assessed knowledge and skills of provider's towered first edition HBB training (Seto et al., 2015p225-232).

Hence second edition HBB training, is a scientific revision of the first HBB edition, this study was made to make awareness of the existing second edition HBB training, steps were highlighted like drying throughout the baby instead of doing routine suctioning of air way, expectant management of the baby with meconium stained amniotic fluid, limiting suctioning , initiating and continuing effective ventilation until spontaneous respiration, information on delaying cord clamping, to initiate ventilation previously cutting the cord then a further assessment of the chest to improve the success of bag mask ventilation (Kamath-Rayne et al., 2018p47-58).

However little is documented on HBB second edition over there is limited information on knowledge and skills retention about HBB second edition in the lower health level of setting .This study about knowledge and skills retention has contributed to the relevant information to be used by research for the following researches .An improvement during OSCE six weeks after the training was observed in the variables of drying thoroughly the baby, clamps or ties and cuts the cord all the trainees have done well these steps. Hereafter the researcher intents to cover that gap by conducting this study.

2.5. CONCEPTUAL FRAME WORK

The conceptual framework is the nature of the study that founded on a specified conceptual model to show the definition of the variables used in the study and allow the reader to know the study's structure and organization. The conceptual framework that guided this study was directed from a conceptual model of Bloom's theory of learning that reveals a philosophy of educational behind cognitive and skills (Bloom et al., 2017).

Demographic data: Age, sex, professional experience, Level of education, previous training in HBB	Pretest score on prior knowledge level on HBB	Training on HBB: Knowledge level & skills level	Immediate score on HBB: knowledge &skills level

Knowledge and skills retention in HBB: Level of retention according to the score six week for follow-up test
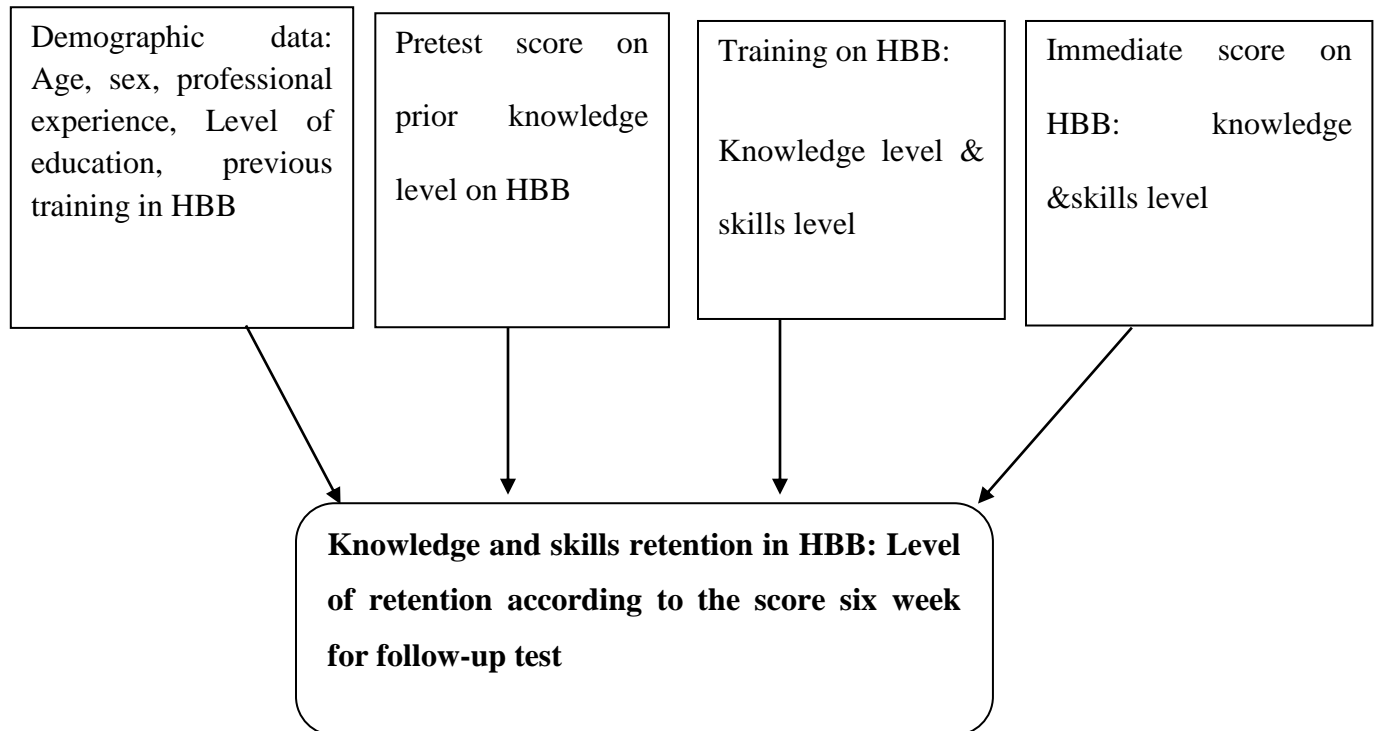
Figure 3: Conceptual framework (Adapted by Bloom's theory of Knowledge and Skills)

This study has two types of variables; independent variable and dependent variable. Prior knowledge on HBB, training in HBB level of knowledge and skills, immediate score on HBB knowledge and skills, demographics data whereby level of education, professional ,age, sex, are independent variable and the dependent variable or outcome is the retention knowledge and skills on HBB .

Retention of learned information can be defined as having long-term information stowed in memory in such a way that it can be readily recovered, for instance in response to standard stimuli. Bloom's work on the three domains of learning described as Knowing/head, psychomotor as doing/hands and affective domain or attitudes (Bloom et al., 2017).

The framework of this study draws upon learning theory can be categorized into two domains cognitive as knowledge and Skills as psychomotor domain (KS). In this study and the same for others whereby knowledge and skills, Bloom's theory of learning highlighted that the higher the level of knowledge and skills depend on the prerequisite at lower levels.

The trainee acquired knowledge through the course by understanding, recalling, examining, correcting and then improve the cognitive level. By observing, applying and coaching as psychomotor, hands on and or physical skills (Bloom et al., 2017). Furthermore, varied studies found that knowledge is linked to practice, a study done Tanzania in Zanzibar, shown that knowledge influence skills, participants retained knowledge and used them in clinical practice towards a baby who was in need of breathing (Wilson, 2017 p12).

In a study done in Rwanda evaluating HBB knowledge and skills for health workers at hospital, results have shown that knowledge improved by 14% immediately after the course to 75 and 95% as well as for practice (Musafili et al., 2013p34-38).

2.6. CONCLUSION TO CHAPTER TWO

After the review of literature revealed overhead, this study brings new knowledge on retention of HBB among nurses and midwives in health centers .Affective domain which is the third domain according to Bloom's theory of learning was not assessed and the study suggested to be evaluated in future research due to the time constraint. There is needs to do further research about the appropriate time to do a refresher course.

More research to determine the reason why skill decline faster than knowledge, more investigation are necessary to identify the reason behind. Furthermore the researcher intents to identify the level knowledge and skills retention after HBB training at different phases and intervals, some factors associated to the retention were stated.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. INTRODUCTION

This chapter describes the methodology and approach that were used to achieve established objectives. Methods in research shown   target population, sample size, data collection procedures, instruments used and data analysis method. The chapter described the management and dissemination of the data, ethical consideration, limitation and challenges encountered by researcher.

