KNOWLEDGE, ATTITUDES, AND PRACTICES OF INTRAPARTUM CARE AMONG OBSTETRIC CARE PROVIDERS IN RURAL KENYA

by

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A Dissertation
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DEDICATION

Now to him who is able to do immeasurably more than all we ask or imagine, according to his power that is at work within us, to him be glory… throughout all generations, for ever and ever! Amen. Ephesians 3:20-21

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LIST OF ABBREVIATIONS AND/OR SYMBOLS

AMTSL ..... Active Management of the Third Stage of Labor
CRR ..... Center for Reproductive Rights
CCT ..... Continuous Cord Traction
EmOC ..... Emergency Obstetric Care
FIDA ..... Federation of Women Lawyers-Kenya
MDG ..... Millennium Development Goals
MMR ..... Maternal Mortality Ratio
MOH ..... Ministry of Health
OCPs ..... Obstetric Care Providers
PPH ..... Postpartum Hemorrhage
SDG ..... Sustainable Development Goals
SMI ..... Safe Motherhood Initiative
UNFPA ..... United Nations Population Fund
WHO ..... World Health Organization

ABSTRACT

KNOWLEDGE, ATTITUDES, AND PRACTICES OF INTRAPARTUM CARE AMONG OBSTETRIC CARE PROVIDERS IN RURAL KENYA

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This descriptive, cross-sectional survey study examined the knowledge, attitudes, and practices of intrapartum care among obstetrics care providers in rural Kenya using the Three Delay Model framework. After IRB authorization, data were collected from a convenience sample of obstetric care providers (N = 326) in 16 Nandi County facilities, using a self-report survey. The research questions were answered using descriptive statistics, independent T-tests, one-way ANOVA, and Spearman's rho correlations. The total mean knowledge score was below accepted international standards (M = 61.46%, SD = 9.8); only 14 providers scored 80% or higher (demonstrating competency in intrapartum care). The measured knowledge and self-reported practices among the providers in rural Kenya were below accepted international guidelines. The providers' confidence in treating obstetric emergencies was not significantly associated with their knowledge or practices related to such emergencies. These findings support a need for the

adoption of evidence-based policies and procedures and increased training in emergency obstetric care to improve the knowledge, attitudes, and practices of obstetric care providers in Nandi County.

CHAPTER ONE

No mother should die giving life. Every day nearly 800 women around the world die from preventable pregnancy and childbirth complications, and 99% of these mothers are from developing or underdeveloped countries (Falconer, 2010; van den Broek & Falconer, 2011; WHO et al., 2014). The children who are left without a mother are vulnerable and are 10 times more likely to die within two years of birth compared to children with mothers (Falconer, 2010; Pande et al., 2015; WHO et al., 2014). These children are also less likely to receive an education, proper nutrition or healthcare (Falconer, 2010; Pande et al., 2015, 2015; WHO et al., 2014). For every mother who dies, nearly 20 other women suffer a major injury or disability resulting from pregnancy and childbirth complications (Falconer, 2010; Pande et al., 2015; WHO et al., 2014). Maternal death refers to the death of a woman during pregnancy or within 42 days of delivery or termination of pregnancy (WHO, 2015; WHO et al., 2014). Most maternal deaths are preventable, and yet we continue to lose our women at the prime of their life. This dissertation aims to understand the knowledge, attitudes, and practices about intrapartum care that are reported by healthcare providers in one part of rural Kenya.

Background and Significance

Kenya alone reported approximately 6,300 maternal deaths in 2013 (WHO et al., 2014). The lifetime risk of a woman dying due to pregnancy or childbirth complications in Kenya is 1 in 53 (WHO et al., 2014). This risk is extremely high especially when compared to the lifetime risk of a woman in the United States (1 in1,800) or a woman in Europe (1 in 3,300) dying of the same complications (WHO et al., 2014). The World Health Organization (WHO) refers to the number of maternal deaths at a given time per 100,000 live births in same time period as maternal mortality ratio (WHO et al., 2014). In 2013 the maternal mortality ratio (MMR) in Kenya was 400 maternal deaths per 100,000 live births. The goal of reducing the MMR to 147 maternal deaths per 100,000 live births by 2015 as part of the Millennium Development Goals (MDGs) was not achieved (Way, 2015).

