CONTINUING PROFESSIONAL DEVELOPMENT ON EMERGENCY OBSTETRICS AND NEWBORN CARE (EmONC): ASSESSMENT, TRAINING INTERVENTION AND ITS OUTCOME IN EMBU AND MERU LEVEL 5 HOSPITALS, KENYA

BY

LUCY KAWIRA GITONGA

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DECLARATION

I hereby declare, that this thesis Entitled "**Continuing Professional Development On Emergency Obstetrics and Newborn Care (EmONC): Assessment, Training Intervention And Its Outcome In Embu And Meru Level 5 Hospitals, Kenya"** is my original work and has not been previously published or presented for the award of a diploma or a degree in this or any other institution. I certify that all material in this thesis which is not my own work has been accredited to the owners by citing as references in text and at the reference section.

Signature _____ Date _____

Lucy Kawira Gitonga

CERTIFICATE OF APPROVAL

This thesis has been done under our supervision and guidance and the report is submitted for examination with our approval as university supervisors.

Prof Anna Karani, Ph.D, MA, BScN, DAN, KRN/M/CHN

Professor of Nursing and Nursing Education,

School of Nursing Sciences,

University of Nairobi

P.O. BOX 19676-00202

Nairobi- Kenya

Signature _____ Date _____

Dr. Waithira Mirie, DHSc, MSc, BSc, IBCLC

Senior Lecturer,

School of Nursing Sciences

University of Nairobi

P.O. Box 19676-00202

Nairobi- Kenya

Signature _____ Date _____

DEDICATION

I wish to dedicate this work to my dear husband Advin Gitonga, our lovely Children Tonny Mwenda, Brian Murimi and Joy Mwende for their unfailing support and encouragement.

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LIST OF ABBREVIATIONS

AMREF	-	African research foundation
ANC	-	Antenatal care
ANCC	-	American Nurses Credentialing Center
ANOVA	-	Analisis of Variance
BSc	-	Bachelor of Science
CINAHL	-	Cumulative Index to Nursing and Allied Health Literature
CPD	-	Continuing Professional Development
CSCT	-	Comprehensive School and Community Treatment
CME	-	Continuing Medical Education
IEC	-	Information, Education and Communication
GDC	-	General Dental Council
JHPIEGO	-	Johns Hopkins Program for International Education in Gynecology and Obstetrics
KEM	-	Kenya Enrolled Midwife
KDHS	-	Kenya Demographic Health Surveys
KRCHN	-	Kenya Registered Community Health Nurse
KRN	-	Kenya Registerd Nurse
MDG	-	Millennium Development Goals
MOH	-	Ministry of Health
MPA	-	Maternal and Perinatal Audit
NCK	-	Nursing Council of Kenya
NCPD	-	National Council for Population and Development
NGO	-	Non Govrnmental Organization
WHO	-	World Health Organization
SPSS	-	Statistical Package for Social Sciences

OPERATIONAL DEFINITION OF TERMS

The following terms are defined in the study as: -

Competence- possession of required skill, knowledge, qualification, or capacity

Confidence- belief in oneself and one's powers or abilities

Essential Obstetric and Neonatal Care Skills -skills required in provision of prenatal, natal and postnatal care of both mother and baby.

Evaluation- is a systematic determination of a subject's merit, worth and significance, using criteria governed by a set of standards.

Impact - Measure of the tangible and intangible effects (consequences) of one things or entity's action or influence upon another.

Maternal mortality- The number of registered maternal deaths due to birth- or pregnancy-related complications

Midwife- A person qualified to practice midwifery, having received specialized training in obstetrics and child care.

Neonatal mortality- death of a live born infant within the first 28 days of live birth

Structural Support- Availability of the necessary equipments, conducive environment as well as supportive policies communicated to all.

EXECUTIVE SUMMARY

Introduction and Background

Each year, more than 536,000 women worldwide die from complications of pregnancy and childbirth – that is one woman die every minute (Mirkuzie et al 2014). The complications include Antepartum haemorrhage, postpartum haemorrhage, obstructed labour as well as sepsis (WHO 2010) and many more survive but will suffer ill health and disability as a result of these complications (Moxon et al 2015 2015). In addition, an estimated 4 million neonatal deaths occur each year accounting for almost 40% of all under 5 deaths (WHO 2010). Moreover, more than ¾ of all these deaths occur in Asia and sub-Saharan Africa (Fotso and Fogarty 2015). Additionally, the health of the neonate is closely related to that of the mother and majority of deaths in the first month of life could also be prevented if interventions were in place to ensure good maternal health (Bluestone et al 2013). Over 80% of all maternal deaths result from five well understood and readily treatable complications: (1) haemorrhage, (2) sepsis, (3) eclampsia, (4) complications of abortion and (5) obstructed labour. It is well known how to prevent these deaths – there are existing effective medical and surgical interventions that are relatively inexpensive (Murphy et al 2014). To reduce maternal mortality it is important that all women have access to maternal health care services, particularly skilled attendance at birth and timely access to Essential (or Emergency) Obstetric Care (EOC) when an obstetric complication occurs (WHO 2010). Two levels of EOC can be distinguished, that is Basic Essential Obstetric Care (BEOC) and Comprehensive Essential Obstetric Care (CEOC) (Ouma et al 2010). BEOC has 7 signal functions: Parenteral Antibiotics, Parenteral oxytocics, parenteral anti-convulsants, Manual removal of a retained placenta, Removal of retained products of conception by Manual Vacuum Aspiration, Assisted vaginal delivery (vacuum extraction) and Resuscitation of the newborn (using bag and mask)(WHO 2010, Fotso and Fogarty 2015) CEOC– 9 signal functions: All 7 BEOC functions (above), Caesarean Section and Blood Transfusion)(WHO 2010, Fotso and Fogarty 2015).

Approximately 15% of expected births worldwide will result in life-threatening complications during pregnancy, delivery, or the postpartum period (Mumtaz et al 2014). Providers skilled in Emergency Obstetric and Newborn Care (EmONC) services are essential, particularly in countries with a high burden of maternal and newborn mortality (Sipsma et al (2012). WHO (2015) has implemented three global programs to enhance provider capacity to provide comprehensive EmONC services to women and newborns in resource-poor settings. Providers have been educated to deliver high-impact maternal and newborn health interventions, such as prevention and treatment of postpartum hemorrhage and pre-eclampsia/eclampsia and management of birth asphyxia, within the broader context of quality health services (Lassi et al 2014)and this has been seen to reduce maternal and neonatal mortality.

Literature identifies gaps in knowledge and practice of EmONC skills to improve maternal and neonatal care (Mwaniki et al 2014, Charsbin statistics Collector Team 2010). The status in Kenya has not been established. L**o**nkhuijzen et al (2010) examined various articles in order to assess the effectiveness of training programs aimed at improving emergency obstetric care in low resource environments and the review revealed limitations which hamper their usefulness in evaluating the effects of

postgraduate educational interventions to improve obstetric care in low resource environments. Das et al (2014) stated that failure of most studies to underpin the results with adequate evidence precludes valid pronouncements on the effectiveness of the courses described. Furthermore, although the introduction of the Reproductive Health Library and the Perinatal Education Program led to an improvement in knowledge and skills, no positive effects on behaviour were reported and patient outcomes were not evaluated (Das et al 2014). It is the responsibility of organizations that initiate and fund training programs to make evaluation an integral part of programs and ensure that the results, assessed by a proper peer-reviewed process, are made available to those who stand to benefit the most from a successful program (Das et al 2014). Large parts of the world are behind schedule in reaching the fourth and fifth Millennium Development Goals (addressed in sustainable Development Goal 3). Improving knowledge and skills through training can contribute to the attainment of these Goals. In order to do so successfully, sound research is needed to provide reliable evidence to support the implementation of effective training programs.

Otolorin (2015) stated that while remarkable progress has been made toward the reduction of maternal and child mortality in many low-resource countries, critical challenges remain in provision of high-quality EmONC services, particularly in Sub-Saharan Africa and Southeast Asia (legale et al 2011). The global community must focus on reaching the poorest and most vulnerable populations to address persistent inequities. These inequities include, among other things, a shortage of skilled birth attendants (SBAs) in the most vulnerable communities that is driven by lack of targeted workforce planning strategies, for example matching deployment with the competencies of providers and addressing well-known factors that discourage workforce retention (Lassi et al 2014).

Objective

To assess, train and evaluate Continuing professional development training in "Emergency Obstetric and Newborn Care" for midwives in order to improve the availability of emergency obstetric and Newborn care (EmONC) in Embu and Meru hospitals, Kenya.

Methods

Study design

The study adopted assessment (phase one), intervention (phase two) and evaluation (phase three) exploratory design. The study participants were midwives from the maternity units of Embu and Meru level five hospitals in Meru and Embu counties respectively. The study was three phased. Phase one (June to November 2013) involved a needs assessment survey of the perspectives of CPD among midwives working in the above mentioned hospitals. A total of 113 midwives were involved in the study (54 from embu hospital and 59 from Meru). During this phase, data was collected using a questionnaire (knowledge, confidence and experience questionnaire), interview checklist and case studies. The main objective of this phase was to identify skills and knowledge gap in the area of maternal and neonatal health among midwives in Meru and Embu hospitals respectively. Method triangulation helped in yielding more valid data than if a single method was used. Quantitative data was analyzed using SPSS version 20.0 and qualitative data was analyzed using the themes that emerged. Pearson's chi square was used to describe the associations

between participant's demographic characteristics and participation in CPD activities. The findings of phase one formed the basis for phase two.

Phase two (December2013- September 2014) involved training of all the midwives in Phase one based on the results of the analysis of the data obtained in phase one. The training programme followed a modular format and competency-based approach. The training content was prepared based on the findings of phase one in reference to ***the WHO materials in the Integrated Management of Pregnancy and Childbirth (IMPAC) series.*** In addition, it used relevant local guidelines and protocols developed by the Division of Reproductive Health, Kenya and ministry of health, Kenya. There were five modules in the package and each module described the learning objectives, learning outcomes, course content, teaching methods, and evaluation methods. The evaluation guidelines contained the data collection tools, data analysis templates and guidelines on how to use each tool. Module one was introduction to maternal and newborn health, module two on rapid initial assessment and emergency management; module three on care during pregnancy; module four on care during labor and child birth and module five on post partum maternal and newborn care.

This training was completed over three weeks period with 8 days classroom theoretical sessions & practice on anatomical model and 10 days of clinical practice in the two health facilities. The trained midwives were followed and monitored in the study areas for three months as they cared for mothers and neonates.

Phase three (November 2014- December 2014) data collection from the trained midwives' evaluation of the impact of the knowledge and skills acquired during the training using the model developed in phase one. Data was analyzed and results compared with those obtained in phase one. Paired t-tests of mean differences between participant's scores and performance of CPD activities before and after intervention were computed. Mean differences in performance of CPD activities between the two hospitals and the nursing qualifications were analyzed using ANOVA.

Results

Overall results showed marked improvements in midwives' knowledge/skills in all areas of antenatal care, normal labor, childbirth, immediate newborn care skills, postpartum care and management of complications. Generally their skills in maternal and newborn care skills improved after training. The results showed that knowledge improved after the training from a pretest mean of 55.92 to a posttest mean of 86.003.This indicates 30% after training improvement. The results were further subjected to paired samples test. The improvement in knowledge was statistically significant with a T= 15.684 (P=0.001) .Therefore, the hypothesis that,' there is no relationship between an educational intervention on nursing essential maternal and neonatal skills and knowledge in these skills was rejected.

Conclusion: The results in phase one identified gaps in knowledge/ skills, experience and practice of EmONC in improving maternal and neonatal health in Kenya. The training in phase two which was a CPD activity was associated with increased level of practice of EmONC skills. The results indicated that respondents on assessment of antenatal skills scored an average of 95.2% while on normal labor, childbirth and

immediate newborn care skills they scored an average of 89.63% on postpartum care (mother and baby) an average of 87.92%, on management of complications they scored a mean of 88.22%.This indicated that midwives showed an improvement after training and this implied that they were well prepared to solve various midwifery related conditions and complications.

It is therefore confirmed that CPD activities are essential in engaging midwives in practising EmONC skills according to laid down guidelines with the aim of reducing maternal and neonatal mortalities in the country.

Recommendations: Based on the findings, CPD in EmONC should be provided to all midwives at all levels of health care delivery in the country including incorporating such activities in the induction programmes for midwives. There is need to review the nursing curricula to be more focused on skills development and retention in the area of EmONC. The findings lead to development of a framework to enhance provision of CPD and also development of evaluation guidelines for assessing development of competences in EmONC (see appendix 4 and 9). These guidelines should be used in the country with the aim of improving maternal and newborn health.

CHAPTER ONE: INTRODUCTION

1.1. Background

Midwifery education in many countries currently follows a didactic curricular model where students learn through classroom lecture with little opportunity for skills practice, simulation and role play needed to develop critical thinking, values, and the clinical decision-making abilities needed for effective practice (Fullerton et al. 2013). Many midwifery students graduate having attended a limited number of women in labor (Fullerton et al. 2010) and some with minimal clinical experience in antepartum, family planning or newborn care. In addition, the assessment of student progress and readiness for practice may not be linked to the intended outcomes of learning and targeted clinical competencies (Mumtaz 2013). Frenk et al., (2010) proposed what they term a 'third generation' of educational reform, in which health professions education is linked to the specific context of the health system in any global setting. Competencies are proposed as the objective criterion for the classification of health professionals; underpinned by a common set of attitudes, values, and behaviors that define every health worker as an accountable practitioner (i.e., competency-based education) (Mirkuzie et al. 2014). A fully qualified midwife (WHO 2013) is the vital link between all levels of care needed by women during the reproductive years and the childbearing cycle. Among the most important attributes of them fully qualified midwife is the ability to promote health and prevent complications before they occur, referring those women needing medical attention early enough to prevent adverse outcomes for the woman or her newborn (Mirkuzie et al. 2014). There is a vital need to improve current knowledge and skills through continuing medical education and relevant training imparted to all cadres of health care providers in fundamental

maternal and newborn problems (Mumtaz et al. 2014). The improvement in skills and knowledge is likely to result in improved neonatal and maternal health outcomes (Lunze et al., 2015, Mwaniki et al., 2014, Okereke et al., 2015). The number of neonatal deaths caused by asphyxiation, and the incidence of disabilities resulting from birth asphyxia by could significantly be reduced by simply enhancing basic resuscitation skills (Lunze et al. 2015, Mwaniki et al. 2014, Okereke et al. 2015). Along with the improvement in the curricula and training it is imperative to review the methodology of training and develop means of continuous medical education (Lunze et al. 2015, Mwaniki et al. 2014, Okereke et al. 2015). Possibly a modified form of educational program, using best evidence teaching methods with emphasis on practical hands-on training program could be implemented. This program may consequently result in significant improvement in maternal and neonatal mortality (Lunze et al. 2015, Mwaniki et al. 2014, Okereke et al. 2015)

According to Jill (2011), Continuing Professional Development (CPD) is a contious process, outside formal undergraduate and postgraduate training, which enables individual health workers to maintain and improve conditions of medical practice through the advancement of skills, behavior, attitudes, and knowledge. CPD should also support specific changes in practice. Arising from the literature review, it is considered that the definition of CPD could be divided into two parts: gaining knowledge and improving patient care (Liljestrand and Sambath 2012).

Furthermore, the procedures for recording CPD were perceived as needing to address both of these aspects. However, a body of literature claimed that a gain in knowledge does not necessarily result in a change in behavior by the clinician (Legale et al.

2011). If that is so, then other questions such as the following arise; will an improvement in patient care occur? And, if it does, how can it be measured? (Jill 2011). Moreover, literature has reviewed that there is little literature on the effectiveness of CPD in improving patient care (Jill 2011). Nevertheless, in his work, Jill stated that: effective CPD involves both *"learning"* and being *"fit to practice"*, understanding both the *"why"* and the *"how"* and putting learning into practice and that efficacy is facilitated when experts are able to conclude on their own learning needs through reflection within the totality of their profession. This means being able to go beyond what is quantifiable.

A responsive health system is one offering appropriate antenatal care; comprehensive emergency obstetrics care and quality delivery services (Mwaniki et al. 2014). Maternal and neonatal morbidity and mortality rates continue to be recognized internationally as public health priorities. Moreover, these indicators in Africa have continued to rise instead of declining since the launch of Safe Motherhood Initiative 15 years ago (Dickson et al. 2015). It has been shown that 99 percent of all maternal deaths occur in developing countries with Sub-Saharan Africa having the highest maternal mortality ratio of 900 maternal deaths per 100,000 live deliveries and also the highest lifetime risk of maternal death of 1:26 (National Road Map-Kenya 2010), NCPD 2013), Nursing Council of Kenya (NCK) (2012) and Harris et al (2011). The idea that health professionals should be accountable to the society they serve is not a new concept (Fleet et al. 2010), and for a long time, the Continuing Professional Development of medical professionals has been seen as one way in which population's level of health could be enhanced.

“Evaluation is as basic to professional development as it is to education” (Abott et al., 2010). Unfortunately, as is common in nursing and midwifery, methodical analyses of professional development programs are rarely undertaken (Legale et al. 2011). According to Absi and Benett (2010), millions of dollars have been provided in the name of professional development, but the quality of these programs goes virtually unchallenged. Abott et al. (2010) stated that Input-based methods are the most commonly used evaluation methods, and that Input-based CPD schemes do not directly indicate whether any learning, change in behavior on the job, or impact on the organization has taken place. Measuring only by inputs appears to be based on the idea that whatever is done under the CPD scheme is useful for achieving the purposes of CPD (Duysburgh et al. 2015). This presumes that all CPD activities allowed under the scheme will be of sufficient quality to lead to the professional development and that the individuals attending will be sufficiently attentive and receptive to reap the benefits. Additionally, Ariff et al. (2010) found out that few organizations actually measure CPD by outputs; those that do usually only require “evidence” of output. The quality or standard of this output is rarely “measured” in any systematic manner (Abott et al. 2010). A great percentage of professional bodies still only ask for a record of activities, without regard to the quality or impact of those activities (Ariff et al. 2010). Very few require objective evidence of learning or change in behavior, while still fewer require evidence of the effectiveness of the learning or changed behavior in affecting services delivered to clients (Ariff et al. 2010). Many professional bodies, Nursing council of Kenya (NCK) in particular have a notion of standard or quality of output but do not have a structured or defined a set of benchmarks or scale for defining this standard. The point of reference of CPD records seems to be defined generally in a simple manner: adequate or not adequate (Ariff et

al. 2010). Even this decision tends to be made rather subjectively. Moreover, Abott et al (2010) states that most current evaluation of CPD falls short in a number of ways and areas, and he suggests that these limitations can be summarised as follows: Most evaluation consists merely of summarising the activities undertaken as part of the professional development program (Abott et al. 2010). What courses were attended and how many credits accrued. This clearly gives no indication of the effectiveness of the activities undertaken, making this form of data collection inadequate as a means of looking at the effects of CPD (Legale et al. 2011). Where some assessment does exist, it normaly occurs in terms of participant satisfaction questionnaires. Apparently, this permits one to gauge whether partakers consider the incident to have been gratifying and fruitful, but does not engage with issues such as gains in awareness, changes in practice expected from professional improvement and certainly does not assess whether there have been changes in student outcomes (Legale et al., 2011). Evaluations are also typically brief, one-off events, often undertaken post hoc (Legale et al. 2011). Evaluation efforts need to reflect the fact that meaningful change will tend to be long-term and that many professional activities will occur over a long period of time and thus evaluation will also take place over time (Legale et al., 2011)

Jill (2011) has indicated that the goal of the health care delivery site is to provide high-quality services to the society it serves. Even though there are various aspects that support good performance in the workplace, skills and knowledge are critical in improving the quality of care (Abott et al. 2010). Abott et al. (2010) also reveal that even the best training does not always result in improved performance unless follow-up of the implementation of the training is done. The usefulness of the midwife has conventionally been associated with maintaining standards of care (Absi and Benett 2010). Additionally, continuing professional development (CPD) is essential to ensure

that this important group feels adequately prepared to perform their role. Moreover, CPD has been recognized as an important factor in maintaining job satisfaction and reducing wasteful staff turnover (Legale et al. 2011). Allen and Hudges (2010), in a study to review the effects of postgraduate training programs to improve the skills and knowledge of trained healthcare professionals who are involved in maternal and perinatal care indicated that training of health care personnel can play a crucial role in improving quality of care and reducing maternal and perinatal mortality and morbidity (Legale et al. 2011). Additionally, a review of the literature indicates that the area of nurses' and midwives' CPD is growing interest in Kenya and internationally (Jill 2011, Bello and Lawson 2013). Conversely, whereas an increasing range of literature focuses on particular aspects of CPD, there is limited literature on the evaluation of the impact of these training on the improvement of maternal and child health. This was supported by Coralynn and Nancy (2013) who stated that training programs might improve the quality of care, but strong proof is lacking, and that legislators need to embrace appraisal and broadcasting of effects in project budgets for new training plans. Jill (2010) also reveals that although many countries are struggling to train, evidence shows that training does not merge with competence. While most CPD experiences might be considered as means of introducing or enhancing knowledge, skills, and attitudes, it cannot be assumed that this is uncontested. Moreover, Aileen (2010) has contended that, it is not merely the type of professional competence being acquired that is imperative, but the context through which it is acquired and consequently used that actually helps us to comprehend the nature of that knowledge.

According to Moxon et al. (2015), more than 536,000 women worldwide die from complications of pregnancy and childbirth – that is one every minute each year. Much more survive but will suffer ill health and disability as a result of these complications (Moxon et al. 2015). In addition, an estimated 4 million neonatal deaths occur each year accounting for almost 40% of all deaths under 5 years globally (Bluestone et al. 2013). More than ¾ of all these deaths occur in Asia and sub-Saharan Africa (Murphy et al. 2014). Additionally, the health of the neonate is closely related to that of the mother and majority of deaths in the first month of life could also be prevented if interventions were in place to ensure good maternal health (Lassi et al. 2014). Over 80% of all maternal deaths result from five complications that are well understood and can be readily treated: (1) hemorrhage, (2) sepsis, (3) eclampsia, (4) complications of abortion and (5) obstructed labor. It is well known how to prevent these deaths – there are existing effective medical and surgical interventions that are relatively inexpensive. To reduce maternal mortality, it is important that all women have access to maternal health care services, particularly skilled attendance at birth and timely access to Essential (or Emergency) Obstetric Care (EOC) when an obstetric complication occurs (WHO 2012). Moxon et al. (2015) state two levels of EOC can be distinguished, that is BEOC and CEOC:Basic Essential Obstetric Care (BEOC) has 7 signal functions:Parenteral Antibiotics, Removal of retained products of conception by Manual Vacuum Aspiration, Parenteral oxytocics, Parenteral anti-convulsants, Manual removal of a retained placenta, , Assisted vaginal delivery (vacuum extraction) and Resuscitation of the newborn (using bag and mask)Comprehensive Essential Obstetric Care (CEOC) – 9 signal functions: All 7 BEOC functions (above), Caesarean Section and Blood Transfusion. The knowledge and skills acquired at the end of the undergraduate and postgraduate training in

medical schools is not sufficient to sustain competence and performance over their job particularly in nursing and midwifery, therefore midwives are expected to remain current in their practice (evidence-informed practice) through participating in CPD programmes (Mumtaz et al. 2014, Warren et al. 2015).

According to WHO (2015), approximately 16% of expected births globally will result in life-threatening problems during the prenatal period, delivery, or the postnatal period. Health providers skilled in emergency obstetric, and newborn care (EmONC) services are essential, particularly in countries with a high burden of maternal and newborn mortality.

1.2 Statement of the Problem

The average maternal mortality ratio in Africa has risen from 870 deaths per 100,000 live births in 1990 to 1,000 deaths per 100, 000 live births in 2001 (Donyai et al. 2010). Additionally, an estimated 529,000 maternal deaths that occur globally every year, 48% are in Africa, a region that constitutes only 12% of the world's population and 17% of all births in the world (World Bank 2013). Poor women in the region are especially susceptible. According to World Bank (2013), in many countries in the region, between 25% and 33% of all deaths of women in their reproductive years are the consequences of a complication of pregnancy or delivery, while in developed countries the possibility of maternal death is very low, estimated at 1 percent (WHO, 2015). Moreover Legale et al. (2011) and CSCT (2010) state the high fertility rates and low contraceptive use in Africa contribute to this high risk. Furthermore, the lifetime risk of maternal death in Africa is estimated at 1:16 compared to 1:3500 in North America, 1:2400 in Europe, 1: 160 in Latin America and the Caribbean, and 1:100 in Asia (WHO 2010). For every maternal death, there are at least thirty women

who suffer short or long-term disabilities. Africa has the highest newborn death toll, which has been approximated to be 45 deaths per 1000 live births as compared to Asia 34, and 17 and 5 in Latin America and in developed nations respectively. Given gross under-reporting and extensive discrepancies within countries, these figures are without doubt much higher. According to Mirkuzie et al (2014) some of the reasons for failure to significantly reduce maternal and neonatal mortality in the region include: Lack of national commitment and financial support, Poor coordination amongst spouses, inadequate male involvement together with low status of females with poor decision-making power, growing poverty predominantly among women, absence of access to, availability and use of quality care during pregnancy, delivery and the immediate postpartum period, focus on ineffective interventions, such as the risk approach, Poorly functioning health systems, with weak referral systems, especially during obstetric and neonatal emergencies and weak national human resource development and management, comprising the continuing brain drain of skilled personnel within and outside Africa. Fotso and Fogarty (2015) states that if nothing is done to efficiently address the above encounters, it is projected that, over the next decade, there will be at least 2.5 million Maternal deaths and 50.0 million Maternal disabilities; resulting in 7.6 million Child deaths worldwide. Additionally, Donyai et al (2010) states that the acknowledgement of the inseparable dyad of the mother and baby permits all spouses to focus special consideration on the accessibility of emergency obstetric and newborn care, skilled attendance during pregnancy and childbearing, and the essential equipment and supplies that will save the lives of women and newborns at all levels.

A research done on appraisal of a program in three states in Indonesia, and South Kalimantan, which involved the training, placement and management of a large number of qualified midwives in villages, an information, education and communication policy to increase use of village midwives for birth, and a district-based maternal and perinatal audit (MPA) (General Dental Council (GDC) 2011) revealed that before the program, the midwives had inadequate ability to manage obstetric complications, and 90% of births took place at home. Only 37% were attended by a skilled attendant. The study also revealed that through in-service training, continuous administration and involvement in the review system midwives also gained confidence and skills in the controlling of obstetric problems. Regardless of this, the percentage admitted to hospital for a caesarean section declined from 1.7 to 1.4% and the proportion admitted to hospital with a complication requiring a life-saving intervention declined from 1.1% to 0.7%. (GDC, 2011).

Statistics reveals that even with a huge decline in maternal mortality rate globally (47 percent), Kenya's level has remained constant (488 deaths per 100,000 live births, by KDHS 2008/2009 and 362 by KDHS 2014) since 1990.The major causes of these elevating figures according to United Nations Population Fund (UNFPA 2014) are the low utilization of skilled care, little attention towards emergency obstetric and comprehensive care with low contraceptive prevalence whilst the unmet need for family planning remaining high (Mwaniki et al. 2014). Provision of maternal and newborn care in health facilities in Kenya is based on the National Reproductive Health Standards (Ouma et al. 2010, NCK 2010). The Reproductive Health principles are all-inclusive and integrated. The following components specifically target maternal and newborn care: focused antenatal care, normal labor, and delivery,

management of complications during labor and delivery and postnatal care of mother and neonate (UNFPA 2014). The neonatal mortality rate has recorded a marginal reduction from 33% in 2003 to 31 % in 2008/2009 KDHS, and then 22 % in KDHS (2014) compared to other indicators of child survival. The results of KDHs (2014) revealed some improvement in other indicators of maternal health as follows: Women have an average of 3.9 children, the contraceptive prevalence rate of any contraceptive method among married women is 58%, Infant mortality rate is 39 deaths per 1,000 live births, and under-five mortality rate is 52 deaths per 1,000 live births, and 61% of births were delivered in a health facility KDHS (2014).

1. 3 Justification of Study

Poor quality of maternal and newborn care in the course of pregnancy, childbirth and in the postnatal period significantly contributes to the annual estimated 289,000maternal deaths (Dickson et al., 2015), 2.6 million stillbirths, and 2.8 million newborn deaths globally (Dickson et al., 2015). Women and newborns are at greatest risk at and around the time of birth, and babies born small and sick are especially vulnerable (Dickson et al., 2015). Available interventions can stop many of these deaths, but interventions often face challenges to scaling up, many of which are specific to context or the intervention (Dickson et al., 2015). Despite a large number of vertical child health survival programs, there has been little or no improvement in perinatal and neonatal health and the rates of reduction in under 5 mortality are among the slowest in the region (Ariff et al., 2010). Most nationally-led efforts towards addressing the health related millennium development goals have rightfully focused on providing the necessary inputs (management functions, training and recruiting personnel, building more facilities, and providing more equipment, etc.) (Mwaniki et

al., 2014). Donor-driven determinations have also been heavily skewed towards provisions of necessary inputs (Mwaniki et al., 2014). Despite this, most countries, especially in sub-Saharan Africa, have only made modest gains towards achieving the aspirations of the health-related Sustainable development goals (Fotso and Fogarty, 2015)). Assessment, training and evaluation of the impact of training of midwives on EmONC is necessary to inform policy on the right direction towards reducing maternal and neonatal deaths.

The researcher chose the study area after reviewing the literature on the maternal and newborn health care indicators. Reviewed literature emphasized the importance of the availability of skilled birth attendance in improving maternal and neonatal mortality. The literature showed similarity in skilled birth attendance in almost all the counties ranging from 93.9 to 97.6 % compared to National which was at 95.5% (UNFPA 2014). This information of the reviewed literature is shown in the tables below. There are only two level five hospitals in Eastern province which comprised of seven counties: Meru and Embu level fives respectively. he counties in Eastern province are Masarbit, Isiolo, Meru, Tharaka-Nithi, Embu, Kitui and Makueni. The researcher decided to carry out the research in the chosen study area by the fact that she is a student with no external funding hence having a lot of financial constraints. The tables 1 below show various indicators of maternal and newborn health:

Table 1: Eastern: Key Indicators from the 2014 KDHS

Indicator	County							
	Isiolo	Meru	Tharaka/Nithi	Embu	Kitui	Machakos	Makueni	National
ANC coverage	96	97	98	99	98	99	98	96
4+ ANC	50	45	56	56	62	61	66	58
Skilled Attendance	44	83	77	82	46	63	55	62
Facility Birth	42	82	78	82	46	63	53	61

The table above point outs that most of the counties have surpassed the national level indicators and Meru and Embu counties have similar indicators except in the area ANC attendance.

1.4 The Purpose of the Study

The aim of this study was to assess, train and evaluate Continuing professional development training in "Emergency Obstetric and Newborn Care" for midwives in order to improve the availability of emergency obstetric and Newborn care (EmONC) in Embu and Meru hospitals, Kenya.

1.5 Objectives of the Study

Phase 1: Baseline Survey

1. To determine the socio-demographic characteristics of the midwives
2. To identify the Midwives' CPD activities and the numbers involved
3. To determine the extent of the practice of EmONC skills in their practice.
4. To identify factor hindering/facilitating CPD practice
5. To determine the confidence level of practicing EmONC skills

Phase 11: Intervention

6. To develop training modules on EmONC based on the needs identified in the baseline survey
7. To develop training evaluation guidelines
8. To train midwives on EmONC with more emphasis on skills retention

Phase 111: Monitoring and Evaluation

9. To evaluate the outcomes of the training on the midwives' knowledge/skills and practice
10. To develop a framework for CPD provision for midwives
11. To inform policy on the level of knowledge, competencies and confidence of midwives on EmONC in the country.

1.6 Study Questions

The research was directed by the following study questions:

1. Which CPD activities are midwives in the maternity units of Embu and Meru level five hospitals engaged in?
2. What are the outcomes of the training intervention on EmONC among midwives?
3. What difference exists in midwives' knowledge and practice of EmONC before and after a training intervention?

1.7 Study Hypothesis

$H0_{1:}$ There is no relationship between midwives' self-reported knowledge in EmONC and practicing EmNOC

$H0_{2:}$ There is no relationship between the midwives' EmONC skills acquired during CPD and change in confidence level in practicing EmONC

$H0_{3:}$ There is no relationship between a training intervention on EmONC and the midwives' knowledge on EmONC.

1.8 Significance of the Study

The outcomes of the research are anticipated to inform the state on the scope of implementation of the training done for midwives and the impact the implementation has on maternal and neonatal mortality in Kenya. Subsequently, this will have financial implication in that money will be directed in the right places because there is clear indication of the expected results as evidence has been obtained.

1.9 Scope of the Study

The study was carried out in Embu and Meru level five hospitals in Embu and Meru Counties, Kenya. The study involved midwives working in two maternity units in the counties.

1.10 Limitations of the Study and Delimitations

Historically there has been little research, which addresses the actual impact of CPD for midwives on practice and service. Given the presence of many extraneous variables, the researcher felt that it might not be probable to quantitatively validate the

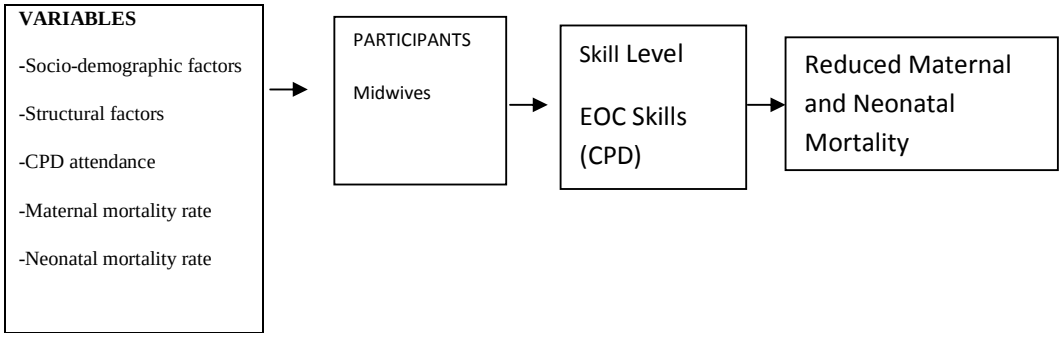
connection between participation in CPD and the effect on practice, patients or service. There are challenges in objectively assessing the impact of CPD on practice, service and patient experience as there are simply too many other variables which could account for variations in practice and service. CPD is comparable to a complex intervention and as such traditional quantitative methods cannot be employed to understand its impact.

Triangulation of methods enabled the questions to be addressed in the context of the real world i.e. focusing on both the object of the study and also the perspective within which it operates, to offer a rich image of what works, for whom, and why or why not; taking into account the different organizational settings, different specialties and teams to apprehend the effect of CPD on performance, service, and practice delivery.

1.11 Assumptions of the study

The respondents gave accurate and honest information

1.12 L. K. Conceptual Framework



The conceptual framework depicts that midwives related factors such as age, gender, attitude, knowledge and skills coupled with education or organizational factors such as structural support (availability of equipment, conducive work environment), motivation and emphasis on EmONC (Independent/predictor variables) during training and coaching period act as predictor variables for midwives' utilization of EmONC skills during patients care. These could be ascertained through situational analysis in the planning phase.

It is expected that with proper knowledge and skills, attitude, motivation, support and proper training and coaching, midwives will greatly practice EmONC skills in the provision of care to patients and clients (dependent/outcome variables). In other words, the different levels of a grouping of the independent variables represent the proximity of the factors to the dependent variable being measured. The background modifying factors may influence the dependent variable indirectly, while the proximate factors may have a direct effect. The background factors may also modify the association between proximate and outcome factors in some way. The main explanatory factor for increased utilization of EmONC skills is the attendance of CPD training. The study examines the associations between the dependent and independent variables.

1.13 Theoretical Framework

The study is based on Kirkpatrick's model (Kirkpatrick's partners 2009-2015) which includes four levels or steps of outcome evaluation: Level 1 Evaluation—Reaction, Level 2 Evaluation-Learning, Level 3 Evaluation-Behavior, Level 4 Evaluation-Results

Level 1-Reaction

This level measures how partakers in a training intervention respond to the training. Every intervention should at least be gauged at this level to answer queries regarding the learners' insights and improve training. This level gains understanding about whether the participants liked the training and if it was pertinent to their work. Negative responses reduce the possibility of learning.

Evaluation tools: Program evaluation sheets, Face-to-face interviews, Participant comments throughout the training, Ability of the course to maintain interest, amount, and appropriateness of interactive exercises, Ease of navigation in Web-based and computer-based training and Participants' perceived value and transferability to the workplace .This type of evaluation is inexpensive and easy to administer using interaction with the participants, paper forms, and online forms.

According to Kirkpatrick the goal in this level is to measure participants' reactions to the training program. One should gauge their reactions immediately after the intervention. Level one assessment should not just include reactions toward the overall program, e.g., Did you like the program? but it should also include measurement of partakers' reactions or attitudes toward particular units of the program, such as the instructor, the focuses, audiovisuals, the presentation style, the schedule, etc. In addition, each of these units can be further broken down into sub-components for evaluation (e.g., you can ask participants to evaluate specific characteristics of the instructor, the presentation, etc.). This was done using the course evaluation form to evaluate the program.

Level 2-Learning

Level 2 assessments are conducted before training (pre-test) and after training (post-test) to assess the amount of learning that has occurred due to a training program (Figure 2).

Level 2 assessments evaluate the extent learners have progressed in attitude, skills, or knowledge. Level 2 evaluation approaches range from self-assessment to team assessment to informal to formal assessment.

Evaluation tools: Individual pre- and post-training tests for comparisons, Assessment of action based learning such as work-based projects and role-plays and Observations and feedback from peers, managers, and instructors

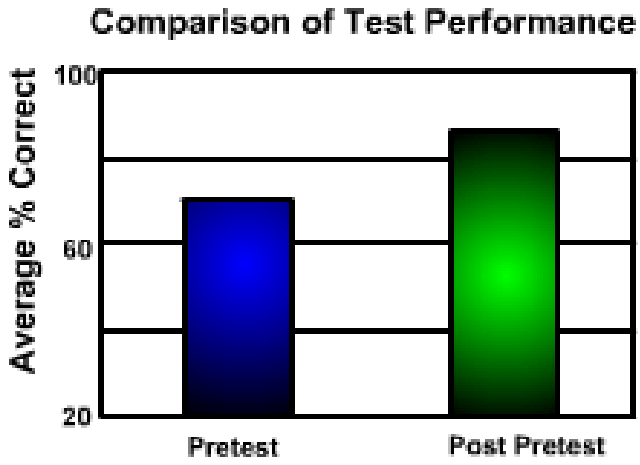


Figure 1: Level 2 Evaluation Showing Results of Pretest and Post Test

Here the objective is to determine what the training program participants learned in the course of the training occasion. Since the training instructor should have particular learning aims, one hopes to find clear learning aftermaths. Learning outcomes can comprise changes in knowledge e.g., what are the key differences between physiological management of third stage of labour and Active Management of Third Stage of Labour?, skills (Can the participant manage mothers with a partograph), or

attitudes (Have participants' attitudes toward Essential maternal and newborn care skills changed?). Some training events will stress knowledge, some will give emphasis to skills, some will underscore attitudes, and some will lay emphasis on several learning outcomes. The assessment should concentrate on measuring what was covered in the training event, i.e., the learning goals. In this level, the researcher used a pre and post-test to test the immediate knowledge acquisition by the learners.

Level 3-Behavior

Assessments at this level try to answer the question of whether the training has been transferred back to the job. This assessment is typically conducted three to six months after training. The assessor would ask questions such as "Are the newly acquired skills, attitude, or knowledge being used in the environment of the trainee"? This evaluation signifies the factual assessment of a program's effectiveness but is pricey. It is often difficult to predict when changes in behavior will occur. Careful planning decisions are needed for this level of evaluation in terms of when to evaluate, how to evaluate and how often to evaluate.

Evaluation questions: Did the learners put their learning into effect when back on the job? , Were the pertinent expertise and knowledge used, Was there a noteworthy and measurable change in the activity and performance of the learners when back in their responsibilities? , Was the change in behavior and a new level of knowledge persistent? Would the learner be able to transfer their knowledge to another person? Is the learner aware of their change in behavior, knowledge, skill level? , Did the representative open each telephone client dialog using his or her designation and department? , Was the representative able to define to you and classify the customer's

protests as either propaganda or valid? , Did the representative use the proper model answer in response to each complaint? , Did the representative close each sale call with a request for purchase? , If the prospect did not make a purchase, did the representative end the call with specific future action steps? And did the representative complete call history records that include summaries of who, what, where, when, and why?

Evaluation tools: Individual pre- and post-training tests or surveys, Face-to-face interviews, Observations and feedback from others and Focus groups to gather information and share knowledge.

Here the goal is to find out if training program participants change their on-the-job behavior (OJB) as a result of their having taken part and contributed to the training program. If the behavior change does not happen, you also want to find out why the change did not take place. The level three question is, did the program have a positive impact on job performance? Level three evaluation specifically involves measuring the transfer of knowledge, skills, and attitudes from the training context to the workplace. In this level, the researcher used questionnaires, interview checklist as well as an observation as the learners perform the skills acquired during the training.

Level 4-Results

This assessment measures the accomplishment of the training program in term that directors and managers can comprehend such as improved production, increased sales, reduced costs, improved quality, reduced rate of recurrence of accidents, higher proceeds or return on investment, positive changes in management style or in general behavior, increase in engagement levels of direct ports and satisfactory feedback from

customers, peers and subordinates. For example, after training in December 2013, the midwives continued to demonstrate skills retention and practice.

Here are some instances of different types of level four outcomes: improved quality of work, higher output, decrease in turnover, decrease in scrap rate i.e., less wasted resources, enhanced superiority of work life, enhanced human relationships e.g., improved vertical and horizontal communication, improved sales, fewer complaints, lower truancy, higher employee morale, fewer accidents and greater job contentment.

Figure 2: Kirkpatrick's Training evaluation Model

Kirkpatrick's (2015) suggested various types of evaluations listed below:

Evaluations:

i) **Quality training:** Measure a reduction in a number of defects.

ii) **Safety training:** Measure reduction in number or severity of accidents.

iii) **Sales training:** Measure variation in customer retention, sales volume, and profitability on each sale after the training program has been implemented.

iv) **Management training:** Measure increase in engagement levels of direct-reports.

v) **Technical training:** Measure decline in time to complete errands, forms, and reports; reduced calls to the help desk; or improved use of software or systems.

vi) **Other:** Measure changes in staff turnover, the number of complaints, growth, attrition, wastage, failures, non-compliance, and quality ratings, achievement of standards and accreditations and customer retention.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature connected with continuing professional development (CPD) for nurses and midwives in relation to achievement of millennium developments goal 5 in Kenya. It also presents literature on evaluation of the effectiveness of various strategies used to improve performance. Literature was searched on the evaluation of CPD activities, CPD practice, and factors that support good performance in the workplace.

2.2 Search Strategies

Pub MED plus, CINAHL and Medline on Megascope databases were searched using keywords: CPD, midwives, midwifery education, health, EmONC, impact, effectiveness, and Evaluation.

2.3 CPD Training and Implementation of CPD Knowledge and skills

Continuing Professional Development (CPD) is the purposeful maintenance and improvement of a professional's knowledge and skills to remain competent in their chosen profession for the benefit of themselves, their patients or clients and the wider profession (Abott et al., 2010). CPD is recognized as a commitment to being professional, keeping up to date and continuously seeking to improve (Absi and Benett, 2010). CPD is intended to encourage the development of professionals so that they reflect on their practice and its quality, are able to adopt and assess new approaches to their practice and develop better ways of working as a result (Jill 2011).