3.2. RESEARCH DESIGN

This study used quasi experimental design .The purpose of this design in nursing is to examine cause and effect relationship between selected independent and dependent variable, to determine the effects of nursing interventions(independent variables) on patient outcome(dependent variable).Various studies have been done in nursing to determine the effect of doing intervention and the outcome(Perry2019p79).

The current study has been used this approach to assess the level of retention of knowledge and skills after a training on HBB second edition among nurses and midwives working in four selected health centers . One group: pre-test, post- test and six week follow-up test of the trainees were done, an immediate questionnaire pre-test was given to nurses and midwives.

3.3. RESEARCH APPROACH

This study used a quantitative approach. A quantitative approach is a non-experimental approach based on post-positivism .Its uses numbers and correct data measurements to examine different causes and their influences and outcome to make generalization about a phenomenon and the results based on interpretation of data measurements (Bacon, 2013p37).

A quantitative, descriptive design. According to Burns & Grove(2010) classification of quantitative design, this study used quasi experimental design .The purpose of this design in nursing is to examine cause and effect relationship between selected independent and dependent variable, to determine the effects of nursing interventions(independent variables) on patient outcome(dependent variable).

Various studies have been done in nursing to determine the effect of doing intervention and the outcome. A quasi-experimental study has been conducted to determine the effect of teaching on medication knowledge of the patients (Burns Grove, 2010p37). The current study has been used this approach to assess the level of retention of knowledge and skills after a training on HBB second edition among nurses and midwives working in four selected health centers . One group: pretest, post- test and follow-up test of the trainees were done, an immediate questionnaire pretest was given to nurses and midwives. After ending a pre-test, participants were trained on HBB for two days was then a posttest and OSCE assessment have be given , a follow-up test 6 weeks after the training (Evers et al., 2006p174).

3.4. RESEARCH SETTING
The research was conducted in Kicukiro district in Kigali city. Compared to other two districts (Nyarugenge and Gasabo) Kicukiro was selected to conduct this study for the following reason:
The first criteria to select this research setting for the study was based to the Rwanda Ministry of Health demographic survey that current data shown in Kicukiro district there is lower level of attendance to the recommended four antenatal visits, only 20% attended the recommended number of visits .The lack to antenatal care can contribute to poor neonatal outcome after birth.

The second reason was based to the significant rate of still birth (19%) , the third reason to select Kicukiro district the post natal care was at 38% , which is considered at a lower level of quality(Annual Health Statistics Booklet,2016).

This study was conducted in four health centers out of the total ten; including Gatenga health centers (HC) with 14 nurses and one midwife, Gahanga HC with 13 nurses and one midwife, Kicukiro HC the nurses represent a number of 16 and one midwife, Bethsaida with 14nurses and

two midwives. In Kicukiro district there are others HC; Gikondo, Masaka, Koilos, Busanza, Kabuga and Nyarugunga.
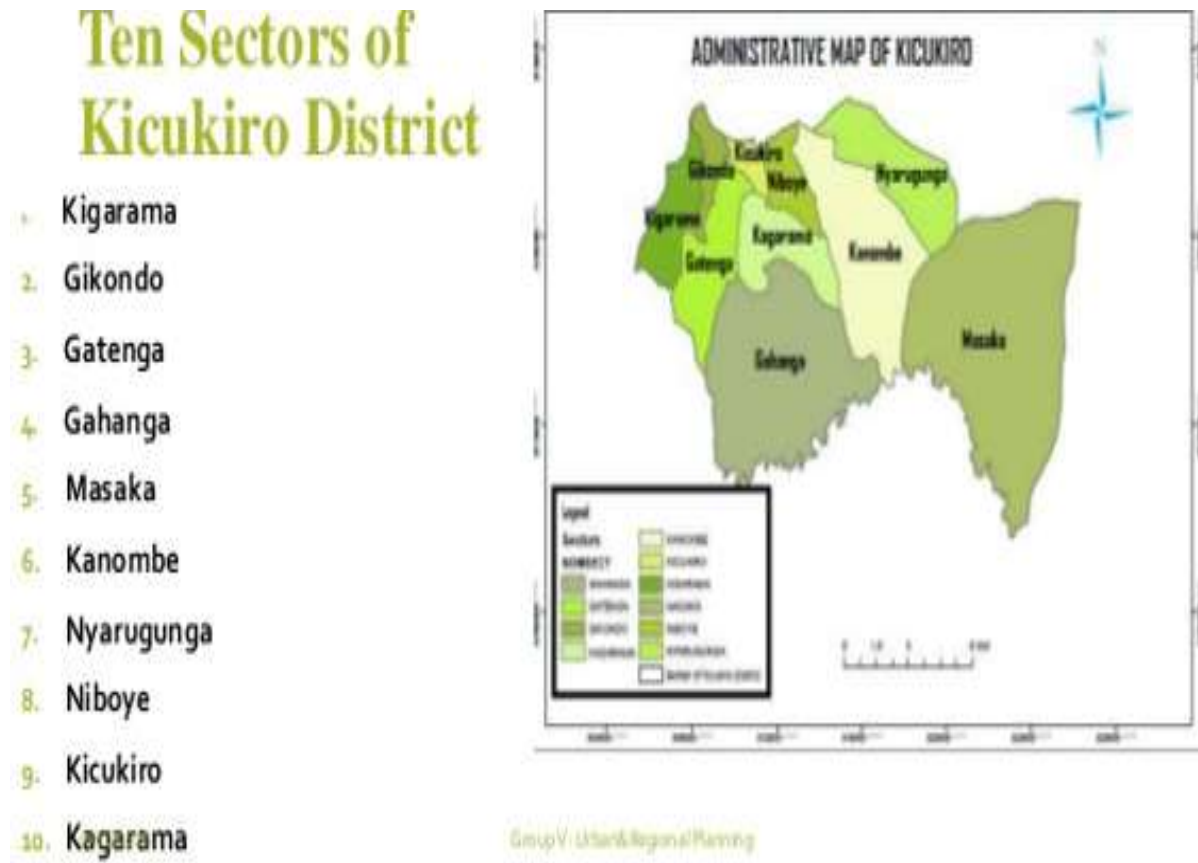
Figure 4.Map of Kicukiro district

3.5. STUDY POPULATION

A population is whole group of persons, substances or objects that meet inclusion criteria set by the research (Grove, Burns and Gray, 2013).The population involved nurses and midwives working in maternity during the period of data collection in four selected health centers in Kicukiro district and the entire population during the time for data collection was 62 nurses and midwives.

3.6. SAMPLING

This section discussed sampling strategy with inclusion and exclusion criteria. In research, it is critical to be carefully in order to make intelligent judgment about sampling, because the decisions have a major impact on the meaning and generalization of findings. (Burn &Grove, 2010p236-249).

3.6. 1. Sample size

The sample was composed of 54 nurses and 6 midwives who consented, met the criteria for selection and willing to participate in this study.

3.6.2. Sampling strategy

Sampling is the procedure of selecting study subjects from the population to be involved in the study sample and to signify the total population (Grove, Burns and Gray, 2013. In this study the criteria of selection of four research sites was purposive sampling whereby four health centers in ten health centers were selected in Kicukiro district catchment area (Palinkas et al., 2015).

To select the sample in the entire number of nurses and midwives working in selected four health centers, according to Taherdoost (2016);" the researcher should be able to collect data from all cases". A total population sampling strategy was used in data collection on each of four the health centers. Due to finite number of nurses and midwives working in the above health facilities, all available nurses and midwives willing to participate had be taken as study sample size and participants.