Causes of maternal death

The lack of knowledge on recognizing the danger signs, poor access to health care facilities, poor quality health services, and the use of unskilled birth attendants are some of the reasons why women are dying due to pregnancy and childbirth complications (Oladapo et al., 2015; Van den Broek & Falconer, 2011). More than half the maternal deaths in the world are directly caused by hemorrhage (27.1%), hypertensive disorders (14%), sepsis (10%), obstructive labor (8%), and complications of abortion (12%) (Illah, Mbaruku, Masanja, & Kahn, 2013; Oladapo et al., 2015; Way, 2015; WHO et al., 2014). HIV, malaria, diabetes, hepatitis, anemia, and other indirect causes of maternal death account for another 20% of pregnancy-related mortality (WHO et al., 2014).

Many maternal deaths are preventable, and many effective interventions can be implemented and utilized even in the poorest nations. For example, death due to hemorrhage can be prevented by the use of active management of third stage of labor (AMTSL), administration of uterotonic agents, availability of blood products, or surgical interventions (Campbell & Graham, 2006; Oladapo et al., 2015). In the case of hypertensive disorders, the correct diagnosis and initiation of treatment with magnesium sulfate and other antihypertensive medication can save a life (Campbell & Graham, 2006; Oladapo et al., 2015). Good hygiene, sterilization of equipment, and prompt antibiotic treatment can prevent maternal death from infection or sepsis (Campbell & Graham, 2006; Oladapo et al., 2015). When it comes to obstructive labor, proper documentation using a partograph can help providers identify the optimal time to intervene with an assisted vaginal delivery or a cesarean delivery (Campbell & Graham, 2006; Oladapo et al., 2015). Maternal deaths due to indirect causes can be prevented with treatment of the underlying problem: nutritional supplements for anemia, antimalarial medication to treat malaria, and antiretroviral medication for HIV disease (Campbell & Graham, 2006; Oladapo et al., 2015; Prata, Sreenivas, Vahidnia, & Potts, 2009).

Accurately predicting which pregnant and post-partum women will develop complications and possibly die is a challenge. Timing is important in the identification and management of complications. Interventions may be less effective when there is a delay in any of the following areas: Identifying the problem, deciding to seek care, reaching a healthcare facility, transferring to a higher level facility, getting the correct

diagnosis, or initiating the appropriate action at the facility (Falconer, 2010; Oladapo et al., 2015; van den Broek & Falconer, 2011).

Initiatives to reduce maternal mortality

There have been several local, national, and global initiatives to reduce maternal mortality. In 1987, the Safe Motherhood Initiative (SMI) was launched in Nairobi, Kenya. The SMI goal was to reduce maternal mortality by 50% by the year 2000. The SMI interventions focused on promoting family planning to reduce unintended pregnancies, providing basic maternity care to all women, and preventing and managing complications during pregnancy, delivery and postpartum (Lissner, 2001). The SMI goals were not met by the year 2000, especially in countries with the highest numbers of maternal deaths (Family Care International, 2007).

In 2000, 189 United Nations member states adopted eight millennium development goals (MDG) to be achieved by the year 2015. The goals of MDG #5 were (a) to improve maternal health by reducing maternal mortality ratio by three-quarters and (b) to achieve universal access to reproductive health for women. Globally, the maternal mortality is almost 50% of the1990 level, so significant progress has been made (Way, 2015). However the 75% target was not attained (Way, 2015). In January 2016, new Sustainable Development Goals (SDG) went into effect; goal # 3.1 is to reduce the global maternal mortality ratio to less than 70 per 100, 000 live births by the year 2030 (United Nations, 2015).

In 2006, the Vision 2030 initiative was launched in Kenya. Vision 2030 was a development plan aimed at improving the quality of life for all Kenyans and boosting the

economy. The reduction of infant and maternal mortality was explicitly identified as a goal to achieve within the first five years (Ministry of Health, Kenya, 2012). In 2010, the Ministry of Health released a national "road map" to accelerate the achievement of the MDG #5 components related to maternal and newborn health. The road map included the Kenya Maternal Newborn Health Model, which placed new emphasis on having skilled attendants and an environment that enabled providing quality care, treating all patients with respect, and encouraging male involvement in maternal health (Republic of Kenya, 2010). Starting in June 2013, all Kenyan public or government healthcare facilities were required to provide free antenatal and maternity services. Women who could not afford the high cost of healthcare now have access to hospitals.