CPD acknowledges varying learning styles among professionals and includes a wide range of formal and informal learning activities. The key principles behind CPD are that it (Maidiment et al., 2010) is self-directed, Is based on learning needs identified by the individual, Builds on an individual's existing knowledge and experience, and links a person's learning to their practice and that it Includes an evaluation of the individual's development (Abott et al., 2010).

Health professional boards worldwide are increasingly requiring practitioners to demonstrate their engagement with continuing professional development (CPD) in order to maintain competence in light of the ever-changing scope of practice and technological advances in the medical sciences (Kasvosve et al., 2014). The enforcement of this requirement varies from country to country and between professions (Kasvosve et al., 2014). The objective of CPD is to maintain high standards of competence in terms of knowledge, skills, and behavior (Goalet et al., 2013). Literature exists demonstrating that CPD in the health occupations is effective in improving health care, patient outcomes, and population health. For example, participation in CPD activities by physicians has been shown to improve the quality of care given to patients and the public (Garza et al., 2012). Research has also shown that physicians who engage in CPD are more likely to accept new and effective treatment modalities and discontinue use of existing lower-benefit practices resulting in improved patient outcomes (Mimura et al., 2012). Health expert boards in some developed countries have embraced CPD as an effective way of maintaining and improving competencies of health professionals and have made them mandatory (Kasvosve et al., 2014). For example, participation in CPD for medical laboratory scientists is a prerequisite for a salary adjustment and career advancement in

developed countries (Kasvosve et al., 2014). Health expert boards in developing countries are making progress in establishing and enforcing CPD requirements for re-licensing (Mimura et al., 2012). In Kenya, Uganda and South Africa, regulatory bodies require completion of CPD credits in order to re-register (NCK, 2012).

In Canada, it is presumed that continuing professional development (CPD), which encompasses continuing medical education (CME) (Legale et al., 2011), plays an important role in maintaining and improving the quality and efficiency of the healthcare system (Legale et al., 2011) by translating evidence into clinical practice (Legale et al 2011). In other words, CPD serves as an important knowledge translation strategy and is one potential approach that could be incorporated into the Knowledge to Action Process (KTA) framework (Legale et al., 2011). The KTA structure, which describes how knowledge is produced and employed in healthcare, constitutes two components: the knowledge formation cycle, and the action cycle.

While the first cycle contains the process of generating knowledge, the second one encompasses the process of applying the knowledge thus created. By interpreting knowledge and proof into practice, CPD relates to the action cycle (Legale et al., 2011). Designed to improve performance in healthcare practices and, ultimately, health outcomes, CPD strategies follow the dynamic and iterative process for knowledge translation.

According to Maidiment et al. (2010), CPD is a critical mechanism for ensuring that all members of the nursing and midwifery professions are able to deliver high-quality nursing and midwifery care and services and keep pace with healthcare developments

that have an impact on their practice (Harris et al., 2011). The knowledge needed to function effectively as a professional nurse or midwife continues to expand and change while consumer demand and expectations continue to increase (Allen and Hudges 2010). Therefore, as registered health practitioners, nurses and midwives have a professional obligation to maintain their competence and to aim for continuous improvement in the standard of service they provide (Fleet et al., 2010). According to Nursing Council of Kenya (NCK) (2012), nurses and midwives must complete CPD activities to meet the Nursing Council of Kenya's (NCK) mandatory requirements for retention. (Full details can be accessed from the NCK's website: http://softkenya.com/contacts/nursing-council-of-kenya-website/)

Participation in CPD has been reported to be the most widely accepted method of measuring clinical competence. One small UK-based study was identified that explored nursing views of continuing professional development. In general, views were positive. However, the study concluded that nurses may need support in self-reflection activities to assist in implementing learning outcomes (Allen and Hudges 2010). Previous reviews have identified that participation in continuing education does not guarantee competence, with some studies questioning whether continuing education results in improvements in clinical practice (Allen and Hudges 2010).

Ministry of Health (MOH), Kenya (2012) states that in order to provide quality healthcare to all Kenyans, there is a need to have adequate, competent health personnel that can undertake current and emerging health needs in the country. This can be attained through training of new health workers, addressing current in-service training requirements, strengthening training organizations to increase their admission

volume and lastly to support the governing bodies to improve professionalism among the health worker force (MOH 2012). A rapid Training Needs Assessment (TNA) done by MOH, Kenya (2012) to identify the areas of need for the health workforce to ensure that adequate numbers of well-trained health workers are available to provide quality services throughout the country identified Cervical Cancer Screening, Prevention of Mother to Child Transmission (PMTCT), Focused Antenatal Care (FANC), Integrated Management of Childhood Illnesses (IMCI), Active management of the third stage of labor, Essential Newborn Care, Pediatric HIV, Commodity Management, and use of MOH Monitoring and Assessment tools as priority needs. This was in line with the nursing council of Kenya CPD framework for nurses and midwives (2012) which stated that for the CPD activities to be effective and have an impact on the service outcomes, training needs assessment for midwives must be done prior to any CPD activity. Based on this Training Needs Assessment (MOH 2012) these were the main endorsements; as the ministries of health concentrate on the top training significances areas in an effort to improve training, they should also consider the local specific training needs. In order to reach a wider group of in-service health employees, there is a greater need for innovative learning methodologies such as mentorship, distance learning, e-learning, and on-the-job training. Training institutes, ministries of health organizers, technical departments and divisions should build their capacity to bring in-service training needs to the standards required and that for sustainability and cost efficiency, the ministries of health should use alternative training venues and training foundations instead of hotels. Additionally, MOH (2012) stated that regulatory authorities should expand CPD to include a broad range of other in-service training which are currently not offered.

2.4.EmONC Situation Analysis

The need to increase the efficacy and efficiency of both pre-service education and continuing professional education (CPE) or in-service training for the health labor force has never been greater (Bluestone et al., 2013). Reducing global resources and an inescapable critical scarcity of skilled health workers are accompanied by an explosion in the increase of and access to information. Universities and educational institutions are rapidly integrating different approaches for learning that move beyond the classroom (Bluestone et al., 2013). The prospects exist both in initial health professional education and CPE to expand education and training methodologies beyond classroom-based situations (Bluestone et al., 2013). In-service training has been and will remain a substantial investment in developing and sustaining essential proficiencies required for optimum public health in all global service settings (Bluestone et al., 2013, Mirkuzie et al., 2014). Regrettably, in spite of major investments, there is limited evidence about the effectiveness of the techniques commonly applied across countries, regardless of the level of resource.

Nevertheless, all in-service training, wherever delivered, must be evidence-based (Bluestone et al., 2013, Mirkuzie et al., 2014). As stated in Bloom's systematic review, didactic practices and providing printed materials alone bundled in the range of no to low effects, while all interactive programs displayed mostly moderate to high beneficial effect (Bluestone et al., 2013). Given current voids in high-quality evidence from low and middle-income nations, the future scholastic study agenda must include well-constructed assessments of effective, cost-effective and socially appropriate combinations of technique, setting, frequency and media, developed for and tested for

all levels of health workers in low- and middle-income countries (Bluestone et al., 2013).

Emergency Obstetric and Neonatal Care (EmONC) is cost effective priority intervention to reduce maternal and neonatal morbidity and mortality in poor resource settings (Mirkuzie et al., 2014, Mwaniki et al. (2014). Basic EmONC (BEmONC) alone can prevent 40 percent of intrapartum-related neonatal deaths and a significant proportion of maternal mortality (Mirkuzie et al., 2014). Africa is facing a challenge of staff incompetence in EmONC according to Mwaniki et al., (2014). A hospital-based national survey in 2010 In Ethiopia that analyzed constraints from policy to practice in selected emergency obstetric and neonatal conditions in 18 hospitals identified providers poor competence as a major deterrent for ensuring quality comprehensive EmONC (Mirkuzie et al2014). In the case of post partum haemorrhage (PPH) for example, all the hospitals had strategy for PPH administration, 93 percent had the required health personnel, 95 percent had the required supplies, and 65 percent received supervision, yet only 39 percent of the providers in these hospitals had good understanding of PPH, and only 29 percent had the skills to appropriately manage postpartum haemorrhage. The same was true for vital newborn care where all the hospitals had the strategy, 92 percent had the needed health staffs, 70 percent had the basic supplies, and 64 percent received supervision; however only 55 percent of the providers had sufficient knowledge with only 18 percent providing the care (Mirkuzie et al., 2014). The persistence of poor providers' competence could be attributed to gaps in pre-service curricula, lack of continuing education, staff turnover, frequent rotation and limited in-service training in Africa (Dickson et al., 2015). A multi-country study that included Ethiopia and a study from

Nigeria reported that the pre-service curricula for midwives and nurses had limitations to ensure graduates with essential midwifery competencies up to the quality standard given by the International Confederation of Midwives (Mirkuzie et al., 2014). Though it is well-recognized that having a skilled birth attendant (SBA) is one of the most reliable predictors of positive maternal and neonatal health outcomes, policies supporting SBAs in the workforce are often lacking (Fotso and Fogarty 2015). For example, in Africa, where the global health crisis is most severe, very few national HRH policies exist to guide the training and deployment of the health workforce for maternal, newborn and child health (Fotso and Fogarty 2015). Where policies are in place, the divide between policy and practice, including imbalances in the workforce structure and distribution, stands in the way of equitable service access, suggesting the need for a more strategic approach to health workforce management (Fotso and Fogarty 2015). A study done in Rwanda (Sipsma et al., 2012) indicated that many practices recommended for high-quality maternal, and newborn care were not routinely performed in Rwandan health facilities, and fewer than 17 percent of amenities performed all suggested practices in prenatal care, delivery, or newborn care. The restricted use of endorsed practices was evident in both government-owned and non-governmental amenities and across all outlying areas of Rwanda. Additionally, although the rural provinces such as Northern, Southern, Eastern, and Western conducted fewer antenatal care activities than the urban area of Kigali City, this association was not steady with delivery or newborn care activities. The improved performance of antenatal care in Kigali City may be attributable to the comparatively recent (since1997) training of midwives, the majority of whom live and practice in Kigali City (Sipsma et al., 2012).

2.5. CPD Measurement and Evaluation

As in other educational professions, most evaluation outlines used in CPD are derived from Kirkpatrick's model (Legale et al., 2011). This ideal evaluates training efficiency by measuring participants' reactions to an educational activity (level 1); changes in participants' knowledge, attitudes, or skills (level 2); transfer of learning to practice/perceived deviations in behaviour (level 3); and finally, the outcomes of the newly acquired behaviour on organizational outcomes such as output and quality (level 4). According to this model, the effects of current approaches to the assessment of the impact of accredited CPD activities should ideally be evaluated focusing on participants' participation, satisfaction, and changes in knowledge, behavior, and patient outcomes (Legale et al., 2011). In practice, however, most CPD providers only assess levels 1 and 2 outcomes using pre- and post-activity self-administered questionnaires. Although the impacts of levels 3 and 4 have been measured in the context of research projects using health services methods (Legale et al., 2011), CPD benefactors are still struggling to find dependable means to measure these impacts on a routine basis.

Moreover, many countries are working to train more skilled providers in emergency obstetric and newborn care to increase access to these services (WHO, 2015). However, few countries have the funds or human resources that are needed to implement quality in-service training. Training that does not translate into the improvement of patient care wastes those scarce resources and can cost lives. Quality training in EmONC (and in any health-related field) goes beyond bringing together providers for classroom and clinical practice for several days. Evidence suggests that training works when it is competency-based and quality-focused and when it

addresses the transfer of learning to the development of clinical decision-making and psychomotor skills. Evidence also reinforces the importance of clinically integrated learning interventions, as they have been found to be superior to classroom-only instruction for generating positive learning outcomes (Legale et al., 2011). This type of training ensures that learners—practicing clinicians and pre-service educators—are trained by qualified facilitators in the appropriate classroom and clinical settings for an adequate amount of time, using evidence-based training materials and approaches (Jill 2011). And it emphasizes timely follow-up of the learners in their workplace, where facilitators can assess how the learners have incorporated their new skills and knowledge into their management of actual clients (WHO 2015). Despite the emphasis on current health policy and practice on enhancing workforce performance through training, (WHO 2010) found no evidence that training was statistically associated with the increased use of recommended practices. This lack of association, however, was consistent with a small body of literature, (Sipsma et al., 2012) and suggested the need to better understand effective training mechanisms. Furthermore, supervision and monetary incentives were also not associated with greater use of recommended practices (Sipsma et al., 2012). Even though non-monetary enticements were associated with improved use in newborn care, this effect was not consistent across all extents (Sipsma et al., 2012, WHO 2010, WHO 2012). (Sipsma et al., 2012) found out that the impact of training occurs only after a critical mass of staff is trained coupled with the quality of the training and supervision. Effective management and an organizational ethos of quality enhancement may also be essential to promote adherence to recommended practices (WHO 2012). As bilateral and multilateral organizations emphasize on capacity development, it is critical that benefactor training be designed and executed with attention to systems-level factors

so that providers' new skills and knowledge may be efficiently translated into practice. , (Sipsma et al., 2012)

However, research done by Kenneth et al., (2011) indicated that the dental and non-dental literature did not provide any information to demonstrate if CPD participation is a valid indicator of professional competence or performance. This was principally due to the research challenges of assessing outcomes of CPD in terms of effectiveness and impact.

As noted in the literature review (Maidiment et al., 2010), input-based measurement of CPD has been considered inadequate by many. Input-based CPD schemes do not directly indicate whether any learning, change in behavior on the job, or impact on the organization has taken place. Measuring only by inputs appears to be based on the idea that whatever is done under the CPD scheme is useful for achieving the purposes of CPD. This presumes that all CPD activities allowed under the scheme will be of sufficient quality to lead to the professional development and that the individuals attending will be sufficiently attentive and receptive to reap the benefits. Additionally, GDC (2011) in their study of 2 found out that few organizations actually measure CPD by outputs; those that do usually only require "evidence" of output. The quality or standard of this output is rarely "measured" in any systematic manner (Legale et al., 2011). Most expert bodies still only ask for a record of activities, without regard to the quality or impact of those activities. Very few require objective evidence of learning or change in behavior, while still fewer require evidence of the effectiveness of the learning or changed behavior in affecting services delivered to clients (Jill 2011). Many professional bodies have a notion of standard or quality of output but do

not have a structured or defined set of criteria or scale for determining this standard. The standard of CPD records seems to be determined generally in a simple manner: adequate or not adequate. Even this verdict tends to be made rather subjectively (Legale et., al 2011).

Even though participation in CPD is currently obligatory in Kenya defining the sanctions or implications for non-participation remains to be defined and even if it is there, it is on paper and not implemented (NCK 2012). The healthcare scenery is diverse and multifaceted. In Kenya, there is presently no commonly recognized approach to long-term learning. However, there is broad agreement that patients are best served when those who care for them maintain competence by engaging in continuous learning and assessment strategies (NCK 2012). Optimally, these policies would be extremely self-directed, with content, learning procedures, and learning resources selected precisely for the purpose of refining the knowledge, skills, and outlooks that nurses and midwives need in their daily professional lives that result in improved patient outcomes (Nigel et al., 2012).

According to Jill (2011), CPD can be defined as an ongoing process, outside formal undergraduate and postgraduate training, that permits individual health employees to sustain and improve criterions of medical practice through the development of skills, attitudes, knowledge, and behavior, CPD should also support particular changes in practice emerging from the literature review, it is believed that the description of CPD could be divided into two sections: gaining knowledge and improving patient care (Nigel et al., 2012). Additionally, the procedures for recording CPD were perceived as needing to address both of these aspects (Jill (2011). Nevertheless, a body of literature

claimed that a gain in knowledge does not necessarily result in a change in behavior by the clinician (Legale et al., 2011). If that is the case, then other questions arise: will an enhancement in patient care take place? And, if it did, in what manner could it be calculated? (Jill 2011). Moreover, literature has reviewed that there is little literature on the effectiveness of CPD in improving patient care (Jill 2011). However, in his writing, he stated that: effective CPD involves both *"learning"* and being *"fit to practice"*, understanding both the *"why"* and the *"how"* and putting learning into practice and that efficiency is enabled when professionals are able to determine their own learning requirements through reflection within the totality of their practice. This means being able to go beyond what is measurable (Legale et al., 2011).

A responsive health structure is one offering suitable antenatal care; all-inclusive emergency obstetrics care and quality delivery services (NCK, 2012). Maternal and neonatal morbidity and mortality rates continue to be recognized globally as public health priorities (WHO, 2012). Additionally, these gauges in Africa have continued to rise instead of decreasing since the launch of Safe Motherhood Initiative 15 years ago (Legale et al., 2012). Of all maternal deaths experienced universally, 99 percent of them occur in developing countries with Sub-Saharan Africa having the highest maternal mortality ratio of 900 maternal deaths per 100,000 live births and also the highest lifetime risk of maternal death of 1:26 (National Road Map-Kenya, 2010, NCPD, 2013, NCK, 2012, and Harris et al., 2011). The idea that health professionals should be accountable to the society they serve is not a new concept (Fleet et al., 2010), and for a long time, the (CPD) of health professionals has been seen as one approach in which populace's level of health could be enhanced. Furthermore, as

competent care providers, midwives identify problems early in problematical births, take appropriate life-saving actions immediately and refer where appropriate.

The community was, and is still today, increasingly demanding a system that is more responsive to regional and community needs (Urdum et al., 2010). As a result, there may be the need for more health professional training in all phases of the education continuum – undergraduate, postgraduate, and CPD – that meets the health and social needs of the populations being served (Nigel et al., 2010). The trend is now towards 'socially accountable' health care, denoting that the wider context of CPD must also include the personal, political, and social facets of health care and as such, involve a broadening of culpability to patients, the community, managers, and policymakers (Fleet et al., 2010). CPD planning should consider both local and national significances as well as personal learning necessities (Legale et al., 2010). There is a glut of activity both internationally and domestically geared towards attending maternal and neonatal morbidity and mortality. This has placed the role of midwives in sharp focus as régimes think of methods of ameliorating this issue. As the number of midwives in Kenya and sub-Saharan Africa, in particular, are constrained, innovative ways of improving their knowledge and skills in highly effective targeted obstetric and newborn interventions without removing them from the workplace are desirable (WHO 2010a). Midwives offer evidence-based, cost –effective high impact care (WHO 2010b). Additionally, their critical thinking and decision-making skills contribute to the saving of lives by making timely decisions and action taking (WHO 2010a).

In this respect, therefore, there is a necessity to strengthen their skills through (CPD). Anecdotal evidence suggests that increasing demands on service delivery have reduced the time available for CPD activities in many countries coupled with less support from service providers in relation to staff needs (Fleet et al., 2010). Research on CPD have been done in other countries but no documented evidence in Kenya to critically analyze the perspectives of CPD practice for Nurses and midwives and their impact on the achievement of Sustainable Development Goal three. Moreover, the fast generation of devastating information of health and complication in technologies in the 21st century poses the utmost challenge to health care personnel capacity to provide effective and resourceful high quality and up to date health care facilities (MOH, 2010).

The skills and knowledge attained at the completion of the undergraduate and postgraduate training in nursing schools are not adequate to sustain competency and performance over their job chiefly in nursing and midwifery, health care benefactors are expected to remain current in their practice (evidence-informed practice) through partaking in CPD programs .Individual learning undertakings improved public awareness, and inspection of the quality of services provided further compounds these encounters. In addition, these problems have promoted a growing stress on the need for culpability within the health professions (Ouma et a., 2010).

CPD benefactors will need to pay attention or respond to the fluctuating political and economic conditions and search for sufficient and effective approaches to maintaining and improving the skills of an agency health care workforce that are currently confronted with rapid technical advances and organizational reformation (Mwaniki et

al., 2014). Besides, despite the lack of experiential data supporting the relations between taught courses and clinical efficacy, there is an increasing emphasis on continuing professional education (CPE) and development (CPD) (Jill 2011). As post registration courses flourish, the shareholders, clinicians, managers, auditors, educators, and patients need the results of pertinent, consistent and valid assessments to inform purchasing decisions and curriculum planning (Dickson et al., 2015). Conversely, very little experiential evidence on the clinical efficiency of education programs exists, and most of this takes the form of reported interview or survey data, rather than direct observations and the connection between professional performance and educations remains blurred(Mwaniki et al., 2014, Jill 2011, Dickson et al., 2015).

Showing the impact of learning is important as it allows the customer to know exactly how the learning process will bring positive results to the business (Legale et al., 2011). However, while the business elements value the business linkage (impact or outcome) and evaluation (measurement) the most, learning departments often spend the least amount of time and resources on these two activities. A study done by Nigel et al., (2012) on the impact of CPD in health care identified that there were no studies of high quality that existed to show the effectiveness of CPD, in terms of quality of care conveyed, performance, professional criterions, proficiency, public satisfaction or safety, or their longer-term impacts on knowledge preservation and application.

In Kenya, it is assumed that (CPD), which encompasses continuing medical education (CME) (NCK 2012), plays an important role in maintaining and improving the quality and efficiency of the healthcare system by interpreting evidence into medical practice. In other words, CPD attends as a significant knowledge translation stratagem

and is one potential approach that could be incorporated into the Knowledge to Action Process (KTA) framework (Legale et al., 2011). The KTA structure, which describes how knowledge is produced and applied to health care, contains two components: the knowledge formation cycle and the action cycle (Legale et al., 2011). Whereas the first cycle encompasses the process of creating knowledge, the second one comprises the process of applying the knowledge thus generated. By transforming knowledge and evidence into action, CPD pertains to the action cycle (Legale et al., 2011). Aimed to improve performance in healthcare undertakings and, eventually, health outcomes, CPD approaches follow the vigorous and iterative procedure for knowledge transformation.

As in other educational professions, most assessment structures used in CPD are derived from Kirkpatrick's model (Legale et al., 2011, GDC 2011). This model assesses training effectiveness at various levels by evaluating participants' reactions to an educational event (level 1); changes in participants' skills, attitudes, or knowledge (level 2); transfer of learning to practice/perceived deviations in behavior (level 3); and finally, the results of the recently learned behaviour on administrative outcomes such as productivity and quality (level 4). According to this model, the effects of current approaches to the assessment of the impact of accredited CPD activities should ideally be evaluated focusing on participants' participation, satisfaction, and changes in knowledge, behavior, and patient outcomes (legale et al., 2011). Practically, nonetheless, most CPD benefactors only assess levels 1 and 2 outcomes using pre- and post-activity self-administered questionnaires. Although the impacts of levels 3 and 4 have been measured in the context of research projects using health services methods (Ligale et al., 2011) CPD benefactors are still struggling to

find steadfast ways to quantify these effects on a routine basis. Godin et al., (2010) proposed an integrated conceptual model to predict behavior change in healthcare specialists that offers a strong basis for developing a valid and dependable measurement apparatus to evaluate CPD bearings on clinical practice (Kirkpatrick's level 3 outcomes).

As individual verdicts are normally vital to the adoption of clinically related behaviors, theories providing information about cognitive mechanisms underlying behaviors help provide direction to behaviour-change interventions targeting health care professionals (Legale et al., 2011). As per Training and Development Agency for schools (TDA), to evaluate the impact of professional development it is crucial to consider what was intended to be achieved, and what impact could reasonably be expected, in any given time frame (Dickson et al., 2015). This agency indicated that for CPD intervention to be effective particular principles have to be followed: Planning for CPD and the evaluation of its effect should be fundamental to performance management, impact assessment should emphasize on what partakers learn, how they apply what they have been trained for, and the effect on the knowledge of children and young people, there should be an established timeline for assessing results, acknowledging that some outcomes, such as children and young people's enhanced performance, may take longer to become apparent than others. Unanticipated outcomes will also be considered for the review, planning, and execution of the effect evaluation should be a concerted process between the individual and key personnel involved in performance management and/or training and mentoring, the evidence base and the success standards for the assessment of impact should be agreed, impact evaluation should be considered in the short, medium

and long-term, longer-term expert development undertakings should involve determinative reviews of impact at agreed phases, the evaluation of effect should include a cost-benefit scrutiny of the professional development and that the progressions for evaluating the effect of CPD undertakings need to be appraised on a regular basis to ensure that they are effective and balanced (Galer et al., 2009, Legale et al., 2011).

2.6. Overview of Maternal Health Globally

Universally, a projected 287,000 maternal deaths occurred in 2010, a decline of 47 percent from levels in 1990 (Mumtaz et al., 2014, Mirkuzie et al., 2014, Fotso and Fogarty, 2015). Sub-Saharan Africa (56 percent) and Southern Asia (29 percent) accounted for 85 percent of the overall burden (245,000 maternal deaths) in 2010. At the nation level, two countries account for a third of global maternal deaths: India at 19 percent (56,000) and Nigeria at 14 percent (40,000) (Mumtaz et al., 2014). The worldwide MMR in 2010 was 210 maternal deaths per 100,000 live births, down from 400 maternal deaths per 100,000 live births in 1990 (WHO, 2012). The Maternal mortality rate in developing states (240) was 15 times more than in developed nations (16). Sub-Saharan Africa had the highest maternal mortality rate at 500 maternal deaths per 100,000 live births, while Eastern Asia had the least among MDG developing countries, at 37 maternal deaths per 100,000 live births. The MMRs of the remaining MDG developing nations, in descending order was Southern Asia, Oceania, South-eastern Asia, Latin America and the Caribbean, Nothern Africa, Western Asia and the Caucasus and Central Asia (WHO, 2012). Their maternal deaths per 100,000 live births was 220, 200, 150, 80, 78, and 71 respectively. According to WHO, UNICEF, UNFPA and The World Bank estimates of 2010 (Mumtaz et al.,

2014, Mirkuzie et al., 2014, Fotso and Fogarty 2015), a total of 40 nation states had high MMR (stated as MMR ≥ 300 maternal deaths for every 100,000 live births) in 2010. Of these countries, Somalia and Chad had tremendously high MMRs (≥1000 maternal deaths for every 100 000 live births) at 1100 and 1000, correspondingly. The other eight highest MMR nations were: Sierra Leone (890), the Central African Republic (890), Burundi (800), Guinea-Bissau (790), Liberia (770), the Sudan (730), and Cameroon (690) and Nigeria (630) in descending order. Even though most sub-Saharan African states had high MMR, Mauritius (60), Sao Tome and Principe (70) and Cape Verde (79) had low MMR (stated as 20–99 maternal deaths for every 100,000 live births), whereas Botswana (160), Djibouti (200), Namibia (200), Gabon (230), Equatorial Guinea (240), Eritrea (240) and Madagascar (240) had moderate MMR (stated as 100–299 maternal deaths for every 100,000 live births). Only four nations outside the sub-Saharan African region had high MMR: the Lao People's Democratic Republic (470), Afghanistan (460), Haiti (350) and Timor-Leste (300). Sub-Saharan Africa had the largest proportion of maternal deaths attributed to HIV at 10%, while the Caribbean had the second largest at 6 %(Mumtaz et al., 2014, Mirkuzie et al., 2014, Fotso and Fogarty 2015). Of the 19,000 maternal deaths as a result of HIV/AIDS globally, 17 000 (91 percent) was in sub-Saharan Africa, whereas 920 (5 percent) occurred in Southern Asia. Additionally, for some nations in Southern Africa, such as Lesotho, Swaziland, Namibia, South Africa, and MMR increased from the year 1990 to 2000. This was majorly because of the HIV epidemic in the mentioned countries. With antiretroviral therapy becoming increasingly available the MMR is now declining in these countries (WHO, 2012).

According to the same report, (WHO 2010), the fifth MDG aimed to advance maternal health, with an aim of decreasing the maternal mortality rate by 75 percent between the years 1990 and 2015. For the 10 countries that have achieved MDG 5 by 2010 that include Estonia, Maldives, Belarus, Romania,, Bhutan, Equatorial Guinea, Islamic Republic of Iran, Lithuania, Nepal, and Viet Nam there percentage reductions was 95 percent, 93 percent, 88 percent, 84 percent, 82 percent, 81 percent, 81 percent, 78 percent, 78 percent, and 76 percent respectively. The progress of the remaining countries can be gauged through examining whether they have had the expected average annual decline of around 6 percent in their maternal mortality rate between 1990 and 2010. The countries that are believed to be on the track are Eritrea, Oman, Egypt, Timor-Leste, Bangladesh, China, Lao People's Democratic Republic, Syrian Arab Republic, and Cambodia. Their MMR was 6.3 percent, 6.2 percent, 6 percent, 6 percent, 5.9 percent, 5.9 percent, 5.9 percent, 5.9 percent, and 5.8 percent respectively. Poland and Turkey whose MMR is at 6.1 percent and 5.8 percent respectively are thought to have experienced average annual declines of more than 5.5 percent. These two countries are not categorized as being on track because their MMR was below maternal deaths for every 100,00 live births in 1990. Likewise, 50 nation states are categorized as making progress. Conversely, 14 countries have made insufficient progress, and 11 are categorized as having made no progress and are likely to miss the MDG objective unless accelerated interventions are put in place. According to WHO (2015), the goal of a healthcare delivery site is to provide high-quality services to the community it serves, and there are several primary factors that support good performance in the workplace:

Job expectations-Do providers know what they are supposed to do?

Performance feedback-Do providers know how well they are doing?

Physical environment and tools-What is the work environment like, and what systems are in place to support it?

Motivation-Do people have a reason to perform as they are asked to perform? Does anyone notice?

Skills and knowledge required to do the job-Do providers know how to do the job?

The final factor on the list required knowledge and skills is addressed primarily through training (WHO 2015). Even the paramount training does not always translate into enhanced performance, however, if the healthcare provider is not able to apply new skills and knowledge on the job (Mumtaz et al., 2014). Consequently, continued expertise support through demonstration, return demonstration, training, and discussion can aid in strengthening skills in order to sustain competency and skill (Sipsma et al., 2012). Supervisors, trainers, and the healthcare providers being trained (referred to as in this research "Midwives") all have important roles in the transfer of learning process (making sure that the skills and knowledge learned during a learning intervention are applied on the job) (WHO, 2015).

2.7. Overview of Maternal Health in Kenya

Millennium Development Goal (MDG) 5 was committed to improving maternal health by reducing maternal mortality by three-quarters and achieving universal access to reproductive health (Mwaniki et al., 2014, Ouma et al., 2010, WHO 2012). Universally, the maternal mortality rate has reduced by 47 percent over the past 20 years, from 400 maternal deaths for very 100,000 live births in 1990 to 210 by the year 2010. Nevertheless, in Kenya, maternal mortality ratio has remained at an

unacceptable high level of at least 362 deaths for every 100,000 live deaths (KDHS 2014).

According to National Council for Population and Development (NCPD) (2013), maternal mortality in Kenya has remained unacceptably high. The high maternal mortality rate is due to low exploitation of skilled care, with only 47 percent of expectant mothers completing the endorsed 4 antenatal care visits and 44 percent getting skilled care at childbirth, while the caesarean unit rate is 6.2 percent against the endorsed rate of 7 to 15 percent. The national maternal health roadmap to accelerate attainment of MDG 5 in Kenya put the target for skilled birth attendance at 90% by 2015(Mwaniki et al., 2014). There is low coverage for rudimentary emergency obstetric care at 9 percent while the comprehensive care is much lower at only 7 percent. The contraceptive prevalence rate (46%) has remained low; while the unmet need for family planning is still high at 26 percent. This is of great worry in a nation with a very young populace (Mwaniki et al., 2014). Other elements leading to the high maternal mortality are shortage of health personnel, insufficient health care provider expertise and harmful socio-cultural activities and behaviors. Numerous stratagems have been put in place by the government through the Ministry of Health in an effort to decrease the high maternal mortality rate (Dickson et al., 2015). Most of these involvements have been generalized across areas, yet each province has unique individualities. This has been further facilitated by the inadequate resources assigned towards maternal and reproductive health, which are then spread thinly across the country in the course of implementation and scale-up of interventions (Ouma et al., 2010, Mwaniki et al., 2014 and Dickson et al., 2015). Recent case studies have shown that great political governance can intensely influence the effect

of health interventions that lead to the decrease of maternal mortality among other health outcomes, whilst reinforcing health systems (Dickson et al., 2015).

2.8. Kenyan Counties with the Highest Burden of Maternal Mortality

According to Kenya Demographic Health Survey 2014- key Indicators Report, there has been some improvement in maternal and neonatal indicators as shown in the figure below:

Among women age 15-49 who had a live birth in the five years preceding the survey, percentage who received antenatal care from a skilled provider for the last live birth and percentage with four or more ANC visits for the last live birth; among all live births in the five years before the survey, percentage delivered by a skilled provider and percentage delivered in a health facility, by county Kenya 2014

	Women who had a live birth in the five years preceding the survey			Live births in the five years preceding the survey		
County	Percentage with antenatal care from a skilled provider[1]	Percentage with 4+ ANC visits	Number of women	Percentage delivered by a skilled provider[1]	Percentage delivered in a health facility	Number of births
Coast	**97.5**	**62.3**	**1,471**	**58.2**	**57.7**	**2,023**
Mombasa	99.2	65.0	422	82.8	81.8	512
Kwale	95.7	60.3	304	50.1	49.0	427
Kilifi	98.2	64.6	503	52.3	52.6	739
Tana River	93.6	50.8	115	32.2	31.6	175
Lamu	95.7	62.2	36	47.3	43.9	56
Taita Taveta	97.9	58.9	90	62.5	61.9	113
North Eastern	**66.5**	**36.8**	**372**	**32.4**	**29.2**	**650**
Garissa	87.3	47.7	135	39.8	36.7	237
Wajir	57.6	37.7	141	21.7	18.3	258
Mandera	50.5	20.2	96	38.7	36.0	155
Eastern	**97.2**	**56.3**	**1,834**	**63.3**	**62.7**	**2,321**
Marsabit	75.6	42.8	64	25.8	25.8	91
Isiolo	96.0	50.2	58	43.8	42.1	85
Meru	97.3	45.3	442	82.8	81.8	517
Tharaka-Nithi	98.3	56.1	121	76.6	77.7	141
Embu	99.2	56.2	167	81.5	81.5	201
Kitui	97.5	62.2	313	46.2	45.6	438
Machakos	98.8	60.8	396	63.4	62.9	493
Makueni	98.0	65.8	274	54.6	53.3	355
Central	**97.3**	**63.4**	**1,528**	**89.7**	**90.2**	**1,796**
Nyandarua	96.7	58.4	195	85.3	86.1	248
Nyeri	96.7	61.1	216	88.1	89.0	249
Kirinyaga	96.4	60.0	174	92.3	92.5	197
Murang'a	97.4	61.4	255	85.5	85.0	308
Kiambu	97.9	67.1	688	92.6	93.4	794
Rift Valley	**93.9**	**51.7**	**4,002**	**51.3**	**50.2**	**5,677**
Turkana	91.0	48.9	214	22.8	23.1	347
West Pokot	85.2	18.2	180	27.0	25.8	302
Samburu	73.8	51.9	79	29.0	24.5	117
Trans-Nzoia	92.0	40.6	382	41.8	41.5	528
Uasin Gishu	96.1	63.0	363	59.0	57.4	483
Elgeyo Marakwet	98.1	46.8	114	65.0	64.7	168
Nandi	98.5	56.8	302	46.8	46.5	402
Baringo	92.8	54.5	160	53.8	53.5	238
Laikipia	93.7	56.2	165	49.5	48.1	209
Nakuru	95.6	61.4	674	69.5	69.7	909
Narok	91.6	46.0	403	40.3	38.6	638
Kajiado	96.7	66.9	335	63.2	62.4	461
Kericho	97.1	53.7	277	64.4	62.2	373
Bomet	93.5	37.2	354	52.2	49.0	502
Western	**97.2**	**51.3**	**1,590**	**47.8**	**47.0**	**2,255**
Kakamega	96.4	45.0	532	48.6	47.0	747
Vihiga	97.1	61.3	164	50.3	50.2	229
Bungoma	97.6	50.0	607	41.4	40.8	870
Busia	97.6	59.9	287	58.5	58.4	409
Nyanza	**96.6**	**58.7**	**1,988**	**65.0**	**64.8**	**2,790**
Siaya	97.8	61.1	268	70.4	69.6	391
Kisumu	98.4	68.1	378	69.2	69.5	500
Homa Bay	93.5	61.4	447	60.4	61.9	658
Migori	96.4	56.4	360	53.4	53.3	565
Kisii	97.7	50.0	384	72.8	69.3	482
Nyamira	96.4	50.3	152	74.1	74.3	195
Nairobi	**97.6**	**73.1**	**1,657**	**89.1**	**88.7**	**2,051**
Total	95.5	57.6	14,442	61.8	61.2	19,564

Figure 3: Maternal care indicators by county

Table 2: Ranking of Kenyan Counties by Number of Maternal Deaths and Maternal Mortality Rate

Rank	Region	Maternal deaths	Rank	Region	Maternal mortality rate (deaths for every 100,000 live births)
	KENYA	6,623		KENYA	495
1	MANDERA	2,136	1	MANDERA	3795
2	WAJIR	581	2	WAJIR	1683
3	NAIROBI	533	3	TURKANA	1594
4	NAKURU	444	4	MARSABIT	1127
5	KAKAMEGA	364	5	ISIOLO	790
6	KILIFI	289	6	SIAYA	691
7	NANDI	266	7	LAMU	676
8	BUNGOMA	266	8	MIGORI	673
9	HOMABAY	262	9	GARISSA	646
10	MIGORI	257	10	TAITATAVETA	603
11	KISUMU	249	11	KISUMU	597
12	SIAYA	246	12	HOMABAY	583
13	TRANSNZOIA	234	13	VIHIGA	531
14	GARISSA	208	14	SAMBURU	472
15	KWALE	203	15	WESTPOKOT	434
	Other counties	85			
	Total	6,538			
Percent of the total number of deaths		98.7			

(Source: Kenya Agribusiness and Agroforestry Alliance 2014)

Even though Kwale, Nakuru, Nandi, Bungoma, Nairobi, Kilifi, and KakamegaAlthough rank higher in terms of number deaths (Kenya Agribusiness and Agroforestry, 2014), in terms of MMR, they are not ranked high. In terms of the maternal mortality burden, it is, therefore, important to include risks in a number of deaths as well as obstetric risk. This is shown in Table 3. At the state level, approximately half of deaths (48 percent) occur in the course of delivery. In 5 counties (Turkana, Mandera, Wajir, Lamu, and Garissa, Wajir) over half of the deaths occur during delivery. The county with the highest percentage dying in the course of pregnancy is Marsabit. Taita Taveta, Kisumu, and Siaya have the highest proportion

dying in the post-partum period. The implication here is that different factors influence the risk of maternal death in the different counties. Kenya is among the top 10 Countries with the highest number of HIV-related maternal deaths and about 20 percent of maternal deaths is ultimately linked with HIV. Thus HIV may be significant in Nyanza region counties which have the highest prevalence of HIV while other factors may be important in Mandera, Wajir, and Garissa with a low prevalence of HIV.

Table 3: Ranking of counties by burden of Maternal Mortality (Source: Kenya Agribusiness and Agroforestry Alliance 2014)

County	Maternal deaths	MMR	Percent of deaths during		
			Pregnancy	Delivery	2 months after delivery
Mandera	2,136	3795	28	56	16
Turkana	175	1594	24	54	22
Wajir	581	1683	28	60	12
Migori	257	673	24	45	30
Nakuru	444	374	28	40	31
Siaya	246	691	22	28	50
Kisumu	249	597	18	33	48
Nairobi	533	212	25	38	38
Homa Bay	262	583	22	34	43
Kakamega	364	316	20	44	36
Garissa	208	646	25	61	13
Marsabit	97	1127	30	47	23
TaitaTaveta	129	603	16	36	48
Isiolo	32	790	25	56	19
Lamu	52	676	10	65	25
Kenya	6,623	495	26	48	26

2.9. Health in Embu and Meru Counties

According to Kenya Agribusiness and Agroforestry (2014), the following were recorded to indicate the health facilities of Embu and Meru Counties compared to the National. Level five 1, level 4 and leve3 86 respectively. Out of these about 60% are public unlike the national (KDHS2008/ 2009) whereby only 40% of all health facilities are public. Doctor to patient ratio is 1: 10,475in Embu and 1:57000 in Mbeere as compared to National which is at 1: 17,000 Population (KDHS2008/2009).

Eastern	97.2	56.3	1,834	63.3	62.7	2,321
Marsabit	75.6	42.8	64	25.8	25.8	91
Isiolo	96.0	50.2	58	43.8	42.1	85
Meru	97.3	45.3	442	82.8	81.8	517
Tharaka-Nithi	98.3	56.1	121	76.6	77.7	141
Embu	99.2	56.2	167	81.5	81.5	201
Kitui	97.5	62.2	313	46.2	45.6	438
Machakos	98.8	60.8	396	63.4	62.9	493
Makueni	98.0	65.8	274	54.6	53.3	355

Figure 4: Maternal Care Indicators by County In Eastern Province

Source: Demographic and Health Survey Key indicators 2014.

2.10. Summary

This chapter is a review of the literature on maternal and neonatal health. Literature has been searched on the maternal health status in the country and globally. The literature on the situation of EmONC skills and impact evaluation has also been searched.

Although there is much that has been studied on CPD and the activities of participating in CPD generally, literature about the evaluation of its impact in midwifery specifically is lacking especially for Africa and more particularly for Kenya. The literature has also revealed the maternal health status in the counties as

well as hindrances and facilitators of CPD practice. This research, therefore, will inform the ministry on the relationship between CPD practice and maternal and neonatal health in Embu and Meru counties with the aim of strengthening CPD practice and implementation in of its practice with the ultimate goal of improving maternal and neonatal health in the country.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter covers research design, sample selection criteria, tools used to collect data as well as data analysis and presentation.

3.2 Research Design

A before–after study was conducted using quantitative and qualitative methods to evaluate trainee reaction and change in knowledge, skills, and behavior, in addition to functionality of healthcare facilities, 3 months post-training.

The study adopted a pre-intervention (phase one), intervention (phase two) and post-intervention (phase three) survey design. Phase one (June to November 2013) was a baseline survey and the findings of phase one formed the basis for phase two.

Phase two (December2013- September 2014) involved training of all the midwives in Phase one based on the results of the analysis of the data obtained in phase one.

Phase three (November 2014- December 2014) was an evaluation to determine the outcomes of the intervention phase.

3.3 Location of the Study

The study was conducted in the maternity units of Embu and Meru level five Hospitals, Kenya. The study area was selected because of convenient by the researcher since she had no external funding to select a distant facility

3.4 Study Population

The study population included all midwives working in the maternity units of Embu and Meru level five hospitals. The study considered midwives with an experience of at least six months post nursing school training and in maternity units. Nigel et al (2012) supports that six months is enough to observe impact of a certain strategy. A total of 113 midwives formed the study population.

3.5 Phase One (Baseline survey): Identification of EmONC gaps

3.5.1 Introduction to Phase One

Phase one involved conductiong a needs assessment survey. This phase utilised a descriptive exploratory study (Ross and Wood 2006) utilizing two types of questionnaires, a knowledge assessment and confidence and experience questionnaires respectively. This kind of study design was chosen because the main aim was to describe the phenomena in as much details as possible in terms of how they are. Moreover an exploratory design (Ross and Wood 2006) was chosen because it was studying an area that was not known hence attempting to identify new knowledge, new insights, new understanding and new meanings.

Moreover Taylor et al (2007) support this by stating that descriptive designs are particularly useful when little is known about a certain phenomenon and that they are a way to start building up knowledge about a topic and are used to conduct an initial exploration on a research question. Additionally, exploratory studies are more flexible and they allow the study to occur in a natural setting (Ross and Wood 2006). Additionally, as Ross and Wood (2006) state, flexibility in exploratory research design is best suited for studies of this type in that it allows the researcher to change

direction as the knowledge of the variables increases. This is because ideas occur as data are collected and examined hence one would be guided by the emerging issues. Moreover, Oppenheim (2009) states that a descriptive study tells us how many (what proportion of) members of a population have a certain opinion or characteristic or how often certain events occur together (that is, are associated with each other); they are not designed to explain anything or to show casual relationships between one variable and another. This is because the research was only to tell how many midwives have been practising CPD by age, qualification, among other variables but she was not able to tell the relationship between this and the actual practice. The data collected was essentially fact-finding and descriptive and also used to make predictions and recommendations for analytic design to answer the "why" questions.