The selected four health centers have in total 61 staffs nurses and midwives; mainly Kicukiro HC with15nurses and one midwife, Bethsaida HC with 14 nurses and 2 midwives, Gatenga HC with 13 nurses and two midwives and Gahanga HC with 13 nurses and one midwife. Since this population is small, all available nurses and midwives allocated in each health center and consented were participated the research (Taherdoost, 2016p58-69).

3.7. VALIDITY& RELIABILITY OF RESEARCH INSTRUMENT

Validity is the extent to how a tool is measuring which is intended to measure. In this part, main types of validity namely; face validity, content validity, construct validity, criterion validity and reliability are discussed (Taherdoost, 2016p58-61).

HBB curriculum was validated by American Association of Pediatricians whereby a multiple choice questionnaire and OSCE from that curriculum was used for knowledge and skill assessment to the trained person using standardized neo Nathalie mannequins and standardized skill assessment modules. All the trainers were oriented on the skills assessment protocol and methodology to ensure uniformity.

The researcher and research assistants reviewed the questionnaire and a pilot research was done in order to appraise possibility, time, cost, adverse events, and expand upon the study design prior to performance of the full research. Content and face validity of the tool was guaranteed by developing the questionnaire boiled and adapted to AAP, 2nd edition HBB.

3.7.1The faces validity:

The face validity measures the validity of a tool informally on its face by observing of items .The American Association of Pediatrics validate the face validity of this tool providing a curriculum including a well-designed multiple choice questionnaires to be used during pretest posttest and also an well-structured check list in form of OSCE to be used in post and the same as questionnaire for follow-up evaluation (Polit and Beck, 2010).

3.7.2. The content validity:

The content validity measures carefully the construct of interest which is conceptually defined ensuring that relevant questions to assess the construct were asked. In this study, the tool was adapted from a validated questionnaire about assessment of knowledge and a checklist evaluating skills, the same tool was used again for assessment the retention of knowledge and skills 6 weeks later, the content validity was ensured. The tool was previously validated by experts in AAP to be effective in low setting areas (Taherdoost, 2016p74-79).

3.7.3. The construct validity:

The construct validity ensures that the tool is measuring the concept of interest. The instrument was valid in its construct as the research questions and objectives were related to the conceptual framework and all the concepts in term of knowledge and skills retention have been presented in conceptual framework and in the tool (Polit and Beck, 2010).

HBB curriculum was validated by American Association of Pediatricians whereby a multiple choice questionnaire and OSCE from that curriculum was used for knowledge and skill assessment to the trained person using standardized neo Nathalie mannequins and standardized skill assessment modules.

All the trainers were oriented on the skills assessment protocol and methodology to ensure uniformity. The researcher and research assistants revised the questionnaire and a pilot study was conducted (Sciences, 2017p78). Content and face validity of the instrument was ensured by developing the questionnaire based on the literature, in my study the check list was adapted to HBB 2nd edition.

Table 1.Construct validity of the instrument

Objectives of the study	Components of the conceptual framework	Second edition HBB tools
To determine pre-training knowledge and skills on HBB among nurses and midwives working in four selected health centers in Kigali.	KS: model Knowledge	Section A, all items (19).of multiples choice questionnaires
To provide HBB training to nurses and midwives working in four selected health centers in Kigali.	KS: model Provide HBB training(Cognitive/ theory and practice/ Skill	Theory and simulation on neo Natalie
To measure immediate post training level of knowledge and skills among nurses and midwives working in four selected health centers in Kigali.	KS: model Immediate test score	Section A, all items (19). multiples choice questionnaires and section B, all items(25) OSCE
To evaluate the level of knowledge and skills retention on HBB among nurses and midwives working in four selected health centers in Kigali.	KS: model Level of retention according to the score for follow-up test	Section A, all items (19). multiples choice questionnaires and section B, all items(25) OSCE

Reliability of the instrument:

Reliability refers to whether or not you get the same answer by using instrument measure something more than once. Its can measure the consistency of a tool over time or stability of a tool, it also measures consistency across different data collectors measuring the equivalence of the tool, and it also measures the consistency across items of the tool and the internal consistency is the commonly used and it is measured using reliability coefficient analysis (Cronbach alpha) which should be between 0.65 and 0.80 to be acceptable; the high the coefficient, the high the tool is reliable (Taherdoost, 2016p76).

The instrument that was adapted and used in this study is reliable in its internal consistency .The researcher and research assistants were several rehearsals together to avoid divergences in training and only questions from HBB second edition curriculum and equipment (neo Nathalie and ambi-bag) provided for the specific training were used. Then, a broad description of design, methodology, a control and recheck of tool variables and accompanying literature control to maintain clarity was considered.

This was enabled the findings of the research to be transferred to another similar context or situation and still preserve the meaning and interpretations of the study (Pilot and Beck, 2010).The instrument adapted in this study is on international standard ,it was applied to the context. The pilot study was done on six participants and the Cronbach alpha was 0.79.

3.8. DATA COLLECTION

This section discusses deeply on study data collection instrument and procedure that followed in gathering data.

3.8.1 Data collection procedure

After obtaining Ethical clearance from UR Institutional Research Board (IRB), and approval letter number 185 requesting permission for conducting the study in Masaka district hospital catchment area both approval were presented to each heath center's administration where the study have been conducted. A one hour of refresher course research with research assistant was

done on HBB second edition in order to have the same and common understanding on the tool to be used one day previous data collection .After that the researcher and research assistant contacted the study population to identifying sample subjects and participants. After getting signed informed consent for each participant, they received enough information regarding the study which has to be done.

Those who signed a consent form they were given a code which has to be used in pre-test posttest and follow-up test (Taherdoost, 2016p87). The data collection started after the staff meeting in all four selected health centers in order to make participants in the same condition and minimize bias.

In order to reach to all participants the researcher and research assistant in collaboration with the charge of each facility collaborated together in order to make a list of all nurses and midwives working in selected health centers according to their availability, they were called and encouraged to participate in the study.

The trainees have been identified and given a code for each one, a pretest multiple choice questionnaires was given to nurses and midwives before the course has been delivered , after that a course of two days with two hours in morning staffs meeting was done. The data collection started from 20 March and end May 8, 2019, the participants have been trained on HBB second edition theory and practice using simulation, case scenario and multiple choice questionnaires were used (Loomis, 2018p85).

Trainers explained theoretical components of the course and demonstrated the practice of HBB second edition on Neo Nathalie then each participant has time to simulate HBB practice on the same mannequin. Immediate feedback was provided to the trainees for improving in each step which was not well performed .For retention of knowledge   and skills a debriefing was done before closing the course of HBB.

For the second day a morning station of HBB practice for each participant then after posttest where knowledge and skills was assessed with multiple choice questions and an OSCE within 7 minutes for each participant (Loomis, 2018p96).

Six weeks later a follow-up test was provided at each selected health center with the same multiples choice questionnaires and the same OSCE in order to evaluate knowledge and skills retention along six weeks, participants were asked to use the same code as it was documented in pretest evaluation.

The study determine the level of knowledge and skills retention of HBB within nurses and midwives in four health centers, prior knowledge and skills, immediate post course assessment of knowledge and skills then a follow-up assessment of knowledge and skills after 6 weeks in order to determine the level of retention. After all data were kept together entry and further analysis.

3.8.2. Data Collection instruments

The tool was English version, a self-administered questionnaire with multiple choice questions from HBB second edition curriculum was used in pretest, post and follow-up test six weeks after training for assessing level of knowledge (Appendix1). Various literatures have done to assess the level of retention knowledge and skills toward HBB training among health care providers in different settings (Taherdoost, 2016p63).