The government has set aside funds for the establishment of two fully equipped diagnostic centers in every county. Counties are also receiving equipment through the Beyond Zero Foundation, an initiative of the first lady of Kenya, Margaret Kenyatta. In 2014, Mrs. Kenyatta started an annual half marathon event to raise money for the foundation. To date, the Beyond Zero foundation has delivered more than 21 mobile clinics to rural counties in Kenya. The goal is to see zero women die from preventable causes (Office of The First Lady, 2014).

Study site

Nandi County has been selected as the site for this study. It is one of the 47 counties in Kenya, in East Africa. Nandi County occupies an area of 2,884 km^2 in the Great Rift Valley and has an estimated population of 752,965. In Nandi County, the doctor to population ratio is 1:53,333 and the nurse to population ratio is 1:284 (Republic

of Kenya County Government of Nandi, 2013). In Kenya, 6,300 women were reported to have died from pregnancy related causes in 2013, and 98.7% of these deaths occurred in just 15 of the nation's 47 counties (UNFPA, 2014). The actual number of maternal deaths is likely even higher, given that only 43.8% of births are attended by health personnel and even at healthcare facilities many births and deaths are not properly recorded (Ministry of Devolution and Planning, 2013). Nandi County had the 7th worst number of known maternal deaths, with 266 fatalities reported in the county in 2013 (UNFPA, 2014).

Problem Statement

A seemingly normal delivery can quickly turn into a life threatening situation. It is for this reason that all facilities providing maternity services should have Emergency Obstetric Care (EmOC) readily available. In Kenya, 80% of women live in the rural areas (WWICS & APHRC, 2011), and most rural facilities in Kenya are weak in emergency obstetric care. In total, about 14,700 women and girls in Kenya are estimated to die due to pregnancy and childbirth complications each year (WWICS & APHRC, 2011) . In addition, 294,000 to 441,000 women and girl in Kenya suffer from disability resulting from pregnancy and childbirth complications (WWICS & APHRC, 2011) . The majority of these deaths and disabilities occur in rural areas (WWICS & APHRC, 2011).

More than half of women in Kenya choose to deliver away from healthcare facilities (Way, 2015). This may be due to the abusive treatment some women report in the hands of skilled providers. Mothers report receiving little or no respect from the healthcare providers in many facilities, and they may be left at the mercy of the healthcare providers as family members are turned away (CRR & FIDA, 2007; Wendy

Holmes & Maya Goldstein, 2012). Women have reported that in some situations they have to deliver their babies in facilities that are dirty, unsanitary, and lacking privacy (CRR & FIDA, 2007).

An audit of 111 maternal deaths in the Central Province of Kenya revealed that 34% of the women who died during the intrapartum period died within 24 hours after being admitted in normal labor and in stable condition, and 37% of these maternal deaths occurred during the immediate postpartum period (Muchemi & Gichogo, 2014). This study indicates that there are facility related factors placing these mothers at a risk of dying while in the hospital. There is an expectation that all maternity wards are staffed with obstetric care providers who are knowledgeable in evaluating patients, identifying complications, making the right diagnosis, implementing the appropriate intervention and transferring patients to a higher level of care without delay. Research is needed to understand possible contributors and to asses if health centers meet the minimum standard of obstetric care (Fotso & Mukiira, 2012; Yego et al., 2013). Improving access to healthcare facilities and providing the essential materials and equipment is not enough. It is important to ensure that the OCPs are well prepared to provide equal, safe and quality intrapartum care.

This KAP Survey will identify OCP knowledge gaps, beliefs, and behavioral patterns, and this insight may facilitate understanding of the problem and the identification of resource needs and priority areas. OCPs are in a position to provide invaluable information on areas in need of attention or improvement. This study will

further research in maternal health by informing practice and policy change in providing quality maternal health, which may save women's lives.

Purpose Statement

The purpose of the study is to examine the knowledge, attitudes, and practices of intrapartum care among obstetric care providers in Nandi County, Kenya.