Wood and Ross (2006) support this by stating that the design is descriptive because it was describing a phenomenon and a lot of information could be acquired through description. An in-depth exploration and description was required to inform of the current practice of CPD, motivating factors and demotivating factors to CPD participation by nurses. However as Oppenheim (2009) and Taylor et al (2007)) state, descriptive designs cannot be used to determine the amount of differences between groups, relationships of characteristics or causality. During this phase, data was collected to establish the midwives' knowledge, experience and confidence level of EmNOC in provision of care to patients and clients. This was necessary in order to identify needs/gaps on the same with the aim of intervening based on the gap identified. Method triangulation was used in data collection. Two sets of questionnaires were used (knowledge questionnaire and confidence and experience questionnaire) and interview checklist.

3.5.2 Study Sample and Sample Size Determination

A total of 113 midwives qualified for phase one.

Kombo and Tromp (2006) define a sample as a part of a large population which is thought to be representative of the larger population. It is a subset of the total target population. Sampling is the process of selecting a few cases in order to provide information that can be used to make judgments about the larger population and hence should be a true representative of the population characteristics (Kathuri & Pals 1993).

A sample for phase one was obtained using guidelines given by Nasiuma (2001).

$$n = \frac{NC^2}{c^2 + (N-1)e^2}$$

Where n=population

c=coefficient of variation which is $\leq 30\%$

e=standard error

Taking a coefficient of variation of 25% and a standard error of 0.03 out of a target population of midwives from Meru Hospital and Embu hospital respectively, a sample of 33 and 31 was obtained. From a target population of 59 and 54 of these institutions, a sample of 33 and 31 respondents was obtained from Meru hospital and Embu hospital respectively. 25% coefficient of variation was used to ensure that the sample was wide enough to justify the results being generalised for the two hospitals. However, all the 113 midwives who qualified to be study subjects were included in phase one and two.

MERU HOSPITAL

Population is 59(N)
C=25%
E=0.03
N (sample)=?

$$n = \frac{59 * 0.25^2}{0.25^2 + (58)0.03^2}$$

$$n = \frac{3.687}{0.0625 + 0.0522}$$

n= 32.14
hence we take n =33 respondents

EMBU HOSPITAL

Population is 54(N)
C=25%
E=0.03
N (sample)=?

$$n = \frac{NC^2}{c^2 + (N-1)e^2}$$

$$n = \frac{54 * 0.25^2}{0.25^2 + (53)0.03^2}$$

$$n = \frac{3.375}{0.0625 + 0.0477}$$

n = 30.626
Hence 31 respondents

3.5.3 Inclusion and Exclusion Criteria

For inclusion in the study, one was required to be a midwife, male or female working in either of the sections of maternity units with a minimum nursing experience of at least six months.

3.5.4 Selection and Training of Research Assistants

Four research assistants at the level degree in nursing were recruited and trained on the purpose of the research, the objectives and how to use the research tools and the evaluation guidelines. They were also trained on the data collection techniques. Honesty and confidentiality among the assistants was emphasized. They were also trained on data processing. Before data collection, the assistants were introduced to the administration of the two hospitals for authority to collect data.

3.5.5 Pre-Testing of Tools

Before the actual data collection, a pilot survey was carried out at Chuka General Hospital because it had similar characteristics with the target population. Piloting is done to assess the clarity of the instrument so that any item found to be inadequate is to be discarded or modified to improve on validity (Mulusa 2008).The researcher tried the questionnaire out on a small sample of 30 respondents which was 26.55% of the population that was targeted in this study. A pre-test of between 10% and 30% of the study population is recommended (Mugenda & Mugenda, 2003)

3.5.6 Reliability

Reliability is a measure of the degree to which the research instrument yields consistent results or data after repeated trials (Mugenda and Mugenda 2003). The tendency towards consistency found in repeated measurements is referred to as reliability. The study used Split-half technique to assess the reliability of the instrument. The data obtained from the pilot survey was used to determine the reliability of the instrument, where the instrument designed had two parts and subject scores from one part were correlated with scores from the second part. A correlation

coefficient of 0.769 was obtained; therefore the researcher adopted the research instrument with minor revision of questions. A correlation coefficient of above 0.65 is acceptable. Reliability coefficient below 0.65 are poor, those in the 0.7 range are good while those above 0.8 are considered best (Sekaran 2006).

3.5.7 Validity of the Instrument

Validity is the ability of the instrument to test what it was intended to test. After preparing the research instruments, e-Delphi process was used to check its face validity and likely acceptability and utility in CPD settings. The Delphi method is a systematic, interactive forecasting method which relies on a panel of independent experts. The carefully selected experts answer questionnaires in two or more rounds. After each round, a facilitator provides an anonymous summary of the experts' forecasts from the previous round as well as the reasons they provided for their judgments. Thus, experts are encouraged to revise their earlier answers in light of the replies of other members of their panel. It is believed that during this process the range of the answers will decrease and the group will converge towards the "correct" answer. Finally, the process is stopped after a pre-defined stop criterion (e.g. number of rounds, achievement of consensus, and stability of results) and the mean or median scores of the final rounds determine the results. In this case the researcher used a panel from one of the Universities in the country in the area of midwifery and nursing education who answered the questions in the questionnaires and the Interview checklist for three rounds as had been agreed earlier by a team of experts from the faculty of Health sciences at Chuka University. The team of experts were reviewing the answers and returning to them until they were sure that the expected answers could be obtained by the tools.

3.5.8 Data collection Methods and Procedure

The study participants were midwives from the maternity units of Embu and Meru level five hospitals in Meru and Embu counties respectively. The study was three phased. Phase one (June to November 2013) involved development of continuing professional development (CPD) training evaluation guidelines in the area of EmONC and a needs assessment survey of the perspectives of CPD among midwives working in the above mentioned hospitals. A total of 113 midwives were involved in the study (59 from Meru hospital and 54 from Embu). During this phase, data was collected using questionnaire (knowledge, confidence and experience questionnaire), interview checklist and case studies. The main objective of this phase was to identify skills and knowledge gap in the area of maternal and neonatal health and factors influencing participation in the continuing development activities.

3.5.9 Research Instruments

Data for phase one was collected using two types of questionnaire (knowledge and confidence and experience questionnaires respectively), interview checklist and case studies. A questionnaire was selected because if self-administered saves time for the researcher, it gives the subject freedom of expression; it takes a very short time to gather a lot of information with a questionnaire can yield candid responses if anonymous and gives a standard format of gathering information (Oppenheim 2009 and Taylor et al 2007). However, a questionnaire has some disadvantages and that is why the researcher will use other methods in conjunction. Disadvantages include: standardization may lead to giving of superficial information, open-ended questions may lead to too much data which may be difficult to analyze, its data can be limited by the respondent's lack of literacy, language, or misunderstandings and

misinterpretations and some subjects may refuse to answer some questions (Taylor et al 2007). During piloting some questions were deleted while others were reframed to answer what was expected. A questionnaire was developed because although there were those existing they could not serve the purpose even with adaptation as it was supported by Taylor et al (2007) and was consisting of both factual and non-factual questions whereby factual information included the biographic data and the non-factual information included the information that was given out by the respondents (subjective data) and that they had control of the responses. Both type of questionnaires had five parts namely socio-demographic data, antenatal care, labour and delivery, postnatal land newborn as well as emergency management component. To increase response, rate the length of the questionnaire was made reasonable such that it took the respondents no longer than half an hour to complete and also ensured that the content did not entail very sensitive aspects of the respondents (Taylor et al, 2007). This was checked at the pilot stage. Moreover, a descriptive title for the questionnaire was written as well as introductory letter (See appendix secton).This was because the introductory letter was telling the respondents who the researcher was, the intended benefits of the study and how to get the results of the research. Signing of the consent forms was termed as acceptance to participate. To increase return rate, the assistants kept on moving round the unit reminding the subjects to return. The non-returned forms were counted as non-responders.

3.5.10 Interview Schedule

While every interview requires a somewhat different structure, certain principles and techniques are applicable to all. The interview schedule three major parts: (1) the opening; (2) the body; (3) the closing.

According to Taylor et al, (2007), the opening should always make the respondent/interviewee feel welcomed and relaxed. In addition, the opening should be addressed. The interviewer should also provide some information to motivate the respondent to answer the questions. Motivating the respondent might involve offering an incentive for participating or an explanation for how the information will be valuable to society. Finally, the opening should indicate the expected length of the interview.

The body of the interview schedule always lists the topics to be covered and potential questions (Oppenheim 2009). Moreover, the number of questions and the exact wording of the questions depend on the type of interview schedule used and the interview may be nonscheduled with only the topics and subtopics listed. A nonscheduled interview generally leaves out potential probing questions to allow the interviewer to adapt to the interaction that unfolds. The nonscheduled interview, however, requires a highly skilled interviewer, provides no means of recording answers and presents problems in controlling the time factor. Beginning interviewers often rely on a moderately scheduled interview that contains major questions and possible probing questions under each. This schedule still allows some freedom to probe into answers and adapt to the situation. In addition, this type of schedule aids in recording answers and is easier to conduct. We will be using the moderately scheduled interview format for our in-class interview.

The closing should maintain the tone set throughout the interview and should be brief but not abrupt. Interviewers should summarize the main issues discussed during the interview, discuss the next course of action to be taken, and thank the respondent for his or her time (Oppenheim 2009 and Taylor et al 2007).

However Oppenheim (2009) and Taylor et al (2007)stated that interview schedules have several advantanges and disadvantages. Some of the advantages incude:The interviewer is present and can establish his/her credentials and develop rapport with the respondent and In a face-to-face interview, the interviewer can use visual aids to illustrate points or identify issues s/he is addressing. These aids include photographs, diagrams, and physical models. Additionally, if the respondent does not understand a question, the interviewer can interpret it. Therefore, the respondent is not provided with potential responses, so that the respondent's genuine views are obtained. They further stated that the data are complete as the interviewer can check that all issues have been covered and all relevant demographic data recoded. On the other hand, Oppenheim (2009) and Taylor et al (2007) stated that the greatest disadvantage of interview schedules is that interviewer bias can occur if the respondent feels a need to provide the answers that the respondent believes the interviewer wants. This is particularly likely to occur if there is a real or perceived power relationship, such as a teacher interviewing a student or a priest/minister interviewing a parishioner. The effect of the disadvantages of the interview schedule was addressed by method triangulation.

3.5.11 Case Study

It as “an empirical enquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Taylor et al 2007). Case studies are intended – unlike more superficial and generalising methods – to provide a level of detail and understanding. “It is defined by interest in an individual case, not by the methods of inquiry used”, and that “the object of study is a specific, unique, bounded system.

The case studies were inquiring about Knowledge, experience and confidence of midwives in providing antenatal, postnatal, newborn and emergency care to patients and clients.

3.5.12 Data Analysis and Presentation of Results in Phase One.

Step 1: Data entry

Data entry was ongoing throughout data collection after training data entry clerks. Data entry programs were created for questionnaires, case studies and the interview schedules. Testing for the data entry programs for each tool was done by entering fictitious data into each data entry file. Each tool was then reviewed to make sure that it has been filled in completely, accurately, and consistently. Any inconsistencies were resolved. The data entry clerks entered all data from tools. All data from each tool was double entered—once into each computer by different staff following the principles:

- Data entry clerks worked at the same pace for data entry. If data entry is attempted too quickly, errors may occur.
- Data from all questionnaires of one type was entered sequentially (i.e., all knowledge questionnaires).

- All data files were backed up regularly on a diskette or CD-ROM, both during data entry and at the end of the day.
- After data entry of questionnaire information, each questionnaire was marked with a check or cross to indicate that data entry has been completed. They were then filed by type of questionnaire and the identification number
- Filed questionnaires were then Stored in a locked cabinet to ensure confidentiality of learners.
- The assessment coordinator supervised data entry and periodically checks the quality of data entry by randomly selecting questionnaires for review.

Step 2: Data Cleaning

The data manager validated the entered data by examining frequencies for each variable. Frequencies were examined for out of range data and inconsistent entries across variables. This process helped identify any inconsistencies in the data, and allowed the data manager to correct them using the original data collection tools. *For example, in the Confidence and Experience Questionnaire, there is a question asking about the number of births attended each week. If the data manager finds that there is a large range in the number of answers given, then the data manager may want to look at the original questionnaires to make sure that the data were entered correctly. Or, the data manager may find that some variables have a lot of missing responses. This would signal the data manager to look at the original questionnaires for that variable to make sure that the data were entered correctly*

Step 3: Development of an analysis plan and selection of key indicators

The analysis plan and key indicators were developed before the assessment occurred to make sure that all key questions were addressed. After the data were collected, entered, and cleaned, the assessment coordinator and data manager met again with the data collection team to finalize an analysis plan.

Step 4: Data analysis

Data was analyzed at two levels, that is phase one and phase three. Since phase one was a level one (whereby the knowledge about the research topic is limited because little or no research has been done, therefore little or no literature is available hence to answer the research question an exploration of the topic in great depth and detail is required) study, it involved two main steps (Ross and Wood 2006). That is content analysis and frequency tabulations. Data was cleaned to eliminate some of the more obvious errors that may have crept in during the preceding stages (frequency distributions, range-checks and internal consistency) as stated by Oppenheim (2009) and analyzed both qualitatively and quantitatively. Qualitative data was analyzed by content analysis of the themes that emerged whereas descriptive statistics and inferential statistics were used to analyze quantitative data. Quantitative data was analyzed by descriptive statistics. After data collection, coding was done and then entered into a data sheet on SPSS. Coding was according to the three main themes and any other emerging theme: CPD activities, motivating and inhibiting factors. Description of the distribution and range of responses to each variable was done and data examined for skewness. Data was categorized on a nominal scale, defining them carefully so as to ensure that they were mutually exclusive. A descriptive summary of the data was then made. Frequency distributions in terms of graphs, charts and tables

was then used as well as measures of central tendency such as mean, median, mode and range and standard deviation to show the dispersion of data (Taylor 2007). Tests of association (Chi-square) were used to enhance the answer to the question (Ross and Wood 2006). The formula for calculating chi-square (^{2}) is:

$^2 = (o-e)^2/e$

That is, chi-square is the sum of the squared difference between observed (*o*) and the expected (*e*) data (or the deviation, *d*), divided by the expected data in all possible categories (Sekaran, 2006).

Step 5: Results presentation

Results were presented in form of tables, figures and narrative and the findings formed the basis for the second phase of the study.

3.6 Phase Two (Intervention): Development Of Training Modules, Training And Monitoring

3.6.1Introduction to Phase Two

Phase two involved development and implementation of EmNOC modules. The training was based on the gaps identified during phase one. Since 2001, a lot of emphasis has been put on EmNOC training globally but evaluation of skills retention has not been documented (WHO 2015).

3.6.2 Development of the Training Modules and the Evaluation Tools and Guidelines

This was based on the gaps identified in phase one. The main aim was to train midwives on EmONC with the aim of improving maternal and neonatal health in the country. The training also aimed at providing coaching and mentorship to the midwives in the clinical areas in order to ensure skills retention. This would make them utilize these skills whenever they are serving patients and clients. The overall goal was to increase midwives' involvement in utilization of EmONC skills whenever they are providing care. The primary focus of these specific training programmes was for midwives to acquire knowledge, skills and abilities necessary to care for mother and newborns. The training content was prepared based on the findings of phase one in reference to ***the WHO materials in the Integrated Management of Pregnancy and Childbirth (IMPAC) series.*** In addition it used relevant local guidelines and protocols developed by the Division of Reproductive Health, Kenya and ministry of health, Kenya. There were five modules in the package and each module described the learning objectives, learning outcomes, course content, teaching methods, and evaluation methods. The evaluation guidelines contained the data collection tools, data analysis templates and guidelines on how to use each tool. Module one was introduction to maternal and newborn health, module two on rapid initial assessment and emergency management; module three on care during pregnancy; module four on care during labor and child birth and module five on post partum maternal and newborn care.

This training was completed over three weeks' period with 8 days classroom theoretical sessions & practice on anatomical model and 10 days of clinical practice in the two health facilities. The trained midwives were followed and monitored in the study areas for three months as they cared for mothers and neonates.

3.6.3 Sample Size and Sampling Methods

All the 113 nurses were trained.

3.6.4 Validity and Reliability of the Training and Evaluation Tools

The tools were tested on twenty midwives from Chuka hospital. This was to ensure face and content validity.

3.6.5Training and Monitoring

The midwives were trained using the developed modules and monitored for three months. WHO (2015) recommends that the researcher must recognize that the time span between the first test and the second test can be confounded by age, fatigue and maturation. Thus, unnecessary prolongation of time should be avoided which can lead to some nurses retiring, resigning or being transferred hence reducing the number to be evaluated.

3.6.6 Mode of Assessment and Evaluation During the Training Period

In order to determine prior knowledge/skill on EmONC, a written pretest was administered (before training) and a score obtained by each participant. The same examination was administered at the end of training (post-test) and a score recorded

for each participant. This was in order to compare the scores for each participant and assess the effect of the training.

3.7Phase Three: Evaluation

3.7.1 Introduction to Phase Three

This phase involved evaluation of outcomes of the training intervention**.** It was done at two levels. That is, immediately after the end of training sessions for each cohort of participants and at three months after completing the entire training. Immediate evaluation involved assessing changes in participants' knowledge in EmONC by comparing scores obtained in the pre and post-tests. It also assessed the midwives' ability to retain competences after the training and coaching.

3.7.2 Data Collection Methods in Phase Three

Evaluation at three months after training was done using the same questionnaires, case studies and interview checklist and procedure used at baseline survey. The tools had the same parts as those in phase one. A total of 64 midwives were selected randomly from the 113 midwives who were trained in phase one.

3.7.3 Data Analysis and Presentation of Results

After entry into the computer, participants' responses in phase 111 were paired with responses in phase 1. The data was then analyzed using SPSS version 22. Demographic information was utilized to describe the sample. Frequencies were obtained for the midwives' demographic characteristics and EmONC activities. Descriptive statistics were used. Statistical testing was done using paired samples t-test to compare results before and after training intervention.

One-way analysis of variance (ANOVA) was also used to assess relationship of study variables within or between groups. The confidence level set at 95% ($p \leq 0.05$). A confidence interval is a range of values that is likely to contain an unknown population parameter. That is to say that a 95% confidence interval indicates that 19 out of 20 samples (95%) from the same population will produce confidence intervals that contain population parameter (Wood and Ross 2006). Results were presented in form of tables and figures.

3.8 Ethical Consideration

Ethics approval was sought from The Ethics and Research Committee, Kenyatta National Hospital/ University of Nairobi. Permission was obtained from the management of Meru and Embu hospitals. All participants were informed about the study and participation was on voluntary basis. Written consent from the participants was obtained and participants were free to withdraw from the study at any point. The filled questionnaires were sealed by the respondents and handed over to be opened by the researcher only. The data obtained was anonymous since no writing of names. Assurance was given to the respondents that the information given was to be used only for the intended purpose of informing the midwifery policy in Kenya and that no plans whatsoever were intended to victimize anybody. Before each interview, the participants were informed about the purpose of the study, how it would be carried out, and that their participation was voluntary. Participants were advised that they could leave the interviews at any time.

3.9 Main Assumption

The study assumed that understanding the factors that influence EmONC skills practice by midwives and eliminating the barriers would help in improving maternal and newborn health.

3.10. Study Limitations

The self -report method utilized in this study could result in reporting bias (Rose and woods 2006). Funds were initially a limitation owing to the magnitude of the study and this delayed the progress. The preparation of the training modules, its implementation, and training of research assistants, stationary and data management and analysis were all very expensive. This study was made possible by the loan that the researcher took from Kenya Commercial Bank.

CHAPTER FOUR: RESULTS

4.1Introduction

This chapter describes the details of the findings in phase one and three. The results phase one are tabulated in tables and illustrated in figures. The chapter ends by giving comparisons of the findings in phase three to those in phase one which show improvements in use of EmONC skills while providing patients' and clients' care.

4.2 Phase 1 Results (Findings from Baseline Survey)

The pre-intervention survey was completed by 113 respondents (54 participants from Embu hospital and 59 participants from Meru hospital). All of them returned the questionnaires representing 100% response rate though 2(1.8%) questionnaires were incomplete.

4.2.1Gender of the Respondents

The gender of the respondents is important to bring out the aspect that midwifery and nursing profession in Kenya traditionally has been considered a female profession in Kenya. This is depicted in table 7 and 8 below. This is important considering the current political and gender issues that are emphasized in the Kenyan constitution of 2010.

Females in Meru hospital comprised 74.6% (n =44) of the participants with males constituting 25.4% (n=15).This is shown in table 7 below:

Table 4: Gender of the Respondents in Meru Level 5 Hospital

Gender	Frequency	Percent
Male	15	25.4
Female	44	74.6
Total	59	100.0

Females in Embu Level5 hospital comprised of 71.4% (n=42) of the participants with males constituting 22.2% (n=12).This is shown in table 5 below: These results compare favourably with the results for meru hospital.

Table 5: Gender of the Respondents in Embu Level 5 Hospital

	Frequency	Percent
Male	12	22.2
Female	42	77.8
Total	54	100.0

4.2.2 Professional Qualifications

This study sought to find out the level of qualification for the nurses in each institution. Descriptive statistics of frequencies and percentages were used to analyses the data. The results are presented in table 5 for Embu hospital and table 6 for Meru hospital.

The information displayed in table 6 below reveals that majority of the nurses in meru hospital (33.9 %) have KRN/M. Those who have accounted for BSc (25.4 %), KRM 18.6%, KRCHN 13.6%, KECHN (8.5%), none of the respondents had KEM.

Table 6: Level of qualifications for nurses in Meru Hospital

Qualification	Frequency	Percent
BScN	15	25.4
KRM	11	18.6
KECHN	5	8.5
KRCHN	8	13.6
KRN/M	20	33.9
Total	59	100.0

The information displayed in table 6 above reveal that majority of the nurses in meru hospital (31.5 %) have KRN/M. Those who have accounted for BSc (25.4 %), KRM 18.6%, KRCHN 13.6%, KECHN (8.5%), none of the respondents had KEM.

4.2.3 Area of Deployment/Work Station of the Respondents

This study sought to find out the work stations for the nurses in each institution. Descriptive statistics of frequencies and percentages were used to analyse the data. The results are presented in table 7 for Meru hospital and table 8 for Embu hospital.

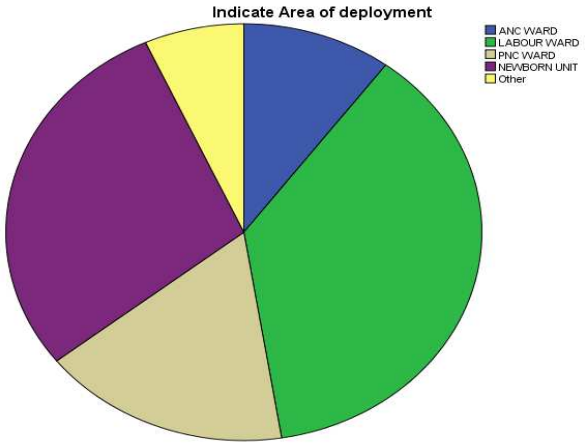


Figure 5: Area of Deployment of respondents of Meru Hospital

Table 7: Work Station for Nurses in Meru Hospital

	Frequency	Percent
ANC WARD	6	10.2
LABOUR WARD	22	37.3
PNC WARD	10	16.9
NEWBORN UNIT	17	28.8
Other	4	6.8
Total	59	100.0

Table 7 above shows that, Most (37.3, 22) of the respondents in Meru Hospital were deployed at the Labour ward, followed by 28.8%, 17 deployed in the new born unit,16.9%,10 in the PNC ward,10.2%, 6 in the ANC ward and the least at 6.8%,4 of the respondents were deployed in the Maternity theatre section of the hospital

Table 8: Work Station for Nurses in Embu Hospital

	Frequency	Percent
ANC WARD	6	11.1
LABOUR WARD	20	37.0
PNC WARD	12	22.2
NEWBORN UNIT	14	25.9
Other	2	3.7
Total	54	100.0

Table 8 above shows that, Most (37.0, 20) of the respondents in Meru town were deployed at the Labour ward, followed by 25.9%, 14deployed in the new born unit,22.2 %,12 in the PNC ward,11.1%, 6 in the ANC ward and the least at 3.7%,2 of the respondents were deployed in the Maternity theatre section of the hospital.

4.2.4 Primary Job Responsibility of the Respondents

This study sought to find out the primary job responsibilities for the nurses in each institution. Descriptive statistics of frequencies and percentages were used to analyse the data. The results are presented in table9 for Meru hospital and table 11 for Embu hospital.

Table 9: Primary Job Responsibilities of the Respondents in Meru Hospital

	Frequency	Percent
Healthcare provider	42	71.2
Clinical training supervisor	10	16.9
Teacher/Educator/Instructor	4	6.8
Others	3	5.1
Total	59	100.0

Table 9 shows that most (71.2%, 42) of the respondents in Meru town hospital were Healthcare providers, only 16.9%, 10 were clinical training supervisors and 6.8% 4 were trainers/ educators. The rest of the respondents (5.1%, 3 had other responsibilities in the wards.

Table 10: Primary Job Responsibilities of the Respondents in Embu Hospital

	Frequency	Percent
Healthcare provider	32	59.3
Clinical training supervisor	9	16.7
Teacher/Educator/Instructor	10	18.5
others	3	5.6
Total	54	100.0

Table 10 shows that most (59.3%, 32) of the respondents in Meru hospital were Healthcare providers, only 16.7%, 9were clinical training supervisors and 18.5% 10 were trainers/educators. The rest of the respondents (5.6%, 3 had other responsibilities in the wards.

4.2.5 Assessment of Midwives before Training Skills on Knowledge in Maternal and Newborn Healthcare

This study sought to find out the essential skills for midwives in each institution of health services. Questionnaires were administered to the respondents and they were asked to select the best possible answers. Descriptive percentages were used to analyse the data and present the results from their responses. The results are presented in table 9 for Meru hospital and table 10 for Embu hospital.

4.2.5.1Meru Level V Assessment Results

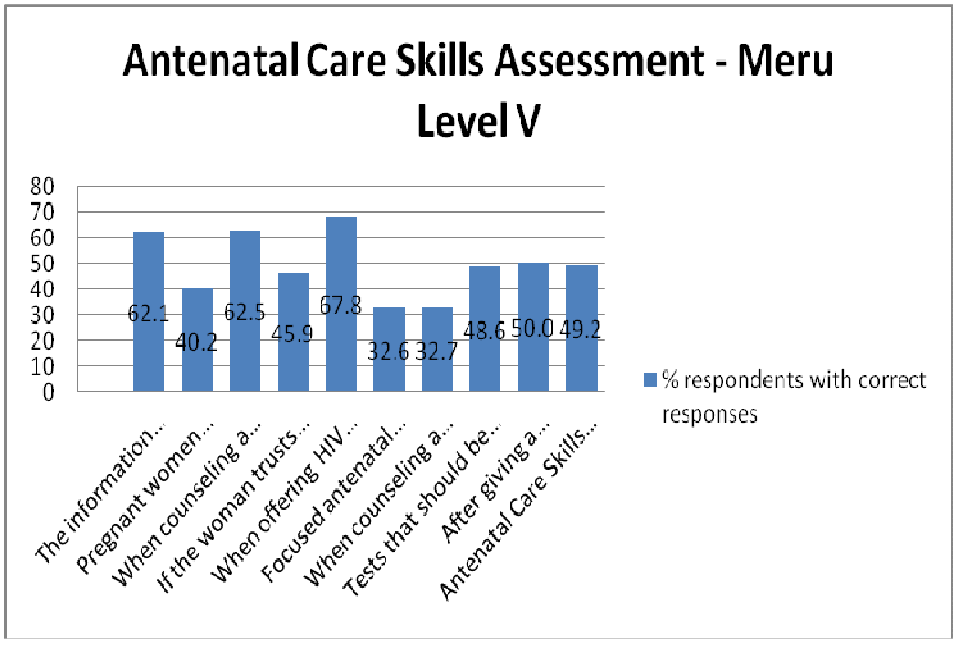


Figure 6: Antenatal care Skills Assessment

The results in the table above show that the midwives did not score the required percentage of 80% and above in any of the competences. The highest score was in the are of HIV care (67.8%)followed by conselling and informationsharing respectively (62.5 and 62.1). The lowest wa in the area of Focused antenatal care(32.6%) and yet this is one of the key interventions in prevention , identification and management of maternal morbidities. The mean score was 49.2%.

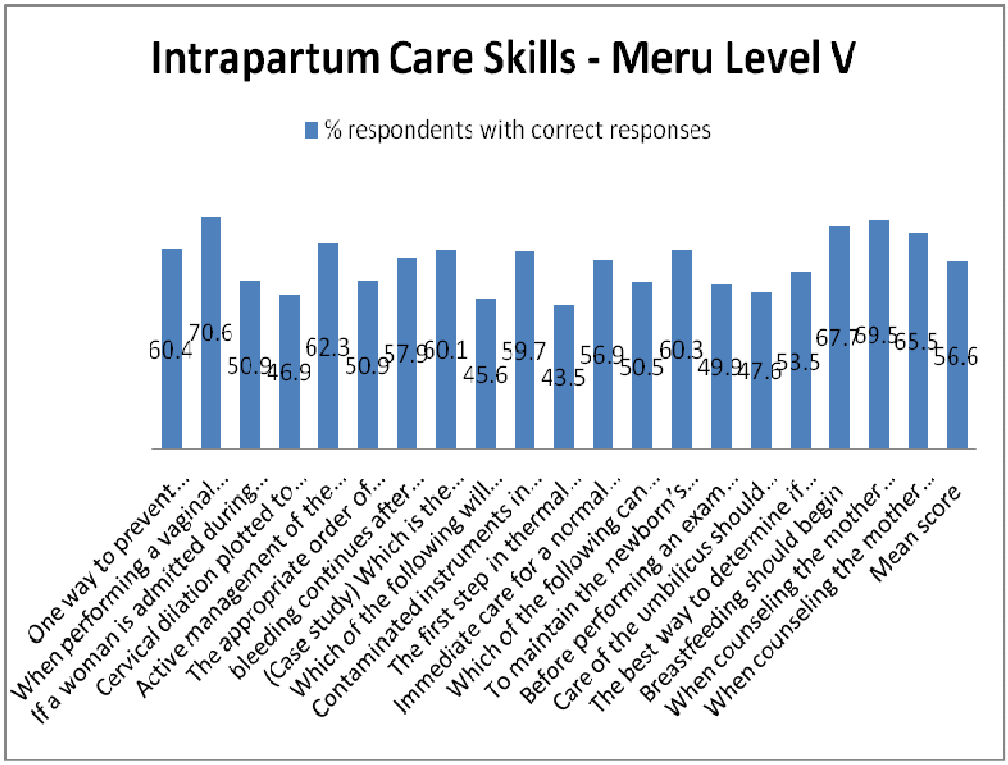


Figure 7 : Intrapartum Care Skills Assessment

In the area of Intrapartum care, the midwives also did not score 80% in any of the areas assessed on. The highest score was in the area of vaginal examination (70.6%) followed by Initiation of breast feeding (69.5%). The mean score was 56.6%

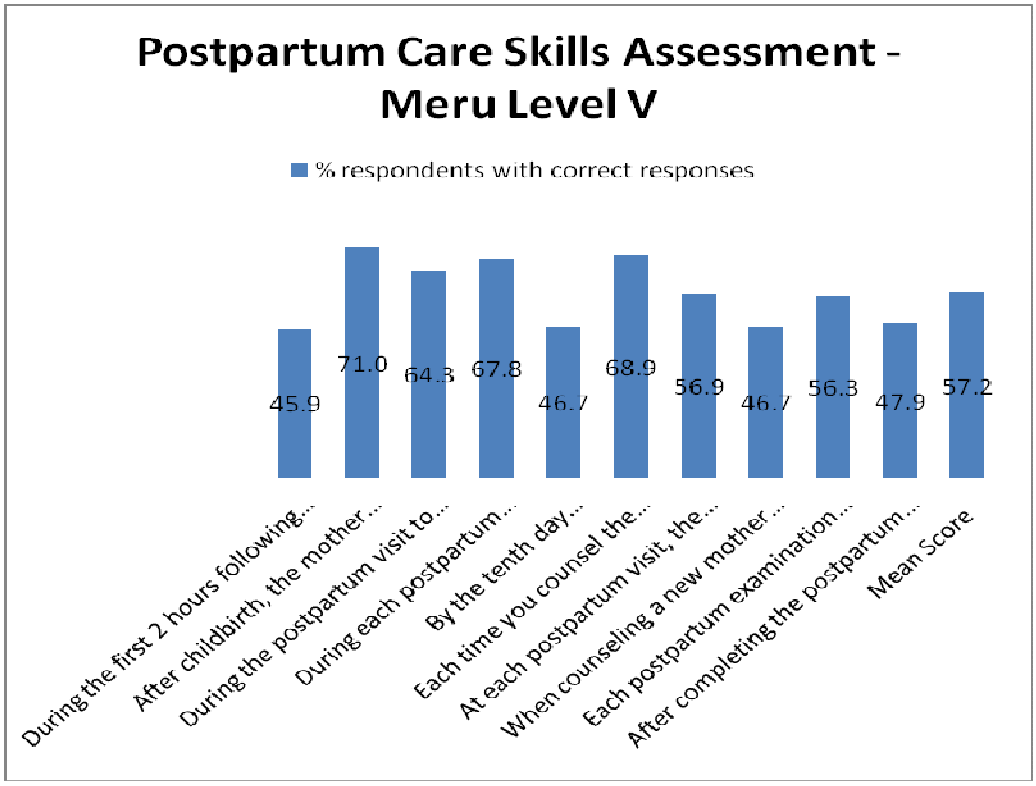


Figure 8: Postpartum Care Skills Assessment

In the area of postpartum care, the average score was 57.2%. The highest score was immediate post natal care (71.0%) followed by post natal counseling (67.8%). The least was danger sign recognition (45.9%).

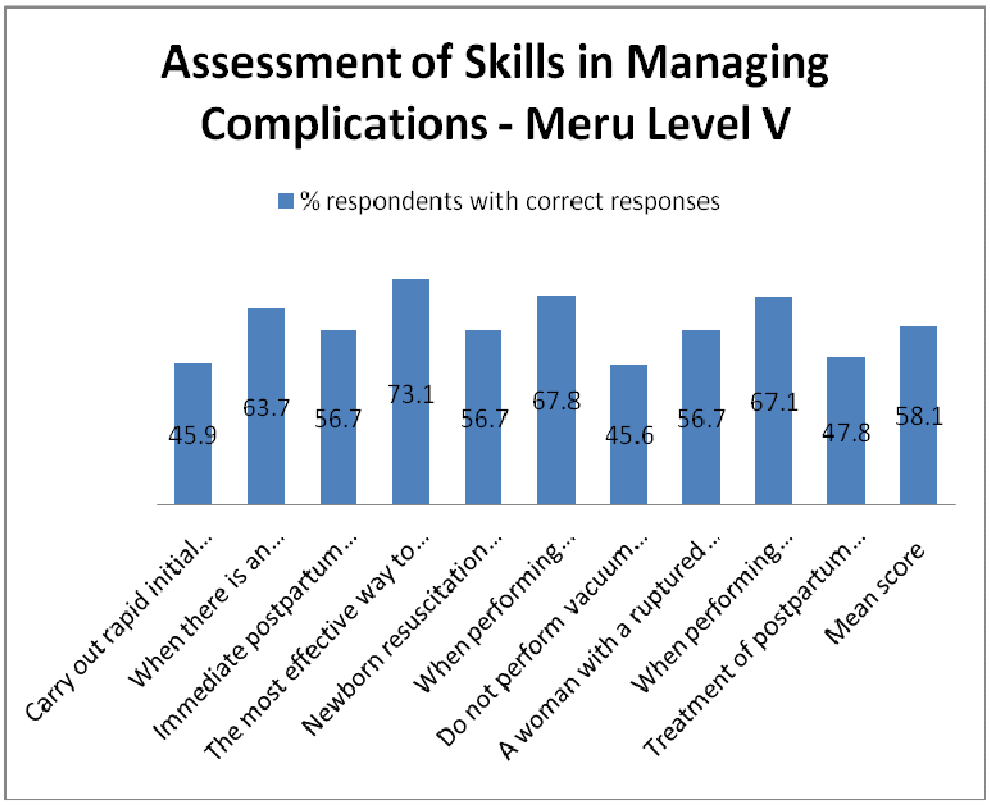


Figure 9 : Management of Complications

When assessed on the management of maternal and newborn complications, the midwives scored an average of 58.1% with the highest score being in the area of essential newborn care skills (73.1%).

4.2.5.2: Embu Level V Assessment Results

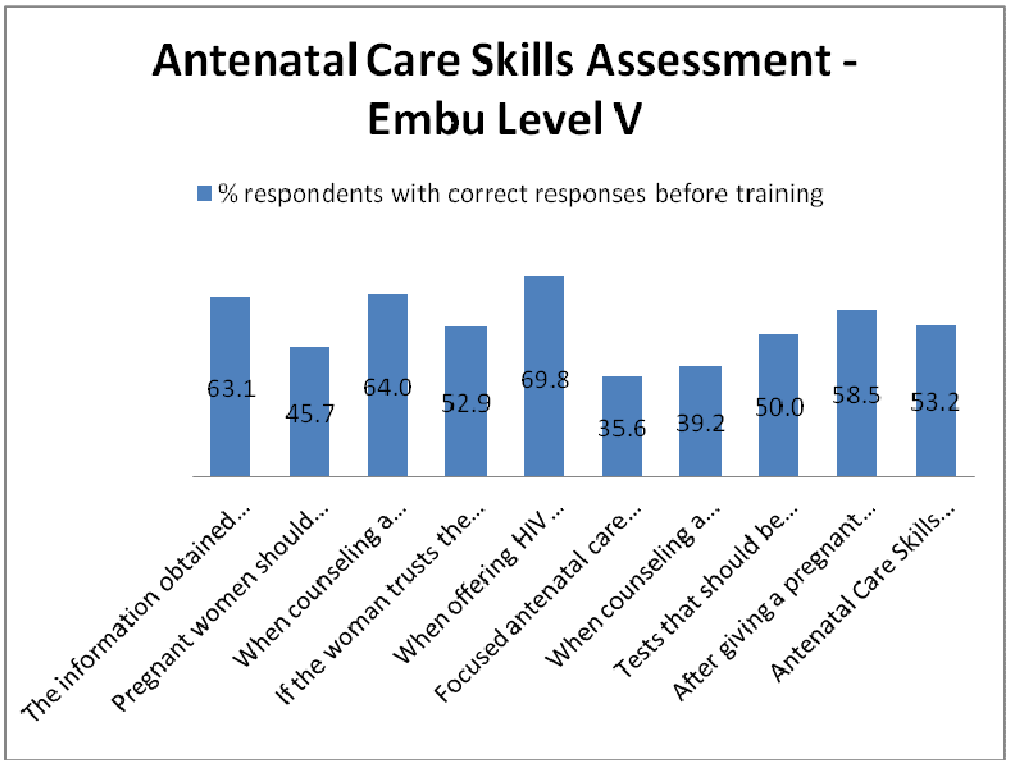


Figure 10: Embu Antennal Care Skills Assessment

In Embu still, the midwives scored highest in the area of HIV care (69.8%) followed by counselling (64.0%). The mean score was 53.2%

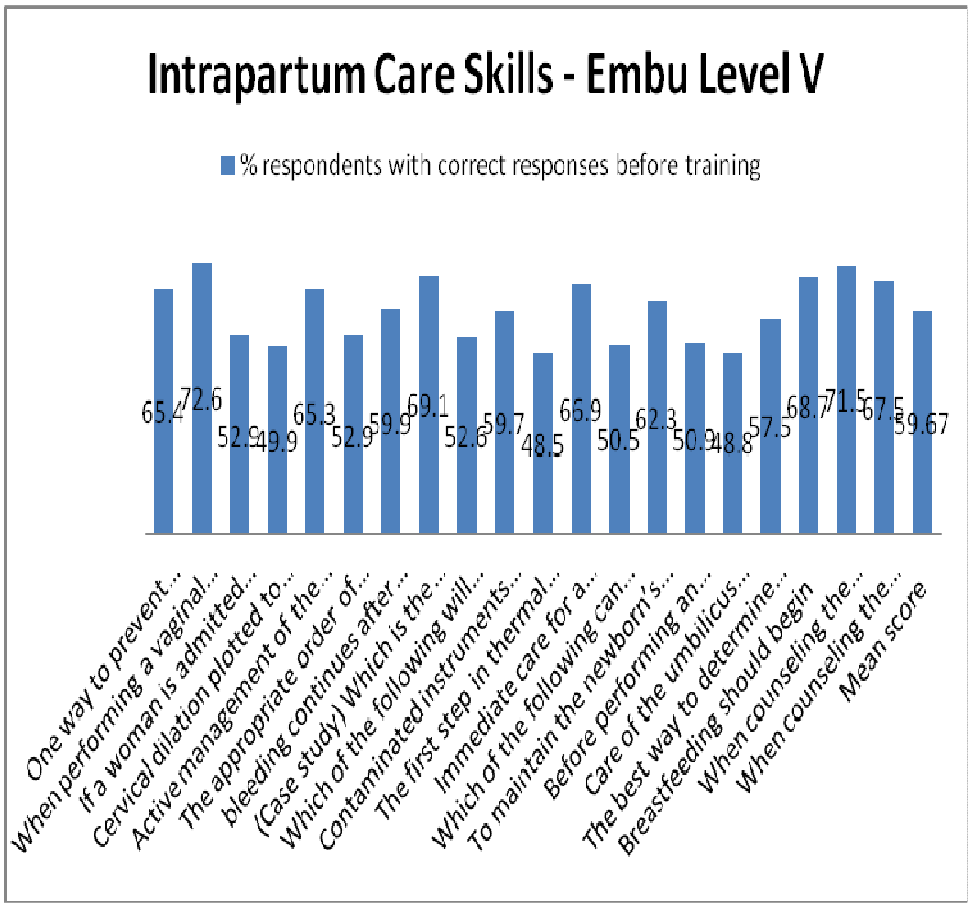


Figure 11: Embu Intrapartum Care Skills Assessment

The midwives scored a mean of 59.7 with the highest score in the area of performing vaginal examination (72.6).

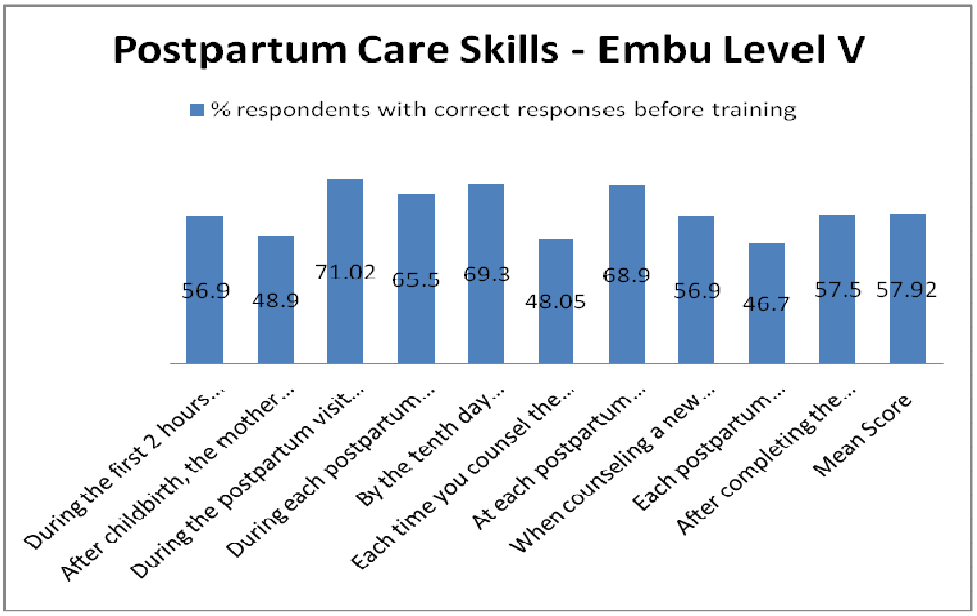


Figure 12: Embu Postpartum Care Skills Assessment

The mean score was 57.9% with the highest score being in the area of post partum followup (71.0%).