A simulation baby Neo Natalie and kit with ambu- bag and mask and others material provided to the specific scenario of HBB was used to train nurses and midwives. An objective structured clinical examination OSCE was used to assess skills in post- test also six weeks after,the scenarios used were drawn from the HBB second edition program.

The Section A composed of socio-demographic records as well as age, code, sex, education level, profession, profession experience ,previous training in HBB ,this section has also 19 items (Appendix 1A) of multiple choice questions assessing level of knowledge ,each correct answer scored one mark and zero for wrong answer. The overall mean score in pre-test was 0.82 in post -test 0.92 and follow-up mean score was 0.96.

Section B was made by a summarized checklist (Appendix1B) with 19 items assessed the skills, each right intervention was scored one mark and zero to wrong or missed intervention. The overall mean score was 0.72 in post- test and 0.97 six weeks after the training.

3.8.3. Sampling criteria

Sampling criteria list the characteristics essential for membership in the target population (Burns & Grove, 2010 p236-237).

3.8.3.1. Inclusion criteria:

According the Burns & Grove (2010) the sample is selected from the population that comply the sampling criteria. Be a registered nurse and or midwife accept to participate in the research and be presents during the period of study were a muster.

3.8.3.2. Exclusion criteria:

Others staffs working in the four selected health centers with different profession to nursing or midwifery. Another criteria of exclusion was for nurses and or midwives for one raison or other are not allowed to work with the babies in need of HBB either for medical or ethical raison.

3.9. DATA ANALYSIS

Data analysis techniques vary in the ability to detect differences in the data (Burn &Grove, 2010p251-253). Data analysis involves the synthesis of all data collected in four selected health centers. Data collected from participants were entered, categorized and analyzed using SPSS version 21. Descriptive categories included age, gender, level of education, professional experiences and training received on HBB.

A descriptive and inferential statistic were done according to the distribution of data. Paired sample T-test analysis was done to compare the level of retention of two means and ANOVA was used to test the difference between the levels of retention of more than two means. The confidence interval of 95% and the probability of less than 0.05 was taken as statistically significant. The data were presented in tables and treatment of the text was made in Microsoft Office Word.

3.10. ETHICAL CONSIDERATIONS

This study was approved by Institutional Review Board (IRB) of University of Rwanda (Appendix 6). After obtaining Ethical clearance from, a letter requesting permission to collect

data was addressed to Masaka district hospital and a copy of permission from Masaka district hospital was addressed to each health center where the study has been conducted.

The research using human right as participants must ensure that human rights are conserved. (Fouke,G.and Mantzorou, M., 2011p74).

After presenting the ethical clearance to the participants, a voluntary consent form was signed by every participant. The purpose of the study was explained to the respondents and the confidentiality and privacy was ensured. Participants were informed that there is no compensation in terms of money, certificate and or others incentives, they were explained that they may decline at any time without concern, privacy of information collected has been reassured. Researcher has given to the participant the contact information of Chairperson of institutional authorizing the study to be conducted.

3.11. DATA DISSEMINATION

Findings from the study will be communicated to the University of Rwanda and the feedback will be given to health centers. The findings will be presented in the conferences, in seminars and also the article from this study will be published in peer review journal.

3.12. DATA MANAGEMENT

Data collected during the study was checked before they are entered in the software. After that, data were kept in locked cupboard and then destroyed after 5 years. By preventing the loss of data in case of loss of the computer, the back up like a flash disk was used.

3.13. LIMITATIONS AND CHALLENGES

Findings from this study cannot be generalized because nurses and midwives from all health centers from Kicukiro District were not attend the training and assessed. The environment was not also conducive for both teaching and assessment due to diary activities of health centers trainers and trainees were interrupted by the clients. Only two domains (cognitive and psychomotor) were assessed, the affective domain was not evaluated due to time constraint (Bloom et al., 1956).

3.14 .CONCLUSION TO CHAPTER THREE

This study used a quantitative approach and descriptive design, data collection procedure validity and reliability of the tool were emphasized.

CHAPTER FOUR: PRESENTATION OF RESULTS

4.0 INTRODUCTION

All 60 trainees completed the course. The main aim of the study was to evaluate the retention of HBB knowledge and skills after six weeks of training among nurses and midwives working in selected health centers in Kigali. This chapter presents the findings obtained after data analysis. The change in practice has been found, comparison of the level of retention according to the socio-demographic were presented in the tables below.

The background characteristics of data of participants were analyzed included age, professional experience, qualification and professional training and also previous training in HBB. The mean and SD for age of the health workers were calculated; mean and median years of professional experience in nursing and or midwifery were considered.

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Table 2: Socio-demographic characteristics of participants (n=60)

Variables	Frequency (n)	Percent (%)
Age (in years)		
Below 25	11	18.3
Between 25-35	36	60.0
Above 35	13	21.7
Gender		
Female	42	70.0
Male	18	30.0
Level of education		
Secondary school	15	25.0
Advanced diploma	45	75.0
Qualification		
Midwife	6	10
Nurse	54	90
Attended the training on HBB		
Yes	13	21.7
No	47	78.3
Experience (in years)		
Below 1 year	9	15.0
Between 1 year and 5 years	25	41.7
Above 5 years	26	43.3

The demographic and professional characteristics of the healthcare personnel who participated in the HBB training are shown in table two. All the 60 healthcare workers enrolled in the HBB completed the course. No participants dropped out of posttest and the follow-up evaluation .A great number 36(60.0%) is between 25-35 years old. Of them 42(70.0%) are female. Those who have advanced diploma represent the majority of participants (63%).

The majority was nurses 54(90 %). Participants who reported being trained on HBB were (11.7). The majority 26(43.3%) reported the experience of above 5 years, followed by those who reported the experience of between 1 year and 5 years.

4.2 THE LEVEL OF KNOWLEDGE ON HBB AMONG NURSES AND MIDWIVES WORKING IN KIGALI SELECTED HEALTH CENTERS

Table 3.The knowledge before (pretest), two days after training (posttest) and 6 weeks later (follow up test),(n%)

KNOWLEDGE ASSESSMENT ITEMS	CORRECT ANSWER		
	Pretest	Posttest	follow-up test
What should you do in The Golden Minute?	49(81.7)	52(86.7)	58(96.7)
Which baby is breathing well?	47 (78.3)	51(85.0)	59(98.3)
To prepare for a birth	51(85.0)	53(88.3)	59(98.3)
To prepare the area for delivery	42(70.0)	53(88.3)	59(88.3)
What should you do to keep baby warm?	52 (86.6)	56(93.3)	60(100.0)
What should you do to keep the baby clean?	53(88.3)	56(93.3)	60(100.0)
Which baby can receive routine care after birth?	49(81.7)	55(92.0)	60(100.0)
Routine care for a healthy baby at birth includes	53(83.3)	58(96.7)	60 (100.0)
When should the umbilical cord be clamped or tied and cut during routine care	51(85.0)	56(93.3)	60(100.0)
A baby is quiet, limp and not breathing at birth, what should you do	53(88.3)	59(98.3)	60 (100.0)
What should you do next steps to stimulate breathing?	49(81.7)	51(85.0)	57(95.0)
In which situation should a baby be suctioned	56(93.3)	58(96.7)	60(100.0)
Suctioning a baby unnecessarily or frequently can cause	42(70.0)	56(93.3)	60(100.0)
Which of the following statements about ventilation with bag and mask is TRUE	38 (63.3)	54(90.0)	58(96.7)
A baby s chest is not moving with bag and mask ventilation, what should you do?	43(71.7)	52(86.7)	57(95.0)
You can stop ventilation if	58(96.7)	60(100.0)	60(100.0)
A newborn baby's heart rate should be	56(93.3)	60(100.0)	60(100.0)
A baby who received ventilation	44(73.3)	51(85.0)	58(96.7)
When should the bag and mask and suction device be disinfected	58 (96.7)	60(100.0)	60(100.0)

The percentages of right answers before (pretest) and after a two day station (posttest) after the course and 6 weeks later (follow up) are presented in table 3. A positive modification was reported in posttest and follow up evaluation.