Research Questions

1. What is the obstetric care providers' knowledge of intrapartum care?
2. What are the obstetric care providers' attitudes about intrapartum care?
3. What are the obstetric care providers' intrapartum care practices?
4. What are the associations among, clinical experience, knowledge, attitudes, and practices of obstetric care providers?

Conceptual Framework

The Three Delay Model, which was developed in 1994 as a framework for analyzing maternal mortality (Thaddeus & Maine, 1994), will be the framework used in this study (Figure 2). The three phases of delay are: (1) the delay in deciding to seek care; (2) the delay in reaching an adequate healthcare facility; (3) and the delay in receiving adequate care at the facility. The three delay model has been used in many studies in Africa. For example, the model has been used as the framework to explore the causes and circumstances surrounding maternal mortality and severe morbidity in Liberia (Lori & Starke, 2012); examine the barriers of timely access to emergency obstetric care services in cases of survivors of severe obstetric complications and cases resulting in perinatal deaths in Gambia (Jammeh, Sundby, & Vangen, 2011); explore the birth experiences of women affected by fistulas in Tanzania (Mselle, Kohi, Mvungi, Evjen-Olsen, & Moland,

2011); investigate the acceptability and barriers to the recommended evidence-based practices to improve practices for better neonatal outcome in eastern Uganda (Waiswa et al., 2008); and examine the causes and contributors to newborn deaths in rural Uganda (Waiswa, Kallander, Peterson, Tomson, & Pariyo, 2010). The main concepts of the three delay model are discussed below.

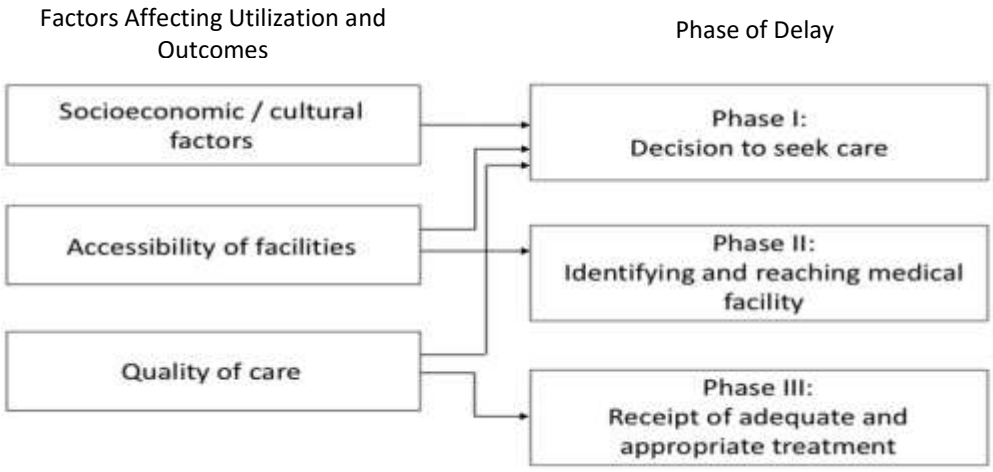


Figure 1 The Three Delay Model.
From Knight, H. E., Self, A., & Kennedy, S. H. (2013). Why Are Women Dying When They Reach Hospital on Time? A Systematic Review of the "Third Delay." PLoS ONE, 8(5), e63846.

Phase I: Delay in deciding to seek care

The first delay is the time lapse between the onset of complication and the decision to seek care. Lack of recognition of a problem or the lack of realization of the severity of the situation may lead to a delay in making the decision to seek care. In some cases, cultural issues such as the husband or mother-in-law controlling the finances and making decisions for the pregnant woman (Mselle et al., 2011). Another reason why

women may hesitate to seek care is the fear of being mistreated at the healthcare facilities. Some healthcare providers have a reputation of being rude or even cruel to patients, and the fear of being neglected, abused, or disrespected by the healthcare providers may play a role in the decision making on seeking care (Barnes-Josiah, Myntti, & Augustin, 1998; Mselle et al., 2011; Waiswa et al., 2008). In one study, 50% of the maternal deaths were attributed to the delay to seek care (Waiswa et al., 2010). The decision to seek care is crucial for maternal survival.