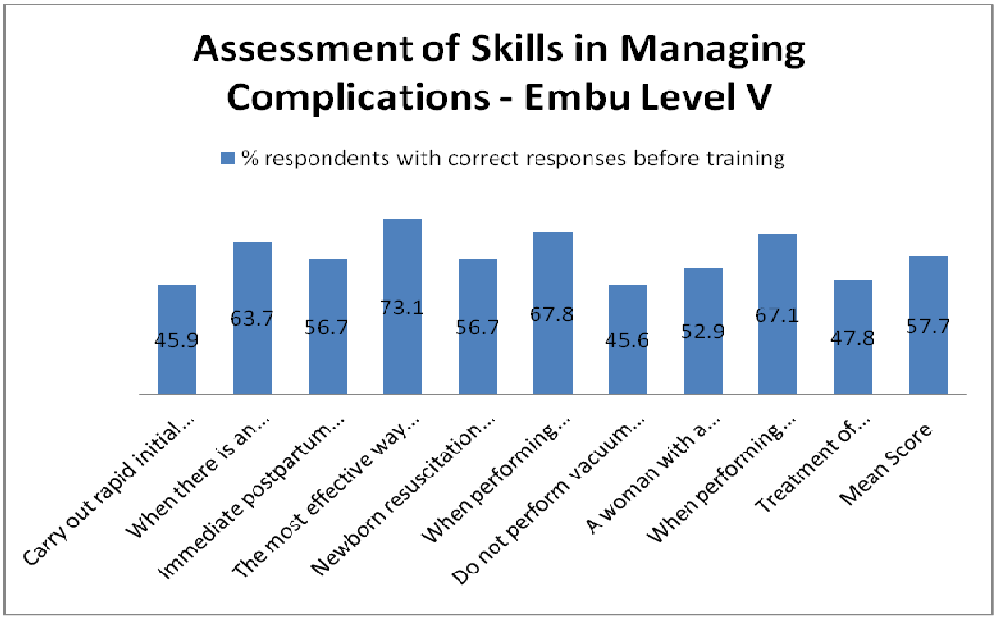


Figure 13: Embu complications management assessment

The mean score was 57.7% with the highest score being in the area of neonatal care (73.1%).

4.2.6.Percentage of Professional Time Spent in Activities

The researcher sought to find out the average percentage time spent in performing some activities. The respondents were given a list of activities to estimate the total percentage time spent each week in each activities in which the total of the activities should add up to 100%.The average percentage time is presented in table 15 and 16 below.

Table 11: Percentage Professional time spent in the following activities in Meru hospital

Activities	Percentage
Patient/client care	90%
Clinical training	5%
Teaching /educating/instructing(not in a clinical setting)	4%
Others(specify	1%
Total	100%

The respondents indicated that they spent 90% of their professional time attending patients or clients care. On average the respondents indicated that they spent 6% on clinical training. On average the respondents indicated that they spent 6% of their professional time teaching or instructing but not in a clinical setting. They indicated that they spent 1% of their time on other activities. This means that although the

midwives were not competent to practice, they spent most of their time handling patients and clients.

4.2.6.1Percentage Professional Time spent in the following Activities in Embu hospital

The respondents indicated that they spent 87% of their professional time attending patients or clients care. On average the respondents indicated that they spent 6% on clinical training. On average the respondents indicated that they spent 6% of their professional time teaching or instructing but not in a clinical setting. They indicated that they spent 1% of their time on other activities. This means that although the midwives were not competent to practice, they spent most of their time handling patients and clients.

Table 12: Percentage professional time spent in the following activities in Embu hospital

Activities	Percentage
Patient/client care	87%
Clinical training	6%
Teaching /educating/instructing(not in a clinical setting)	6%
Others(specify	1%
Total	100%

4.2.7 Use Partograph to Monitor Labor

The researcher sought to find out whether the hospitals used Partograph to monitor labour. The responses were presented in frequencies and percentages. This is presented in table 13 and 14 below.

4.2.7.1 Use Partograph to Monitor Labor in Embu Hospital

The results show that 64.8% indicated that the hospitals used a partograph to monitor labor.14.8% of the respondents indicated the hospitals did not have a partograph. 20.4% of the respondents indicated that they did not know whether the hospitals used partograph to monitor labor.

Table 13: Use Partograph to Monitor Labor in Embu Hospital

	Frequency	Percent
Yes	35	64.8
No	8	14.8
Don't Know	11	20.4
Total	54	100.0

4.2.7.2 Use Partograph to Monitor Labor in Meru Hospital

The results show that 67.8% indicated that the hospitals used a partograph to monitor labor.15.3% of the respondents indicated the hospitals did not have a partograph. 16.9% of the respondents indicated that they did not know whether the hospitals used partograph to monitor labor.

Table 14: Use Partograph to Monitor Labor in Meru Hospital

	Frequency	Percent
Yes	40	67.8
No	9	15.3
Dont Know	10	16.9
Total	59	100.0

This showed that although the midwives were not competent in the EmONC skills they greatly practiced them. Proper charting and appropriate interpretation of the partograph requires a competent midwife. Therefore, although the midwives were using the partograph, they could not use it to prevent complications from occurring.

4.2.8 Managing Complications

The researcher sought to find out whether the hospitals used manuals in managing complications in the hospitals.The responses were presented in frequencies and percentages. This is presented in table 19 and 20 below.

4.2.8.1Using manuals to manage complications in Embu hospital

Results indicate that majority of the respondents (59.3%) in Embu hospital indicated that they did not use a manual to manage complications arising during birth and after birth in their institution.25.9% indicated that they did not know whether the institution had a manual. Only 14.8% indicated they did use the manuals.

Table 15: Use of Manuals to Manage Complications in Embu Hospital

	Frequency	Percent
Yes	8	14.8
No	32	59.3
Dont Know	14	25.9
Total	54	100.0

4.2.8.2Using manual to manage complications in Meru hospital

Results indicate that majority of the respondents (57.6%) in Meru hospital indicated that they did not use a manual to manage complications arising during birth and after birth in their institution.25.4% indicated that they did not know whether the institution had a manual. Only 16.9% indicated they did use the manuals. These results compare favorably with the results for embu hospital.

Table 16: use manuals to manage complications in Meru Hospital

	Frequency	Percent
Yes	15	25.4
No	34	57.6
Dont Know	10	16.9
Total	59	100.0

4.2.9 Use of Manual as a Reference

The researcher sought to find out the frequency in which the hospitals used manuals as a reference in the two hospitals. The responses are presented in frequencies and percentages. This is presented in table 21 and 22 below.

4.2.9.1Using Manual as a Reference in Embu Hospital

Table 17 indicates that majority of the midwives indicated that they rarely used the manuals (38.9%).25.9% of the respondents indicated that they never used the manuals.14.8% indicated that they used the manual once per month.11.1% indicated that they used the manual once per week. Only 9.3% of the respondents indicated that they used the manual every day.

Table 17: Use of Manual as reference in Embu Hospital

	Frequency	Percent
Everyday	5	9.3
Once Per Week	6	11.1
Once Per Month	8	14.8
Rarely	21	38.9
Never	14	25.9
Total	54	100.0

4.2.9.2 Using Manual as a Reference in Meru Hospital

Table 22 indicates that majority of midwifes in Meru indicated that they rarely used the manuals (39.0%).30.5% of the respondents indicated that they never used the manuals.11.9% indicated that they used the manual once per month.10.2 % indicated that they used the manual once per week. Only 8.5% of the respondents indicated that they used the manual every day. These results compare favorably with the results in Embu Hospital.

Table 18: Use of Manual as Reference in Meru hospital

	Frequency	Percent
Everyday	5	8.5
Once Per Week	6	10.2
Once Per Month	7	11.9
Rarely	23	39.0
Never	18	30.5
Total	59	100.0

4.2.10 Safe Motherhood Committees

The researcher sought wether the nurses had formed safe motherhood committees in the two hospitals. The responses are presented in frequencies and percentages. This is presented in table 19 and 20below.

4.2.10.1 Safe Motherhood Committees in Embu Hospital

The results indicate that majority (40.7%) of the respondents in Embu hospital indicated that they had not formed any safe motherhood committees. The results further show that the 35.2% respondents in Embu Hospital did not know whether there were any safe motherhood committees in hospital. Only 24.1% of the respondents indicated that they had formed safe motherhood committees.

Table 19: Awareness on Safe Motherhood Committees in Embu Hospital

	Frequency	Percent
Yes	13	24.1
No	22	40.7
Dont Know	19	35.2
Total	54	100.0

4.2.10.2 Safe Motherhood Committees in Meru Hospital

The results indicate that majority (50.8%) of the respondents in Meru hospital indicated that they had not formed any safe motherhood committees. The results further show that the 25.4% respondents in Embu Hospital did not know whether there were any safe motherhood committees in hospital. Only 23.7% of the respondents indicated that they had formed safe motherhood committees.

Table 20: Awareness on Safe Motherhood Committees in Meru Hospital

	Frequency	Percent
Yes	14	23.7
No	30	50.8
Dont Know	15	25.4
Total	59	100.0

4.2.11 Births Attended Per Week

The researcher sought the number of births attended per week in the two hospitals. The responses are presented in frequencies and percentages. This is presented in table 21 and 22 below.

4.2.11.1Number of Births Attended Per Week in Embu Hospital

The results in table 21 below indicate that majority of the respondents (46.3% indicated that they attended 91-120 births per week.25.9 % indicated that they attended an estimate of 31-60 births per week.18.5% indicated that they attended 61-90 births per week. Only 5.6% indicated that they attended above 120 births per week and 3.7% indicated they attended 30 and below births per week.

Table 21: Number of Births attended per week in Embu Hospital

	Frequency	Percent
1-30	2	3.7
31-60	14	25.9
61-90	10	18.5
91-120	25	46.3
Above 120	3	5.6
Total	54	100.0

4.2.11.2 Number of Births Attended Per Week in Meru Hospital

The results in table 22 below indicate that majority of the respondents (52.5% indicated that they attended 91-120 births per week.18.6 % indicated that they attended an estimate of 31-60 births per week.15.3 % indicated that they attended 61-90 births per week. Only 3.4% indicated that they attended above 120 births per week and 10.2 % indicated they attended 30 and below births per week. These results compare favorably with the results in Embu town Level 5 hospital.

Table 22: Number of Births Attended Per Week in Meru Hospital

	Frequency	Percent
1-30	6	10.2
31-60	11	18.6
61-90	9	15.3
91-120	31	52.5
above 120	2	3.4
Total	59	100.0

4.2.12 Antenatal Clients Attended Per Week

The researcher sought the number of Antenatal clients attended per week in the two hospitals. The responses are presented in frequencies and percentages. This is presented in table 23 and 24 below.

4.2.12.1Antenatal Clients Attended Per Week in Embu Hospital

The results in table 21 below indicate that majority of the respondents (66.7% indicated that they attended above 120 antenatal clients per week.11.1 % indicated that they attended an estimate of 61-90 antenatal clients per week.9.3 % indicated that they attended 91-100 antenatal clients per week. Only 7.4% indicated that they attended 31-60 antenatal clients per week and 5.6 % indicated they attended 30 and below antenatal clients per week. These results compare favorably with the results in Embu town Level 5 hospital.

Table 23: Antenatal Clients Attended per Week in Embu hospital

	Frequency	Percent
1-30	3	5.6
31-60	4	7.4
61-90	6	11.1
91-120	5	9.3
above 120	36	66.7
Total	54	100.0

Table 24: Antenatal Clients Attended per Week in Meru hospital

	Frequency	Percent
1-30	7	11.9
31-60	3	5.1
61-90	34	57.6
91-120	11	18.6
above 120	4	6.8
Total	59	100.0

4.2.13 Postpartum Clients Attended Per Week

The researcher sought the number of postpartum clients attended per week in the two hospitals.The responses are presented in frequencies and percentages. This is presented in table 24 and 25 below.

4.2.13 1Postpartum Clients Attended Per Week in Embu Hospital

The results in table 29 below indicate that majority of the respondents44.4% indicated that they attended above 61-90 postpartum clients per week.27.8 % indicated that they attended an estimate of 1-30 postpartum clients per week.18.5 % indicated that they attended 31-60 postpartum clients per week. Only 5.6 % indicated that they attended above 120 postpartum clients per week and 3.7 % indicated they attended above 90-120 postpartum clients per week. These results compare favorably with the results in Embu town Level 5 hospital.

Table 25: number of Postpartum Clients Attended per Week in Embu Hospital

	Frequency	Percent
1-30	15	27.8
31-60	10	18.5
61-90	24	44.4
90-120	2	3.7
above 120 clients	3	5.6
Total	54	100.0

4.2.13.2 Postpartum Clients Attended Per Week in Meru Hospital

The results in table 26 below indicate that majority of the respondents 45.8% indicated that they attended above91-120 postpartum clients per week.18.6% indicated that they attended an estimate of 1-30 postpartum clients per week.16.9% indicated that they attended 31-60 postpartum clients per week. Only 13.6 % indicated that they attended 61-90 postpartum clients per week and 5.1% indicated they attended above 120postpartum clients per week. These results compare favorably with the results in Embu town Level 5 hospital.

Table 26: Number of postpartum clients attended per week in Meru Hospital

	Frequency	Percent
1-30	11	18.6
31-60	10	16.9
61-90	8	13.6
91-120	27	45.8
above 120	3	5.1
Total	59	100.0

4.2.14 Relationship between Births Attended Per Week by Respondents and Confidence in Attending the Skills

Midwives and Nurses are expected and should be confident when performing births in the hospital. This study sought to establish the relationship between the number of births attended per week and the confidence of the nurses in attending the skills in hospitals. Descriptive statistics of percentages and chi-square results from the tabulation were used to analyse the data. The results are presented in table 27 for responses in Embu level five hospital and 28 for responses in Meru town hospital.

Table 27: Relationship between Births Attended per Week and Confidence in Performing the Skills in Embu level five hospital

Births you attend per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not permited	Total
0-30	3.7%	.0%	.0%	0.0%	3.7%
31-60	3.7%	22.2%	.0%	.0%	25.9%
61-90	1.9%	16.7%	.0%	0.%	18.5%
91-120	.0%	3.7%	42.6%	0.%	46.3%
Above 120	0.0%	0.0%	1.9%	3.7%	5.6%
Totals	9.3%	42.6%	44.4%	3.7%	100%

Chi-square value=99.668, df=12, p-value=0.057

Results from table 27 indicated that for those who said that they were very confident and needed no training in performing the skills also said that they performed 0-30 births per week (3.7%). 3.7% also said they were confident in performing the skills and they said they performed 31-60 births per week.22.2 % said they were not very confident and needed more coaching but they performed 31-60 births per week.16.7% Said they were not very confident in performing the skills but they performed 61-90 births per week .Generally, results show that majority of the respondents 42.6% felt that they were not very confident (they cannot perform this skill) yet they performed 91-120 births per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 99.668 and p value 0.057 implied that there no significant association between the numbers of births midwives attend per week and the confidence levels in performing the skills.

Table 28: Relationship between Births Attended per Week and Confidence in Performing the Skills in Meru hospital

Births you attend per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not Permited	Total
0-30	6.7%	3.4%	.0%	.0%	10.2%
31-60	.0%	5.1%	13.6%	.0%	18.7%
61-90	1.7%	.0%	8.5%	5.1%	15.3%
91-120	13.6%	18.6%	13.6%	6.8%	52.6%
Above 120	.0%	.0%	3.2%	.0%	3.2%
Totals	22.%	27.1%	39.0%	11.9%	100%

Chi-square value=27.001 df =12 p-value 0.486

Results from table 28 indicated that for those who said that they were very confident and needed no training in performing the skills also said that they performed 0-30 births per week (6.7%)..0% also said they were confident in performing the skills and they said they performed 31-60 births per week.5.1% said they were not very confident and needed more coaching but they performed 31-60 births per week..0% Said they were not very confident in performing the skills but they performed 61-90 births per week .Generally, results show that majority of the respondents 18.6% felt that they were not very confident(needed more coaching)(18.6%) yet they performed 91-120 births per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 27.001 and p value 0.486 implied that there was no significant association between the number of births midwives attend per week and the confidence levels in performing the skills.

Table 29: Relationship between Antenatal Clients attended per Week and Confidence in Performing the Skills in Embu hospital

Antenatal clients you attend per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not permitted	Total
0-30	5.6%	.0%	.0%	0.0%	5.6%
31-60	3.7%	3.7%	.0%	.0%	7.4%
61-90	0.%	11.1%	.0%	0.%	11.1%
91-120	.0%	9.3%	.0%	0.%	9.3%
Above 120	0.0%	18.5%	44.4%	3.7%	66.7%
Totals	9.3%	42.6%	44.4%	3.7%	100%

Chi-square value=62.896 df =12 p-value= 0.530

Results from table 29 indicated that for those who said that they were very confident and needed no training in performing the skills also said that they attended 0-30 antenatal clients per week (5.6%).3.7% also said they were confident in performing the skills and they said they attended 31-60 antenatal clients per week.11.1 % said they were not very confident and needed more coaching but they attended 61-90 births per week.9.3% Said they were not very confident in performing the skills but they attended 91-120 antenatal clients per week .Generally, results show that majority of the respondents 44.4% felt that they were not very confident (they cannot perform this skill) yet they attended above 120 antenatal clients per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 45.668 and p value 0.530 implied that there is no significant association between the number of births midwifes attend per week and the confidence levels in performing the skills.

Table 30: Relationship between Antenatal Clients attended per Week and Confidence in Performing the Skills in Embu hospital

Antenatal clients you attend per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not permitted	Total
0-30	11.9%	1.7%	5.1%	0.0%	18.6%
31-60	.0%	8.5%	8.5%	.0%	16.9%
61-90	0.%	1.7%	11.9%	0.%	13.6%
91-120	0.%	8.5%	0.%	10.2%	45.8%
Above 120	1.7%	1.7%	27.2%	1.7%	5.1%
Totals	13.6%	22.0%	52.7%	11.9%	100%

Chi-square value =59.789 df=12 p-value=0.569

Results from table above indicated that for those who said that they were very confident and needed no training in performing the skills also said that they attended 0-30 antenatal clients per week (11.9%).8.5% also said they were confident in performing the skills and they said they attended 31-60 antenatal clients per week.11.9 % said they were not very confident and needed more coaching but they attended 61-90 births per week.8.5% Said they were not very confident in performing the skills but they attended 91-120 antenatal clients per week .Generally, results show that majority of the respondents 27.2% felt that they were not very confident (they cannot perform this skill) yet they attended above 120 antenatal clients per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 59.789 and p value 0.569 implied that there is no significant association between the number of births midwives attend per week and the confidence levels in performing the skills.

Table 31: Relationship between postpartum Clients attended per Week and Confidence in Performing the Skills in Meru hospital

Postpartum clients you see per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not Permited	Total
0-30	6.8%	5.1%	.0%	.0%	11.9%
31-60	.0%	3.4%	1.7%	.0%	5.1%
61-90	15.3%	11.9%	20.3%	10.2%	57.6%
91-120	5.1%	.0%	11.9%	1.7%	18.6%
Above 120	.0%	1.7%	5.1%	.0%	6.8%
Totals	27.1%	22.0%	39.0%	11.9%	100%

Chi-square value=19.401 df =12 p-value 0.079

Results from table above indicated that for those who said that they were very confident and needed no training in performing the skills also said that they attended 0-30 postpartum clients per week (6.8%).3.4% also said they were confident in performing the skills and they said they attended 31-60 pospartum clients per week.11.9 % said they were not very confident and needed more coaching but they attended 61-90 postpartum clients per week.11.9 % Said they were not very confident in performing the skills but they attended 91-120 postpartum clients per week. Generally, results show that majority of the respondents 20.3% felt that they were not confident (they cannot perform this skill) yet they attended above 61-90 postpartum clients per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 19.401 and p value 0.079 implied that there is no significant association between the number of postpartum clients midwives attend per week and the confidence levels in performing the skills.

Table 32: Relationship between postpartum Clients attended per Week and Confidence in Performing the Skills in Embu hospital

Postpartum clients you see per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not Permited	Total
0-30	9.3%	18.5%	.0%	.0%	27.8%
31-60	.0%	18.5%	.0%	.0%	18.5%
61-90	0.%	0.%	42.6%	1.9%	44.4%
91-120	0.%	.0%	1.9%	1.9%	3.7%
Above 120	.0%	5.6%	0.%	.0%	5.6%
Totals	9.3%	42.6%	44.4%	3.7%	100%

Chi-square value =75.518 df=12 p-value= 0.492

Results from table above indicated that for those who said that they were very confident and needed no training in performing the skills also said that they attended 0-30 postpartum clients per week (9.3%).18.5% also said they were confident in performing the skills and they said they attended 31-60 postpartum clients per week.42.6 % said they were not very confident and needed more coaching but they attended 61-90 postpartum clients per week.1.9 % Said they were not very confident in performing the skills but they attended 91-120 postpartum clients per week. Generally, results show that majority of the respondents 42.6% felt that they were not confident (they cannot perform this skill) yet they attended above 61-90 postpartum clients per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 75.518 and p value 0.492 implied that there is no significant association between the number of postpartum clients midwives attend per week and the confidence levels in performing the skills. In conclusion, the first two hypotheses were accepted.

4.2.15 Baseline Survey Results for the 64 Trained Nurses

4.2.15.1 Introduction

113 midwives in the baseline survey participated in the training programme. However, baseline results for 60 of them were extracted for comparison purposes in phase three. This is because the cohort of 60 trained nurses was the same that was evaluated at four months after intervention using the posttest questionnaire. Their number reduced from 64 because two of the trained nurses from Meru and one from Embu were on maternity leave during this period while one respondent from Meru

hospital had left the hospital. Therefore, section will show results for 30 trained nurses from Meru hospital and 30 trained nurses from Embu hospital. Their details are indicated below.

4.2.15.2 Gender of the Respondents:

Females in Meru hospital comprised 70 % (n =21) of the participants with males constituting 30% (n=9). This is shown in table 3 below

Table 33: Gender of the Respondents in Meru Provincial Hospital

Gender	Frequency	Percent
Male	9	30
Female	21	70
Total	30	100.0

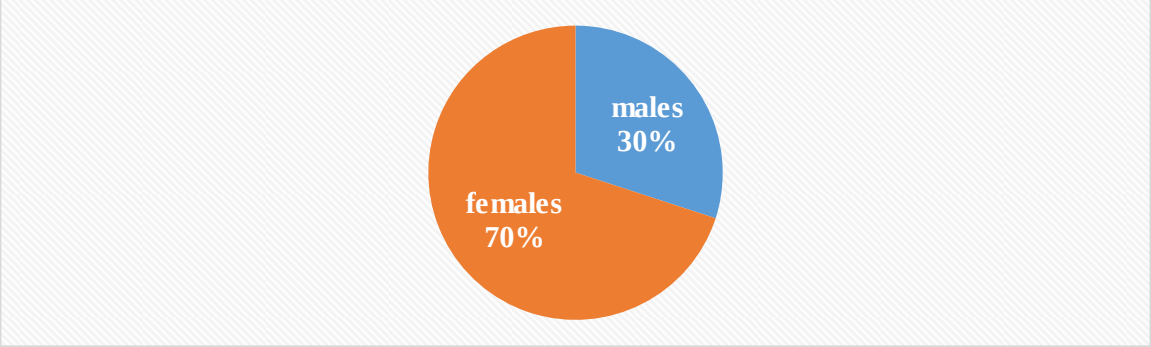


Figure 14: Gender of the Respondents in Meru Provincial Hospital

Females in Embu provincial hospital comprised of 86.7 % (n=26) of the participants with males constituting 13.3 % (n=12).This is shown in table 34 below

These results compared favourably with the results for Meru hospital.

Table 34: Gender of the Respondents in Embu Provincial Hospital

	Frequency	Percent
Male	4	13.3
Female	26	86.7
Total	54	100.0

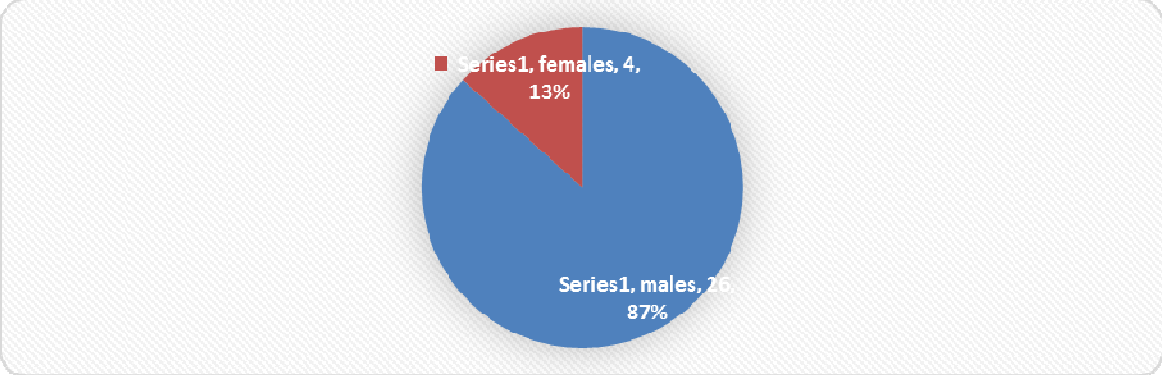


Figure 15: Gender of the Respondents in Embu Provincial Hospital

4.2.15.3 Professional Qualifications

This study sought to find out the level of qualification for the nurses in each institution. Descriptive statistics of frequencies and percentages were used to analyses the data. The results are presented in table 35 for Meru hospital and table 36 for Embu hospital.

4.2.15.4 Level of Qualifications For Nurses In Meru Hospital

The information displayed in table five below reveals that majority of the nurses in Meru hospital (40 %) have KRN/M. Those who have accounted for BSc (23.3 %), KRM 16.7%, KRCHN 13.3%, KECHN (6.7%), none of the respondents had KEM.

Table 35: Level of Qualifications for Nurses in Meru Hospital

Qualification	Frequency	Percent
BScN	7	23.3
KRM	5	16.7
KECHN	2	6.7
KRCHN	4	13.3
KRN/M	12	40
Total	30	100.0

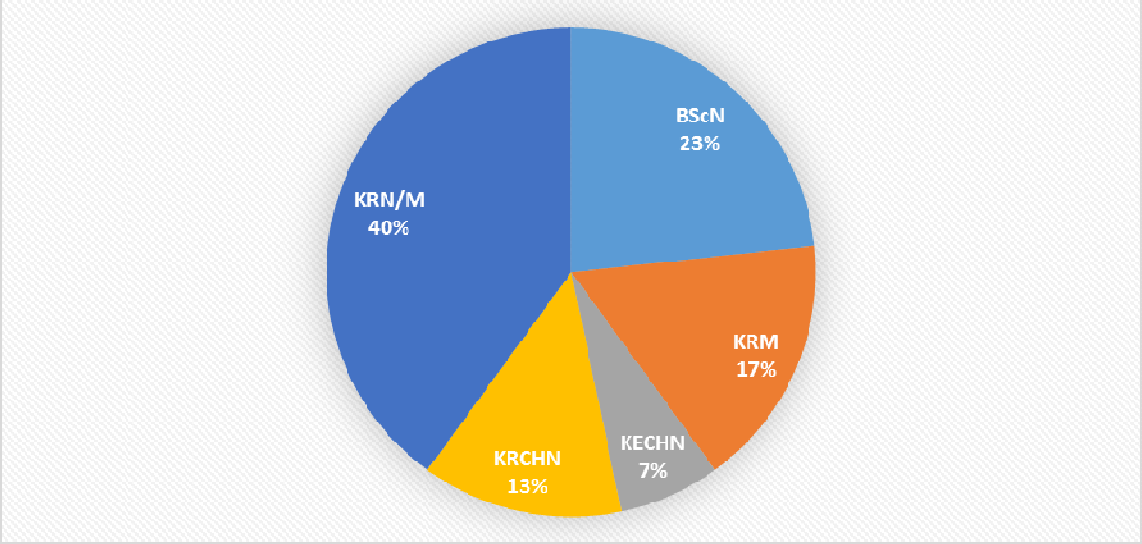


Figure 16: Level of Qualifications for Nurses in Meru Hospital

4.2.15.5 Level of Qualifications for nurses in Embu Hospital

The information displayed in table five below reveals that majority of the nurses in Embu hospital (40 %) have KRN/M. Those who have accounted for BScN (20%), KRM 16.7%, KRCHN 13.3%, KECHN (10%), none of the respondents had KEM.

Table 36: Level of qualifications for nurses in Embu Hospital

Qualification	Frequency	Percent
BScN	6	20
KRM	5	16.7
KECHN	3	10
KRCHN	4	13.3
KRN/M	12	40
Total	30	100.0

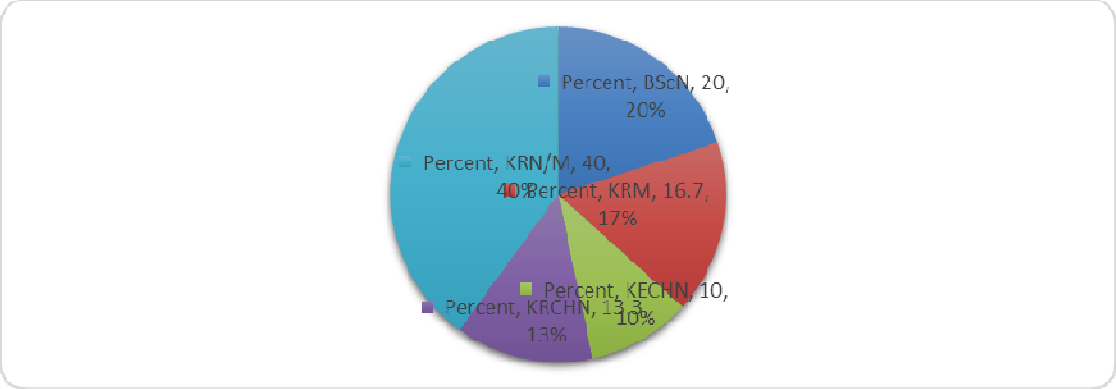


Figure 17: Level of qualifications for nurses in Embu Hospital

4.2.15.6 Area of Deployment/Work Station of the Respondents

This study sought to find out the work stations for the nurses in each institution. Descriptive statistics of frequencies and percentages were used to analyse the data. The results are presented in table 37 for Meru hospital and table 38 for Embu hospital.

Table 37: Work Station for Nurses in Meru Hospital

	Frequency	Percent
ANC Ward	3	10
Labour Ward	11	36.7
PNC Ward	5	16.7
Newborn Unit	9	30
Other	2	6.7
Total	30	100

Table 37 above shows that, Most (36.7, 11) of the respondents in Meru town were deployed at the Labour ward, followed by (30%, 9) deployed in the new born unit, (16.7%,5) in the PNC ward, (10%, 3) in the ANC ward and the least at 6.7%,2 of the respondents were deployed in the Maternity theatre section of the hospital.

Table 38: Work Station For Nurses In Embu Hospital

	Frequency	Percent
ANC Ward	6	11.1
Labour Ward	20	37.0
PNC Ward	12	22.2
Newborn Unit	14	25.9
Other	2	3.7
Total	30	100.0

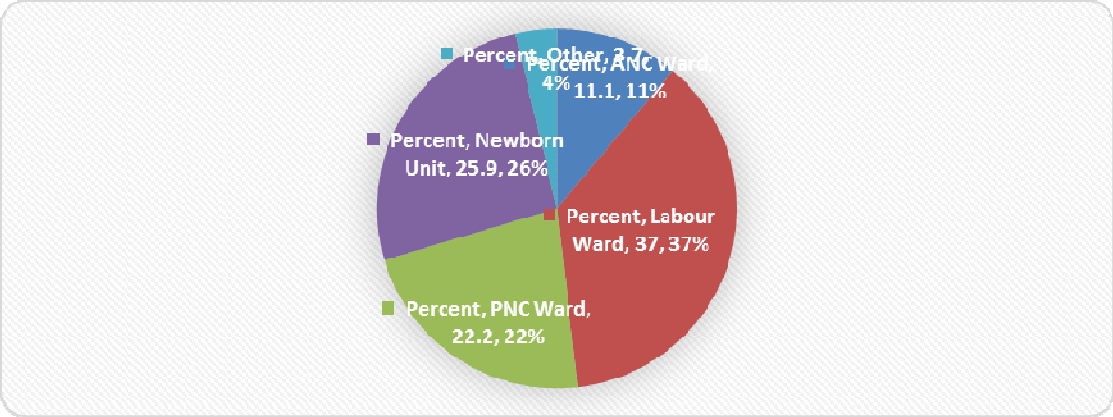


Figure 18: Work Station for Nurses in Embu Hospital

Table 38 above shows that, Most (37.0, 20) of the respondents in Meru town were deployed at the Labour ward, followed by 25.9%, 14deployed in the new born unit,22.2 %,12 in the PNC ward,11.1%, 6 in the ANC ward and the least at 3.7%,2 of the respondents were deployed in the Maternity theatre section of the hospital.

4.2.15.7 Primary Job Responsibility of the Respondents

This study sought to find out the primary job responsibilities for the nurses in each institution. Descriptive statistics of frequencies and percentages were used to analyse the data. The results are presented in table 43 for Meru hospital and table 39 for Embu hospital.

Table 39: Primary Job Responsibilities of the Respondents in Meru Town Hospital

	Frequency	Percent
Healthcare provider	20	66.7
Clinical training supervisor	5	16.7
Teacher/Educator/Instructor	2	6.6
Others	3	10
Total	30	100.0

Table 39 shows that most (66.7%, 20) of the respondents in Meru town hospital were Healthcare providers, only 16.7%, 5 were clinical training supervisors and (6.6% 2) were trainers/ educators. The rest of the respondents (10 %, 3) had other responsibilities in the wards.

Table 40: Primary Job Responsibilities of the Respondents in Embu Town Hospital

	Frequency	Percent
Healthcare provider	16	53.3
Clinical training supervisor	8	26.7
Teacher/Educator/Instructor	4	13.3
Others	2	6.7
Total	30	100.0

Table 40 shows that most (53.3%, 16) of the respondents in Meru town hospital were Healthcare providers, only 26.7%, 8 were clinical training supervisors and 13.3% 4 were trainers/educators. The rest of the respondents (6.7%, 2 had other responsibilities in the wards.

4.2.15.8 Assessment of Midwives' Skills and Knowledge in Maternal and Newborn Healthcare before training

This study sought to find out the essential skills for midwives in each institution of health services. Questions were administered to the respondents and they were asked to select the best possible answers from the multiple choice answers. Descriptive percentages were used to analyses the data and present the results from their responses. The results are presented in table 41 for Meru hospital and table 42for Embu hospital.

Table 41: Table: Percentage and averages of correct and incorrect responses for midwives in Meru hospital

n=59

Questions **Skills Assessment** **Antenatal Care**	% respondents with correct responses	% respondents with incorrect responses
The information obtained from the antenatal history can help the midwives	59.1	40.9
Pregnant women should receive educational messages about which of the following	46.29	53.71
When counseling a pregnant woman about formulating a birth plan, the midwive should tell her	62.43	37.57
If the woman trusts the provider and feels that s/he cares about the outcome of the pregnancy, she will be more likely to	41.92	58.08
When offering HIV testing services to a pregnant woman, the provider should	64.69	35.31
Focused antenatal care means that	32.59	67.41
When counseling a pregnant woman about nutrition, be sure to	32.74	67.26
Tests that should be performed for every woman during antenatal care include	48.56	51.44
After giving a pregnant woman her first dose of tetanus toxoid by intramuscular injection, the used syringe and needle should be.	49.96	50.04
Antenatal Care Skills Mean Score	**48.69**	**51.31**
NORMAL LABOR, CHILDBIRTH, AND IMMEDIATE NEWBORN CARE SKILLS		
One way to prevent transmission of HIV from an infected mother to her baby (vertical transmission) is to	69.4	30.6
When performing a vaginal examination, which of the following is recorded on the partograph?	68.6	31.4
If a woman is admitted during the active phase of labor, cervical dilation is initially plotted on the partograph	54.9	45.1
Cervical dilation plotted to the right of the alert line indicates	46.9	53.1
Active management of the third stage of labor should be practiced	62.3	37.7
The appropriate order of steps in active management of the third stage of labor include	50.9	49.1
bleeding continues after delivery of the placenta using active management, the **first thing** the provider should do is call for help and	57.9	42.1

(Case study) Which is the **most** appropriate intervention?	60.1	39.9
Which of the following will help to decrease the risk of infection during childbirth?	40.6	59.4
Contaminated instruments in the labor ward should immediately be	59.7	40.3
The **first** step in thermal protection for the newborn includes	43.5	56.5
Immediate care for a normal newborn includes	56.9	43.1
Which of the following can contribute to hypothermia in newborns	50.5	49.5
To maintain the newborn's axillary temperature between 36.5º C and 37.5º C it is important to	60.3	39.7
Before performing an exam on a baby who is 2 hours old and who has not been bathed, the skilled provider should	39.6	60.4
Care of the umbilicus should include	47.6	52.4
The best way to determine if a newborn needs resuscitation is to	53.5	46.5
Breastfeeding should begin	67.7	32.3
When counseling the mother about breastfeeding, the skilled provider should tell her to	69.5	30.5
When counseling the mother about her newborn, the skilled provider should	65.5	34.5
Average score	**56.2**	**43.8**
POSTPARTUM CARE (MOTHER AND BABY) SKILLS		
During the first 2 hours following birth, the provider should	49.9	50.1
After childbirth, the mother should have a postpartum visit with a skilled provider	69.92	30.08
During the postpartum visit to the clinic, obtain a history for the	62.9	37.1
During each postpartum visit, specific information should be obtained from the woman about	67.8	32.2
By the tenth day postpartum, you should be able to palpate the uterus	46.7	53.3
Each time you counsel the breastfeeding mother about nutrition, tell her that	78.4	21.6
At each postpartum visit, the mother should be counseled to seek care if she has which of the following danger signs	56.9	43.1
When counseling a new mother about breastfeeding in the 6 hours following birth	46.7	53.3
Each postpartum examination should include	66.3	33.7
After completing the postpartum examination	49.2	50.8
Average score	**59.47**	**40.53**

MANAGEMENT OF COMPLICATIONS		
Carry out rapid initial assessment	54.3	45.7
When there is an obstetric emergency, tell the woman and her family or support person.	60.7	39.3
Immediate postpartum hemorrhage can be due to	56.7	43.3
The most effective way to **immediately** control eclamptic convulsions is to	74.1	25.9
Newborn resuscitation procedures	56.7	43.3
When performing newborn resuscitation with an Ambu bag and mask, it is important to verify that	67.8	32.2
Do not perform vacuum extraction in the case of	45.6	54.4
A woman with a ruptured uterus has which of the following signs and symptoms	53.7	46.3
When performing newborn resuscitation with an Ambu bag and mask, ventilateat the rate of	67.1	32.9
Treatment of postpartum metritis includes	62.8	37.2
Average score	**59.95**	**40.05**
Overall average score	**55.92**	**44.08**

From the table 41 above, it emerged that the essential knowledge and skills that the nurses have in Maternal and Neonatal Health is insufficient. According to WHOa (2015) and other local reproductive health guidelines, a midwives should score at least 80% in each of the questions administered. The results above indicate an average of 55.92 which is quite minimal. The results indicate that respondents on assessment of antenatal skills scored an average of 59.95%, while on normal labor, childbirth and immediate newborn care skills they scored an average of 59.47% on postpartum care (mother and baby) an average of 56.2%, on management of complications they scored a mean of 48.09%.This indicates that nurses need extra training on basic maternal and newborn care skills so that they can help and solve various health complications.

Table 42: Percentage and Averages of Correct and Incorrect Responses for Midwives in Embu Hospital

n=54

Questions Skills Assessment	Average percentage correct scores	Average percentage incorrect scores
Antenatal Care	58.02	41.98
Normal Labor, Childbirth, And Immediate Newborn Care Skills	59.64	41.36
Postpartum Care (Mother And Baby) Skills	57.89	42.11
Management of Complications	64.08	35.92
Total average	59.9075	40.0925

The results in table 46 above are similar to those for Meru Hospital. According WHO (2015) and other local reproductive health guidelines, a midwife should score at least 80% in each of the questions administered. The results above indicate an average of 59.9075 which is quite minimal. The results indicate that respondents on assessment of antenatal skills scored an average of 58.02%, while on normal labor, childbirth and immediate newborn care skills they scored an average of 59.4% on postpartum care (mother and baby) an average of 57.89%, on management of complications they scored a mean of 64.08%. This indicates that nurses need extra training on basic maternal and newborn care skills so that they can help and solve various health complications.

4.2.15.9 Percentage of Professional Time Spent In Activities

The researcher sought to find out the average percentage time spent in performing some activities. The respondent were given a list of activities to estimate the total percentage time spent each week in each activities in which the total of the activities

should add up to 100%.The average percentage time is presented in table 47 and 48 below.Percentage of Professional time Spent on activities in Meru Hospital

Table 43: Percentage professional time spent in the following activities in Meru hospital

Activities	Percentage
Patient/client care	84%
Clinical training	9%
Teaching /educating/instructing(not in a clinical setting)	5%
Others(specify	2%

The respondents indicated that they spent 84% of their professional time attending patients or clients care. On average the respondents indicated that they spent 9% on clinical training. On average the respondents indicated that they spent 5% of their professional time teaching or instructing but not in a clinical setting. They indicated that they spent 2% of their time on other activities.

4.2.15.9.1 Percentage professional time spent in the following activities in Embu hospital

The respondents indicated that they spent 88% of their professional time attending patients or clients care. On average the respondents indicated that they spent 5% on clinical training. On average the respondents indicated that they spent 6% of their professional time teaching or instructing but not in a clinical setting. They indicated that they spent 1% of their time on other activities.

Table 44: Percentage professional time spent in the following activities in Embu hospital

Activities	Percentage
Patient/client care	88%
Clinical training	5%
Teaching /educating/instructing(not in a clinical setting)	6%
Others(specify	1%
Total	100%

4.2.16 Use Partograph to Monitor Labor

The researcher sought to find out whether the hospitals used Partograph to monitor labour. The responses were presented in frequencies and percentages. This is presented in table 48 and 49 below.

4.2.16.1Use Partograph to Monitor Labor in Embu Hospital

The results show that 46.7% indicated that the hospitals used a partograph to monitor labor.33.3% of the respondents indicated the hospitals did not have a partograph. 20% of the respodents indicated that they did not know whether the hospitals used partograph to monitor labor.

Table 45: Use Partograph to Monitor Labor in Embu Hospital

	Frequency	Percent
Yes	14	46.7
No	6	20
Don't Know	10	33.3
Total	30	100.0

4.2.16.2 Use Partograph to Monitor Labor in Meru Hospital

The results show that 60% indicated that the hospitals used a partograph to monitor labor.10% of the respondents indicated the hospitals did not have a partograph. 30 % of the respondents indicated that they did not know whether the hospitals used partograph to monitor labor.

Table 46: Use Partograph to Monitor Labor in Meru Hospital

	Frequency	Percent
Yes	18	60
No	3	10
Dont Know	9	30
Total	59	100.0

4.2.17 Managing Complications

The researcher sought to find out whether the hospitals used manuals in managing complications in the hospitals. The responses were presented in frequencies and percentages. This is presented in table 50 and 51 below.