All participants gave collect responses to knowledge assessment items what should you do to keep baby warm, what should you do to keep the baby clean ,which baby can receive routine care after birth, routine care for a healthy baby at birth includes ,when should the umbilical cord

be clamped or tied and cut during routine care ,a baby is quiet, limp and not breathing at birth, what should you do ,in which situation should a baby be suctioned , consequences of unnecessarily or frequently suctioning ,when should the bag and mask and suction device be disinfected.

Table 4: Changes in knowledge 6 weeks after HBB training

KNOWLEDGE ASSESSMENT ITEMS	Pretest			Posttest in 2 days			Retention 6 weeks follow-up test	
	Mean	± SD	P	Mean	±SD	P	Mean	SD
What should you do in The Golden Minute?	0.81	0.39	0.083	0.86	0.34	0.013	0.96	0.18
Which baby is breathing well	0.78	0.41	0.045	0.85	0.36	0.004	0.98	0.12
To prepare for a birth	0.85	0.36	0.532	0.88	0.32	0.033	0.98	0.12
To prepare the area for delivery	0.70	0.46	0.001	0.88	0.32	0.013	0.98	0.12
What should you do to keep baby warm?	0.86	0.34	0.209	0.93	0.25	0.045	1.0	0.0
Which baby can receive routine care after birth?	0.81	0.39	0.135	0.91	0.27	0.024	1.0	0.0
Routine care for a healthy baby at birth includes.	0.88	0.32	0.024	0.96	0.18	0.568	0.98	0.12
When the umbilical cord should be clamped or tied and cut during routine care.	0.85	0.36	0.167	0.93	0.25	0.45	1.0	0.0
A baby is quiet, limp and not breathing at birth, What should you do for newborn baby is quiet, limp and not crying, the baby	0.88	0.32	0.013	0.98	0.12	<0.000	0.75	0.43
What should you do next does not respond to steps to stimulate breathing.	0.81	0.39	0.419	0.85	0.36	0.033	0.95	0.21
In which situation should a baby be suctioned	0.93	0.25	0.159	0.96	0.18	0.159	1.0	0.0
Suctioning a baby unnecessarily or frequently can cause	0.70	0.46	0.001	0.93	0.25	0.159	0.96	0.18
Which of the following statements about ventilation with bag and mask is TRUE	0.63	0.48	<0.000	0.90	0.30	0.045	0.96	0.18
Baby's chest is not moving with bag and mask ventilation, what should you do?	0.71	0.45	0.049	0.86	0.34	0.024	0.95	0.21
You can stop ventilation if	0.96	0.18	0.159	1.0	0.0	-	1.0	0.0
A newborn baby's heart rate should be	0.93	0.25	0.045	1.0	0.0	-	1.0	0.0
A baby who received ventilation	0.73	0.44	0.007	0.85	0.36	0.007	0.96	0.18
When should the bag and mask and suction device be disinfected	0.96	0.18	0.159	1.0	0.0	-	1.0	0.0
overall mean score	**0.82**			**0.91**				**0.96**

(P □ p value)

Change in knowledge six weeks after HBB training was reported in table four. Six weeks after training, there was change in score for knowledge assessment items, which baby is breathing well the mean score increased from 0.78 in pre-test to 0.85 in post-test then 0.98 in six week

follow-up test , suctioning a baby unnecessarily or frequently can cause, the mean score n pre-test was 0.70 to 0.93 and 0.96 in post-test.

4.3 THE LEVEL OF SKILLS ON HBB AMONG MIDWIVES AND NURSES WORKING IN KIGALI SELECTED HEALTH CENTERS.

Table 5: The percentages of correct action immediate after training and correct action six weeks later

Practice assessment items	OSCE2days after training	OSCE 6 weeks after training
Identifies a helper and reviews an emergency plan	33(55.0)	58(96.7)
Prepares the area for delivery (warm, well-lighted, clean)	32(53.3)	57(95.0)
Washes hands Prepares an area for ventilation and checks function of bag,	35(58.3)	53(88.3)
mask and suction device	45(75.0)	59(98.3)
Dries thoroughly	40 (81.7)	60(100)
Removes wet cloth	49(86.7)	57(95.0)
Recognizes baby is not crying	45(75.0)	54(90.0)
Positions head and clears airway	42(70.0)	53(88.3)
Stimulates breathing by rubbing the back	38(63.3)	56(93.3)
Recognizes baby is crying and breathing well	52(86.7)	56(93.3)
Clamps or ties and cuts the cord.	60(100.0)	60(100.0)
Positions skin-to-skin on mother's chest and puts on the head covering	42(70.0)	58(96.6)
Communicates with mother	32(53.3)	56(93.3)
Recognizes baby is not breathing	53(88.3)	57(95.0)
Cuts cord and moves to area for ventilation or positions by mother for ventilation	40(66.3)	55(91.6)
Ventilates with bag and mask within The Golden Minute Ventilates	41(68.3)	58(96.6)
at 40 breaths/minute (30-50 acceptable		
Evaluates for breathing or chest movement	42(70.0)	54(90.0)
Reapplies mask	41(68.3)	58(96.0)
Repositions head	44(73.3)	54(90.0)
Clears secretions from the mouth and nose as needed	44(73.0)	57(95.3)
Opens mouth slightly	40(66.7)	53(88.3)
Squeezes bag harder.	31(51.7)	57(95.0)
Recognizes baby is not breathing but heart rate is normal	42(70.0)	58(96.6)
Recognizes baby is breathing and heart rate is normal	41(68.3)	52(86.6)
Provides close observation for the baby and communicates with the mother	33(55.0)	56(93.3)

34

The percentages of correct action immediate after training and correct action six weeks later are presented in table 5. An improvement was observed during OSCE after training. However all participants practice correctly practice assessment items dries thoroughly, clamps or ties and cuts the cord.

Table 6: Changes in practice two days and six weeks after HBB training

ASSESSMENT ITEMS	OSCE 2 days			OSCE 6 weeks	
	Mean	± SD	P-V	Mean	± SD
Identifies a helper and reviews an emergency plan	0.55	0.42	0.002	0.97	0.12
Prepares the area for delivery (warm, well-lighted, clean)	0.53	0.44	0.004	0.95	0.17
Washes hands	0.58	0.39	0.012	0.88	0.22
Prepares an area for ventilation and checks function of bag, mask and suction device	0.75	0.27	0.049	0.98	0.11
Dries thoroughly	0.67	0.390	0.08	1.0	0.0
Removes wet cloth	0.82	0.25	0.048	0.95	0.17
Recognizes baby is not crying	0.75	0.20	0.038	0.90	0.20
Positions head and clears airway	0.70	0.29	0.034	0.88	0.22
Stimulates breathing by rubbing the back	0.63	0.40	0.022	0.93	0.18
Recognizes baby is crying and breathing well	0.87	0.22	0.123	0.93	0.18
Clamps or ties and cuts the cord.	1.0	0.0	-	1.0	0.0
Positions skin-to-skin on mother's chest and puts on the head covering	0.70	0.29	0.034	0.97	0.12
Communicates with mother	0.53	0.44	0.023	0.93	0.18
Recognizes baby is not breathing	0.88	0.22	0.234	0.95	0.17
Cuts cord and moves to area for ventilation or positions by mother for ventilation	0.67	0.39	0.032	0.92	0.18
Ventilates with bag and mask within The GoldenMinute Ventilates at 40 breaths/minute (30-50 acceptable Evaluates for breathing or chest movement	0.68	0.38	0.033	0.97	0.12
Reapplies mask	0.70	0.29	0.023	0.90	0.19
Repositions head	0.68	038	0.022	0.88	0.22
Clears secretions from the mouth and nose as needed	0.73	0.26	0.029	0.90	0.20
Opens mouth slightly	0.73	0.26	0.032	0.95	0.17
Squeezes bag harder.	0.67	0.37	0.028	0.88	0.22
Recognizes baby is not breathing but heart rate is normal	0.70	0.29	0.021	0.97	0.12
Recognizes baby is breathing and heart rate is normal	0.68	0.38	0.023	0.87	0.23
Provides close observation for the baby and communicates with the mother	0.55	0.42	0.032	0.93	0.18
Overall score	**0.72**			**0.97**	