Phase II: Delay in reaching an adequate healthcare facility

The second delay is the time it takes to get to an adequate healthcare facility from the time the decision to seek care was made. Most developing countries do not have enough accessible healthcare facilities. Women travel long distances to reach healthcare providers. A lack of reliable transportation, too few paved roads, and genuine security concerns may hinder women's efforts to access healthcare facilities. Women also have to travel longer distances to seek care at night in places where some healthcare facilities are closed after dark. In some cases, women may reach one facility and require a transfer to a higher level facility, but have no mode of transport to get them there. Reaching an adequate healthcare facility can significantly impact maternal survival rate (Lori & Starke, 2012).

Phase III: Delay in receiving adequate care

The third delay is the time it takes from when the patient arrives to the healthcare facility, when a skilled provider evaluates the patient, makes a correct diagnosis, and intervenes appropriately. Timely provision of care may be impacted by late or wrong

diagnosis, or by incorrect actions by the healthcare providers. All healthcare facilities should be staffed with providers who are well trained and qualified to handle complications. Patients are reluctant to seek care in facilities where they do not trust the providers, or they do not feel supported, or feel neglected, or health workers are rude, corrupt, or absent from work (Mbaruku, van Roosmalen, Kimondo, Bilango, & Bergström, 2009; Mselle et al., 2011; Thaddeus & Maine, 1994; Waiswa et al., 2008). Improving the quality of care may not only reduce maternal deaths, but it may also help reduce the patients delay in seeking care significantly.

Three delay model use in Kenya

In Kenya the three delay model has been used in the *National Guidelines for Quality Obstetrics and Perinatal Care* reference manual (2012). Every facility providing reproductive health services or reproductive health training is required to have a copy of this manual available for reference. The manual highlights the significance of proper time management in obstetric care. OCPs are encouraged to always identify the problem they are dealing with clearly, know the urgency required to deal with the complication, constantly evaluate the effectiveness of their management, and also be aware of the distance or time to the next level of care (Ministry of Health, Kenya, 2012). To eliminate avoidable delays, Kenya needs skilled obstetric care providers. Skilled providers should be proficient in managing normal labor, diagnosing complications, managing complications, and making appropriate referrals. The three delay model is a good fit for this study. OCPs are in a position to and have the capability to address the delay in receiving adequate care at a facility. In this study, we will examine what OCPs know

about intrapartum care, how they provide intrapartum care, and how they feel about the care they are providing.

Conceptual and Operational Definitions

In this study, Intrapartum care refers to the care provided to patients during normal labor and delivery, the immediate post-delivery time period, and the management of complications during labor and delivery. The conceptual and operational definitions of the variables examined in this study are described below (Table 1).

Table 1 Conceptual and Operational Definitions

Variable	Conceptual Definition	Operational Definition
Knowledge	Knowledge is what the obstetric care providers know about providing intrapartum care.	Knowledge will be measured using 30 multiple choice questions. 1. 10 questions on normal labor and childbirth. 2. 10 questions on immediate newborn care. 3. 10 questions on the management of complications.
Attitude	Attitudes about obstetric care providers, perceptions, beliefs, and misconceptions about pregnancy and childbirth, and how the obstetric care providers feel about their knowledge and their educational activities.	1. Attitude: OCPs will be asked to rate how much they agree or disagree with 8 common perceptions about pregnancy, childbirth, and the period immediately after childbirth, on a 5 point Likert scale (1= strongly disagree; 2= disagree; 3=neither agree nor disagree; 4= agree; 5= strongly agree). 2. Perceived knowledge: OCPs will be asked to rate their knowledge and their coworkers knowledge using 7 statements on a 5 point Likert scale. (1=extremely poor; 2= below average; 3= average; 4= above average;