4.2.17.1Using manual to manage complications in Embu hospital

Results indicate that majority of the respondents (60%) in Embu hospital indicated that they did not use a manual to manage complications arising during birth and after birth in their institution 23.3% indicated that they did not know whether the institution had a manual. Only 16.7% indicated they did use the manuals.

Table 47: Using manual to manage complications in Embu hospital

	Frequency	Percent
Yes	5	16.7
No	18	60
Dont Know	7	23.3

4.2.17.2 Using manual to manage complications in Meru hospital

Results indicate that majority of the respondents (56.7%) in Meru hospital indicated that they did not use a manual to manage complications arising during birth and after birth in their institution 16.7% indicated that they did not know whether the institution had a manual. Only 26.7% indicated they did use the manuals. These results compare favorably with the results for embu hospital.

Table 48: Using manual to manage complications in Meru hospital

	Frequency	Percent
Yes	8	26.7
No	17	56.7
Dont Know	5	16.7
Total	30	100.0

4.2.18 Use of manual as a Reference

The researcher sought to find out the frequency in which the hospitals used manuals as a reference in the two hospitals.The responses are presented in frequencies and percentages. This is presented in table 53 and 54 below.

4.2.18.1 Using Manual as a Reference in Embu Hospital

Table 53 indicates that majority of the midwives indicated that they rarely used the manuals (43.3%). 10% of the respondents indicated that they never used the manuals.16.7% indicated that they used the manual once per month.16.7% indicated that they used the manual once per week. Only 13.3% of the respondents indicated that they used the manual every day.

Table 49: Using Manual as a Reference in Embu Hospital

	Frequency	Percent
Everyday	4	13.3
Once Per Week	5	16.7
Once Per Month	5	16.7
Rarely	13	43.3
Never	3	10
Total	30	100.0

4.2.18.2 Using Manual as a Reference in Meru Hospital

Table 54 indicates that majority of midwifes in Meru indicated that they rarely used the manuals (40%).3.3% of the respondents indicated that they never used the manuals.23.3% indicated that they used the manual once per month.20% indicated that they used the manual once per week. Only 13.3% of the respondents indicated that they used the manual every day. These results compare favorably with the results in Embu Hospital.

Table 50: Using Manual as a Reference in Meru Hospital

	Frequency	Percent
Everyday	4	13.3
Once Per Week	6	20
Once Per Month	7	23.3
Rarely	12	40
Never	1	3.3
Total	30	100

4.2.19. Safe motherhood committees

The researcher sought wether the nurses had formed safe motherhood committes in the two hospitals.The responses are presented in frequencies and percentages. This is presented in table 55 and 56 below:

4.2.19.1 Safe Motherhood Committees in Embu Hospital

The results indicate that majority (46.7%)of the respondents in Embu hospital indicated that they had not formed any safe motherhood committees. The results further show that the 33.3% respondents in Embu Hospital did not know whether there were any safe motherhood committees in hospital. Only 20% of the respodents indicated that they had formed safe motherhood committees.

Table 51: Existence of safe motherhood committees in Embu Hospital

	Frequency	Percent
Yes	6	20
No	14	46.7
Dont Know	10	33.3
Total	30	100.0

4.2.19.2 Safe Motherhood Committees in Meru Hospital

The results indicate that majority (53.3%) of the respondents in Meru hospital indicated that they had not formed any safe motherhood committees. The results further show that the 30% respondents in Embu Hospital did not know whether there were any safe motherhood committees in hospital. Only 16.7% of the respondents indicated that they had formed safe motherhood committees.

Table 52: Existence of Safe motherhood committees in Meru Hospital

	Frequency	Percent
Yes	5	16.7
No	16	53.3
Dont Know	9	30
Total	30	100.0

4.2.20. Births Attended Per Week

The researcher sought the number of births attended per week in the two hospitals. The responses are presented in frequencies and percentages. This is presented in table57 and 58 below.

4.2.20.1Number of Births Attended Per Week in Embu Hospital

The results in table 53 below indicate that majority of the respondents (43.3% indicated that they attended 91-120 births per week.23.3 % indicated that they attended an estimate of 31-60 births per week.20% indicated that they attended 61-90 births per week. Only 3.3% indicated that they attended above 120 births per week and 3.7% indicated they attended 30 and below births per week.

Table 53: Number of Births Attended Per Week in Embu Hospital

	Frequency	Percent
1-30	3	3.7
31-60	7	23.3
61-90	6	20
91-120	13	43.3
Above 120	1	3.3
Total	30	100.0

4.2.20.2 Number of Births Attended Per Week in Meru Hospital

The results in table 21 below indicate that majority of the respondents (40%) indicated that they attended 91-120 births per week.16.7 % indicated that they attended an estimate of 31-60 births per week.26.6 % indicated that they attended 61-90 births per week. Only 6.7 % indicated that they attended above 120 births per week and 10 % indicated they attended 30 and below births per week. These results compare favorably with the results in Embu town Level 5 hospital.

Table 54: Number of births attended per week in Meru Hospital

	Frequency	Percent
1-30	3	10
31-60	5	16.7
61-90	8	26.6
91-120	12	40
above 120	2	6.7
Total	30	100.0

4.2.21 Antenatal Clients Attended Per Week

The researcher sought the number of Antenatal clients attended per week in the two hospitals. The responses are presented in frequencies and percentages. This is presented in table 59 and 60 below.

4.2.21.1 Antenatal Clients Attended Per Week in Embu hospital

The results in table 55 below indicate that majority of the respondents (53.3%) indicated that they attended above 120 antenatal clients per week.13.4 % indicated that they attended an estimate of 61-90 antenatal clients per week.33.3 % indicated that they attended 91-120 antenatal clients per week. None of the respodents indicated that they attended 31-60 antenatal clients per week none indicated they attended 30 and below antenatal clients per week. These results compare favorably with the results in Embu town Level 5 hospital.

Table 55: Antenatal Clients Attended per Week in Embu hospital

	Frequency	Percent
1-30	0	0
31-60	0	0
61-90	4	13.4
91-120	10	33.3
above 120	16	53.3
Total	30	100.0

Table 56: Antenatal Clients Attended per Week in Meru hospital

	Frequency	Percent
1-30	3	10
31-60	2	6.7
61-90	17	56.7
91-120	6	20
above 120	2	6.7
Total	30	100.0

4.2.22 Postpartum Clients Attended Per Week

The researcher sought the number of postpartum clients attended per week in the two hospitals. The responses are presented in frequencies and percentages. This is presented in table 57 and 58 below.

4.2.22.1 Postpartum Clients Attended Per Week in Embu Hospital

The results in table 61 below indicate that majority of the respondents 43.3% indicated that they attended above 61-90 postpartum clients per week.26.7 % indicated that they attended an estimate of 1-30 postpartum clients per week.20 % indicated that they attended 31-60 postpartum clients per week. Only 3.3 % indicated that they attended above 120 postpartum clients per week and 6.7 % indicated they attended above 90-120 postpartum clients per week. These results compare favorably with the results in Embu town Level 5 hospital.

Table 57: Postpartum Clients Attended in Embu Hospital

	Frequency	Percent
1-30	8	26.7
31-60	6	20
61-90	13	43.3
90-120	2	6.7
above 120 clients	1	3.3
Total	30	100.0

4.2.22.2 Postpartum Clients Attended Per Week in Meru Hospital

The results in table 58 below indicate that majority of the respondents 50% indicated that they attended above 91-120 postpartum clients per week.10 % indicated that they attended an estimate of 1-30 postpartum clients per week.13.3% indicated that they attended 31-60 postpartum clients per week. Only 23.3 % indicated that they attended 61-90 postpartum clients per week and 3.3% indicated they attended above 120 postpartum clients per week. These results compare favorably with the results in Embu town Level 5 hospital.

Table 58: Postpartum Clients Attended in Meru Hospital

	Frequency	Percent
1-30	3	10
31-60	4	13.3
61-90	7	23.3
91-120	15	50
above 120	1	3.3
Total	30	100.0

4.2.23 Relationship between Births Attended Per Week by Respondents and Confidence in Attending the Skills

Midwives and Nurses are expected and should be confident when performing births in the hospital. This study sought to establish the relationship between the number of births attended per week and the confidence of the nurses in attending the skills in hospitals. Descriptive statistics of percentages and chi-square results from the tabulation were used to analyse the data. The results are presented in table 59 for responses in Embu level five hospital and 60 for responses in Meru town hospital.

4.2.15.17.1 Relationship between Births Attended per Week and Confidence in Performing the Skills in Embu level five hospital

Table 59: Relationship between Births attended and Confidence in Performance in Embu Hospital

Births you attend per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not permited	Total
0-30	5.7%	.0%	.0%	0.0%	5.7%
31-60	2.7%	22.2%	.0%	.0%	24.9%
61-90	1.9%	13.6%	.0%	0.%	15.5%
91-120	.0%	3.7%	41.6%	0.%	45.3%
Above 120	0.0%	0.0%	4.9%	3.7%	8.6%
Totals	10.3%	39.5%	46.5%	3.7%	100%

Chi-square value=69.666, df=12, p-value=0.059

Results from table 59 indicated that for those who said that they were very confident and needed no training in performing the skills also said that they performed 0-30 births per week (5.7%).2.7% also said they were very confident in performing the skills and they said they performed 31-60 births per week.22.2 % said they were not very confident and needed more coaching but they performed 31-60 births per

week.13.6% Said they were not very confident in performing the skills but they performed 61-90 births per week .Generally, results show that majority of the respondents 41.6% felt that they were not very confident (they cannot perform this skill) yet they performed 91-120 births per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 69.666 and p value 0.059 implied that there no significant association between the number of births midwifes attend per week and the confidence levels in performing the skills.

4.2.15.17.2Relationship between Births Attended per Week and Confidence in Performing the Skills in Meru hospital

Table 60: Relationship between Births attended and Confidence in Performance in Embu Hospital

Births you attend per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not Permited	Total
0-30	9.6%	3.4%	.0%	.0%	12.7%
31-60	.0%	8.1%	10.6%	.0%	18.7%
61-90	1.7%	.0%	8.5%	5.1%	15.3%
91-120	.0%	10.6%	29.2%	8.8%	48.6%
Above 120	.0%	.0%	5.4%	.0%	4.7 %
Totals	11.3.%	22.1%	53.7%	13.9%	100%

Chi-square value=42.001df =12 p-value 0.524

Results from table 60 indicated that for those who said that they were very confident and needed no training in performing the skills also said that they performed 0-30 births per week (9.6%). 0% also said they were confident in performing the skills and they said they performed 31-60 births per week.8.1% said they were not very

confident and needed more coaching but they performed 31-60 births per week..0% Said they were not very confident in performing the skills but they performed 61-90 births per week .Generally, results show that majority of the respondents 29.2% felt that they were not very confident (needed more coaching) yet they performed 91-120 births per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 42.001 and p value 0.524 implied that there no significant association between the number of births midwifes attend per week and the confidence levels in performing the skills.

4.2.24 Relationship between Antenatal Clients attended per Week and Confidence in Performing the Skills Embu hospital

Table 61: Relationship of Antenatal Clients attended per Week and Confidence in Performing the Skills in Embu Hospital

Antenatal clients you attend per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not permitted	Total
0-30	5.6%	.0%	.0%	0.0%	5.6%
31-60	3.7%	3.7%	.0%	.0%	7.4%
61-90	0.%	11.1%	.0%	0.%	11.1%
91-120	.0%	9.3%	.0%	0.%	9.3%
Above 120	0.0%	18.5%	44.4%	3.7%	66.7%
Totals	9.3%	42.6%	44.4%	3.7%	100%
Chi-square value=62.896 df =12 p-value= 0.530					

Results from table 61 indicated that for those who said that they were very confident and needed no training in performing the skills also said that they attended 0-30 antenatal clients per week (5.6%).3.7% also said they were confident in performing the skills and they said they attended 31-60 antenatal clients per week.11.1 % said they were not very confident and needed more coaching but they attended 61-90 births per week.9.3% Said they were not very confident in performing the skills but they attended 91-120 antenatal clients per week .Generally, results show that majority of the respondents 44.4% felt that they were not very confident (they cannot perform this skill) yet they attended above 120 antenatal clients per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 45.668 and p value 0.530 implied that there is no significant association between the number of births midwifes attend per week and the confidence levels in performing the skills.

Meru hospital

Table 62 Relationship of Antenatal Clients attended per Week and Confidence in Performing the Skills in Meru Hospital

Antenatal clients you attend per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not permitted	Total
0-30	11.9%	1.7%	5.1%	0.0%	18.6%
31-60	.0%	8.5%	8.5%	.0%	16.9%
61-90	0.%	1.7%	11.9%	0.%	13.6%
91-120	0.%	8.5%	0.%	10.2%	45.8%
Above 120	1.7%	1.7%	27.2%	1.7%	5.1%
Totals	13.6%	22.0%	52.7%	11.9%	100%

Chi-square value =59.789 df=12 p-value= 0.569

Results from table above indicated that for those who said that they were very confident and needed no training in performing the skills also said that they attended 0-30 antenatal clients per week (11.9%).8.5% also said they were confident in performing the skills and they said they attended 31-60 antenatal clients per week.11.9 % said they were not very confident and needed more coaching but they attended 61-90 births per week.8.5% Said they were not very confident in performing the skills but they attended 91-120 antenatal clients per week .Generally, results show that majority of the respondents 27.2% felt that they were not very confident (they cannot perform this skill) yet they attended above 120 antenatal clients per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 59.789 and p value 0.569 implied that there is no significant association between the number of births midwifes attend per week and the confidence levels in performing the skills.

4.2.25 Relationship between postpartum Clients attended per Week and Confidence in Performing the Skills.

Table 63: Relationship between Postpartum clients and Skills Confidence in Meru Hospital

Postpartum clients you see per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not Permited	Total
0-30	6.8%	5.1%	.0%	.0%	11.9%
31-60	.0%	3.4%	1.7%	.0%	5.1%
61-90	15.3%	11.9%	20.3%	10.2%	57.6%
91-120	5.1%	.0%	11.9%	1.7%	18.6%
Above 120	.0%	1.7%	5.1%	.0%	6.8%
Totals	27.1%	22.0%	39.0%	11.9%	100%

Chi-square value=19.401df =12 p-value 0.079

Results from table above indicated that for those who said that they were very confident and needed no training in performing the skills also said that they attended 0-30 postpartum clients per week (6.8%).3.4% also said they were confident in performing the skills and they said they attended 31-60 pospartum clients per week.11.9 % said they were not very confident and needed more coaching but they attended 61-90 postpartum clients per week.11.9 % Said they were not very confident in performing the skills but they attended 91-120 postpartum clients per week. Generally, results show that majority of the respondents 20.3% felt that they were not confident (they cannot perform this skill) yet they attended above 61-90 postpartum clients per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 19.401 and p value 0.079 implied that there is no significant association between the number of postpartum clients midwifes attend per week and the confidence levels in performing the skills.

Table 64: Relationship between Postpartum clients and Skills Confidence in Embu Hospital

Postpartum clients you see per week	Confidence in performing the skills				
	Very confident	Not very confident	Not confident	Not Permited	Total
0-30	9.3%	18.5%	.0%	.0%	27.8%
31-60	.0%	18.5%	.0%	.0%	18.5%
61-90	0.%	0.%	42.6%	1.9%	44.4%
91-120	0.%	.0%	1.9%	1.9%	3.7%
Above 120	.0%	5.6%	0.%	.0%	5.6%
Totals	9.3%	42.6%	44.4%	3.7%	100%
Chi-square value =75.518 df=12 p-value= 0.492					

Results from table above indicated that for those who said that they were very confident and needed no training in performing the skills also said that they attended 0-30 postpartum clients per week (9.3%).18.5% also said they were confident in performing the skills and they said they attended 31-60 postpartum clients per week. 42.6 % said they were not very confident and needed more coaching but they attended 61-90 postpartum clients per week.1.9 % Said they were not very confident in performing the skills but they attended 91-120 postpartum clients per week .Generally, results show that majority of the respondents 42.6% felt that they were not confident (they cannot perform this skill) yet they attended above 61-90 postpartum clients per week.

The data was further statistically analysed using chi-square test at 5% significant level. The computed chi-square value 75.518 and p value 0.492 implied that there is no significant association between the number of postpartum clients midwives attend per week and the confidence levels in performing the skills.

4.2.26 Discussion

The aim of this study was to identify gaps in EmONC among midwives in Meru and Embu level five hospitals in Meru and Embu counties in Kenya. It is widely acknowledged that accelerating progress to the UN maternal and newborn health targets (MDGs 4 and 5) in low and middle income countries requires that barriers limiting access to essential and quality maternal and newborn care services are identified and addressed at all levels of the health system. The efforts and commitments to address this issue has focused primarily on providing access to life-saving interventions based on the nine signal functions proposed by the World Health

Organization (Essendi et al 2015). The results indicate that many practices recommended for high quality maternal and newborn care were not routinely performed in Meru and Embu hospitals. The study has shown that the facilities had the necessary inputs and personnel for the provision of BEmONC which presents a major improvement in the part of the health sector]. These reflect the efforts made by the government and other stakeholders to bridge quality gaps on BEmONC in Kenya. However, the lack of progresses in provider's competence in detecting, preventing and managing emergency obstetric and neonatal complications entails further concerted efforts.

PPH remains a major cause of maternal mortality and morbidity in poor resource settings (WHO 2012, Mwaniki et al 2014). In the absence of proper and prompt management, PPH could claim the life of the women within two hours (Lassi et al 2014).The study showed poor provider's competence on preventing and managing PPH. This is consistent with a study in 18 hospitals in Ethiopia, where only 39% of the providers had knowledge to prevent PPH by 2010 (Essendi et al 2015). The persistence of poor providers' competence could be attributed to gaps in pre-service curricula, lack of continuing education, staff turnover, frequent rotation and limited in-service training in Kenya. A multi country study that included Ethiopia and a study from Nigeria report that the pre-service curricula for midwives and nurses have limitations to ensure graduates with essential midwifery competences up to the standard set by the International Confederation of Midwives (Essendi et al 2015). Only 12% of the interviewed providers in 2013 and 16% in 2008 reported receiving in-service BEmONC training (Essendi et al 2015). The national Health Sector Development Programme for the year 2010 to 2015 has given focus on developing

critical work force skills for improving the quality of health care in Ethiopia with due emphasis on standard in-service trainings (Essendi et al 2015). Atonic PPH is the commonest cause of PPH and is showing an increasing trend (WHO 2012, Mumtazi et al 2014, Essendi et al 2015). Active Management of Third Stage Labour (AMTSL) is an effective intervention for preventing and managing atonic PPH (Fotso and Fogarty 2015, Lunze at al 2015, Dickson et al 2015). AMTSL has three steps; the first step is the administration of oxytocin within 1–2 minutes of birth; the second step is controlled contraction and the third step is uterine massage. However, providers' knowledge on AMTSL remained sub-optimal in both hospitals. Competence gaps in AMSTL appear to be common place in many resource poor settings, despite the availability of essential supplies of the procedure. Studies from eight countries, including Ethiopia have reported that AMTSL use is ranging from 0.5% to 32% (Essendi et al 2015).

Neonatal asphyxia occurs when there is failure to initiate spontaneous breathing whereby about 10% of newborn babies could have this problem at birth (Das et al 2014). Hence, competence on neonatal resuscitation is critical to help babies who failed to initiate spontaneous breathing at birth or those who breathe poorly (Okereke et al 2015). The study revealed that the midwives had low knowledge level on neonatal resuscitation. Babies born asphyxiated should be ventilated within the first minute after birth also called "The Golden Minute" and delays to initiate ventilation increase the risk of mortality and long term neurological sequel (Essendi et al 2015).

In a study by Harvey and colleagues; many maternal and newborn care providers are not skilled enough; hence giving birth at a health care facility does not guarantee skilled birth care, which seem to be the case in Kenya, Essendi et al 2015). Moreover, some of the intrapartum stillbirths could be attributed to diagnostic bias where babies born with primary apnoea would have been misclassified as stillbirths (WHO 2012). Although, Kenya is showing imrovements in MDG 4(KDHS 2014), the neonatal mortality and the rate of stillbirth remains high suggesting the need for quality improvement in maternal and newborn care services with, a focus on in-service EmONC training (Mwaniki et al 2014)

Conclusion and Recommendations

Even though commendable progresses have been made in availing the necessary inputs and personnel, sub-optimal quality EmONC services continues to prevail in Kenya mainly due to poor providers' competency, which should be a matter of urgent consideration. Although the standard national EmONC curricula are comprehensive and up-to-date it appears to be not feasible for local partners such as health bureaus and health facilities to implement it. To further bridge the quality gaps in EmONC, responsible stakeholders might need to consider tailoring competence based in-service short courses on priority maternal and neonatal conditions

4.3 Phase 11 (Intervention): Training and Monitoring

In phase11, midwives were trained using the curriculum (Appendix4) on EmONC based on the need that were identified in phase one. Topics were identified based on the needs identified. The aim was to fill the gaps identified with the ultimate goal of improving the midwives' knowledge and skills on EmONC.

The training modules ranged from introduction to maternal and newborn health, rapid assessment and emergency management, pregnancy care, management of labour and delivery to postpartum and newborn care. The methods of delivery included but not limited to lecture, discussions, demonstrations, presentations and role plays. The training included both class room teaching as well as clinical practice. The learners underwent a 10 day classroom teaching practicing on models felled by a eight days clinical practice. During the eight days clinical practice, the students were supplied with log books to fill in the competences acquired (see appendix3)

Alongside the developed modules, a pretest/posttest (appendix9) consisting of multiple choice questions on EmONC was developed. Each question had 4 options for the participants to choose the correct one (s). The pretest/post test complied with blooms taxonomy (1956) of educational objectives ensuring that the participants covered and were tested on cognitive, affective and psychomotor domains of learning. It tested recall/recognition, comprehension, synthesis, analysis and application of EmONC. The pretest/posttest was necessary in order to assess participants' EmONC knowledge/skills before and after the intervention.

The measurable outputs (results) in this phase included the differences in scores obtained by each participant from the pretest/posttest offered by the researcher which was developed based on the objectives of the phase. Ability to demonstrate the skills on the models was also another measurable output.

4.3.1Training

The midwives were divided into four groups comprising of 24 participants in three groups and 21 participants in group four and each group was trained for three weeks. Group size and selection of facilitators was based on WHO (2006) criteria for EmONC training. Training took eighteen working days from 8am to 5pm.To avoid shortage in the clinical areas during the theory period, the researcher arranged with the Directors of nursing to replace those midwives in the training with the nurses with midwifery skills from other wards. Three facilitators were selected based on the criteria below:

- Qualification as a midwife, doctor, or anesthetist trained in EmONC
- Qualification as a trainer through a Clinical Training Skills (CTS) course or ModCAL/CTS
- Currently working in a facility that delivers EmONC services or has regular opportunities to maintain clinical skills

They comprised of one obstetrician and two midwives from Embu and Meru medical training colleges and Meru Level five hospitals. The training was done in the months of January, February and March 2014. At the end of three months 113 of the targeted 140 midwives were trained on EmONC. The remaining 27 could not be trained because some were on leave at the time of training while others could not get replacements from the hospitals. This was understandable owing to the strained health workforce in the country. The 113 represented a response rate of 81%. This rate was reasonable and adequate for interpretation purposes (Pilot &Beck 2008). The researcher acted as the supervisor and was overseeing the progress of the training programme and gave guidance as it was necessary.

4.3.2 Teaching and Learning Methods

The training involved various activities. The participants were supposed to register twice a day, in the morning and in the evening to ensure that the participants remain in the training throughout. After introduction of the course and climate setting, the pretest was administered under the supervision of all the facilitators.

The teaching/learning included lectures, discussions, assignments, individual and group presentations, roles plays, video shows, and clinical practice. The whole training exercise for each group culminated with a post test and skills assessment on models. The post test was the one done at the beginning of the training. After passing the pretest and post test, the participants underwent clinical practice of ten days and were assessed on actual patients. Those participants who did not get 85% and above in the post test were coached further and the test administered to them again.

The training emphasized on various aspects with regard to essential maternal and neonatal care that included:

1. **Emergency Obstetric and Newborn Care (EmONC)**

Topics for midwives:

- Maternal and newborn mortality reduction
- Evidence-based practices in maternal and newborn health
- Human rights; respectful care of women and their families
- Clinical decision-making
- Infection prevention pract
- Best practices during normal labor and childbirth, including partograph use, active management of the third stage of labor (AMTSL) and essential newborn care
- Care of the mother and baby during the immediate postpartum period

- Rapid initial assessment
- Management of shock
- Vaginal bleeding in early pregnancy and post abortion care (PAC)
- Vaginal bleeding in late pregnancy
- Headache, blurred vision, loss of consciousness and elevated blood pressure
- Management of cord prolapsed, breech delivery and shoulder dystocia (optional)
- Vacuum-assisted delivery
- Vaginal bleeding after childbirth
- Fever during and after childbirth
- Newborn resuscitation
- Newborn sepsis
- Improving EmONC through criterion-based audit or other quality improvement approaches such as Standards-Based Management and Recognition (SBM-R)

2. Clinical Skills Standardization

Clinical skills standardization begun in the classroom/skills lab as learners used evidence-based, standardized checklists to become competent in specific skills using anatomic models. Learners were judged competent in all skills before proceeding to the clinical setting to care for clients.

Depending on the number of learners and the level of skills they brought to the training, clinical skills standardization required up to two days to complete for all learners. “Stations” were set up for each skill that learners were supposed to master (e.g., newborn resuscitation, normal birth, AMTSL, immediate newborn care, suturing, and so on). After each skill was demonstrated by facilitators, learners practiced in pairs at the station using checklists. Each learner was then assessed by the

facilitators for competency in the skill using models. Anyone who did not attain mastery of the skill in simulation continued to practice until competent.

3. **Stations for EmONC skills assessment and mastery for midwives in the classroom:**

- Normal delivery, including AMTSL and immediate newborn care
- Management of severe pre-eclampsia and eclampsia using MgSO4
- Repair of episiotomy and vaginal and cervical lacerations
- Postabortion care and manual vacuum aspiration (MVA)
- Vacuum-assisted delivery
- Management of postpartum hemorrhage (PPH), including manual removal of the placenta, bimanual compression of the uterus and compression of the abdominal aorta
- Normal newborn exam
- Newborn resuscitation
- Breech delivery

Facilitators made sure that all learners had mastered these skills in simulation before they moved to the practicum at the clinical site(s).

4. **Clinical Practicum**

During the practicum facilitators divided learners into groups of three or four, with no more than four learners per facilitator, and developed rotation schedules in ANC, maternity (triage/admission, labor, and birth areas), inpatient antepartum, and immediate postpartum/newborn. A room where anatomic models and supplies were availed for continued practice and where case studies, “partograph rounds,” and role plays were carried out at times when the service was not busy was availed. Each learner had a logbook for recording daily activities (Appendix3).

Continual assessment of learners during their clinical work was essential to ensure that each one had an opportunity to practice various skills with clients. Facilitators met daily with each learner to assess their progress and challenges and to ensure that each had adequate clinical experience and coaching to become competent in as many skills as possible. The meetings usually took place at the end of the day. Facilitators also met daily as a group to discuss the general progress of learners and any specific issues that arose during the training.

On the last day of the training, learners and facilitators met again in the classroom. Some important activities that took place during the day were:

- Learners completed a written knowledge assessment covering the best practices addressed during the training. They were supposed to score at least 85%; if they do not, they were coached and then took the assessment again. They continued to retake the assessment until they reached the required score.
- Each team of learners (from the two facilities) developed an action plan to implement in the three months following the trainings. Action plans ensured that learners continued to use their new skills and teach them to colleagues, thereby improving the quality of services at their facilities. The learners were asked to select up to three clinical practices that they wanted to improve at their facility and delineated the steps they would take to achieve the improvements.

Facilitators and learners discussed next steps, and facilitators shared information about:

- The use of the logbooks to record all the skills performed by the learners after the training and before the follow-up visit;
- The implementation of the action plans;
- The follow-up visit (including, dates and process); and
- Evaluation of the training.

Learners shared their feelings and feedback about the training. Each learner filled out an anonymous questionnaire assessing several components of the training, including the objectives, methodology, content, logistics, and venue. (Appendix E provides an example of a training evaluation questionnaire)

4.3.3 Follow-Up of the Training

Follow-up and supportive supervision are key to helping providers solve problems and apply new practices on the job. Using performance standards (harmonized and standardized with training materials) within a post-training follow-up approach or supportive supervision system can also support performance improvement (WHO 2015).

Before leaving the training site learners developed action plans in which they selected three or four skills they had acquired and put them into practice in their workplaces. Follow-up takes place from six weeks to three months after the training (WHO 2015) so learners will have had time to practice their new knowledge and skills and put their action plans into effect. They will then have the opportunity to discuss their successes

and challenges with a facilitator (WHO 2015). The learners were followed at six weeks and three months after the training. The three months follow up was evaluation in phase three.

When conducting each follow-up visit, the facilitators organized their activities as follows:

1. Assessment of the learners' action plan implementation, including successes and challenges encountered.
2. Knowledge assessment for each learner using questions similar to those used in the training.
3. Case studies on the partograph and PPH
4. Assessment of skills and attitudes with clients (ideally) or anatomic models (if there are no clients) using checklists
5. Review of each learner's clinical experiences logbook
6. Debriefing with the facility management team
7. Discussion of next steps to ensure that as many elements as possible of EmONC continue to be practiced in the facility

4.3.4 Course Materials

Since the goal of EmONC training is to teach providers evidence-based best practices (WHO 2015), training must be based on the most up-to-date teaching materials and manuals. This section contained links to the learning resource packages (LRPs) that facilitators needed in order to organize the EmNOC courses in a logical way. The LRPs contained schedules, session outlines, knowledge questionnaires, case studies, role plays, skills checklists and PowerPoint presentations. In addition, linkswere

provided to several reference manuals that contained global evidence-based guidelines for emergency obstetric and newborn care. The LRPs were formulated to reflect the information in these manuals.

Table 65: Materials for EMNoC Course

DOCUMENTS TO PREPARE IN ADVANCE	
For each learner:	**For each facilitator:**
Course schedule	Course schedule and course outline
Precourse questionnaire	Precourse questionnaire and answer key
Midcourse questionnaire	Midcourse questionnaire and answer key
Action plan	Copy of learners' action plan
TRAINING MATERIALS TO DOWNLOAD	
For each learner	**For each facilitator**
Best Practices in Maternal and Newborn Care: A Learning Resource Package for Essential and Basic Emergency Obstetric and Newborn Care. Learner's Notebook. http://www.accesstohealth.org/toolres/pdfs/ACCESS_BPmnclrpPart.pdf	*Best Practices in Maternal and Newborn Care: A Learning Resource Package for Essential and Basic Emergency Obstetric and Newborn Care. Facilitator's Guide.* http://www.accesstohealth.org/toolres/pdfs/ACCESS_BPmncrlpFacil.pdf
Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors. World Health Organization, 2003. http://whqlibdoc.who.int/hq/2000/WHO_RHR_00.7.pdf	*Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors. World Health Organization, 2003.* http://whqlibdoc.who.int/hq/2000/WHO_RHR_00.7.pdf
Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice. WHO, 2006. http://www.who.int/reproductivehealth/publications/en/	Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice. WHO, 2006. http://www.who.int/reproductivehealth/publications/en/
Emergency Obstetric Care: Quick Reference Guide for Frontline Providers. Jhpiego, 2003. http://www.jhpiego.org/en/node/477	*Emergency Obstetric Care: Quick Reference Guide for Frontline Providers. Jhpiego, 2003.* http://www.jhpiego.org/en/node/477

Table 66: Materials for Follow-Up of Learners

For each midwife

- Clinical experience logbook
- *Guidelines for Assessment of Skilled Providers after Training in Maternal and Newborn Health. Jhpiego, 2004. www.jhpiego.org/files/GdlnsSkillProvEN.pdf*
- Action plan
- Related standards

Listed below are descriptions and ordering information for anatomic models and other equipment needed for EmONC trainings. At a minimum, models for childbirth (for practicing AMTSL, immediate newborn care, and PPH treatment) and newborn resuscitation should be made available for BEmONC training (WHO 2015). All these were made available for the training.

Table 67: Anatomic Models

DESCRIPTION	SOURCE
Childbirth simulator	BUYAMAG INC. www.buyamag.com GAUMARD SCIENTIFIC Tel: 001305-971-3790 www.gaumard.com
MamaNatalie (normal birth & vacuum)	LAERDAL www.laerdal.com/mamaNatalie
Pelvic model for breech delivery	SUPERIOR MEDICAL superiormedical.com/l_models.html
Model and equipment for MVA	IPAS www.ipas.org
Fetus model for vacuum extraction	PELICAN HEALTHCARE LTD. www.pelicanhealthcare.co.uk Tel: 029 2074 7000 Fax: 029 2074 7001 Email: contactus@pelicanhealthcare.co.uk
Model for PPH management: MamaNatalie	LAERDAL www.laerdal.com
Model and equipment for newborn resuscitation: Helping Babies Breathe (HBB) model NeoNatalie	LAERDAL GLOBAL HEALTH www.laerdalglobalhealth.com/neonatalie.html

The following videos and presentations were useful in EmONC training to reinforce the key components of each skill being taught. Learners viewed them at their own convenience during and following training as needed to refresh their knowledge.

Table 68: Videos and Presentations

DESCRIPTION	SOURCES
Active Management of the Third Stage of Labor: A Demonstration	ACCESS Program www.accesstohealth.org/toolres/amtslweb/amtsl.html
Vaginal Breech Delivery and Symphysiotomy	WHO Reproductive Health Library http://apps.who.int/rhl/videos/en/index.html
Manual Vacuum Aspiration	IPAS www.ipas.org View video at http://youtu.be/I0daZ8dLXdY
Vacuum Extraction	WHO Reproductive Health Library http://apps.who.int/rhl/videos/en/index.html
Vacuum-Assisted Delivery: A Brief Summary of Key Principles	Clinical Innovations, Inc. http://www.clinicalinnovations.com/kiwi_video_vad.htm Tel: 888-268-6222 or 801-268-8200 To order video, go to: http://www.clinicalinnovations.com/vacca.htm#dvd
Steps to Overcome Shoulder Dystocia	WHO Reproductive Health Library http://apps.who.int/rhl/videos/en/index.html
Caesarean Section Evidence-Based Surgical Techniques	WHO Reproductive Health Library http://apps.who.int/rhl/videos/en/index.html
Spinal Anesthesia	www.operationalmedicine.org/ed2/video/spinal.mpg
Labour Companionship: Every Woman's Choice	WHO Reproductive Health Library http://apps.who.int/rhl/videos/en/index.html

JOB AIDS

A full list of resources, including job aids, can be found in the Essential Obstetric and Newborn Care (EONC) Toolkit, on the Knowledge for Health website (visit http://www.k4health.org/publications-and-resources). The following job aids were very useful during training. It was ensured that each facility represented at the training had copies of them.

Job Aids in the EONC Toolkit (www.k4health.org):

- Positions for Labor (drawings of positions in labor and squatting position for birth), by Victor Okello (artist); from GOAL, Uganda
- Steps to Perform AMTSL (poster)
- Steps to Perform MVA (poster)
- Algorithm for Management of Preeclampsia/Eclampsia (poster)
- Dilution and Mixing of MgSO4 (poster)
- Algorithm for Management of PPH (poster)

Other Job Aids:

- *Positions for Laboring Out of Bed* Tear Pad Cascade Healthcare Products www.1cascade.com/ProductInfo.aspx?productid=2937
- *Action Plan* Poster
- Helping Babies Breathe Action Plan www.helpingbabiesbreathe.org/docs/ActionPlan.pdf
- Large laminated WHO Modified Partograp
- Wall chart to demonstrate cervical dilatation

4.4 Phase III: Post Intervention Results

4.4.1Introduction to Phase III

This was an evaluation of the outcomes of the training intervention that was done in phase two. It was done at two levels, immediately after the training and clinical practice by use of a post test and skills assessments on models and clients and at four months by use of questionnaires, case studies and interview checklists. The sample size was 64 midwives who were randomly selected from the trained midwives (33 from Meru and 31 from Embu hospitals). All the midwives attained 85% and above in both skills and knowledge assessment.

In the second evaluation, the same tools that were used in phase one were used but excluded questions on barriers and training needs. The observation justifies why post-intervention evaluation.

During this phase, evaluation of the outcomes of training intervention was done. It was done to 60 Nurses 30 from Embu and 30 from Meru hospital. Their number reduced from 64 because two of the trained nurses from Meru and one from Embu were on maternity leave during this period while one respondent from Meru hospital had left the hospital. This observation justifies why post-intervention evaluation was done on the fourth month after training. Treece and Treece (1986) recommended that the researcher must recognize that the time span between the first test and the second test can be confounded by age, fatigue and maturation. Thus unnecessary prolongation of time was avoided to prevent a scenario where some nurses could have transferred or moved from the study areas for some reasons hence reducing the sample.

The evaluation was done at the respondents' place of work where they were requested to fill in the post intervention questionnaires, interview checklist and observed as they performed the tasks. Data was then entered into the computer and analysed using SPSS version 22. The results were as presented below.

4.4.2 Participants' Characteristics

The characteristics of the 60 participants who were evaluated in phase 11 are described in 4.2.1 above under the sub heading Demographic characteristics of the trained participants.

4.4.3 Use Partograph to Monitor Labor

The researcher sought to find out whether there was any significant difference of responses from baseline survey to those in phase three on whether hospitals used Partograph to monitor labour. The responses were presented in frequencies and percentages. This is presented in table 32 and 34 below.

4.4.3.1 Embu Hospital

The results indicated that there was a significant difference in percentages. In baseline survey only 46.7% as compared to 93.3% after training indicated that the hospitals used a partograph to monitor labor. From a percentage of 33.3% to a minimum of only 3.3% of the respondents indicated the hospitals did not have a partograph. From a percentage of 20% to only 3.3% of the respondents in phase three indicated that they did not know whether the hospitals used partograph to monitor labor.

Table 69 Use Partograph to Monitor Labor in Embu Hospital

	Before training (%)	After training (%)
Yes	46.7	93.3
No	33.3	3.3
Dont Know	20	3.3
Total	100.0	100.0

4.4.3.2 Meru Hospital

The results indicated that there was a significant difference in percentages. In baseline survey only 60 % as compared to 96.67% after training indicated that the hospitals used a partograph to monitor labor. From a percentage of 10 % to a minimum of only 3.3% of the respondents indicated the hospitals did not have a partograph. From a percentage of 30 % to only 0 % of the respondents in phase three indicated that they did not know whether the hospitals used partograph to monitor labor.

Table 70: Use Partograph to Monitor Labor in Meru Hospital

	Before training (%)	After training (%)
Yes	60	96.67
No	10	3.33
Dont Know	30	0
Total	100.0	100.0

4.4.4 Using Manual as a Reference

4.4.4.1 Embu Hospital

The results indicate that there was a significant difference between before training and after training results. Majority of the nurses before training indicated that they rarely used the manuals (43.3%). After training Majority of the respondents (80%) indicated that they used manual as a reference and to manage complications.

Table 71: use of Manual as Reference in Embu Hospital

	Before Training (%)	After Training (%)
Everyday	13.3	80
Once Per Week	16.7	13.3
Once Per Month	16.7	16.7
Rarely	43.3	6.7
Never	10	0
Total	100.0	100.0

4.4.4.2 Meru Hospital

The results in Meru hospital are similar to those in Embu hospital .They indicate a significance difference between before and after training results. Majority of the respondents before training indicated that they rarely used manual as a reference. After training majority of the respondents indicated that they used the manual every day.

Table 72: Use of Manual as Reference in Meru Hospital

	Before training (%)	After training (%)
Everyday	13.3	83.3
Once Per Week	20	10
Once Per Month	23.3	6.7
Rarely	40	0
Never	3.3	0
Total	100.0	100.0

4.4.5 Safe Motherhood Committees

The researcher sought whether the nurses had formed safe motherhood committees in the two hospitals. The responses were presented in frequencies and percentages. This was presented in tables below.

4.4.5.1 Embu Hospital

The results indicate that majority (46.6%) of the respondents before training indicated that they did not belong to any safe motherhood committees. After training majority of the respondents (96.67%) indicated that they belonged to safe motherhood committees. Most respondents indicated the name of the safe motherhood committees is'' Hospital safe motherhood committee"

Table 73: Safe Motherhood Committees at Embu Hospital

	Before training	After training
Yes	20	96.67
No	46.6	3.33
Dont Know	33.3	0
Total	100.0	100.0

4.4.5.2 Meru Hospital

The results in Meru hospital compare favorably with the results in Embu hospital. However there is a significant difference between the results in baseline line survey and phase three after training results. In baseline survey majority of the respondents (53.3%) indicated that they did not belong to any safe motherhood committees. After training the results indicate that 90% of the respondents indicated that they belonged to safe motherhood committees.

Table 74: Safe Motherhood Committees at Embu Hospital

	Frequency	Percent
Yes	16.7	90
No	53.3	6.7
Dont Know	30	3.3
Total	100.0	100.0

4.4.6 Assessment of Midwives' Skills and Knowledge in Maternal and Newborn Care after Training

This study sought to find out the essential skills for midwives in each institution of health services after the training. Questions were administered to the respondents and they were asked to select the best possible answers. Descriptive percentages were used to analyses the data and present the results from their responses. The results are presented in table 79 for Meru hospital and table 80 for Embu hospital.

Table 75: Percentage and averages of correct and incorrect responses for midwives in Meru hospital (posttest scores)

	MERU
Questions **Skills Assessment** **Antenatal Care**	% respondents with correct responses
The information obtained from the antenatal history can help the midwives	82.1
Pregnant women should receive educational messages about which of the following	90.23
When counseling a pregnant woman about formulating a birth plan, the midwive should tell her	92.46
If the woman trusts the provider and feels that s/he cares about the outcome of the pregnancy, she will be more likely to	85.92
When offering HIV testing services to a pregnant woman, the provider should	87.78
Focused antenatal care means that	92.59
When counseling a pregnant woman about nutrition, be sure to	82.74
Tests that should be performed for every woman during antenatal care include	78.56
After giving a pregnant woman her first dose of tetanus toxoid by intramuscular injection, the used syringe and needle should be.	79.96
Antenatal Care Skills Mean Score	**85.812**
NORMAL LABOR, CHILDBIRTH, AND IMMEDIATE NEWBORN CARE SKILLS	
One way to prevent transmission of HIV from an infected mother to her baby (vertical transmission) is to	90.6
When performing a vaginal examination, which of the following is recorded on the partograph?	80.6
If a woman is admitted during the active phase of labor, cervical dilation is initially plotted on the partograph	90.9
Cervical dilation plotted to the right of the alert line indicates	86.6
Active management of the third stage of labor should be practiced	82.3
The appropriate order of steps in active management of the third stage of labor include	90.8
bleeding continues after delivery of the placenta using active management, the **first thing** the provider should do is call for help and	87.9
(Case study) Which is the **most** appropriate intervention?	90.1
Which of the following will help to decrease the risk of infection during childbirth?	95.6
Contaminated instruments in the labor ward should immediately be	89.7
The **first** step in thermal protection for the newborn includes	83.5
Immediate care for a normal newborn includes	86.9
Which of the following can contribute to hypothermia in newborns	90.5
To maintain the newborn's axillary temperature between 36.5º C and 37.5º C it is important to	90.3

Before performing an exam on a baby who is 2 hours old and who has not been bathed, the skilled provider should	89.9
Care of the umbilicus should include	87.6
The best way to determine if a newborn needs resuscitation is to	93.5
Breastfeeding should begin	97.7
When counseling the mother about breastfeeding, the skilled provider should tell her to	89.5
When counseling the mother about her newborn, the skilled provider should	95.5
Average	**89.5**
POSTPARTUM CARE (MOTHER AND BABY) SKILLS	86.9
During the first 2 hours following birth, the provider should	85.9
After childbirth, the mother should have a postpartum visit with a skilled provider	81.02
During the postpartum visit to the clinic, obtain a history for the	84.3
During each postpartum visit, specific information should be obtained from the woman about	77.8
By the tenth day postpartum, you should be able to palpate the uterus	86.7
Each time you counsel the breastfeeding mother about nutrition, tell her that	78.9
At each postpartum visit, the mother should be counseled to seek care if she has which of the following danger signs	86.9
When counseling a new mother about breastfeeding in the 6 hours following birth	86.2
Each postpartum examination should include	86.3
After completing the postpartum examination	87.9
Average	**84.44**
MANAGEMENT OF COMPLICATIONS	
Carry out rapid initial assessment	85.9
When there is an obstetric emergency, tell the woman and her family or support person.	83.7
Immediate postpartum hemorrhage can be due to	86.7
The most effective way to **immediately** control eclamptic convulsions is to	83.1
Newborn resuscitation procedures	96.2
When performing newborn resuscitation with an Ambu bag and mask, it is important to verify that	79.8
Do not perform vacuum extraction in the case of	85.6
A woman with a ruptured uterus has which of the following signs and symptoms	76.7
When performing newborn resuscitation with an Ambu bag and mask, ventilateat the rate of	77.1
Treatment of postpartum metritis includes	87.8
Average	**84.26**
Overall score	**86.003**

n=30

From the table 75 above, it emerged that the essential knowledge and skills that the nurses have in Maternal and Neonatal Health sufficient. According to WHO (2015) and other local reproductive health guidelines, a midwives should score at least 80% in each of the questions administered. The results above indicate an average of 86.003 which is sufficient.The results indicate that respondents on assessment of antenatal skills scored an average of 84.26%, while on normal labor, childbirth and immediate newborn care skills they scored an average of 84.44% on postpartum care (mother and baby) an average of 89.5%, on management of complications they scored a mean of 85.812%.This indicates that the nurses showed a great improvement after training. Therefore this indicates that the training improved their basic maternal and newborn care skills so they can be able to solve various health complications.