(P = p value)

Improvement in score of practice immediate training, and after training 6 weeks later are presented in table 6. The improvement was statistically significant for practice assessment items of prepare area for delivery, prepare area for ventilation, recognize baby is crying and breathing well, and recognize baby is not breathing... (P<0.005).

Table 7: Comparison of the means of score by Socio-demographic information of participants after training

Variables	Knowledge		Practice	
	Mean score	p-value	Mean score	p-value
Age (in years)				
Below 25	0.91	0.435	0.92	0.643
Between 25-35	0.92		0.93	
Above 35	0.93		0.95	
Gender				
Female	0.90	0.342	0.92	0.212
Male	0.92		0.94	
Level of education				
Secondary school	0.90	0.045	0.91	0.046
Advanced diploma	0.98		0.98	
Qualification				
Nurse	0.96	0.221	0.90	0.034
Midwife	0.98		0.98	
Attended the training on HBB				
Yes	0.94	0.766	0.96	0.211
No	0.96		0.91	
Experience (in years)				
Below 1 year	0.94	0.065	0.92	0.035
Between 1 year and 5 years	0.96		0.94	
Above 5 years	0.97		0.98	

(P = p value)

Comparison of the means of score by Socio-demographic information of participants was carried out after training (table 7). In case of knowledge the difference was statistically significant between those who completed secondary school and advanced diploma holders (p= 0.045). The difference in mean scores was observed also in practice (p= 0.046). The difference in mean score was reported among nurses and midwives (p=0.034). The mean score difference was statistically significant in practice as per experience. (p= 0.035)

CHAPTER FIVE: DISCUSSION OF THE RESULTS

5.1. INTRODUCTION

The aim of this chapter is to discuss the findings from this study done to assess the level of knowledge and skills retention among nurses and midwives compared to previously published data in line with the objectives. The discussion focused on the level of retention of knowledge and practice 6 weeks after training in HBB among nurses and midwives in four selected health centers in Kicukiro District.

5.1. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

The demographic characteristics of participants were varied; the majority were aged between 25-35 (60%), nurses (90%), female (70%), the level of education, advanced diploma (75%), had not attended HBB training (78.3%).

5.2. PRE-TEST KNOWLEDGE ON HBB AMONG MIDWIVES AND NURSES WORKING IN FOUR HEALTH CENTER

HBB knowledge and skills is a key factor in determining competence in managing birth asphyxia. There are no study assessing HBB pre knowledge among midwives and nurses working in health centers, the findings of other studies will be considered in this aspect. In similar study done in India, pre-test score of knowledge was lower for nurses, 34 % against a score of 35% for doctors; there were no midwives in this study (Das et.al, 2018p89).There is congruence to previous studies shown that a low level of knowledge in HBB among care provider in different studies. The study done to document the impact of three days training on neonatal resuscitation, the pre-training status of knowledge was poor (Ashish, 2017p103).

The current study compared to the previous prior knowledge overall mean score was not low compared to another study done in Nepal evaluating quality improvement cycle on retention of neonatal resuscitation a prior knowledge-value was low. It was observed that when the HBB training introduced to a new country or a region, methods that have resulted in programs becoming effective (Bang et al., 2018p81-85).

A prior knowledge assessment of HBB among care provider nurses, midwives and doctors in different lower setting countries pretest level of knowledge provided the figure of trainee which

is guiding the provision of the training and the evaluation of knowledge and skills retention. In pretest assessment, only knowledge was assessed in this study , this challenge was a limitation for many others studies assessing knowledge and skills retention whereby a cognitive and psychomotor evaluation is recommended (Bloom, 2017).

The suggestion on prior knowledge and skills both assessments of learner's background and experience should be performed prior to start HBB training and then training should take into account ,there were limitations for this study(Seto et al.,2015p58).

5.3. POST TRAINING ASSESSMENT IN HBB KNOWLEDGE AND SKILLS AMONG MIDWIVES AND NURSES

The current study whereby assessing immediate post –training skills among nurses and midwives after providing demonstration of HBB on neo-Nathalie and counter demonstration, what should you do in the Golden Minute, recognize which baby is breathing well, prepare the area for delivery P-Value was statistically significant(P $\square$ 0.013 to 0.033).

There is congruence to another study done in Ethiopia, HBB training participants shown improvement in knowledge and skills post-training, there was a high level of score immediately after providing HBB course training (Drake et.al, 2019p51).Post training level of knowledge and skills in HBB was assessed immediately after a two days training on HBB; in the study done in Delhi documented improvement in knowledge scores among nurses from 19.1 to 30.7 and skill scores from12.8 to 20.6 after training (Das et al.,2018p51).Similar data in the study from Zambia reported an increased level in the knowledge and skills among nurses from 56% to 71% and 58% to 81%, respectively after training (Ministry et al., 2018p2017-223).

The current study done at four heath centers immediately post training level of skills and knowledge among midwives and nurses, what should you do in the Golden Minute, suctioning a baby unnecessary or frequently, correct statement about ventilation with bag and mask ,p-value was statistically significant (p = 0.083 & 0.001).

To evaluate post training assessment in HBB among nurses and midwives, a study done in Ghana, the nurses level of knowledge had significantly improved from 43% to 81% and midwives level of knowledge scores increased from 38% to 71% (Eblovi et al., 2017pp138-

185).There was reported in the study done in India, Zambia, Ghana, and Malawi has reported improvement of knowledge and skills scores following HBB training (Das, 2019).

Despite significant improvement following HBB training, scores and improvement were disproportionate in term of knowledge and skills, contrary to the current studies. (Tabangin et al., 2018p163-171).

According to George Miller's pyramid of clinical proficiency done in medical education, the acquired knowledge was at high level to the skills (Cruess et al., 2016p180-185).

Contrary, in the study done in Tanzania, where participants had been trained in initial and modified HBB program, approaches displayed similar acquisition of HBB skills, as shown by immediate scores after training (Drake et al., 2019p51).This finding of study is congruent to the current study whereby previous experienced and training shown significantly improvement.

5.4. THE LEVEL OF KNOWLEDGE AND SKILLS RETENTION SIX WEEKS AFTER HBB TRAINING

The current study has shown a change in the level of knowledge and skills retention six weeks after the training in HBB second edition among midwives and nurses working in four health centers in Kicukiro District. Similar findings in the study done in Tanzania, demonstrated an overall strong retention of the knowledge and skills among health worker, a refresher course was proposed to keep up to date knowledge and skills (Drake et al., 2019p53).)The same findings were reported in the study done in India among health workers, highlighted that a follow-up done before three months knowledge and skills ,the level of retention was significant (Das et al.,2018p96).