Variable	Conceptual Definition	Operational Definition
		5=excellent) 3. Perceive education: OCPs will be asked to rate the usefulness of educational activities for reducing maternal mortality in their environment- 5 statements on a 5 point Likert scale (1=not at all useful; 2= somewhat useful; 3= useful; 4= very useful; 5=extremely useful).
Practices	Practices is what the obstetric care providers do when providing intrapartum care. Practices also include the actions taken by the facility in terms of personnel training, supplying equipment, and providing the essential drugs needed for emergency obstetric care.	1. Practice: OCPs practice will be measured by 5 questions on a 5 point Likert scale. OCPs will be asked indicate the frequency of their actions and their coworkers actions in providing intrapartum care (1= never; 2=rarely; 3=sometimes; 4= often; 5=always).The questions on how frequently OCPs use fundal pressure during delivery will be transposed during analysis so that 1= always to 5=never. 2. Confidence: OCPs will be asked to rate their personal confidence in providing emergency Obstetric care. 5 statements on a 5 point Likert scale (1=not at all confident; 2= somewhat confident; 3= confident; 4= very confident; 5=completely confident). 4. Effect on EmOC: The OCPs will be asked to rate how much the listed occurrences affect emergency Obstetric care at their facility. 10 statements on a 5 point Likert scale (1=not at all; 2= slightly; 3= moderately, 4=very much 5=extremely).

Variable	Conceptual Definition	Operational Definition
Clinical Experience	Clinical experience is the obstetric care providers' direct participation or personal encounter in events related to providing intrapartum care.	Experience will be measured using self-reported: 1. Years of providing intrapartum care. 2. Number of hours worked per month. 3. Number of deliveries. 4. EmOC training. 5. Number of maternal deaths witnessed. 6. Number of postpartum hemorrhages managed.
Open Ended Questions	Obstetric care providers' identified facility problems in intrapartum care and solutions.	1. In your opinion what are the two greatest problems facing this health facility in the delivery of intrapartum care right now? 2. What are the solutions to this problems?
Demographic Characteristics	Individual characteristics that identify participants into groups.	Information on each participant's title, gender, age, free maternity care, type of facility they work and facility affiliation. No personal or identifiable information will be collected.

Summary

Maternal mortality is a global issue which has placed an enormous burden on developing nations. In rural Kenya, we want to see improved health, increased number of patients with complications receiving hospital care, decreased time from admission to treatment, and increased survival of women admitted in the hospitals with complications. To achieve this, the hospitals need to be staffed with well-trained obstetric care providers, have established blood banks, and have essential drugs, supplies and equipment. The majority of women in Kenya live in rural areas where there is limited access to quality healthcare services. Efforts are being made at the government level to improve access to

care and to adequately equip healthcare facilities. OCPs need to be at the forefront in the fight to save women's lives for the country to make any real progress towards reducing maternal deaths. Access to health care and well equipped facilities will not make a difference in the efforts to save the lives of women without skilled OCPs. Addressing the delay in time from arrival to facility to evaluation by a qualified OCP, diagnosis, and the implementation of correct treatment or plan of care is essential for preventing the avoidable deaths of hospitalized patients. This study will seek to examine the knowledge, attitudes, and practices of intrapartum care among obstetrics care providers in rural Kenya using the three delay model framework.

CHAPTER TWO: LITERATURE REVIEW

This chapter presents a review of current literature on the knowledge, attitudes and practices of intrapartum care among obstetrics care providers. The chapter will provide information on the literature search process and the current literature about obstetric care providers' knowledge, attitudes, and practices of intrapartum care.

A literature search was conducted using CINAL, Psych Info, Medline, Global Health and the Cochrane Library databases for original research studies on the knowledge, attitudes and practices of intrapartum care among obstetrics care providers; reducing hospital based maternal mortality; and the "third delay" in Kenya. The following literature review code was entered in the selected databases: [("health knowledge attitudes practice" or "attitude of health personnel") and (obstetrics care providers or caregivers or "health personnel" or "professional practice" or doctors or nurses or midwives or "clinical competence" or "maternal health services" or "reproductive medicine") and ("intrapartum care" or "maternity care" or "labor and delivery" or childbirth or "maternal mortality" or pregnancy) and ("Third delay" or perceptions) not (HIV or Malaria) and (Kenya or Africa)]. The results were limited to studies reported from the year 2004 to 2015 to be current. There was no limitation on publication language. Additional academic articles and reports cited on seminal works were also retrieved for review.