Table 76: Percentage and averages of correct and incorrect responses for midwives in Embu hospital (n=30)

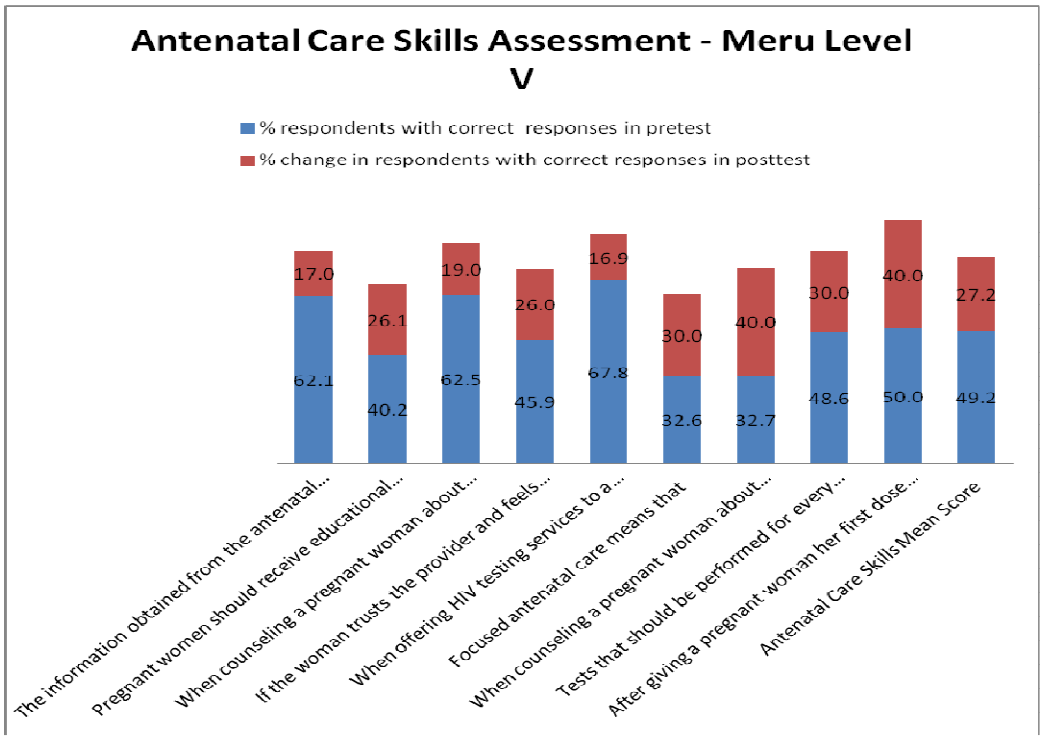
Questions SKILLS ASSESSMENT	Average percentage correct scores
Antenatal Care	95.2
Normal Labor, Childbirth, And Immediate Newborn Care Skills	89.63
Postpartum Care (Mother And Baby) Skills	87.92
Management of Complications	80.12
Overall score	88.22

The results in table 80 above are similar to those for Meru Town Hospital. According to WHO (2015) and other local reproductive health guidelines, a midwife should score at least 80% in each of the questions administered. The results above indicate an average of 88.22 which is sufficient. The results indicate that respondents on assessment of antenatal skills scored an average of 95.2%, while on normal labor, childbirth and immediate newborn care skills they scored an average of 89.63% on postpartum care (mother and baby) an average of 87.92%, on management of complications they scored a mean of 88.22%.This indicates that nurses showed an improvement after training and they are well able to solve various health complications.

4.5 Comparison of Phase I and Phase III Results

The results obtained in phase 111 were matched and then compared with those obtained in phase1.This was necessary in order to access the changes in the knowledge, point of view and performance of the nurses after training. It was also necessary in order to determine factors that need reinforcement for sustainability of nursing research capacity and culture of evidence based practice among the staff.

Overall results showed marked improvements in nurses' knowledge/skills in all areas of newborn care skills, normal labor, childbirth, immediate newborn care skills, postpartum care and management of complications. Generally their skills in maternal and newborn care skills improved after training. This is presented in the tables below.



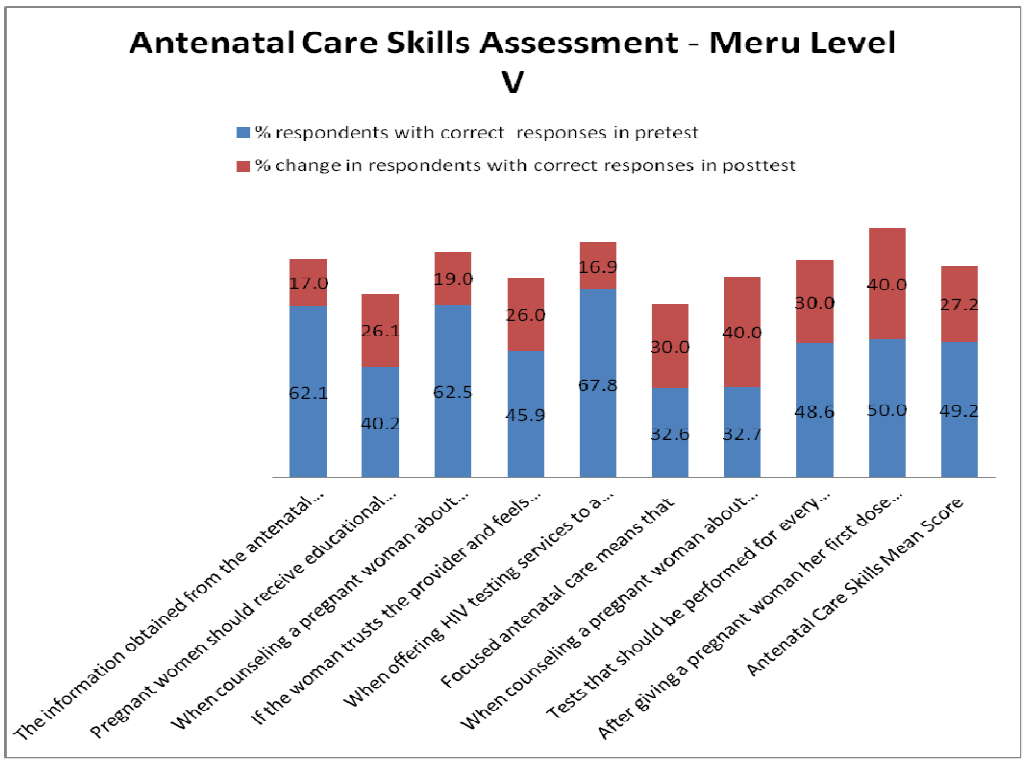


Figure 19: Percentage change in Respondents' correct scores on Antenatal Care Skills after training in Meru Level V Hospital

The figure above showed improvement in knowledge in all the areas of antenatal care with the highest score in the area of counselling pregnant women and giving tetanus (40%) followed by focused antenatal care respectively (30%). The meanscore increase was 27.2% and the ttotal score after the training was 76.4% up from 49.2%.

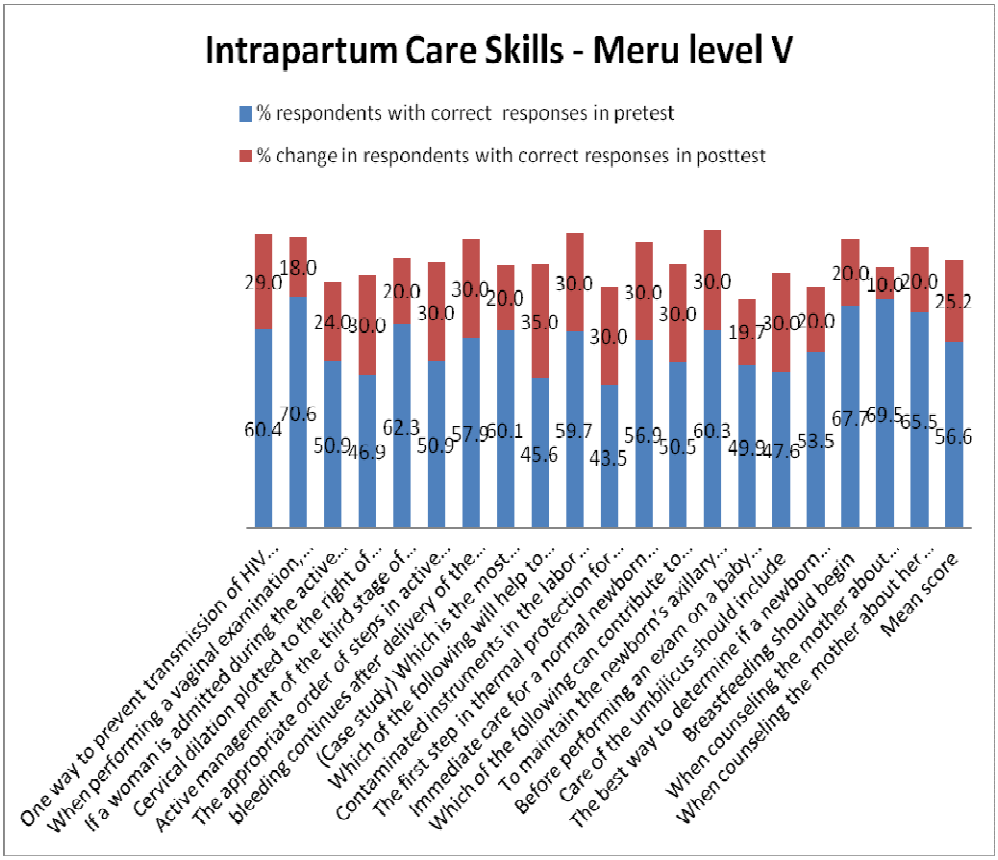


Figure 20 : Percentage change in Respondents' correct scores on Intrapartum Care Skills after training in Meru Level V Hospital

The figure above showed improvement on all areas tested on with a mean score increase from 56.6% to 81.8%

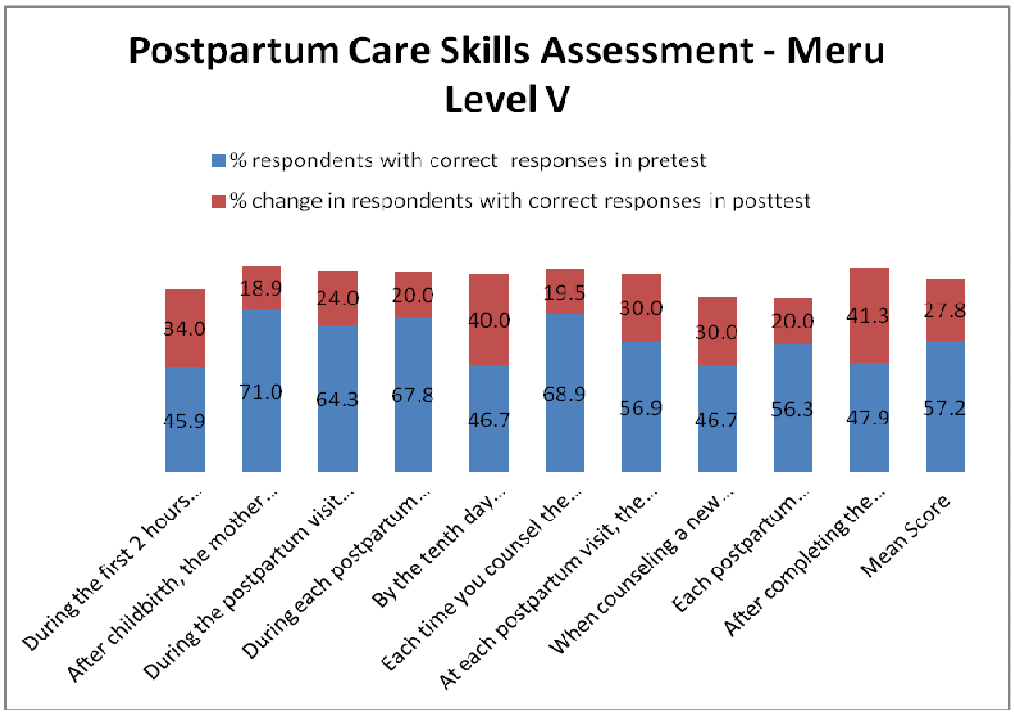


Figure 21: Percentage change in Respondents' correct scores on Postpartum Care Skills after training in Meru Level V Hospital

In the area of postpartum care the score improved from 57.2% to 85.0%.

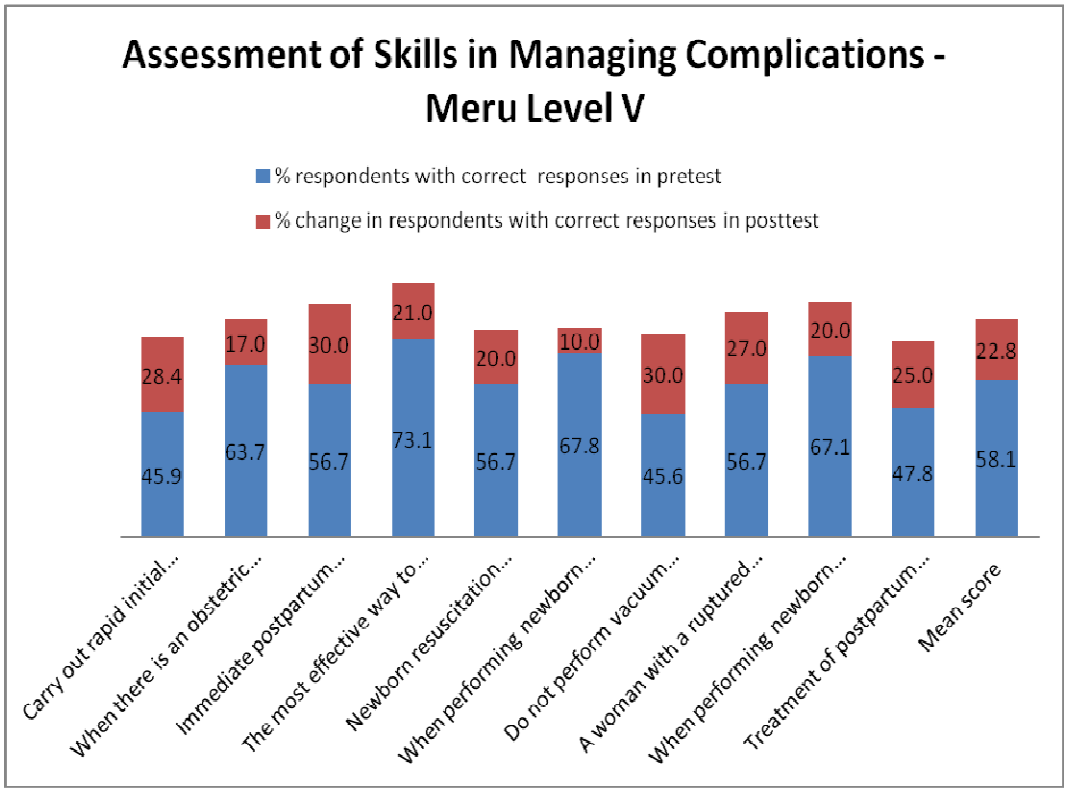


Figure 22: Percentage change in Respondents' correct scores on Management of Complication Skills after training in Meru Level V Hospital

The average score increased from 58.1% to 80.9%

The results showed that knowledge improved after the training from a pretest mean of 55.3 to a post test mean of 81.0.This indicates 25.8% after training improvement. The results were further subjected to paired samples test. The improvement in knowledge was statistically significant with a T= 15.684 (P=0.001) (see table 77 below).Therefore, the hypothesis that,' there is no relationship between an educational intervention on midwives' essential maternal and neonatal skills and knowledge in these skills was rejected.

Table 77: Paired Samples Test for Meru

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	V2 - V3	30.5130000	5.2421381	2.6210691	22.1715885	38.8544115	11.641	3	.001

A scatter plot comparing pretest and post test scores was generated in order to determine whether the training benefited all participants equally. As shown in the scatter plot, the training benefitted all participants equally with both those who had lower or higher scores in the pretest improving in almost equal margins in the posttest.

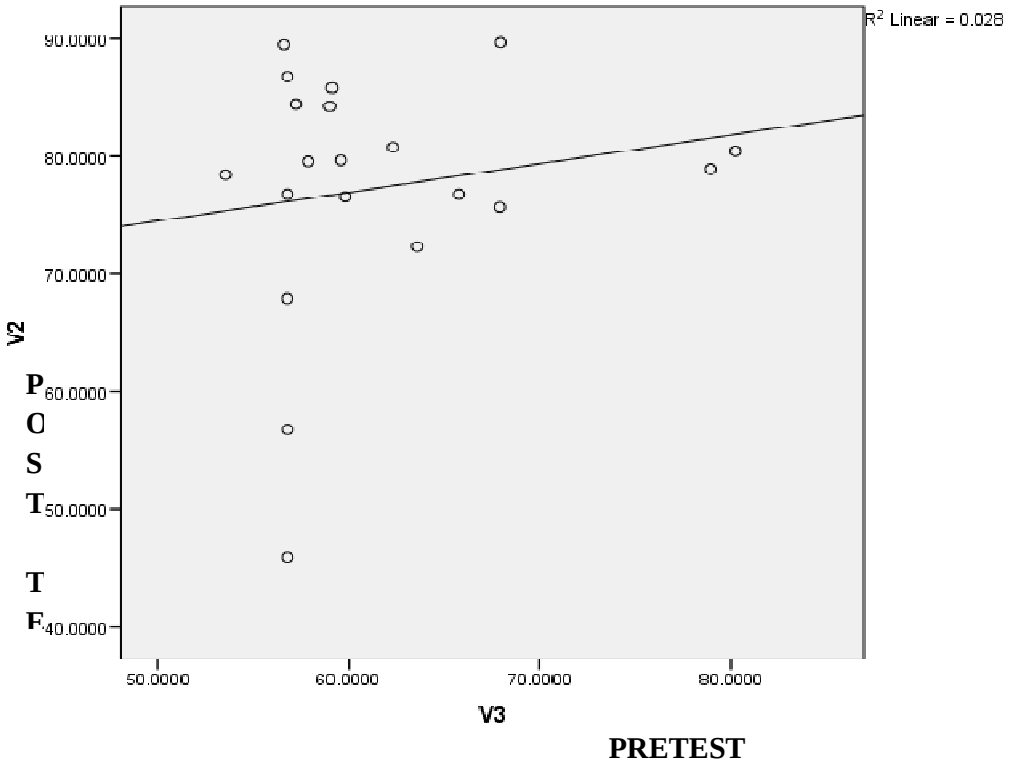


Figure 23: Scatter plot for Meru

Comparison for Embu Level Five Hospital

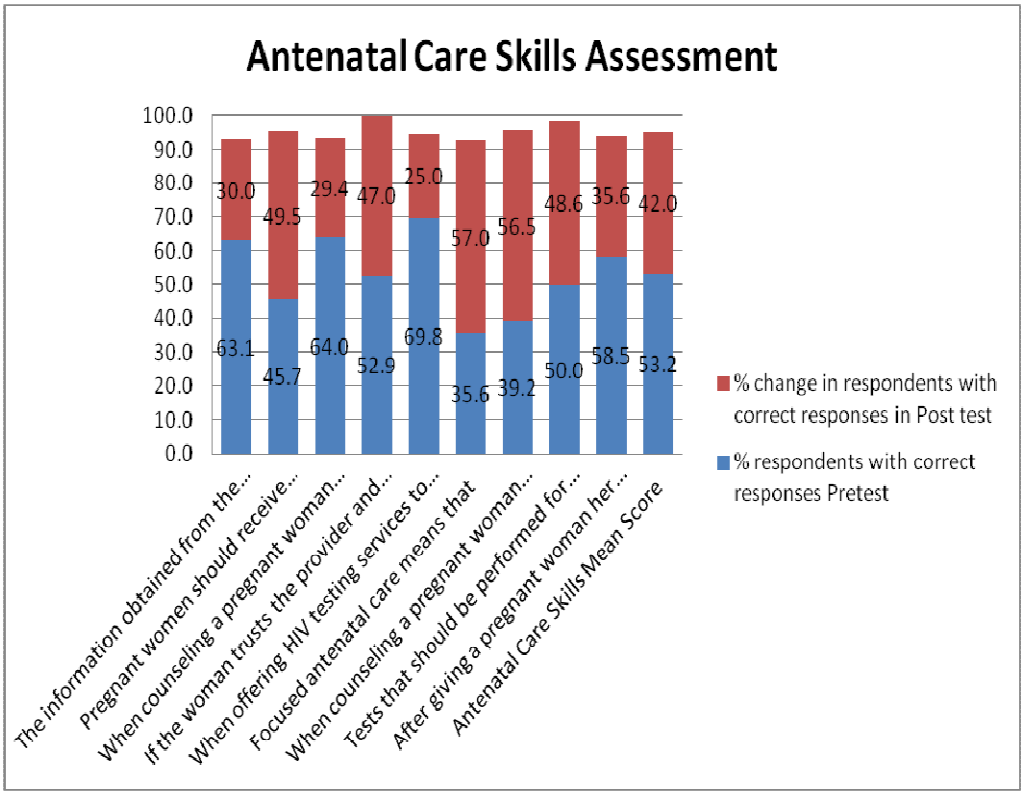


Figure 24: Percentage change in Respondents' correct scores on Antenatal care Skills after training in Embu Level V Hospital

There was improvement in all the areas tested in antenatal care with a mean of 42.0% increase. The total score was 95.2% up from 53.2%

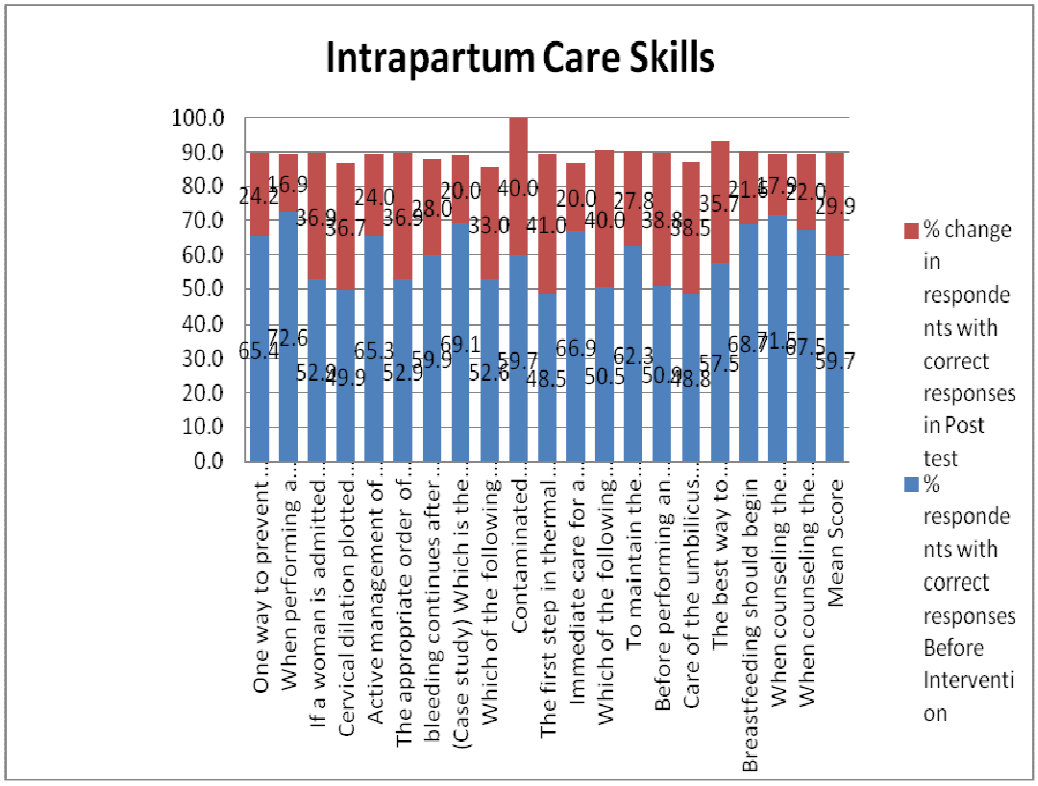


Figure 25: Percentage change in Respondents' correct scores on Intrapartum care Skills after training in Embu Level V Hospital

There was marked increase with a mean score of 29.9%. The total score was 89.6% up from 59.7%. There was imrovement in all the areas with a mean of 87.9% up from 57.9%.

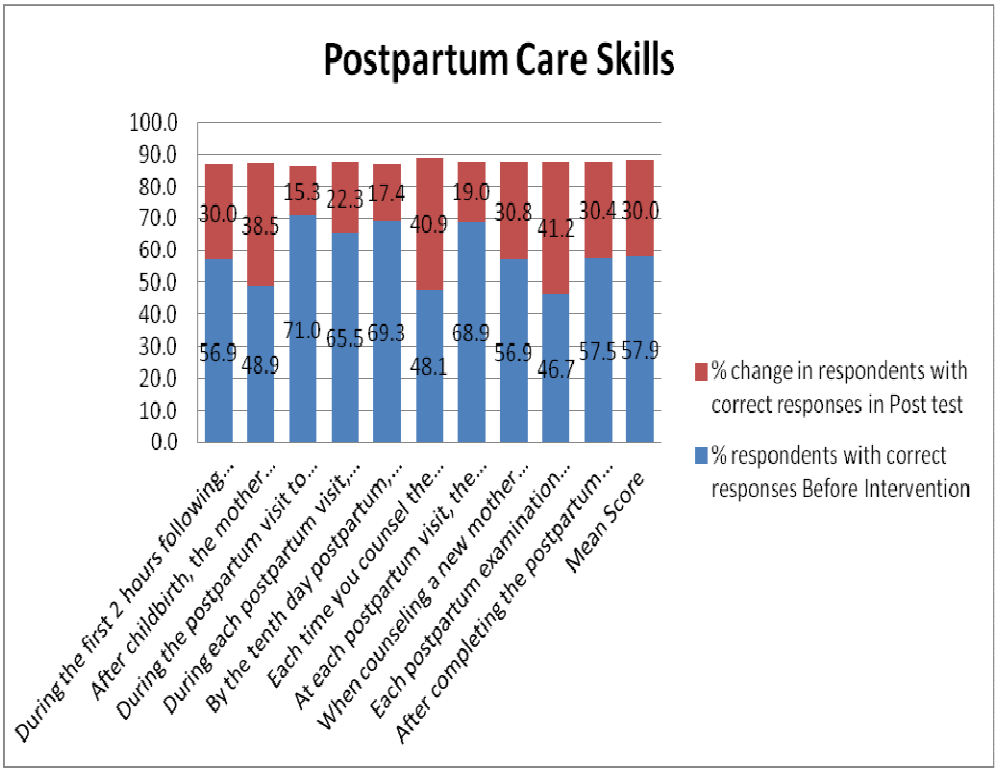


Figure 26: Percentage change in Respondents' correct scores on Management of complications Skills after training in Embu Level V Hospital

There was improvement in all the areas with a mean score increase of 22.4%. The total score was 80.1% up from 57.7%

Table 78: Comparing Pretest and Posttest Scores For the Embu Hospital Nurses

Questions Skills Assessment	Pretest% correct scores	%Posttest scores	% Adjustment
Antenatal Care	58.02	95.2	+37
Normal Labor, Childbirth, And Immediate Newborn Care Skills	59.64	89.63	+30
Postpartum Care (Mother And Baby) Skills	57.89	87.92	+30
Management of Complications	64.08	80.12	+16
Total average	59.9075	88.22	+28

The results showed that knowledge improved after the training from a pretest mean of 59.92 to a posttest mean of 88.22. This indicates 28% after training improvement. The results were further subjected to paired samples test. The improvement in knowledge was statistically significant with a T= 6.397 (P=0.008) (see table 42 below). Therefore, the hypothesis that,' there is no relationship between an educational intervention on midwives' essential maternal and neonatal care skills and knowledge in these skills was rejected.

Table 79: Paired Samples Test for Embu

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	V2 - V3	28.3100000	8.8508116	4.4254058	14.2263836	42.3936164	6.397	3	.008

A scatter plot comparing pretest and posttest scores was generated in order to determine whether the training benefited all participants equally. As shown in the scatter plot, the training benefitted all participants equally with both those who had lower or higher scores in the pretest improving in almost equal margins in the posttest.

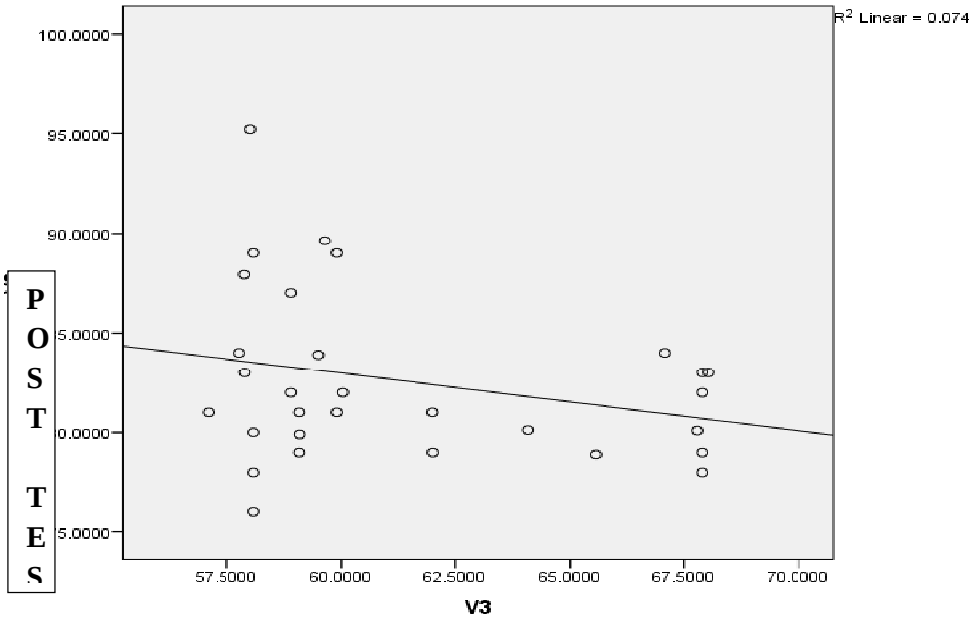


Figure 27: Scatter plot for Embu PRE TEST

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1Introduction

This chapter discusses the findings of the study in relation to the reviewed literature.

5.2 Discussion

This study found that, most participants were females. This is expected since the nursing and midwifery profession has for a long been dominated by females.

Almost all midwives indicated practising EmONC despite lacking confidence to do so. This finding is not unusual as EmONC competences among midwives are poor globally as stated by WHO (2015). Although the midwives practiced EmNOC skills, the results revealed that majority of them did not have confidence.

In this study, only 59% of the midwives had knowledge on EmONC in the baseline survey. A study done in Tanzania, by Otorin et al (2015) supports that training of midwives improved utilization of EmONC skills greatly. The study revealed that midwives had low competences before the training but after the training there was a lot of improvement in all the areas. The training intervention led to notable improvements in care. For example, 60% of women received active management of the third stage of labor (AMTSL) according to the current guidelines and standards in 2012—an increase of 19% from 2010. There was increased use of oxytocin at all health facilities, and the overall use of 99% oxytocin in the performance of AMTSL reflected excellent availability. In 2012, only four cases of postpartum hemorrhage (PPH) (0.8% of 500 births) were observed compared with 10 cases in 2010, which is a

testament to the impact of preventing PPH through AMTSL. All PPH cases were managed successfully.

The assessment of use of partograph in managing patients and clients revealed 47% in baseline survey and 87% respectively. This was supported by Opiah et al (2012) in cross-sectional study assessed knowledge and utilization of the partograph among midwives in two tertiary health facilities in the Niger Delta Region of Nigeria. A descriptive survey design was utilized, using a structured questionnaire administered to 165 midwives purposively selected from the Federal Medical Center (FMC) (79) and Niger Delta University Teaching Hospital (NDUTH) (86). Results revealed that 84% of midwives knew what the partograph was and 92.7% indicated that the use of the partograph reduces maternal and child mortality. About 50.6% midwives in FMC and 98.8% in NDUTH indicated that it was routinely utilized in their centers. Assessment of utilized partograph charts revealed that only 18_(37.5%) out of 48 in FMC and 17_(32.6%) out of 52 in NDUTH were properly filled. Factors in the utilization of the partograph were:-non-availability of the partograph (30.3%), shortage of staff (19.4%), little or no knowledge in the use of the partograph (22.2%), and 8.6 percent indicated it was time consuming. A significant relationship existed between knowledge of the partograph and its utilization ($\chi 2$= 32.298. Df = 1; P <0.05) and between midwives years of experience and its utilization ($\chi 2$=4.818, Df = 4; P <0.05). However, this study also showed that despite midwives good knowledge of the partograph, there was poor utilization in labor monitoring in both centers. Training of midwives on the use of the partograph with periodic workshops and seminars and a mandatory hospital policy are recommended and vital to the safety of women in labor

(WHO 2015). The study revealed that the midwives scored low in the use of partograph before the training and the score improved after the training improvement. Legale et al (2011) claimed that a gain in knowledge does not necessarily result in a change in behaviour by the clinician and this was challenged by Jill (2011) who urged that if that was so, then other questions arise: will an improvement in patient care occur? And, if it does, how can it be measured? More over literature has reviewed that there is little literature on the effectiveness of CPD in improving patient care (Jill 2011). However in his work, he stated that: effective CPD involves both *"learning"* and being *"fit to practise"*,knowing both the *"why"* and the *"how"* and putting learning into practice and that effectiveness is facilitated when professionals are able to determine their own learning needs through reflection within the totality of their practice. This means being able to go beyond what is quantifiable. The research revealed a positive effect on blended training intervention which includes both theory and practice. The results indicated improvement in all the aspects and revealed an average of over 80% scores which WHO (2015) recommends to be safe for midwifery practice.

It was evident that although majority of the midwives stated that the hospital used partograph in managing clients, they were not aware of the availability of the EmONC guidelines in the wards. WHO (2015) supported this by stating that midwives need to be confident in order to be safe to practice. However the study revealed that although majority of the midwives spent most of their time with patients and clients, majority stated that they were not very confident in performing their skills.

5.3 Conclusion

The study identified established the gaps that existed in the EmONC knowledge and skills among midwives in Embu and Meru hospitals. The respondents from both hospitals showed great understanding of the importance of EmONC knowledge and skills in improving maternal and neonatal health. They expressed great interest for sensitization, training and support in implementing their skills and knowledge.

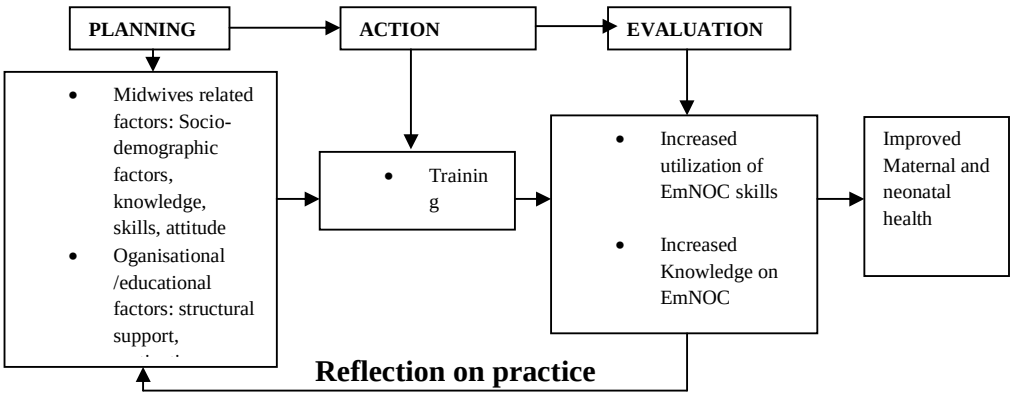
Findings of the study added to the existing body knowledge of EmONC by midwives and the impact of training and coach in competency building and retention. Health care organizations could facilitate strengthening of EmONC knowledge and skills gaining during formal training of Nurses and midwives by supporting CPD activities locally.

Collaboration with all key players in health is necessary in order to support CPD activities for midwives and nurses.

If maternal and neonatal health need to be improved, it is important that midwives in this country are motivated to be change agents and champions towards safe midwifery practice. This can be done by motivating them to attend CPD activities that are related to their practice.

5.4 Contribution from the study to the body of Knowledge in Midwifery & Nursing Education

Figure 29: Lucy Gitonga CPD Model



5.4 Recommendations

From the findings, it is recommended that:

i. CPD in EmNOC should be provided to all midwives at all levels of health care delivery in the country including incorporating such activities in the induction programmes for midwives.

ii. There is need to review the nursing curricula to be more focused on skills development and retention in the area of EmNOC.

iii. There is need to identify EmONC focal persons in all maternity units in the country to champion the agenda of midwifery forward.

iv. The findings lead to development of a framework to enhance provision of CPD and also development of evaluation guidelines for assessing development of competences in EmNOC. These guidelines should be used in the country with the aim of improving maternal and newborn health.

v. A further research to be done in all other level five hospitals in the country to allow generalization.

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APPENDIXES

APPENDIX 1: PUBLICATION ONE

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Essential Maternal and Newborn Care Skills Training for Midwives: Their Impact on Reducing Maternal and Neonatal Mortalities in Kenya

Lucy Gitonga[1], Anna Karani[2], Waithira Mirie[3]

[1]Chuka University, Chuka, Kenya
Email: gitonga30@yahoo.com
University of Nairobi, Nairobi, Kenya

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Abstract

Continuing professional development (CPD) continues to gain acceptance as a model for health care professionals to engage in lifelong learning. Little is known about how CPD participants put the experience and the new knowledge into practice and whether it has impact on patient care outcomes. The primary objective of this study was to evaluate the effectiveness of CPD of Midwives on Essential Maternal and Newborn care skills on maternal and neonatal mortality in Embu County, Kenya. The study was an interventional non-randomized pretest post test study design of midwives from the participants of the 2010 ministry of health training on essential maternal and newborn care skills. Sixty (60) midwives working in maternity unit of Embu level five hospitals were targeted. The study was carried out in two phases. Phase one involved environmental scanning of the factors that support good performance in the workplace using a questionnaire. Phase two involved evaluation of the impact by testing a hypotheses using data collected by use of questionnaires, evaluation checklist and chart audit. Data were analyzed using qualitative content analysis and presented using percentages and frequency tables. Chi-square test and correlation analysis were used to show the association between variables, which are midwives essential maternal and newborn care skills and maternal and neonatal mortality. A chi-square $\chi^2 = 14.143$, df = 9 and a coefficient = 0.357. This coefficient is less than p-value at Alpha 0.05 and therefore is not significant, proving that the essential maternal and neonatal care skills do not contribute to reduction in mortalities as such two variables are almost independent of each other, whether one exists does not necessitate the existence of another nor does it reduce maternal and neonatal mortalities in Kenya.

Keywords

Continuing Professional Development (CPD), Maternal and Newborn Care

1. Background to the Study

"Evaluation is as basic to professional development as it is to education". Unfortunately, as it is so often the case in nursing and midwifery, systematic evaluations of professional development programs are rarely undertaken. According to Bello [1], millions of dollars have been provided in the name of professional development, but the quality of these programs goes virtually unchallenged. Reviewed literature has indicated that the goal of health care delivery site is to provide high quality services to the community it serves. Although there are various factors that support good performance in the workplace, skills and knowledge are critical in improving quality of care. Literature also reveals that even the best training does not always result in improved performance unless follow up of implementation of the training is done. This is also according to [2].The effectiveness of the midwife has traditionally been associated with maintaining standards of care. Continuing professional development (CPD) is essential to ensure that this important group feels adequately pre-pared to perform their role, and has been recognized as an important factor in maintaining job satisfaction and reducing wasteful staff turnover. Courtis and Netten [3], in a study to review the effects of postgraduate training programs to improve the skills and knowledge of trained health care professionals who are involved in maternal and perinatal care stated that training of health care workers can play an important role in improving quality of care and reducing maternal and perinatal mortality and morbidity. Additionally, a review of the literature indicates that the area of nurses' and midwives' continuing professional development (CPD) is of growing interest in Kenya and internationally. However, while an increasing range of literature focuses on particular aspects of CPD, there is a limited literature on the evaluation of the impact of these trainings on improvement of maternal and child health. This was supported by Danielson and Hallin [4] who stated that training programs may improve quality of care but strong evidence is lacking and that policymakers need to include evaluation and re-porting of effects in project budgets for new training programs. Review of literature also reveals that although many countries are struggling to train, evidence shows that training does not merge with competence. While most CPD experiences might be considered as means of introducing or enhancing knowledge, skills and attitudes, it cannot be assumed that this is uncontested. Moreover many researchers have argued that it is not merely the type of professional knowledge being acquired that is important, but the context through which it is acquired and subsequently used that actually helps us to understand the nature of that knowledge [5].Analyzing the means through which CPD for nurses and midwives is organized and structured may help us to understand not only the motivation behind such structures, but also the nature of professional knowledge and professionalism itself.

1.1. Statement of the Problem

Provision of maternal and newborn care in health facilities in Kenya is based on the National Reproductive Health Standards. The Reproductive Health standards are comprehensive and integrated. The following components specifically target maternal

and newborn care: focused antenatal care, normal labor and delivery, management of complications during labor and delivery and postnatal care of mother and neonate. Despite recent developments health care in Kenya remains suboptimal. In a country with a population a population of approximately 38 million (Kenya Demographic Health Survey) [6] [7], there are currently an estimated 54 nurses/ 100,000 population which is far below the World Health recommendation. Maternal mortalities in Kenya have remained increasing high since 1998 to 488 maternal deaths per 100,000 live births in the year 2008/2009 (with some regions reporting maternal mortalities of over 1000/100,000 live births). Neonatal mortality rate has recorded a marginal reduction from 33% in 2003 to 31% in 2008/2009 compared to other indicators of child survival. A study done on evaluation of a programme in three districts in South Kalimantan, Indonesia, which consisted of the training, deployment and supervision of a large number of professional midwives in villages, an information, education and communication (IEC) strategy to increase use of village midwives for birth, and a district-based maternal and perinatal audit (MPA) [8] revealed that before the programme, the midwives had limited ability to manage obstetric complications, and 90% of births took place at home. Only 37% were attended by a skilled attendant.