However the skills dropped more than knowledge over the time, characteristics associated with deterioration of skills were associated to the lack of prior resuscitation training among care providers. In different studies to assess the level of knowledge and skills towered HBB training, lack of motivation, lack of refresher training and equipment for self-practice towered health care providers contributed to the decline of scores in follow-up training (Gobezayehu et al.,2014p21-31)The similar findings in the study done in Honduras, there is a decline in skills observed after four months, therefore a refresher course was suggested as effective method to retain the knowledge and skills(Seto et al.,2015). In the study done in Tanzania the fall -off skills in a

follow-up at 4 to 6 weeks was significant and the contributing factors were a lack of refresher training (Arlington et al., 2017).

A study done in Rwanda at two district and one tertiary referral hospital evaluating HBB first edition training, knowledge was retained for 3 at least months, while skill dropped over the time (Musafili et al,2013).Another study assessed the level of retention over the time, to skill deterioration, the mean time between initial and refresher training was significant (p $\square$ 0.001) .The study suggested that training for improvement of knowledge and skill, effective teaching ,assessment for maintaining HBB knowledge and skills performance(Tabangin et al.,2018).

A systematic review study analyzed acquisition of knowledge and skills retention on HBB training in lower middle income countries (LMICs) found that a significant fall off knowledge and skills after training and suggested a formal structured practice refresher session to expand retention(Wilson et al.,2017p47-57).

For further suggestion in the study done in Uganda about strengthening skill and knowledge retention on HBB, pre and post training, as well as a follow-up testing at one month and 12 months, the scores revealed that participants knowledge developed significantly following the training, and remain high correspondingly to the current study .However the scores fell by 12 months post-training. The study showed that lack of refresher course and post-training as factors and barriers to retention of knowledge and skills on HBB (Mildenbergen et al., 2017p69). A fast loss of resuscitation skills arises after an initial training, a frequent practice leads to retention .Moreover this study attests that knowledge and skills retention is associated with the refresher course given at suitable time (Drake et al, 2019p51).

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1. INTRODUCTION:

This study used descriptive comparative design to measure the level of knowledge and skill retention on HBB second edition training among midwives and nurses. The sample size of 60 participants of them 54 nurses and 6 midwives of the population was selected by using a total sampling technique and all participants attended a three phase of the study (pretest, posttest and follow-up assessment 6 weeks later after training).A multiple choice questionnaire and an OSCE were done to all the participants.

6.2. CONCLUSIONS

The study found that there is retention of knowledge and skills six weeks after HBB training second edition among midwives and nurses working in Kicukiro, Bethsaida, Gahanga and Gatenga health centers in Kicukiro District. The overall mean score for skills increased compared to the knowledge. The findings revealed the difference was observed in practice as per experience (P $\square$ 0.035). The comparison of mean scores of social demographic information of participants was carried out after training. There is statistically significance in difference of the level of knowledge and practice among midwives and nurses with different level of education (P $\square$ 0.046).

6.3. RECOMMENDATIONS

Knowledge and skill are important for HBB, only practice is not sufficient to sustain and retain knowledge, there is necessity to continue updating knowledge and skills. The recommendations for this study were addressed to the following levels:

To the Ministry of education:

There is suggestion to revise the curriculum based on the current evidence based practice.

To the Ministry of health:

To strength in service training and mentorship system to the healthcare providers working in health centers.

To provide adequate equipment and supply necessary for HBB provision to the lower settings facilities.

To the NGOs:

To mobilize funds needed for supporting low resources countries in other to end preventable deaths of newborns and children under five years of age.

To provide regular refresher training between mentorship program and in service teaching.

To provide to the trainees facility and resources as motivation for learning and retention.

To Masaka district hospital

There is need for rotation in between the nurses and midwives working in health center to the district level where they can learn through mentorship.

To provide mentorship and monitoring and evaluation of care provided in health centers.

To the health centers

The following recommendations addressed to the health centers where this study had been conducted:

To allocate in delivery room a nurse and or midwife trained in HBB so that she or he will be able to provide assistance to newborn born with asphyxia. A part assistance of newborn in need of HBB, this person has responsibility to maintain in use material and equipment provided for HBB for each health centers and also to keep mentoring the team.

Future research

The researcher recommends that more studies are needed about knowledge and skill retention on HBB second edition in Rwanda, further more in health centers. Consequent studies should reflect pre-test result of skill as a control and consider assessing the three domain of Bloom's theory (cognitive, psychomotor and affective domain).

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APPENDICES

APPENDIX 1. ETHICAL CLEARANCE REQUEST LETTER

College Of Medicine and Health Sciences

School Of Nursing and Midwifery

Research & post-graduate studies program

Email:

Phone: +250788456661

DATE: 1st October, 2018

To: Chairperson of UR-CMHS/Institutional Review Board (IRB)

Dear Sir,

Re: Request for ethical clearance to conduct research in Kicukiro health centers: Gatenga, Bethesaida, Kicukiro and Gahanga

I, KANKINDI Felicite from Master Program in school of nursing and midwifery, track of Neonatology at UR-CMHS would like to request for ethical clearance which will enable me to undertake a study entitled:" Knowledge and skills retention in Helping Babies Breathe training among midwives and in Rwanda.

Please find attached the research proposal for your consideration.

I look forward to hearing from your response. Thank you

KANKINDI Felicite

REPUBLIC OF RWANDA

11st/12/2018

REF.165.../MSK/DH/2018

KIGALI CITY
DISTRICT KICUKIRO
HOPITAL MASAKA
B.P 3472 KIGALI
E-mail: masaka.hospital@moh.gov.rw

To: KANKINDI Félicité

Re: **PERMISSION TO CONDUCT DATA COLLECTION**

Dear Madam,

Reference made by decision of Director General of Masaka district hospital on your research proposal entitled *"Knowledge and Skills retention in helping babies breath training among nurses and midwives working selected healthe centers in Kigali"* The management of Masaka District Hospital is pleased to inform you that, you have authorization to conduct a study in our hospital.

Sincerely

Dr. Marcel UWIZEYE
Director General Masaka Hospital

APPENDIX 3. INFORMED CONSENT EXPLANATION FORM

STUDY TITLE: KNOWLEDGE AND SKILLS RETENTION IN HELPING BABIES BREATHE TRAINING AMONG NURSES AND MIDWIVES WORKING IN SELECTED HEALTH CENTRES IN KIGALI

To be read and understood and questions to be answered in a language the participants understand.

Dear Participant, My name is KANKINDI Felicite, a Masters student in Master of Sciences in Nursing (Neonatology track) at University of Rwanda, College of Medicine and Health Sciences. I am carrying out a scientific study on the "Knowledge and skills retention in helping babies breathe training among nurses and midwives working in Kigali selected health centres
The study forms a part of the requirements for the award of a Master's Degree under the supervision of Mrs. MUHAYIMANA Alice and Dr. MUKESHIMANA Madeleine who are my lecturers in the University of Rwanda. I invite you to participate by answering questions on the designated questionnaire. At the end of the study; recommendations for intervention measures will be made.

Please note the following:
   a.   There will be NO compensation for taking part in this research.
   b.   Your participation is voluntary
   c.   Participation involves answering questionnaires and a training of two days, a posttest followed by an assessment of knowledge and skills six weeks after the trainin .
   d.   You can withdraw from the study at any time without any penalties or loss of benefits.
   e.   Your name will not be used anywhere in the study and the information gathered will be treated with confidence for this study and for an intervention project based on findings.
   f.   No harmful or invasive procedures shall be conducted on you.
   g.   All information obtained will be professional and confidentiality will be upheld.
   h.   I kindly request you to sign the statement below after reading through it.
For any question or ethical disrespect, you can contact the Chairperson of the UR/CMHS/ IRB on 0788 490 522 or the Deputy Chairperson on 0783 340 040

 Signature of participant …… …………………………………………….
 Date ……………….……..

APPENDIX 4.INFORMED CONSENT LETTER

I agree to participate in this research project on "Knowledge and skills retention in helping babies breathe training among nurses and midwives working in Kigali selected health centres "which is being conducted by KANKINDI Felicite.

I understand that this study involves answering prepared questions and OSCE. I understand that my participation in this study is completely voluntary, and that if I wish to withdraw from the study, I may do so at any time, and that I do not need to give reason for doing so. If I withdraw from the study, I understand this will have no effect on my relation with researchers.

I understand that I may not receive any direct benefit from participating in this study, but my participation may help others in the future. I understand the information I give will be reserved confidentially to the scope permitted by law. I have read and I understand this information and agree to be part in the study.

Signature of participant …… …………………………………………….

Date ……………….……..

Helping Babies Breathe Second Edition

Approved by American Academy of Pediatricians

A. DEMOGRAPHICS DATA

Age:

Code:

Sex:

Level of education:

Professional experience:

Training received in HBB:

B. KNOWLEDGE CHECK

INSTRUCTION: CIRCLE THE CORRECT ANSWER

TOTAL MARKS: 20MARKS

1. What should you do in The Golden Minute?
a. Bathe the baby
b. Deliver the placenta
c. Evaluate the heart rate
d. Help a baby breathe if necessary
2. Which baby is breathing well?
a. A baby who takes one deep breath followed by a long pause
b. A baby who is breathing quietly and regularly
c. A baby who is quite and not crying
d. A baby who is gasping

3. To prepare for a birth

a. You identify a helper and review the emergency plan

b. You ask everyone but the mother to leave the are

c. You prepare equipment only you need it

d. You do not need a helper

4. To prepare the area for delivery

a. Open all the doors and windows to get fresh air

b. Darken the room

c. Make sure the area is clean ,warm, and well-lighted

d. Keep the room temperature cold

5. What should you do to keep baby warm?

a. Open all the windows

b. Give the baby a bath after birth

c. Place hot water bottles next to the baby's skin

d. Place the baby skin-to-skin with mother

6. What should you do to keep the baby clean?

a. Wash hands before touching the baby and help mother wash her hands before breastfeeding

b. Reuse the suction device before cleaning

c. Keep the umbilical cord tightly coved

d. Do not touch the baby

7. Which baby can receive routine care after birth?

a. A baby who is not breathing

b. A baby who is gasping

c. A baby who is crying /or breathing well

d. A baby who is limp

8. Routine care for a healthy baby at birth includes

a. Drying, removing the wet cloth, and bathing the baby

b. B. Drying, removing the wet cloth, and positioning the baby skin-to-skin

c. Bathing and putting clean clothes on the baby

d. Drying and wrapping the baby in the wet cloth

9. When should the umbilical cord be clamped or tied and cut during routine care?

a. After the placenta is delivered

b. Around 1-3 minutes after birth

c. Immediate after the baby is born

d. Before a baby has cried

10. A baby is quiet, limp and not breathing at birth, what should you do?

a. Dry the baby thoroughly

b. Shake the baby

c. Throw cold water

d. Hold the baby upside down

11. A newborn baby is quiet, limp and not crying, the baby does not respond to steps to stimulate breathing. What should you do next?

 a. Slap the baby's back

 b. Hold the baby upside down

 c. Squeeze the baby's ribs

 d. Begin ventilation

12. In which situation should a baby be suctioned?

a. When a baby is crying at birth

b. When a baby is crying but there is meconium in the amniotic fluid

c. When you see secretions blocking the mouth and nose

d. Before drying the baby

13. Suctioning a baby unnecessarily or frequently can

a. Cause a baby to stop breathing

b. Make a baby start coughing and breathing

c. Stimulate a baby to cry

d. Increase the baby's heart rate

14. Which of the following statements about ventilation with bag and mask is TRUE?

a. The mask should cover the eyes

b. Air should escape between the mask and face

c. Squeeze the bag to produce gentle movement of the chest

d. Squeeze the bag to give 80 to 100 breaths per minute

15. A baby, s chest is not moving with bag and mask ventilation, what should you do?

a. Stop ventilation

b. Reapply the mask to get a better seal

c. Slap the baby's back

d. Give medicine to the baby

16. You can stop ventilation if

a. A baby is bleu and limp

b. A baby's heart rate is slow

c. A baby's heart rate is normal and the chest is not moving

d. A baby's heart rate is normal and the baby's breathing or crying

17. A newborn baby's heart rate should be

a. Faster than your heart rate

b. Slower than your heart rate

c. Checked before drying the baby

d. Checked only when the baby's is crying

18. A baby who received ventilation

 a. Needs continued observation with moth

 b. Cannot be fed

 c. Always needs advanced care

 d.   Should immediately receive antibiotics

19. When should the bag and mask and suction device be disinfected?

a. After every use

b. Only when they appear dirty

c. Week

d. Once a month

APPENDIX 6.B. OSCE EVALUATION TOOL

Helping Babies Breathe Second Edition

Approved by American Academy of Pediatrics

A. DEMOGRAPHICS DATA

Age:

Code:

Sex:

Level of education:

Professional experience:

Training received in HBB:

B. OSCE

ITEMS	DONE	NOT DONE
1. Identifies a helper and reviews an emergency plan		
2. Prepares the area for delivery (warm, well-lighted, clean)		
3. Washes hands		
4. Prepares an area for ventilation and checks function of bag, mask and suction device		
INSTRUCTION: After 5-7 minutes give baby to participant and say, "There is meconium in the amniotic fluid. The baby is delivered onto the mother's abdomen. Show how you will care for the baby."		
5. Dries thoroughly.		
6.Removes wet cloth		
INSTUCTION: Prompt: Show the baby is not crying. "There is meconium blocking the mouth."		
7. Recognizes baby is not crying		

8. Positions head and clears airway		
9. Stimulates breathing by rubbing the back		
INSTRUCTION: Show the baby is breathing well (cries)		
10. Recognizes baby is crying and breathing well.		
11. Clamps or ties and cuts the cord.		
12. Positions skin-to-skin on mother's chest and puts on the head covering		
13. Communicates with mother.		
INSTRUCTION: *Show the baby is not breathing.*		
14. Recognizes baby is not breathing		
15. Cuts cord and moves to area for ventilation or positions by mother for ventilation.		
16. Ventilates with bag and mask within The Golden Minute Ventilates at 40 breaths/minute (30-50 acceptable)		
17. Evaluates for breathing or chest movement		
INSTRUCTION: Please show what to do if the chest is not moving with ventilation." After one or more steps to improve ventilation, say "The chest is moving now."		
18. Reapplies mask		
19. Repositions head		
20. Clears secretions from the mouth and nose as needed		
21. Opens mouth slightly		
22. Squeezes bag harder.		
23. Recognizes baby is not breathing but heart rate is normal		
24. Recognizes baby is breathing and heart rate is normal		
25. Provides close observation for the baby and communicates with the mother		

SCORING:…...../25

Number Done Correctly...................... Facilitator initials..............................