Through in-service training, continuous supervision and participation in the audit system midwives also gained confidence and skills in the management of obstetric complications. Despite this, the proportion admitted to hospital for a caesarean section declined from 1.7% to 1.4% and the proportion admitted to hospital with a complication requiring a life-saving intervention declined from 1.1% to 0.7%. Embu County is one of the counties where a lot of continuing professional development on essential newborn care and maternal care has been done for midwives. However there is no research indicating whether this training has negatively or positively impacted on these deaths.

1.2. The Purpose of the Study

The broad objective of the study was to evaluate the impact of CPD activities for nurses and midwives in reducing maternal and neonatal mortality in Embu County, Kenya.

1.3. Objectives of the Study

The specific objective of this study was to:

Evaluate the impact of midwives' essential maternal and newborn care skills performance and patients/service outcomes.

1.4 Study Questions

How does midwives' participation in CPD contribute to improvements in patient or service outcomes?

1) How does midwives' participation in CPD affect their practice and performance?

1.4.1. Study Hypothesis

$H0_1$: There is no significant relationship between the midwives' maternal and new born care skills acquired during CPD and change in percentage of maternal and neonatal mortality in Embu County.

1.4.2. Significance of the Study

The findings of the study are expected to inform the government and the community on the scope of implementation of the trainings done for midwives and the impact the implementation has on maternal and neonatal mortality in Kenya. Consequently, this will have financial implication in that money will be directed in the right places because there is clear indication of the expected results as evidence has been obtained.

1.5. Definition of Terms

The following terms are defined in the study as:

Essential maternal and newborn care skills—Skills required in provision of prenatal, natal and postnatal care of both mother and baby.

Midwife—a person qualified to practice midwifery, having received specialized training in obstetrics and child care.

Evaluation—is a systematic determination of a subject's merit, worth and significance, using criteria governed by a set of standards.

Impact—Measure of the tangible and intangible effects (consequences) of one things or entity's action or influence upon another.

Maternal mortality—the number of registered maternal deaths due to birth- or pregnancy-related complications.

Neonatal mortality—Death of a live born infant within the first 28 days of life death.

2. Literature Review

Although participation in CPD is currently compulsory in Kenya defining the sanctions or implications for non participation remains to be defined and even if it is there it is in paper and not implemented. The healthcare landscape is diverse and complex. In Kenya there is currently no commonly accepted approach to lifelong learning, however, there is broad agreement that patients are best served when those who care for them maintain competence by engaging in continuous learning and assessment strategies [9]. Optimally, these strategies would be 'highly self-directed, with content, learning methods, and learning resources selected specifically for the purpose of improving the knowledge, skills, and attitudes that nurses and midwives require in their daily professional lives that lead to improved patient outcomes.

According to Hallin and Danielsone [10] CPD can be defined as A continuing process, outside formal under-graduate and postgraduate training, that enables individual health workers to maintain and improve standards of medical practice through the development of knowledge, skills, attitudes and behaviour, CPD should also sup-port specific changes in practice Arising from the literature review, it is considered that the definition of CPD could be divided into two parts: gaining knowledge and improving patient care.

Additionally, the procedures for recording CPD were perceived as needing to address both of these aspects. However, a body of literature claimed that a gain in knowledge does not necessarily result in a change in behaviour by the clinician Jill *et al.* [11]. If that is so, then other questions arise: will an improvement in patient care occur? And, if it does, how can it be measured? [11]. More over literature has reviewed that there is little literature on the effectiveness of CPD in improving patient care [11]. However in his work, he stated that: effective CPD involves both "*learning*" and being "*fit to practise*", knowing both the "*why*" and the "*how*" and putting learning

into practice and that effectiveness is facilitated when professionals are able to determine their own learning needs through reflection within the totality of their practice. This means being able to go beyond what is quantifiable.

A responsive health system is one offering appropriate antenatal care; comprehensive emergency obstetrics care and quality delivery services. Maternal and neonatal morbidity and mortality levels continue to be recognized internationally as public health priorities. Moreover these indicators in Africa have continued to rise in-stead of declining since the launch of Safe Motherhood Initiative 15 years ago. Of all maternal deaths occurring globally, 99% of them occur in developing countries with Sub-Saharan Africa having the highest maternal mortality ratio of 900 maternal deaths per 100,000 live births and also the highest life time risk of maternal death of 1:26 [12]. The idea that health professionals should be accountable to the society they serve is not a new concept and for a long time [13], the continuing professional development (CPD) of health professionals has been seen as one way in which population's level of health could be improved.

The public was, and is still today, increasingly demanding a system that is more responsive to regional and community needs. As a result, there is a need for more health professional education at all stages of the education continuum—undergraduate, postgraduate, and continuing professional development—that meets the health and social needs of the populations being served. The trend is now towards "socially accountable" health care, meaning that the broader context of CPD must also include the personal, social, and political aspects of health care and as such, involve a widening of accountability to patients, the community, managers and policymakers [14]. CPD planning must take into account local and national priorities as well as personal learning needs. There is plethora of activity both globally and locally geared towards addressing maternal and neonatal morbidity and mortality. This has placed the role of midwives in sharp focus as governments think of ways of ameliorating this problem. Since the number of midwives in sub-Saharan Africa and Kenya in particular, are limited, innovative ways of improving their knowledge and skills in highly effective targeted obstetric and newborn interventions without removing them from the workplace are desirable [15]. Midwives offer evidence - based, cost-effective high impact care [16]. Moreover as competent care providers, midwives detect problems early in complicated births, take appropriate life-saving actions immediately and refer where appropriate. Additionally, their critical thinking and decision making skills contribute to the saving of lives by making timely decisions and action taking.

In this regard therefore, there is need to strengthen their skills through continuing professional development (CPD). Anecdotal evidence suggest that increasing demands on service delivery have reduced time available for CPD activities in many countries coupled with less support from service providers in relation to staff needs [5]. Researches on CPD have been done in other countries but no documented evidence in Kenya to critically analyze the perspectives of CPD practice for Nurses and midwives and their impact in achievement of MDG 4 and 5. Moreover the fast generation of overwhelming information of health and complexity in technologies in the 21st century poses the greatest challenge to health care workers ability to provide effective and efficient high quality and up to date health care services.

The knowledge and skills acquired at the end of the under graduate and post graduate training in medical schools is not sufficient to sustain competence and performance over their job particularly in nursing and midwifery, health care providers are expected to remain current in their practice (evidence informed practice) through participating in CPD programmes. Individual learning activities increased public awareness and scrutiny of the quality of services offered further compounds these challenges. Additionally, these challenges have fostered a growing emphasis on the need of accountability within the health professions.

CPD providers will need to focus/respond to the changing economic and political environment and seek sufficient and effective approaches to maintaining and improving the skills of an agency health care work force that are currently faced with rapid technological advances and organizational restructuring. Moreover, despite the lack of empirical data supporting the links between taught courses and clinical effectiveness, there is an increasing emphasis on continuing professional education (CPE) and development (CPD). As post registration courses proliferate, the stakeholders, clinicians, managers, accountants, educators and patients need the results of relevant, reliable and valid evaluations to inform purchasing decisions and curriculum planning. However, very little empirical evidence on the clinical effectiveness of education programmes exists, and most of this takes the form of reported interview or survey data, rather than direct observations. The relationship between professional performance and educations remains unclear.

Showing the impact of learning is important as it allows the customer to know exactly how the learning process will bring positive results to the business. However, while the business units value the business linkage (impact or outcome) and evaluation (measurement) the most, learning departments often spend the least amount of time and resources on these two activities.

In Kenya, it is assumed that continuing professional development (CPD), which encompasses continuing medical education (CME) [17], plays an important role in maintaining and improving the quality and efficiency of the healthcare system [18] by translating evidence into clinical practice. In other words, CPD serves as an important knowledge-translation strategy and is one potential approach that could be incorporated into the Knowledge to Action Process (KTA) framework [17]. The KTA framework, which explains how knowledge is produced and implemented in healthcare, contains two parts: the knowledge creation cycle and the action cycle [17]. While the first cycle comprises the process of creating knowledge, the second one constitutes the process of applying the knowledge thus created. By translating knowledge and evidence into practice, CPD pertains to the action cycle [17]. Designed to improve performance in healthcare practices and, ultimately, health outcomes, CPD strategies follow the dynamic and iterative process for knowledge translation.

As in other educational disciplines, most evaluation frameworks used in CPD are derived from Kirkpatrick's model [17]. This model assesses training effectiveness by measuring participants' reactions to an educational activity (level 1); changes in participants' knowledge, skills, or attitudes (level 2); transfer of learning to practice/observed changes in behaviour (level 3); and finally, the results of the newly acquired behaviour on organizational outcomes such as productivity and quality (level

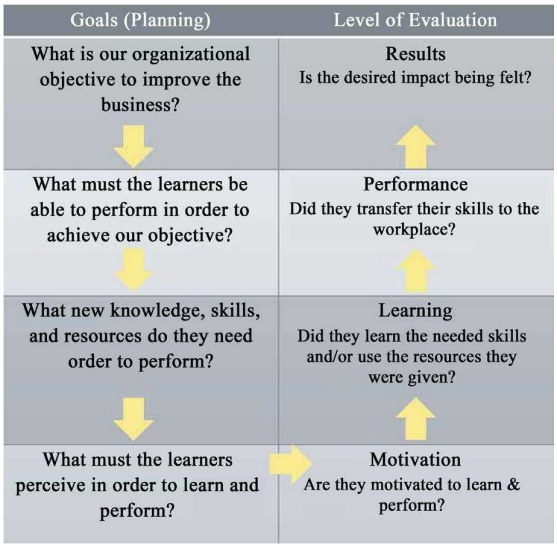
4). According to this model, the effects of current approaches to the assessment of the impact of accredited CPD activities should ideally be evaluated focusing on participants' participation, satisfaction, and changes in knowledge, behaviour, and patient outcomes [16]. In practice, however, most CPD providers only assess levels 1 and 2 outcomes using pre- and post-activity self-administered questionnaires. Although the impacts of levels 3 and 4 have been measured in the context of research projects using health services methods [17]. CPD providers are still struggling to find reliable ways to measure these impacts on a routine basis.

Munro [19] proposed an integrated conceptual model to predict behaviour change in healthcare professionals that offers a clear basis for developing a valid and reliable measurement instrument to assess CPD impacts on clinical practice (Kirkpatrick's level 3 outcomes).

Since individual decisions are often central to the adoption of clinically related behaviours, theories providing information about cognitive mechanisms underlying behaviours help provide direction to behaviour-change interventions targeting healthcare professionals. According to Training and Development Agency for schools (TDA), to evaluate the impact of professional development it is crucial to consider what was intended to be achieved, and what impact could reasonably be expected, in any given time frame. This agency stated that for CPD program to be effective certain principles have to be followed: Planning for CPD and the evaluation of its impact should be integral to performance management, Impact evaluation should focus on what participants learn, how they use what they have learned, and the effect on the learning of children and young people, There should be an agreed timeline for evaluating outcomes, accepting that some outcomes, such as children and young people's improved performance, may take longer to become evident than others. Unanticipated outcomes will also be considered by the review, planning and implementation of the impact evaluation should be a collaborative process between the individual and key staff involved in performance management and/or coaching and mentoring, the evidence base and the success criteria for the evaluation of impact should be agreed, Impact evaluation should be considered in the short, medium and long term. Longer-term professional development activities should involve formative reviews of impact at agreed stages, the evaluation of impact should include a cost-benefit analysis of the professional development and that the processes for evaluating the impact of CPD activities need to be reviewed regularly to ensure that they are effective and proportionate.

Theoretical Framework

The study is based on Kirkpatrick's Training Evaluation Model.



3. Methodology

3.1. Research Design

This was an interventional non-randomized pretest post test study design utilizing questionnaire and charts audit.

3.2. Study Population

Participants were all midwives working in the maternity unit who had attended CPD in the past six months. A total of sixty (60) midwives working in Embu Provincial General Hospital had attended CPD activities in the last six months.

3.3. Selection Criteria

This was an all-inclusive study whereby all the midwives working in the unit were included in both phases of the study. It was assumed that any nurse deployed to work in a maternity unit had midwifery skills. Additionally, only the nurses on duty during the study period were interviewed. A total of fifty-three (53) nurses were on duty that time.

3.4. Sampling Procedures and Sample Size

According to Nigel *et al.* [20] Sampling is the process of selecting few cases in order to provide information that can be used to make judgment about a much larger number of cases. The sampling of the hospital was random sampling from the eleven level five hospitals in the country. These midwives were considered appropriate to provide accurate and quality information so as to achieve the objectives of the study. Since the population was small, the researcher endeavored to include the entire population of the study. According to Quinn and Hughes [21] and Telford and Wrenkin [22] a simple census collects information from every unit in a population.

As a result, data is truly representative of the whole population and detailed accurate data can be made available right down to small areas.

3.5. Research Instruments

Environmental scanning was done using a questionnaire while evaluation was done using Questionnaire and Chart Audit. Questionnaires are described by Muluus *et al.* [23] as "the most popular means of gathering information on participants' reactions". Questionnaires represent the easiest way to assess change in knowledge as well and may also be used to assess perceived self-performance changes. The questionnaire had three parts whereby part A consisted of demographic data, part B consisted questions on environmental scanning whereas part C consisted questions on impact of CPD in reducing maternal and neonatal mortality. Laura and Dathan [14] defines Chart audit as any method of evaluation that uses data taken from practitioner records, whether stored electronically or by pulling data from physical records of clients seen by the participants of continuing professional development activities. Chart audits represent an alternative occasionally used to assess practitioner performance and consumer results when those results are quantitative in nature. In this study data extraction sheet was developed to capture two sets of data. That is before the training and after the training for comparison purposes. Criteria were also adopted from WHO recommendations on improving maternal and newborn health. The data obtained by this was also through chart audit.

3.6. Data Collection Procedures

The research followed all the procedures put in place by the University of Nairobi before going out into the field to collect data. Once permission was granted, the researchers then visited Embu level five hospital and sought written permission to collect data. The researcher collected data from all the research subjects. The participants were asked to complete a consent form before participating in the study. Questionnaires were self administered while chart audits were done by the researcher and two research assistants who had been trained.

4. Results and Discussion

4.1. Demographic Characteristics

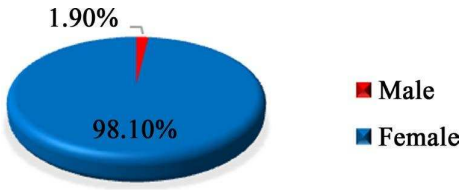
This section presents data on demographic characteristics of the respondents which included gender, age and education qualifications. Such information is considered important in providing a better understanding of the respondents thus providing a foundation for a detailed discussion of the results based on the objectives of the study.

4.2. Gender of Respondents

Fifty-three (53) respondents participated in the study. The researcher sought information on the gender of respondents. **Figure 1** presents data on the gender of the respondents.

Information on **Figure 1** shows that majority (98.10%) of respondents were female whereas 1.90% were males. The gender of the respondents is important to bring out the aspect that the results on evaluation of impact of midwives' essential maternal and

newborn care skills in reducing maternal and neonatal mortality were gender sensitive considering the current political and gender issues that are associated with the gender issues in our country Kenya. The gender disparity among the midwives is presented in **Figure 1**.



Source: field data

Figure 1. Distribution of respondents by gender.

4.3. Academic Qualification of the Respondents

According to information shown on **Table 1**, majority of the respondents (64.2%) had KRCHN while 26.4% had KECHN qualification. Respondents with KEM and KRM qualification accounted for 3.8% and 5.7% respectively.

4.4. Age Distribution of the Respondents

The study also sought to establish the distribution of the respondents by age. **Table 2** displays the age distribution of the respondents.

Information displayed on **Table 2** reveals that majority (24.5%) of the respondents were in the 30 - 34 years age bracket. Those in the 50 - 54 year age group accounted for 20.8%, while 17.0% were in the 40 - 44 age groups. Only 1.9% was in the 25 - 29 year age group. Those in the 40 - 44 year age bracket accounted for 17.0% while 9.4% were in the 45 - 49 years age bracket.

4.5. Midwives Perception on the Contribution of CPD

The study also sought to establish ways in which CPD contributed to either personal or patients' outcome. Data obtained is presented in table above.

Information presented on **Table 3** shows that most (84.9%) of the respondents perceived CPD to contribute to knowledge acquisition another 75.5% of the respondents agreed CPD was successfully changing the mid wives attitude towards management of mothers in labour. Another 83.0% of the respondents were of the view that CPD contributed improved practical skills with 75.5% holding the opinion that CPD led to learner satisfac-tion.CPD also contributed to patients' outcome as indicated by 77.3% of the respondents. Other ways, in which CPD was successful included impact on immediate colleagues, improved practical skills, Knowledge acquisition, learner satisfaction and patient outcome.

Table 4 above consists of data obtained from a research on CPD programs with most impact on learning and practice. The sample has 53 individuals and the following are the themes that emerged: medical conference (11.3%), E-learning (13.2%), Helping baby breathe (9.4%), IMCI (18.9%), Life skills in EMnOC (26.4%), Post partum

family planning (13.2%), Nursing process (3.8%) and Supervisory skills (3.8%) respectively. Overall

Table 1. Academic qualification of the respondents.

	Frequency	Percent
KRC HN	34	64.2
KEC HN	14	26.4
KEM	2	3.8
KRM	3	5.7
Total	**53**	**100.**

Source: field data.

Table 2. Age distribution of the respondents.

Age Group	Frequency	Percentage
25 - 29	1	1.9
30 - 34	13	24.5
35 - 39	7	13.2
40 - 44	9	17.0
45 - 49	5	9.4
50 - 54	11	20.8
55 - 59	7	13.2
Total	53	100.0

Source: field data.

Table 3. Perceptions on the contributions of CPD.

	SA	A	N	D	SD
Change in attitude	30.2	45.3	22.6	1.9	0
Change in departmental/unit practice	20.8	18.9	52.8	1.9	5.7
Change in diagnosis practice	37.7	11.3	30.2	13.2	7.5
Change in treatment practice	24.5	34.0	37.7	3.8	0.0
Impact on immediate colleagues	18.9	41.5	39.6	0	0.0
Improved practical skills	56.6	26.4	17.0	0.0	0.0
Knowledge acquisition	60.4	24.5	15.1	0.0	.0.
Learner satisfaction	45.3	30.2	24.5	0.0	0.0
Patient outcome	41.5	35.8	22.7	0.0	0.0
Patients (and family) satisfaction	22.6	43.4	34.0	0.0	0.0

Others	13.2	3.8	83.0	0.0	o.o

Table 4. CPD programs with most impact on learning and practices.

	F	%
Medical conference	6	11.3
E-learning	7	13.2
help the baby breathing	5	9.4
IMCI	10	18.9
Life saving skills in essential maternal and neonatal care (EMnOC)	14	26.4
Post partum family planning	7	13.2
Nursing process	2	3.8
Supervisory skills	2	3.8
Total	53	100.0

67.95% of the respondents stated skills training on EMnOC as having the greatest impact in reducing maternal and neonatal mortality.

Table 5 above shows the criteria followed by the sample after delivery. The whole sample population indicated that they did not treat the patient with magnesium sulphate according to protocol this shows that the right procedures are not followed despite any awareness about these procedures. 70% indicated that Urine albumin was done and recorded and 30% did not. 90% of the midwives indicated that Patients were given oxytocin and 10% responded that the patients were not given.100% of the respondents indicated that Puncture proof disposal containers are accessible everywhere, needles are used. 70% of the respondents indicated that Breastfeeding is initiated within one hour of birth and before their transfer out of the delivery room while 30% indicated that this was not done. A larger population of respondents at 80% indicated that Vitamin K1 administered to the baby immediately after delivery while a smaller percentage of 20% indicated that this was not done.100% of the respondents indicated that the woman monitored at least every 15 minutes for the first two hours and record blood pressure, pulse, uterine contraction and vagina bleeding. 80% of the respondents indicated that Baby monitored along with the mother every 15 minutes in the first 2 hours for the following: respiration, color, temperature and the cord for bleeding while 20% indicated that this was not done. 60% said that the Mother monitored with a partograph while 40% said that the baby was not monitored by a partograph. Overall, majority of the respondents stated that they followed the standard operating procedures set according to WHO recommendations for reducing maternal and neonatal care.

The data was used to calculate the chi-square and test the hypothesis postulated. Pearson chi-square was used and it was aided by SPSS. A chi-square $\chi^2 = 14.143$ df = 9 and a coefficient of 0.357. This Coefficient is less than p-value at Alpha 0.05 and therefore is not significant. Subsequently, the null hypothesis was rejected. There is

little relation between the percentage maternal and neonatal mortality experienced between the period the midwives acquired these skills through CPD and the period in which they had not acquired these skills. Bringing the researcher to the conclusion that there is no reduction in average mortalities even after the midwives had acquired these skills through CPD (**Table 6**).

Chi-square results of HO_2 (there is no significant relationship between the maternal and new born care midwives' skills acquired during CPD and change in percentage maternal and neonatal mortality in Embu County).

The study results above tested whether there was any significant relationship between the maternal and new born care midwives' skills acquired during CPD and change in percentage maternal and neonatal mortality in Embu County. From the above findings there was no significant relation between the maternal and new born care midwives' skills acquired during CPD and change in percentage maternal and neonatal mortality in Embu County. It was hypothesized that the maternal and neonatal mortalities do not reduce regardless of the essential maternal and neonatal skills that the midwives acquire in continuous professional development.

The level of correlation that exists between the mortalities in the period the midwives acquired essential maternal and newborn care skills and the mortalities in the period before they acquired.

In this study there was the objective to find out the level of correlation that exists between the mortalities in the period the midwives acquired essential maternal and newborn care skills and the mortalities in the period before they acquired. This was tested by the use of correlation analysis in SPSS and the results were presented in **Table 7**.

From the **Table 7** the correlation coefficient got is 0.027, this shows that there exists a very low level of correlation between the mortalities between the two periods mortalities. This is so because 0.027 is closer to zero than to one indicating that there is almost no correlation at all between the two, proving that the essential mater-nal and neonatal care skills do not contribute to reduction in mortalities as such two variables are almost

Table 5: Criteria followed by the sample after delivery.

Criteria	Yes%	No %
Patient treated with magnesium sulphate	0.0	100
according to protocol Urine albumin was done and recorded	70	30
Patient was given oxytocin	90	10
Puncture proof disposal containers are accessible everywhere, needles are used.	100	0
transfer out of the delivery room Vitamin K1 administered to the baby immediately after delivery	70	30
The woman monitored at least every 15 minutes for the first two hours and record blood pressure, pulse, uterine contraction and vagina bleeding	20	80
Baby monitored along with the mother every 15 minutes in the first 2 hours for the following: respiration, colour, temperature and the cord for bleeding	100	0
Mother monitored with a partograph	80	20

Table 6. Relation between the essential maternal and newborn care skills acquired by midwives when they attend CPD and the average maternal and neonatal mortality in Embu level 5 hospital.

When you attend CPD training? Do you acquire the following skills?	Percentage mortalities before and after training	
	Percentage mortalities before training	Percentage mortalities after training
Essential newborn care skills	0	1
Use of magnesium sulphate	2	3
Use of parental antibiotics	0	1
Caesarian section	3	3
Blood transfusion	1	2
Targeted post natal care	0	2
Use of paretograph to monitor labour.	1	3
Total	13	15

Chi-square = 0.898, df = 9, p value = 0.027. Source: field data.

Table 7. Correlation between mortalities before and after CPD training

		Before receiving CPD training on essential maternal and newborn care skills	After receiving CPD training on essential maternal and newborn care skills
Before receiving CPD training on essential maternal and newborn care skills	Pearson Correlation	1	0.027
	Sig. (2-tailed)	.	0.898
	N	26	26
After receiving CPD training on essential maternal and newborn care skills	Pearson Correlation	0.027	1
	Sig. (2-tailed)	0.898	.
	N	26	26

Source: field data.

independent of each other, whether one exists does not necessitate the existence of another nor does it reduce maternal and neonatal mortalities in Kenya.

5. Summary, Conclusions and Recommendations

Though midwives have undergone CPD and practicing the WHO laid down criteria for reducing maternal and neonatal mortality, the results show that there

is no significant change before and after the training. The re-searcher therefore recommends that a further research be done to explore other factors that could be hindering observable change after midwives acquire these skills.

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APPENDIX 2: PUBLICATION TWO

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Assessment, Training and Evaluation of Emergency Obstetric and Neonatal Care Competences for Midwives in Tharaka-Nithi and Embu Counties, Kenya

Lucy Kawira Gitonga, Anna Karani, Waithira Mirie

Department of Nursing, Faculty of Health Sciences, Chuka University, Nairobi, Kenya
University of Nairobi, Nairobi, Kenya

Email address:
gitonga30@yahoo.com
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Abstract: Midwifery education in many countries currently follows a didactic curricular model where students learn through classroom lecture with little opportunity for skills practice, simulation and role play needed to develop critical thinking, values and the clinical decision making abilities needed for effective practice. Many midwifery students graduate having attended a limited number of women in labour and some with minimal clinical experience in antepartum, family planning or newborn care. In addition, the assessment of student progress and readiness for practice may not be linked to the intended outcomes of learning and targeted clinical competencies. The aim of the study was to assess, train and evaluate training in "Emergency Obstetric and Newborn Care" for midwives in order to improve the availability of emergency obstetric and Newborn care (EmONC) in Embu and Meru hospitals, Kenya. A three phase explorative study was used involving assessment, training and evaluation of 113 midwives from the maternity units of two hospitals I Kenya. Data was collected by use of a questionnaire, case study and checklist. Data was analysed using SPSS 2.0. Correlational analysis was also used. The results indicated that respondents on assessment of antenatal skills scored an average of 95.2% while on normal labor, childbirth and immediate newborn care skills they scored an average of 89.63% on postpartum care (mother and baby) an average of 87.92%, on management of complications they scored a mean of 88.22%. Based on the findings, CPD in EmONC should be provided to all midwives at all levels of health care delivery in the country including incorporating such activities in the induction programmes for midwives.

Keywords: Evaluation, Essential Obstetrics Care, Nursing Education, Midwifery Education, CPD

1. Introduction

Midwifery education in many countries currently follows a didactic curricular model where students learn through classroom lecture with little opportunity for skills practice, simulation and role play needed to develop critical thinking, values and the clinical decision making abilities needed for effective practice [1, 2]. Many midwifery students graduate having attended a limited number of women in labour [2] and some with minimal clinical experience in antepartum, family planning or newborn care. In addition, the assessment of student progress and readiness for practice may not be linked to the intended outcomes of learning and targeted clinical competencies [3, 4].

Many articles published in the decade since promulgation of the Millennium Development Goals (Sustainable Development Goals) have acknowledged the distinct advantages to maternal and newborn health outcomes that can be achieved as a result of expanding access to skilled birth attendant (including midwifery) service ((United Nations Population Fund [5, 6]. However, these advantages are often predicated on the assumption that the midwifery workforce shares a common definition and identity. Regrettably, a clear delineation of midwifery competencies is rarely addressed [7]. A core set of midwifery competencies is essential to providing the high quality services that lead to the desirable health outcomes described in that body of research [8]. Attribution of improved outcomes to access to midwifery cannot be made without a common understanding of a defined set of services provided to standard by the midwifery workforce across the inter-conceptional and childbearing time frame [9]. The International Confederation of Midwives (ICM) has developed a clear list of competencies that delineate the domains of practice for the fully qualified, professional midwife. These domains frame the educational outcomes that must be conveyed within competency-based education programmes [10, 11]. Access to a qualified competent midwife during pregnancy and the day of birth would prevent many of the 350,000 maternal deaths each year from pregnancy related complications and the high burden of newborn morbidity and mortality (World Health Organization [12, 13]. Regrettably, there are profound shortages of fully qualified midwives (WHO 2010b) where they are needed most. In Ethiopia, for example the government projects a need for almost 10,000 midwives to care for its population of 91 million [13]. As of 2012, Ethiopia had fewer than 3000 midwives; and many of these individuals are not fully qualified according to the ICM definition [14, 15]. A body of research details the distinct advantages to maternal and newborn health outcomes that can be achieved as a result of expanding access to skilled birth attendant (including midwifery) services [16]. However, these advantages are often predicated on the assumption that the midwifery workforce shares a common definition and identity. Regrettably, a clear delineation of midwifery competencies is rarely addressed [16, 17].

Each year, more than 536,000 women worldwide die from complications of pregnancy and childbirth – that is one woman die every minute [17]. The complications include Antepartum haemorrhage, postpartum haemorrhage, obstructed labour as well as sepsis [18] and many more survive but will suffer ill health and disability as a result of these complications [18]. In addition, an estimated 4 million neonatal deaths occur each year accounting for almost 40% of all under 5 deaths [18]. Moreover, more than ¾ of all these deaths occur in Asia and sub-Saharan Africa [19]. Additionally, the health of the neonate is closely related to that of the mother and majority of deaths in the first month of life could also be prevented if interventions were in place to ensure good maternal health (Bluestone et al 2013). Over 80% of all maternal deaths result from five well understood and readily treatable complications: (1) haemorrhage, (2) sepsis, (3) eclampsia, (4) complications of abortion and (5) obstructed labour. It is well known how to prevent these deaths – there are existing effective medical and surgical interventions that are relatively inexpensive [20]. To reduce maternal mortality it is important that all women have access to maternal health care services, particularly skilled attendance at birth and timely access to Essential (or Emergency) Obstetric Care (EOC) when an obstetric complication occurs (WHO 2010). Two levels of EOC can be distinguished, that is Basic Essential Obstetric Care (BEOC) and Comprehensive Essential Obstetric Care (CEOC) (Ouma et al 2010). BEOC has 7 signal functions: Parenteral Antibiotics, Parenteral oxytocics, parenteral anti-convulsants, manual removal of a retained placenta, Removal of retained products of conception by Manual Vacuum Aspiration, Assisted vaginal delivery (vacuum extraction) and Resuscitation of the newborn (using bag and mask). CEOC– 9 signal functions: All 7 BEOC functions (above), Caesarean Section and Blood Transfusion).

Approximately 15% of expected births worldwide will result in life-threatening complications during pregnancy, delivery, or the postpartum period [21]. Providers skilled in Emergency Obstetric and Newborn Care (EmONC) services are essential, particularly in countries with a high burden of maternal and newborn mortality [21]. [22] has implemented three global programs to enhance provider capacity to provide comprehensive EmONC services to women and newborns in resource-poor settings. Providers have been educated to deliver high-impact maternal and newborn health interventions, such as prevention and treatment of postpartum hemorrhage and pre-eclampsia/eclampsia and management of birth asphyxia, within the broader context of quality health services [22] and this has been seen to reduce maternal and neonatal mortality.

Literature identifies gaps in knowledge and practice of EmONC skills to improve maternal and neonatal care [22, 23]. The status in Kenya has not been established. [22, 23] examined various articles in order to assess the effectiveness of training programs aimed at improving emergency obstetric care in low resource environments and the review revealed limitations which hamper their usefulness in evaluating the effects of postgraduate educational interventions to improve obstetric care in low resource environments. [23] stated that failure of most studies to underpin the results with adequate evidence precludes valid pronouncements on the effectiveness of the courses described. Furthermore, although the introduction of the Reproductive Health Library and the Perinatal Education Program led to an improvement in knowledge and skills, no positive effects on behaviour were reported and patient outcomes were not evaluated [24]. It is the responsibility of organizations that initiate and fund training programs to make evaluation an integral part of programs and ensure that the results, assessed by a proper peer-reviewed process, are made available to those who stand to benefit the most from a successful program [25]. Large parts of the world are behind schedule in reaching the fourth and fifth Millennium Development Goals (addressed in sustainable Development Goal 3). Improving knowledge and skills through training can contribute to the attainment of these Goals. In order to do so successfully, sound research is needed to provide reliable evidence to support the implementation of effective training programs.

[26] stated that while remarkable progress has been made toward the reduction of maternal and child mortality in many low-resource countries, critical challenges remain in provision of high-quality EmONC services, particularly in Sub-Saharan Africa and Southeast Asia [27]. The global community must focus on reaching the poorest and most vulnerable populations to address persistent inequities. These inequities include, among other things, a shortage of skilled birth attendants (SBAs) in the most vulnerable communities that is driven by lack of targeted workforce planning strategies, for example matching deployment with the competencies of providers and addressing well-known factors that discourage workforce retention [28]

2. Methods

The study adopted assessment (phase one), intervention (phase two) and evaluation (phase three) exploratory design. The study participants were midwives from the maternity units of Embu and Meru level five hospitals in Meru and Embu counties respectively. The study was three phased. Phase one (June to November 2013) involved a needs assessment survey of the perspectives of CPD among midwives working in the above mentioned hospitals. A total of 113 midwives were involved in the study (54 from embu hospital and 59 from Meru). During this phase, data was collected using a questionnaire (knowledge, confidence and experience questionnaire), interview checklist and case studies. The main objective of this phase was to identify skills and knowledge gap in the area of maternal and neonatal health among midwives in Meru and Embu hospitals respectively. Method triangulation helped in yielding more valid data than if a single method was used. Quantitative data was analyzed using SPSS version 20.0 and qualitative data was analyzed using the themes that emerged. Pearson's chi square was used to describe the associations between participant's demographic characteristics and participation in CPD activities. The findings of phase one formed the basis for phase two.

Phase two (December 2013- September 2014) involved training of all the midwives in Phase one based on the results of the analysis of the data obtained in phase one. The training programme followed a modular format and competency-based approach. The training content was prepared based on the findings of phase one in reference to *the WHO materials in the Integrated Management of Pregnancy and Childbirth (IMPAC) series.* In addition it used relevant local guidelines and protocols developed by the Division of Reproductive Health, Kenya and ministry of health, Kenya. There were five modules in

the package and each module described the learning objectives, learning outcomes, course content, teaching methods, and evaluation methods. The evaluation guidelines contained the data collection tools, data analysis templates and guidelines on how to use each tool. Module one was introduction to maternal and newborn health, module two on rapid initial assessment and emergency management; module three on care during pregnancy; module four on care during labor and child birth and module five on post partum maternal and newborn care.

This training was completed over three weeks period with 8 days classroom theoretical sessions & practice on anatomical model and 10 days of clinical practice in the two health facilities. The trained midwives were followed and monitored in the study areas for three months as they cared for mothers and neonates.

Phase three (November 2014- December 2014) data collection from the trained midwives' evaluation of the impact of the knowledge and skills acquired during the training using the model developed in phase one. Data was analyzed and results compared with those obtained in phase one. Paired t-tests of mean differences between participant's scores and performance of CPD activities before and after intervention were computed. Mean differences in performance of CPD activities between the two hospitals and the nursing qualifications were analyzed using ANOVA.

3. Results

Overall results showed marked improvements in midwives' knowledge/skills in all areas of antenatal care, normal labor, childbirth, immediate newborn care skills, postpartum care and management of complications. Generally their skills in maternal and newborn care skills improved after training. The results showed that knowledge improved after the training from a pretest mean of 55.92 to a posttest mean of 86.003. This indicates 30% after training improvement. The results were further subjected to paired samples test. The improvement in knowledge was statistically significant with a T= 15.684 (P=0.001). Therefore, the hypothesis that,' there is no relationship between an educational intervention on nursing essential maternal and neonatal skills and knowledge in these skills was rejected.

4. Conclusion

The results in phase one identified gaps in knowledge/ skills, experience and practice of EmONC in improving maternal and neonatal health in Kenya. The training in phase two which was a CPD activity was associated with increased level of practice of EmONC skills. The results indicated that respondents on assessment of antenatal skills scored an average of 95.2% while on normal labor, childbirth and immediate newborn care skills they scored an average of 89.63% on postpartum care (mother and baby) an average of 87.92%, on management of complications they scored a mean of 88.22%. This indicated that midwives showed an improvement after training and this implied that they were well prepared to solve various midwifery related conditions and complications.

It is therefore confirmed that CPD activities are essential in engaging midwives in practising EmONC skills according to laid down guidelines with the aim of reducing maternal and neonatal mortalities in the country.

Recommendations

Based on the findings, CPD in EmONC should be provided to all midwives at all levels of health care delivery in the country including incorporating such activities in the induction programmes for midwives. There is need to review the nursing curricula to be more focused on skills development and retention in the area of EmONC. The findings lead to development of a framework to enhance provision of CPD and also development of evaluation guidelines for assessing development of competences in EmONC. These guidelines should be used in the country with the aim of improving maternal and newborn health.

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APPENDIX 3: PRACTICUM LOGBOOK FOR MIDWIVES (TO BE FILLED OUT DURING EMNOC TRAINING)

	DAY 1	**DAY 2**	**DAY 3**	**DAY 4**	**DAY 5**	**DAY 6**	**DAY 7**	**DAY 8**	**Total**
Partograph									
Normal delivery									
Active management of third stage of labour									
Episiotomy and/ repair of lacerations									
Newborn resuscitation									
Vacuum – assisted delivery									
Manual removal of placenta									
Manual vacuum aspiration									

APPENDIX 4: TRAINING CURRICULUM FOR MIDWIVES ON ESSENTIAL OBSTETRICS CARE SKILLS

LUCY K GITONGA
MScN, BScN, HSM
PREPARED FOR A CAPACITY BUILDING PROGRAMME FOR PHASE 2 OF A RESEARCH CONDUCTED IN FULFILLMENT OF THE REQUIREMENTS FOR AWARD OF DOCTOR OF PHILOSOPHY IN NURSING OF THE UNIVERSITY OF NAIROBI

JANUARY 2014

Table of contents

PREAMBLE

A baseline survey was done in Meru and Embu level five hospitals among 113 midwives working in antenatal, labourward, post natal, newborn unit and maternity theatres of the two hospitals respectively.

The specific objectives of the survey were to:

12. To determine the socio-demographic characteristics of the midwives
13. To identify the Midwives' CPD activities and the numbers involved
14. To determine the extent of practice of EmNOC skills in their practice.
15. To identify factor hindering/facilitating CPD practice
16. To determine the confidence level of practising EmNOC skills

The findings established that the level of the midwives' EmNOC skills practice was low (57.9 % in Meru and 57.7% in Embu). This was below the recommended 80%.

RATIONALE

The findings from phase one of the study indicated that, although more than halve of the midwives were involved in EmNOC activities, their confidence level was low (less than 80%) in both hospitals. This was because of lack of knowledge on the available reference manuals, mentorship and couching. It is on this basis that a curriculum is developed in order to train and sensitize midwives on the EmNOC in order to equip them with knowledge, skills and change their attitude towards use of EmNOC skills in caring for patients and clients. The curriculum also aimed at providing mentorship and coaching in EmNOC to help in skill retention and motivate them to continue with the practice.

PHILOSOPHY

This continuing programme is developed on the belief that:

1. Midwives play an important role in reducing maternal and neonatal mortality.
2. EmNOC skills are key in reducing maternal and newborn mortalities and morbidities.
3. Midwives attitudes contribute largely to the practice of midwives.

PROGRAMME GOAL

To equip midwives with relevant knowledge, skills and attitudes on EmNOC skills so as to effectively contribute towards provision of quality care to patients and clients in a dynamic society.

LEARNING OUTCOMES

Upon completion of training, the participants will be able to:

1. Apply the EmNOC knowledge in the management of patients and clients
2. Demonstrate change of attitude towards EmNOC
3. Manage patients and clients with complications.

TEACHING/LEARNING METHODS

Lectures/Discussions, presentations
Case studies, demonstrations, Practicals

TEACHING/LEARNING RESOURCES

Lecture halls, demonstration rooms, hospitals, LCDs , laptops, models , simulated patients, giving sets, cannulas, syringes and needles, fetal scopes

MODE OF LEARNING

It will involve theory and practicals. Monday to Saturday from 8 am to 5 pm.

TRAINEE SELECTION

All the 113 midwives in the two hospitals will undergo the training and then followed for 8 days in the clinical areas for couching. After that they will be released to the clinical areas for three months before they are evaluated.

MODE OF EVALUATION

Pretest
Post test
Skills test

CERTIFICATION
A certificate shall be awarded to the participants on successful completion of the prescribed training.

COURSE STRUCTURE
MODULE ONE: INTRODUCTION TO MATERNAL & NEWBORN HEALTH
UNIT 1: INTRODUCTION
1.1. Introduction To Maternal And Newborn Health
1.2 Module learning objectives

UNIT 2: CURRENT APPROACH TO REDUCTION OF MATERNAL AND NEWBORN MORTALITY
2.1. Unit learning objectives
2.2. Global and national situation of maternal and perinatal morbidity and mortality
2.3. Factors affecting maternal and perinatal mortality and morbidity
2.4 . Current approaches

MODULE TWO: RAPID INITIAL ASSESSMENT AND MANAGING EMERGENCIES
UNIT 1: INTRODUCTION
1.1. Introduction
1.2 . Module learning objectives

UNIT 2: RAPID INITIAL ASSESSMENT AND MANAGING EMERGENCIES
1.1Unit learning objectives
2.2. Being prepared and responding to an emergency
2.3. Rapid initial assessment
2.4. Emergency management principles
2.5. Managing a patient in "SHOCK"
2.6. Managing a patient with difficulty in breathing.

MODULE THREE: PREGNANCY CARE
UNIT 1: INTRODUCTION
UNIT 2: BASIC CARE DURING PREGNANCY
2.1. Unit learning objectives
2.2. Introduction
2.3. Focused ANC
2.4. ANC for PMTCT

UNIT THREE: CARE FOR DISEASES AND COMPLICATIONS DURING PREGNANCY
3.1. Unit learning objectives
3.2. Anemia during pregnancy
3.3. Vaginal Bleeding in early pregnancy and post-abortion care
3.4. Vaginal bleeding in later pregnancy and labor
3.5. Fever during pregnancy and labor
3.6. Abdominal pain in early pregnancy

MODULE FOUR: CHILD BIRTH CARE (labor, delivery and immediate post partum)

UNIT 1: INTRODUCTION

UNIT 2: BASIC CARE DURING CHILD BIRTH

2.1. Learning objectives.
2.2. Assessment of a woman in labor
2.3. Detect and respond to obstetrical problems at admission
2.4. Supportive care of a woman in labor
2.5. Partographic follow-up of labor
2.6. Intrapartum care for PMTCT
2.7. Basic care during second stage and assisting normal delivery
2.8. Active management of third stage of labor
2.9. Immediate care of the newborn
2.10. Newborn resuscitation
2.11. Immediate postpartum care.
2.12. Basic immediate postnatal newborn care

UNIT 3: CARE AND REFERRAL FOR DISEASES AND COMPLICATIONS DURING CHILD BIRTH:

3.1. Learning objectives
3.2. Unsatisfactory progress of labor
3.3. Fetal distress
3.4. Episiotomy
3.5. Respond to problems in the immediate post partum
3.6. Vaginal bleeding after childbirth (PPH)
3.7. Manual removal of placenta
3.8. Repair of genital tears
3.9. Breech presentation
3.10. Vacuum extraction

MODULE FIVE: POSTPARTUM MATERNAL (UP-TO 6 WKS) & NEWBORN CARE

UNIT 1: INTRODUCTION

UNIT 2: BASIC POST-PARTUM MATERNAL CARE

2.1. Learning objectives
2.2. Basics of post partum period
2.3. Assessment (history and physical examination) and care of a post partum woman
2.4. Postpartum care for PMTCT

UNIT 3: CARE FOR DISEASES AND COMPLICATIONS DURING THE POST-PARTUM PERIOD

3.1. Unit learning objectives
3.2. Late post partum hemorrhage
3.3. Fever after child birth

UNIT 4: BASIC POST-NATAL NEWBORN CARE

4.1 Unit learning objectives
4.2 Organizing care of the sick or small new born
4.3 Rapid initial assessment and immediate management

4.3.1 Rapid assessment
4.3.2 Further assessment (history and physical examination) and management.
4.3.3 Immediate actions once assessment is complete
4.4 Follow-up care for the sick newborn

COURSE DESCRIPTION
ESSENTIAL MATERNAL AND NEWBORN CARE SKILLS TRAINING (40 HOURS)
Module One: Introduction To Maternal & Newborn Health (5 Hours)

Specific Objective	Content	Instructional methodology	Duration (Hours)	Resources
By the end of this module, the participants will be able to: Appreciate the magnitude of maternal and newborn mortality & morbidity in the developing world generally and in our country specifically	-Definition of maternal and neonatal mortality -magnitude of maternal and newborn mortality and morbidity	Lecture Discussion	2	Books Handouts
Describe the current approach to reduction of maternal and newborn mortality.	-Current approaches of reducing maternal and newborn mortality	Lecture Discussion	3	Books Handouts
Module Two: Rapid Initial Assessment And Managing Emergencies (8 Hours)				
By the end of this module, the participants will be able to: 1. Describe how to organize the facility to respond to an obstetric emergency. 2. Describe key steps in rapid initial assessment of a woman with emergency problems.	-Preparedness For Emergency Response -Rapid initial assessment	4	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts
3. Outline key emergency management steps for specific obstetric emergency problems. 4. Describe pre-referral management to a recognized emergency situation	- Emergency Management Principles - Referring The Woman For Care	4	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts
Module Three: Pregnancy Care (8 Hours)				
By the end of this module, the participants will be able to: 1. Describe focused antenatal care. 2. Provide focused antenatal care to the pregnant woman. 3. Identify and provide care to pregnant women with diseases and complications.	-Introduction -Focused Antenatal Care -Bsic Components Of Focused	5	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts

4. Recognize an emergency situation during pregnancy which requires immediate treatment and urgent referral to a higher level health facility. 5. Describe pre-referral management to a recognized emergency situation.	-Management of diseases and conditions in pregnancy _management of emergencies in pregnancy -Referral protocols in pregnancy	3	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts
Module Four: Child Birth Care (Labor, Delivery And Immediate Post Partum) (10 Hours)				
By the end of this module, the participants will be able to: 1. Provide basic care to the woman and the fetus during labor. 2. Provide basic care to the woman and the fetus during delivery. 3. Provide basic care to the woman in the immediate postpartum period.	-Introduction -Basic care to the woman and the fetus during labour - Care of the woman and fetus during delivery -Immediate post partum care	3	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts
4. Provide basic care to the newborn in the immediate postpartum period. 5. Detect and provide care for complications during labor. 6. Detect and provide care for complications during delivery. 7. Detect and provide care for complications to the woman in the immediate postpartum period.	-Essential newborn care _complications management During labour -Complications management during delivery	4	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts
8. Recognize an emergency situation during labor, delivery and immediate postpartum period which requires immediate treatment and, in most cases, urgent referral to a higher level health facility. 9. Provide pre-referral management to a recognized emergency situation.	-Complications management during immediate post partum period - Emergency recognition and management -Referral management	3	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts
Module Five: Postpartum Maternal (Up-To 6 Wks) & Newborn Care (9hours)				
By the end of this module, the participants will be able to: 1. Provide basic care to the woman in post-partum period. 2. Detect and provide care for diseases and complications in the post-partum period. 3.Recognize an emergency situation in the women during the postpartum period which requires immediate treatment and, in most cases, urgent	-Introduction -Basic postpartum care	3	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts

referral to a higher level health Facility.	-Management of complications and disease during the postpartum period			
4. Explain the basic care of neonates presenting to the health facility in the postnatal period 5. Describe steps contained in the initial rapid assessment and emergency management of a sick neonate	-Emergency management and referral protocols -Basic neonatal care -Assessment and Emergency management of a sick neonate	4	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts
6. Detect and provide care for sick neonates presenting to the health facility with illnesses and complications during the postnatal period.	-Neonatal complications management	2	Lecture Demonstration Case studies Discussions	Books Hand outs Models Flip charts

Reference

Required textbook

1. World Health Organization. (2006). *Pregnancy, Childbirth, Postpartum and Newborn Care: A guide for essential practice.*
2. Ministry of Health/ DRH (2010)**.** National Road Map for Accelerating the Attainment of MDGs related to Maternal and Newborn Health in Kenya

Further Reading

3. Diane M. Fraser and Margaret A. Cooper.: 2003: Myles textbook for midwives. 16th Edition.
4. Kenya Clinical Guidelines: MOH 2007
5. Ministry of Health, Kenya. (2010).National Guidelines for Quality Obstetrics and Perinatal Care
6. Ministry of Health/ DRH (2012): Revised Kenya Partograph
7. World Health Organization*. (2000).Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors.*
8. World Health Organization. (2004). *Managing Newborn Problems (Integrated management of pregnancy and childbirth): a guide for doctors, nurses, and midwives*
9. World health statistics 2014: World Health Organization 2014.
10.

APPENDIX 5: INTRODUCTORY LETTER

LUCY KAWIRA GITONGA
NURSE MIDWIVES RESEARCH QUESTIONNAIRE

Purpose of project

To evaluate the impact of midwives' essential Maternal and newborn care skills in reducing maternal and neonatal mortality aimed at strengthening midwifery in the management of care, community care to contribute effectively in improving maternal and Neonatal health.

Instructions

Please follow the instructions for each question carefully and answer **ALL** questions that are relevant to you. Information gathered from the questionnaire will be collated and a report will be written and forwarded through the office of the Director of medical services. The information you provide in this questionnaire will be treated with strictest confidence.

Questionnaire will take approximately 10 minutes to complete.

APPENDIX 6: ETHICAL APPROVAL LETTER

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
(254-020) 2726300 Ext 44355

KNH/UON-ERC
Email: uonknh_erc@uonbi.ac.ke
Website: www.uonbi.ac.ke

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/164 **Link:www.uonbi.ac.ke/activities/KNHUoN** 26th May 2014

Lucy Kawira Gitonga
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear Lucy

RESEARCH PROPOSAL: EVALUATION OF IMPACT OF MIDWIVES' ESSENTIAL MATERNAL AND NEWBORN CARE SKILLS IN REDUCING MATERNAL AND NEONATAL MORTALITY IN EMBU COUNTY, KENYA (P584/11/2013)

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and **approved** your above proposal. The approval periods are 26th May 2014 to 25th May 2015.

This approval is subject to compliance with the following requirements:

a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
f) Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
g) Submission of an *executive summary* report within 90 days upon completion of the study
This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website **www.uonbi.ac.ke/activities/KNHUoN.**

Protect to Discover

APPENDIX 7: PERMISSION LETTER

Lucy Kawira Gitonga

P.o. Box 109-60400

Chuka

20th June, 2014

The Medical Superintendent,

Embu Level 5 Hospital,

P.o Box 33-60100,

Embu.

RE: REQUEST FOR PERMISSION TO CARRY OUT AN ACADEMIC RESEARCH

I am a PhD student in the University of Nairobi, School of Nursing Sciences.

I am writing to request permission to carry out an academic research in your institution on "Evaluation of Impact of Midwives Essential Maternal and Newborn care skills in reducing Maternal and Newborn Mortality in Embu County, Kenya"

I intend to carry out data collection in your institution for a period of three (3) months from July to September 2014. I will collect data in the Maternity and Records department of the Hospital

Attached please find a copy of my research proposal, data collection tool and letter of approval by the KNH/UON ethics and Research Committee.

Looking forward to a positive response

Yours Faithfully

Lucy Kawira Gitonga.

APPENDIX 8: DATA COLLECTION TOOLS

1: KNOWLEDGE, experience and Confidence Checklist

PART A: DEMOGRAPHIC DATA

1. Age _____ years
2. Male (1) Female (2)
3.. What your qualifications? (Check only one)
   I. BScN (1)
   II. KRCHN (2)
   III. KRM(3)
   IV. KRN/ M(4)
   V. KECHN (5)
   VI. KEM (6)

Other (specify) _____

4. Year persevere training completed_____
5. What is your area of deployment?
   I. ANC WARD (1)
   II. NEWBORN UNIT (4)
   III. LABOUR WARD (2)
   IV. PNC WARD (3)
   V. Other (5) (specify) _____

6. What is your current job title? _____
7. How many years have you been working in this position? _____ years
8. What is your primary job responsibility?

a) Healthcare provider (1) b) Clinical training supervisor (2) c) Teacher/Educator/Instructor (3)

d)Other (4) (specify) …….

PART B: ANTENATAL CARE
(To be completed by Learner)
Date(s) of assessment _____
DIRECTIONS
Read the following questions and write an "X" on the line of the single best answer to each question.

1. The information obtained from the antenatal history can help the midwive
   a) ____ Plan for childbirth
   b) ____ Identify existing problems
   c) ____ Identify health education and counseling needs
   d) ____ All of the above
2. Pregnant women should receive educational messages about which of the following?
   a) ____ Personal hygiene, rest, and exercise during pregnancy
   b) ____ Diet and nutrition during pregnancy
   c) ____ Danger signs during pregnancy
   d) ____ All of the above

3. When counseling a pregnant woman about formulating a birth plan, the midwife should tell her
   a. ____ if she has no risk factors, she can give birth at home with a traditional birth attendant
   b. ____ There are ways of knowing whether she will develop a complication
   c. ____ It is not recommended that she have a companion during labor and childbirth
   d. ____ She should put money aside to pay for the expenses of the birth
4. If the woman trusts the provider and feels that s/he cares about the outcome of the pregnancy, she will be more likely to
   a. ____ Return for scheduled antenatal care visits
   b. ____ Return immediately if a danger sign appears
   c. ____ Comply with recommended treatment
   d. ____ All of the above
5. When offering HIV testing services to a pregnant woman, the provider should
   a. ____ Counsel the woman and let her decide whether to be tested
   b. ____ Ask the husband's permission
   c. ____ Perform the test without informing the woman
   d. ____ Tell the woman she must have the test for her baby's benefit
6. Focused antenatal care means that
   a. ____ Care provided to every woman during pregnancy is for the purpose of providing support of the normal pregnancy as well as early detection and management of complications
   b. ____ A vaginal exam should be performed at every visit
   c. ____ All women have the same concerns about their pregnancies
   d. ____ Women don't need information about danger signs in pregnancy
7. When counseling a pregnant woman about nutrition, be sure to
   a. ____ Ask her what she eats in a typical day to determine if her diet is adequate
   b. ____ Tell her to eat the same amount of food that she ate before her pregnancy
   c. ____ Recommend that she weigh herself once a week
   d. ____ Inform her that only very anemic women need iron/folate supplements
8. Focused antenatal care includes which of the following actions?
   a. ____ Checking the baby's position at 28 weeks
   b. ____ Checking the woman's blood pressure at every visit
   c. ____ Assessing ankle edema at 36 weeks
   d. ____ Counseling the woman about danger signs only at the last visit
9. Tests that should be performed for every woman during antenatal care include
   a. ____ Hemoglobin
   b. ____ Test for syphilis
   c. ____ Ultrasound of baby
   d. ____ A and B only
10. After giving a pregnant woman her first dose of tetanus toxoid by intramuscular injection, the used syringe and needle should be
   a. ____ Decontaminated before placing in puncture-proof containers
   b. ____ Capped again before placing in puncture-proof containers
   c. ____ Decontaminated before reusing them
   d. ____ Placed in a garbage can

PART C: NORMAL LABOR, CHILDBIRTH, AND IMMEDIATE NEWBORN CARE

1. One way to prevent transmission of HIV from an infected mother to her baby (vertical transmission) is to
   a. ____ Use condoms
   b. ____ Give AZT to the woman after the baby is born
   c. ____ Rupture membranes early in labor
   d. ____ Give a single dose of nevirapine to the woman in labor and to the baby after birth

2. When performing a vaginal examination, which of the following is recorded on the partograph?
   a. ____ Cervical dilation of 3 centimeters
   b. ____ Vaginal temperature and wetness
   c. ____ Position of the presenting part
   d. ____ Degree of molding

3. If a woman is admitted during the active phase of labor, cervical dilation is initially plotted on the partograph
   a. ____ To the left of the alert line
   b. ____ To the right of the alert line
   c. ____ On the alert line
   d. ____ On the action line

4. Cervical dilation plotted to the right of the alert line indicates
   a. ____ Satisfactory progress in labor
   b. ____ Unsatisfactory progress in labor
   c. ____ The end of the latent phase
   d. ____ The end of the active phase

5. Active management of the third stage of labor should be practiced
   a. ____ Only for women who have a history of postpartum hemorrhage
   b. ____ Only for the primipara
   c. ____ Only for the multipara
   d. ____ For all women in labor

6. The appropriate order of steps in active management of the third stage of labor include
   a. ____ Controlled cord traction, fundal massage, and oxytocin
   b. ____ Intravenous oxytocin, cord clamping and cutting, and fundal massage
   c. ____ Cord clamping and cutting, controlled cord traction, ergometrine administration, an inspection to be sure the placenta is intact
   d. ____ Intramuscular injection of oxytocin, controlled cord traction with countertraction to the uterus, and uterine massage

7. If bleeding continues after delivery of the placenta using active management, the first thing the provider should do is call for help and
   a. ____ Start an IV
   b. ____ Massage the uterus
   c. ____ Insert a urinary catheter
   d. ____ Check the placenta to make sure that it is complete

8. When Mrs. K. was admitted in labor at 10 AM the following were found: cervix: 5 cm; contractions:
3 in 10 minutes lasting 20–40 seconds; fetal head: 2/5 palpable; membranes intact; fetal heart rate: 138 beats per minute.

At 2 PM the following were found: cervix: 7 cm; contractions: 2 in 10 minutes lasting 20 seconds; fetal head: 1/5 palpable; membranes intact; fetal heart rate: 142 beats per minute.

Which is the most appropriate intervention?

a. ____ Prepare for vacuum extraction
b. ____ Encourage the mother to empty her bladder
c. ____ Sedate the mother so that she can rest
d. ____ Augment the labor with oxytocin

9. Which of the following will help to decrease the risk of infection during childbirth?

a. ____ Performing frequent vaginal examinations
b. ____ Rupturing membranes as soon as possible in the first stage of labor
c. ____ Routine catheterization of the bladder before childbirth
d. ____ Reducing prolonged labor

10. Contaminated instruments in the labor ward should immediately be

a. ____ Washed with soap and water and boiled for 2 hours
b. ____ Soaked in 0.5% chlorine solution for 10 minutes
c. ____ Soaked in 0.5% chlorine solution for 30 minutes
d. ____ Washed with soap and water and soaked in 0.5% chlorine solution for 10 minutes

IMMEDIATE NEWBORN CARE

11. The first step in thermal protection for the newborn includes

a. ____ Drying the baby thoroughly immediately after birth
b. ____ Drying the baby thoroughly after the cord has been cut
c. ____ Covering the baby with a clean, dry cloth immediately after birth
d. ____ Covering the baby with a clean, dry cloth after the cord has been cut

12. Immediate care for a normal newborn includes

a. ____ Skin-to-skin contact followed by placing the baby in a warming incubator
b. ____ Drying the baby, removing the wet cloth, and covering the baby with a clean, dry cloth
c. ____ Stimulating the baby by slapping the soles of the baby's feet
d. ____ Deep suctioning of the airway to remove mucus

13. Which of the following can contribute to hypothermia in newborns?

a. ____ The baby is not dried thoroughly immediately after birth
b. ____ The baby is bathed immediately after birth
c. ____ The baby is dried and placed in skin-to-skin contact with the mother
d. ____ A and B

14. To maintain the newborn's axillary temperature between 36.5º C and 37.5º C it is important to

a. ____ Place the baby in an incubator
b. ____ Bathe the baby in warm water immediately after birth
c. ____ Rub the baby vigorously with a blanket
d. ____ Cover the baby's head, place the baby in skin-to-skin contact on the mother's chest, and cover with a blanket

15. Before performing an exam on a baby who is 2 hours old and who has not been bathed, the skilled provider should
    a. ____ Wash hands with soap and dry with a clean towel, then put on exam gloves
    b. ____ Wash hands with soap and dry with a clean towel
    c. ____ Bathe the baby with soap and water
    d. ____ Put on sterile gloves
16. Care of the umbilicus should include
    a. ____ Cleansing with alcohol
    b. ____ Covering with a sterile compress
    c. ____ Cleansing with cooled, boiled water and leaving uncovered
    d. ____ Applying antibiotic cream
17. The best way to determine if a newborn needs resuscitation is to
    a. ____ Wait until 1 minute after birth and assign the Apgar score
    b. ____ Listen to the baby's heart rate
    c. ____ Observe respirations immediately and begin resuscitation if they are less than 30/minute
    d. ____ Perform resuscitation only if central cyanosis is present
18. Breastfeeding should begin
    a. ____ After the baby's first bath
    b. ____ When the baby starts to cry
    c. ____ Within the first hour following birth
    d. ____ When the mother's milk comes in
19. When counseling the mother about breastfeeding, the skilled provider should tell her to
    a. ____ Avoid giving colostrum to the newborn
    b. ____ Establish a schedule for breastfeeding so the baby gets plenty of sleep
    c. ____ Give the baby water after each feed
    d. ____ Breastfeed on demand for as long as the baby wants to feed
20. When counseling the mother about her newborn, the skilled provider should
    a. ____ Help the mother formulate a complication readiness plan for her baby
    b. ____ Make sure the mother understands danger signs for her baby and where to go if they arise
    c. ____ Tell the mother to bring her baby for a newborn care visit on the sixth day after birth
    d. ____ All of the above

PART D: POSTPARTUM CARE (MOTHER AND BABY)

1. During the first 2 hours following birth, the provider should
    a. ____ Measure the woman's blood pressure and pulse once, and insert a catheter to empty her bladder
    b. ____ Measure the woman's blood pressure and pulse, and check the uterine tone every 15 minutes
    c. ____ Not disturb the woman if asleep because her rest is more important than her vital signs
    d. ____ Measure the woman's temperature and pulse, massage the uterus, and perform a vaginal examination to remove clots

2. After childbirth, the mother should have a postpartum visit with a skilled provider
   a. ____ Once, at 3 weeks postpartum
   b. ____ Once, at 6 weeks postpartum
   c. ____ Three times: at 6 hours, 6 days, and 6 weeks postpartum and any time she has danger signs
   d. ____ Only if she has danger signs
3. During the postpartum visit to the clinic, obtain a history for the
   a. ____ baby only
   b. ____ mother only
   c. ____ mother and baby
   d. ____ mother, her support person, and the baby
4. During each postpartum visit, specific information should be obtained from the woman about
   a. ____ Problems during pregnancy, during and after childbirth, and any present problems
   b. ____ Present problems only
   c. ____ Only those problems directly related to childbirth
   d. ____ None of the above
5. By the tenth day postpartum, you should be able to palpate the uterus
   a. ____ Just below the umbilicus
   b. ____ At the level of the umbilicus
   c. ____ Just above the symphysis pubis
   d. ____ Halfway between the symphysis pubis and the umbilicus
6. Each time you counsel the breastfeeding mother about nutrition, tell her that
   a. ____ There are many foods that she should avoid
   b. ____ She should eat at least one extra meal per day
   c. ____ She should only drink a few glasses of fluids per day
   d. ____ Iron/folate supplementation is not necessary
7. At each postpartum visit, the mother should be counseled to seek care if she has which of the following danger signs
   a. ____ Normal lochia, temperature 37º C, or slight breast engorgement
   b. ____ Edema of hands and face, severe abdominal pain, or sore, cracked nipples
   c. ____ Severe headache, foul-smelling lochia, or calf tenderness
   d. ____ B and C
8. When counseling a new mother about breastfeeding in the 6 hours following birth
   a. ____ Help her position her baby so that s/he attaches properly to the nipple
   b. ____ Tell her to give breast milk substitutes so her baby will grow faster
   c. ____ Advise that she breastfeed her baby 4 times/day
   d. ____ Tell her that she needs a method of contraception even if she is exclusively breastfeeding
9. Each postpartum examination should include
   a. ____ Measurement of blood pressure and temperature, and assessment of conjunctiva, breasts, abdomen, perineum, and legs
   b. ____ Observation of breastfeeding
   c. ____ Information about contraception, safer sex, and counseling and testing for HIV

d. ____ All of the above

10. After completing the postpartum examination
    a. ____ There is no need to wipe off the exam table with 0.5% chlorine solution
    b. ____ The exam table should be wiped off with 0.5% chlorine solution only if there is blood on it
    c. ____ The exam table should be wiped off with 0.5% chlorine solution after each use
    d. ____ The exam table should be wiped off with soap and water after each use

PART E: MANAGEMENT OF COMPLICATIONS

1. Carry out rapid initial assessment
    a. ____ Only for women who present with abdominal pain and vaginal bleeding
    b. ____ Only for women who present with abdominal pain
    c. ____ Only for women who present with vaginal bleeding
    d. ____ For all women of childbearing age who present with a danger sign

2. When there is an obstetric emergency, tell the woman and her family or support person
    a. ____ As much as possible about the management of the emergency
    b. ____ As little as possible about the management of the emergency
    c. ____ What the provider thinks she/they should be told
    d. ____ Nothing at all

3. Immediate postpartum hemorrhage can be due to
    a. ____ Uterineatony
    b. ____ Genital trauma
    c. ____ Retained placenta
    d. ____ All of the above

4. The most effective way to immediately control eclamptic convulsions is to
    a. ____ Give diazepam
    b. ____ Give magnesium sulfate
    c. ____ Deliver the baby as soon as possible
    d. ____ Give nifedipine

5. Newborn resuscitation procedures
    a. ____ Always require the use of oxygen
    b. ____ Should be started after assigning the Apgar score
    c. ____ Can usually be carried out without oxygen
    d. ____ Should only be carried out by a pediatrician

6. When performing newborn resuscitation with an Ambu bag and mask, it is important to verify that
    a. ____ The newborn’s head is in neutral position
    b. ____ The seal between the newborn’s mouth, nose, and Ambu bag is adequate
    c. ____ The baby is not covered
    d. ____ Cardiac massage is being performed

7. Do not perform vacuum extraction in the case of
    a. ____ A cephalic presentation
    b. ____ A face presentation
    c. ____ Cervical dilation of 7 cm
    d. ____ Fetal head not engaged

8. A woman with a ruptured uterus has which of the following signs and symptoms
   a. ____ Rapid maternal pulse
   b. ____ Persistent abdominal pain and suprapubic tenderness
   c. ____ Fetal distress
   d. ____ All of the above
9. When performing newborn resuscitation with an Ambu bag and mask, ventilateat the rate of
   a. ____ 20–30 breaths per minute if there is no chest indrawing
   b. ____ 40 breaths per minute for all babies
   c. ____ 60 breaths per minute if the baby is gasping
   d. ____ None of the above
10. Treatment of postpartum metritis includes
   a. ____ Discontinuation of breastfeeding
   b. ____ Bed rest and adequate hydration
   c. ____ Intravenous ampicillin, gentamicin, and metronidazole until fever-free for 48 hours
   d. ____ B and C

2. QUESTIONNAIRE

(To be completed by Learner)

Thank you for taking the time to complete this form. Your answers will contribute to a database of information collected to help improve skill-based training in maternal and newborn healthcare. All answers are confidential and will not be shared with supervisors or affect your job in any way.

Please write your comments about any question in the margins or the spaces provided.

PART A: DEMOGRAPHIC DATA

Serial Number_____
_____

Name of institution _____

1. Age _____ years
2. . Male (1) Female (2)
3. What your qualifications? (Check only one)
   a. BScN (1)
   b. KRCHN (2)
   c. KRM(3)
   d. KRN/M(4)
   e. KECHN (5)
   f. KEM (6)
   g. Other (7) (specify) _____

4. Year preservice training completed_____
5. What is your area of deployment?
   a) ANC WARD (1)
   b) NEWBORN UNIT (4)
   c) LABOUR WARD (2)

d) PNC WARD (3)
e) Other (5) (specify) …….

5. What is your current job title? ……..

6. How many years have you been working in this position? …….. years

7. What is your primary job responsibility?
a) Healthcare provider (1)
b) Clinical training supervisor (2)
c) Teacher/Educator/Instructor (3)
d) Other (4) (specify) …….

PART B: EmONC Experience and Confidence Questionnaire

8. Please estimate the percentage of your professional time each week spent in the following activities. (Total should add up to 100 %.)

Patient/Client Care _____%
Clinical Training _____%
Teaching/Educating/Instructing _____% (not in clinical setting)
Other (specify) _____ _____%
TOTAL 100 %

9. Does your institution use the current WHO Partograph to monitor labor?
Yes (1)No (2) Don't know (98)

10. Is the WHO manual Managing Complications in Pregnancy and Childbirth available in your institution?
Yes (1)No (2) Don't know (98)

11. If yes, on average, how many times have you used the manual as a reference?
1. Every day
2. Once per week
3. Once per month
4. Rarely
5. Never

12. Do you currently belong to any committees or organizations related to Safe Motherhood?
Yes (1)No (2) Don't know (98)

13. If yes, what is (are) the name(s) of the committee(s) or organization(s)? _____

14. Approximately how many births do you attend per week? _____

15. Approximately how many antenatal care clients do you see per week? _____

16. Approximately how many postpartum clients do you see per week? _____

The next questions provide information on how often you perform specific clinical skills that you learned during the course and your level of confidence performing each of these skills. Please indicate which of these skills you have taught to others since you attended the skills-based training course.

17. Date of skills-based training course
_____
18. Topic or content of skills-based training course_____

19. Please complete the table according to the following instructions.

Column A. How many cases have you performed since completing the skills-based training course?

Column B. Rate your level of confidence in performing the skills:

1. Very confident; I do not need any coaching
2. Not very confident; I need more coaching
3. Not confident; I cannot perform this skill
4. N/A; Not permitted to perform this skill according to country/institutional policies

Column C. Please check those skills you have taught to others since you completed the skills-based training course.

	COLUMN A	**COLUMN B**	**COLUMN C**
SKILL	**Number of cases performed**	**Confidence in performing**	**Taught the skill to others**
Antenatal care			
Counseling women on birth preparedness andcomplication readiness			
Normal labor, childbirth, and immediate			
newborn care			
Monitoring labor using the partograph			
Active management of the third stage of labor			
Postpartum care			
Newborn resuscitation			
Manual removal of the placenta			
Bimanual compression of the uterus			
Repair of cervical tears			
Repair of first and second degree perineal tears			
Management of postpartum hemorrhage			

19. If you ranked your confidence as “3” in any skill, please explain some of the reasons why you do not feel confident performing this skill…….

21. Do you feel that after training you have had enough practice to remain competent in these skills?

Yes (1)No (2) Don’t know (98)

Please explain……

22. Has the skills-based training changed your job performance? Yes (1)No (2)
23. If yes,
how……

24. If no, why
not……

3: CASE STUDY

Mrs. K is a 30-year-old gravida 4, para 4. She gave birth at the health center to a healthy, full-term baby weighing 4.2 kg. You gave oxytocin 10 units IM following birth of the baby. The placenta was delivered 5 minutes later without complication. However, 30 minutes after childbirth, Mrs. K tells you that she is having heavy vaginal bleeding.

1. What is the first action you will take?
a. ____ Check the uterus to see whether it is contracted
b. ____ Administer more oxytocin
c. ____ Perform bimanual compression of the uterus
d. ____ Perform manual exploration of the uterus

2. Vaginal bleeding immediately after birth in the presence of a well contracted uterus is most often due to:
a. ____Uterine atony
b. ____ Endometritis
c. ____ Genital trauma
d. ____ Abnormal clotting mechanism

You have completed your assessment of Mrs. K and your main findings include the following:

z Pulse 88/minute
z Respiration rate 18/minute
z Blood pressure 110/80
z Temperature 37□ C

Her uterus is firm and well contracted. The placenta is complete. She has no perineal trauma. It is difficult to examine the vagina and cervix because she continues to have heavy vaginal bleeding.

3. Based on these findings, what is your next step?
a. ____ Pack the uterus and vagina
b. ____ Begin a blood transfusion
c. ____ Start antibiotics
d. ____ Perform speculum examination of the vagina and cervix to identify and repair tears

4. What will you tell your assistant to do while you perform the exam?
a. ____ Monitor vital signs and begin intravenous fluids
b. ____ Reassure Mrs. K and her family
c. ____ Draw blood for hemoglobin
d. ____ All of the above

One hour following childbirth, you repair Mrs. K's cervical tear.

5. What is the most appropriate manner to repair a cervical tear?
a. ____ Perform interrupted sutures using silk
b. ____ Perform continuous sutures using silk

c. ____ Perform continuous sutures using chromic catgut or polyglycolic suture
d. ____ Perform interrupted sutures using chromic catgut or polyglycolic suture

After repair of the cervical tear, Mrs. K's hemoglobin is found to be 10 g/dL, and her vital signs are stable.

6. What is the most appropriate plan of care?
a. ____ Begin transfusing blood
b. ____ Send her home
c. ____ Monitor her vital signs for 24 hours and begin ferrous sulphate and folate supplementation; encourage breastfeeding
d. ____ Continue administration of oxytocin for 24 hours

APPENDIX 9: GUIDELINES FOR USING THE TOOLS

A. ASSESSMENT TOOLS Table

CONTENT AREA	TOOL	ASSESSMENT METHOD	SCORING
All Content Areas	Experienceand Confidence Questionnaire	Written questionnaire completed by learner.	N/A
Antenatal Care	Knowledge Questionnaire for Antenatal Care	Written questionnaire completed by learner.	Answers 80% of questions Correctly.
	Skills Checklist for Antenatal History, Physical Examination, and Basic Care	Direct observation: learner performs skills with woman or through role play. Trainer observes using checklist.	Performs 90% of steps correctly.
Normal Labor, Childbirth, and Immediate Newborn Care	Knowledge Questionnaire for Normal Labor, Childbirth, and Immediate Newborn Care	Written questionnaire completed by learner.	Answers 80% of questions Correctly.
Newborn Care	Case Study: Use of the Partograph	Written case study completed by learner.	Answers 80% of questions Correctly.

NB: The passing score of 80% is based on the number of questions included in each of the four Questionnaires.

CONTENT AREA	TOOL	ASSESSMENT METHOD	SCORING
Normal Labor, etc. (cont.)	Skills Checklist for Normal Labor, Childbirth, and Immediate Newborn Care	Direct observation: learner performs skills with woman or anatomic model. Trainer observes using checklist.	Performs 90% of steps correctly.
Postpartum Care (Mother and Baby)	Knowledge Questionnaire for Postpartum Care (Mother and Baby)	Written questionnaire completed by learner.	Answers 80% of questions correctly.

	Skills Checklist for Postpartum	Direct observation: learner performs skills	Performs
	History, Physical Examination	with woman or through role play. Trainer	90%
	(Mother and Baby), and Basic	observes using checklist.	of steps correctly.
	Care		
Management of	Knowledge Questionnaire for	Written questionnaire completed by learner.	Answers
Complications	Management of Complications		80% of questions correctly.
	Case Study: Postpartum	Written case study completed by learner.	Answers
	Hemorrhage		80% of questions correctly.
	Skills Checklist for Newborn	Direct observation: learner performs skills	Performs
	Resuscitation	with baby or anatomic model. Trainer	90% of steps correctly.
		observes using checklist.	
	Skills Checklist for Manual	Direct observation: learner performs skills	Performs
	Removal of the Placenta	with woman or anatomic model. Trainer	90% of steps correctly.
		observes using checklist.	
	Skills Checklist for Bimanual	Direct observation: learner performs skills	Performs
	Compression of the Uterus	with woman or anatomic model. Trainer	90% of steps correctly.
		observes using checklist.	
	Skills Checklist for Repair of	Direct observation: learner performs skills	Performs
	Cervical Tears	with woman or anatomic model. Trainer	90% of steps correctly.
		observes using checklist.	
	Skills Checklist for Repair of	Direct observation: learner performs skills	Performs
	First and Second Degree	with woman or anatomic model. Trainer	90% of steps correctly.
	Perineal Tears	observes using checklist.	
All Content Areas	Supervisor Interview	Oral interview with supervisor conducted by	N/A
		trainer.	
	Learner Interview	Oral interview with learner conducted by	N/A
		trainer.	

B. Followup Visit Summary Form Guidelines

Use this form to summarize the scores of all of the learners who were assessed during this visit.

Write the Serial number of the learner visited in the first column.

Record the learner's final score on the appropriate knowledge assessment(s).

Record the learner's final score on the appropriate case study(s).

Record the learner's performance of the appropriate skill(s) before and after coaching. Write C to indicate competent or N to indicate not competent.

If an assessment was not completed for the learner's area of training, explain why on the reverse of this form.

Send this Summary Form together with all completed assessment forms to the researcher for the followup visit.

APPENDIX 10: PRETEST/POSTTEST FOR TRAINING PARTICIPANTS

EmONC Pretest/ Posttest

Insructions

1. **All** questions are compulsory
2. Choose the correct answer among the given options
3. No copying

1. The throphoblast of a blastocyst;
   a. Is the inner cell mass
   b. Is also referred to as the embryoblast
   c. Forms the placenta and umbilical cord
   d. Produces human chorionic gonadotrophin (Hcg)
2. Quickening;
   a. Can occur as early as 16 weeks of gestation
   b. Is a positive sign of pregnancy
   c. Refers to the pulsation of fornices
   d. Is caused by increased blood flow to the uterus
3. In placenta previa;
   a. There is severe lower abdominal pain on abdominal examination
   b. The degree corresponds to the amount of bleeding
   c. The midwife performs a digital vaginal examination to confirm the degree
   d. Vaginal delivery is possible for 2nd degree
4. A client who is pregnant reports nausea and vomiting. The nurse reassures the client that these symptoms will subside by;
   a. 5-8 weeks
   b. 9-12 weeks
   c. 14-17 weeks
   d. 18-22 weeks
5. The four stages of an eclamptic fit in order of occurrence are:
   a. Premonitory, Tonic, clonic, coma
   b. Premonitory, clonic, tonic, coma
   c. Coma, clonic, tonic, premonitory
   d. Clonic, tonic, premonitory, coma
6. In class III cardiac disease in pregnancy, patient has:
   a. No limitation of physical activity, heart murmur on general examination
   b. Slight limitation of physical activity, no symptoms when at rest
   c. Marked limitation of physical activity, slight exertion leads to fatigue, palpitations, dyspnoea
   d. Inability to carry out any physical activity without discomfort, signs of cardiac disease and heart failure even at rest
7. Anaemia is defined as:
   a. A reduction in the oxygen carrying capacity of blood due to decrease in RBC production.
   b. A reduction in the oxygen carrying capacity of blood relative to the RBC production.
   c. A reduction in the oxygen carrying capacity of blood and decrease in RBC production.

d. A reduction in the oxygen carrying capacity of blood due to increase in plasma relative to RBC production.

8. Immediate post abortion management involves:
   a. Evacuation of the products of conception and administration of intravenous fluids
   b. Stabilization and treatment by evacuation of products of conception
   c. Stabilization and initiation of a family planning method
   d. Evacuation of the products of conception and initiation of a family planning method
9. The drug of choice in managing hypertension in pregnancy is;
   a. Propranolol
   b. Methyldopa
   c. Captopril
   d. Enalapril
10. The preferred anticoagunt agent used in pregnant women with cardiac diseases is:
   a. Warfarin
   b. Aspirin
   c. Heparin
   d. All of the above
11. In the management of a neonatal intensive care unit (NICU) special attention is given to the following **except**;
   a. Lighting
   b. Noise control
   c. Overall designation
   d. Colour of the wall
12. Causes of hypothermia include the following **except;**
   a. Cold room whose temperature is below 25 degrees centigrade
   b. Mothers abdomen because the midwives keep on touching it
   c. The newborn is wet with liquor
   d. The baby is placed on a cold surface
13. The ways a baby loses heat to the environment include the following **except**;
   a. Radiation
   b. Conduction
   c. Convection
   d. Vaporization
14. Summarize the key points to good positioning. The mother is relaxed and comfortable and;
   a. The baby's head and body are on a straight line
   b. The baby's face is directly opposite the nipple and the breast
   c. The baby's face is directly opposite the nipple only
   d. The baby's whole body is supported very closely to the mothers body
15. What is the key areas of everyday care that are important for a newborn baby?
   a. Tetracycline eye ointment
   b. Breastfeeding
   c. Warmth
   d. Watch out for danger signs
16. What do you understand by "the golden one minute"?
   a. Normal transition of a newborn is characterized by crying in less than one minute

b. Abnormal transition is when a baby does not cry by the one minute
c. Assisted ventilation must begin by the one minute
d. Breastfeeding must have started by the one minute

17. The term “Special care needs’’ is the care given to the babies who fall in the following categories **except;**
a. Born preterm
b. Term but with weight less than 25oog
c. Term but weight is at 2500g
d. Preterm or small baby with weight more than compared to gestation age.

18. Trends in neonatal mortality and morbidity show that there is an upward move. The major cause of neonatal death includes;
a. Preterm birth
b. Congenital anomalies
c. Tetanus
d. Hypothermia

19. There are different types of jaundice. In normal jaundice;
a. Skin and eyes appear yellow but there is no signs of fever, jaundice starting from the first day of life
b. Skin and eyes appear yellow but there is fever and jaundice starts on the first day of life
c. Skin and eyes are deeply yellow with signs of fever and jaundice starting on first day
d. Skin and eyes deeply yellow but with no signs of fever or jaundice starting on the first day

20. The basic steps in resuscitation will include the following **except;**
a. Assess baby’s response at birth
b. Dry, warm, clear airway and stimulate
c. Give resuscitation drugs to stimulate crying
d. Ventilation with bag and mask

21. The hormone of milk ejection is:
a. oestrgen
b. progesterone
c. prolactine
d. oxytocin

22. The discharge from the uterus during puerperium on 7-9th day postpartum is:
a. lochia serosa
b. lochia rubra
c. lochia alba
d. lochia cream

23. The aim of targeted postpartum care is to:
a. integrate mother and her newborn into the family and the community
b. for complete rest in hospital until she stops bleeding
c. support mother and her family and respond to their needs
d. facilitate the acquiring of new life with her baby

24. Following delivery, non-breastfeeding women experience a period of infertility:
a. which may only last as long as four weeks
b. which may last for over one year, so she doesn□t need to worry about contraception
c. which lasts about six weeks

d. Which lasts six months?

25. Which family planning methods can be used immediately postpartum (within 7 days) by breastfeeding women?

a. Condoms, female sterilization
b. Progestin-only injectables, combined injectables
c. Female sterilization, Progesterone only pill
d. Combined oral contraceptives, progesterone only pill

26. Maternal death reviews are efforts both in facility and in the community to:

a. find out who might have caused the death of a woman or her baby
b. allow the family to seek legal help because of their loss
c. investigate the circumstances surrounding the maternal death
d. allow for the routine post-mortem of the mother or her baby before burial

27. The community too has a role in preventing maternal and neonatal mortality. What the community should do in birth preparedness is to:

a. Build hospitals, get men involved, organize transport, finances
b. Get men involved,organize transport, finances, communicate with the facility
c. Alert the TBA, organize transport,finances, get men involved
d. Involve the C H W, involve men, finances, train midwives

28. Which of the following is **TRUE** about the IUD?

a. The IUD itself does not increase the risk of pelvic infection
b. The IUD must be removed if a pelvic infection occurs
c. The IUD prevents pregnancy by destroying the fertilized
d. The IUD may never be used in women who are HIV-infected

29. Emergency Contraceptive Pills (ECPs) may be used:

a. Up to 24 hours after unprotected sex
b. Up to 72 hours after unprotected sex
c. Up to 120 hours after unprotected sex
d. Up to one week after unprotected sex

30. To initiate and maintain breastfeeding for the newborn, the most important thing to do is:

a. Baby should be cradled by the mother on her chest for the better part of the day to be near the breast
b. Breasts should be massaged three times a day with hot water to facilitate for the let down
c. Starting to breastfeed the newborn soon after birth
d. Mother should wait for three days before the milk form in the breasts

APPENDIX 11: RESPONDENTS' CONSENT FORM

Research on Emergency Obstetrics and Newborn Care (Emonc): Assessment, Training Intervention and Its Outcome in Embu and Meru Level 5 Hospitals, Kenya

Dear respondent,

My name is Mrs Lucy Gitonga (**Tel no. 0727519526**). I am a student at the University of Nairobi pursuing a degree in Doctor of Philosophy in Nursing. One of the requirements for the award of the degree is to carry out a research. In this regard, I am carrying out a research on **"Research on Emergency Obstetrics and Newborn Care (Emoc): Assessment, Training Intervention and Its Outcome in Embu and Meru Level 5 Hospitals, Kenya".** The research has undergone all the stages of Ethical approval and has been approved. It involves interviewing of midwives in the two hospitals.

In order to obtain the information, a questionnaire will be utilized. I am kindly requesting you to participate in the study by filling the questionnaire. Participation is voluntary and you can withdraw at any stage. There is no risk involved. The information you provide will be treated with total confidentiality as permitted by law. No name is required anywhere in this questionnaire.

The results will help in identifying the gaps in knowledge and skills in Essential maternal and neonatal care with the aim of improving the midwives competences which will consequently help in improving maternal and neonatal health. As a person, you will benefit by participating in the training.

If you wish to know the results, they will be availed to you when finalized. You may ask questions about your rights as a participant or anything else about the research that is not clear to you. The researcher can also be contacted through her mobile phone. My supervisors can also be of paramount help if contacted.

Supervisors

1. Prof Anna Karani**……. 0721519526**
2. Dr Waithira Mirie ……**0727142385**

Thank you for your time.

Respondent's Consent

I have read and understood the above details about the research. I voluntarily agree to participate in the study.

Respondent's sign…….. Date…….

Investigator's sign……Date……

APPENDIX 12: REQUEST FOR RELEASE OF MIDWIVES TO ATTEND THE TRAINING

Lucy Kawira Gitonga
C/O School of Nursing Sciences, UON
P.O. BOX 423-00202, **Nairobi**

5th December, 2013

The Medical superintendent,
Meru / Embu Level five Hospitals,
Attention: Nursing officer in charge.

Dear Madam,

Re: Training of Midwives on EmONC

I thank the management to allow me to do research in your hospital. As discussed earlier verbally, I would like to request you to release the midwives that were selected to participate in the above mentioned training. The training will take 18 days comprising of 8 days theory and 10 days practical experience. The midwives will practice in their respective hospitals hence will be away for only 8 days. I would also request you to avail a training venue within the facility. Teas and lunches will be provided to the participants by the facilitator.

The training will start on 10th December 2013.

Yours faithfully,

LUCY K. GITONGA
Tel. 0727519526

APPENDIX 13: PARTICIPANTS' TRAINING AND EVALUATION FORM

Integrated Maternal and Newborn Clinical Skills Course Evaluation

1. What were the strong points of the classroom portion of this clinical skills course?

……
……
……

2. How would you improve the classroom portion of the course? What are your recommendations?

……
……
……

3. What were the strong points of the clinical practicum? Did you have enough practical experiences in clinical to feel competent and confident in your newly acquired skills?

……
……
……

4. How would you improve the clinical practicum? What are your recommendations?

……
……
……

5. What seemed to be the most innovative thing that you learned during this clinical skill
course?.....
.....
.....

6. How will you put what you learned into practice when you return to your place of work?.....
.....
.....

APPENDIX 14: MAP WITH COUNTRIES BY CATEGORY ACCORDING TO THEIR MATERNAL MORTALITY RATIO (MMR, DEATH PER 100 000 LIVE BIRTHS), 2010

Legend