A total of 33 studies focusing on healthcare providers were identified and reviewed. After the first reading, all the studies discussing patient's opinion, technology, and accessibility to care were eliminated from the review. Articles with patients as the population of interest were also eliminated. Intrapartum care includes normal labor, immediate newborn care, management of complications and immediate postpartum care. On further review, studies which assessed or evaluated only one aspect of intrapartum care such as the use of partograph, postpartum hemorrhage, patient referral, or preeclampsia were also excluded from review. Based on these criteria, only six articles were relevant to this study (Bayley et al., 2014; Chodzaza & Bultemeier, 2010; CRR & FIDA, 2007; Kagema et al., 2010; Mirkuzie, Sisay, Reta, & Bedane, 2014; Puri et al., 2012). However, none of the studies retrieved explicitly addressed the knowledge, attitudes, and practices of intrapartum care among OCPs in rural Kenya or in Kenya as a whole.

There are major weaknesses in the obstetric care provided in Kenyan health facilities. Women have reported abuse and neglect at the hands of healthcare providers. The federation of Women Lawyers-Kenya (FIDA) and the Center for Reproductive Rights (CRR), collected information from 120 women, healthcare providers, medical association leaders, and licensing and regulatory bodies' officials, for a qualitative study to investigate the state of obstetric care in Kenya (CRR & FIDA, 2007). The report paints a grave picture of how the women are treated while in labor. Most of the report appears to focus on Pumwani Maternity Hospital, which is the biggest and busiest maternity hospital in Kenya. The sample was made up of women living in Nairobi and Nyanza. Some

women report that their family members are turned away at the entrance and the women are left to figure their way to the maternity ward without any assistance. Other women report physical abuse; OCPs are known to pinch, slap, or beat patients who do not follow instructions. The delivery rooms are reported as being dirty and unsanitary. Some women have no choice but to wipe down the delivery bench with their own clothes and deliver on a contaminated surface. Medical students, nursing students, or other unqualified personnel were reports as sometimes being the only available providers performing procedures without supervision. This places women at risk of poor maternal outcomes. A few of the women interviewed reported that their experiences led them to make the decision to stay away from healthcare facilities for future deliveries. The healthcare providers reported that they are understaffed, overworked, poorly compensated, and forced to work without essential materials or equipment. In this study the writer states that women were quick to report that not all healthcare providers were abusive or bad, but the negative experiences had a greater impact.

The quality of maternal and newborn care provided in Kenya is below the internationally accepted standards of care (Kagema et al., 2010). Kagema et al. assessed the care received by mothers and newborns during antenatal and delivery care in a representative sample of 695 health facilities in Kenya. Labor and delivery services were provided in 207 of those facilities. The study examined the quality and frequency of interventions which address the direct causes of maternal and newborn death. In this study 234 health workers were interviewed, 1409 antenatal consults were observed, and 626 deliveries were observed. Eight providers from each facility were included in the

study. The most senior providers were selected for the interviews and observations. In regards to labor and delivery care, the results were disappointing. On average, the providers' knowledge score was below 80% in all areas; they scored 71% on knowledge of routine labor and delivery care. Essential supplies for immediate newborn care were available in 91% of the selected facilities, but the knowledge score on the actions to manage asphyxiated newborns was poor; only 12% of the providers knew all the steps. Postpartum hemorrhage is one of the major causes of maternal death. Almost all women with PPH were given oxytocin, but less than 1% of the providers knew all the correct steps to manage PPH. In addition, the providers had an unacceptably average knowledge score of 43% on the signs of PPH. Pre-eclampsia is the other major cause of maternal death. The study found that even though 83% of the providers knew how to diagnose pre-eclampsia, only 1% of the providers knew all the steps to manage severe pre-eclampsia. The knowledge score on signs of sepsis and actions to manage sepsis was 41%. The health workers practices were also below national standards. For example, only 36% of the providers performed hand washing before and after patient examination, increasing the patients' risk of infection. The partograph was used 88% of the cases observed, but only 4% of the providers were familiar with all the correct steps to manage obstructed labor. There were no harmful practices noted on 80% of the deliveries, but 10% of the providers performed fundal pressure, which should be avoided, during delivery. This study demonstrated the need for improving health workers knowledge and skills in providing labor and delivery care in Kenya. A major limitation in this study was that the

highest ranking or most educated provider was interviewed for the study. The scores may not give a true picture of all the providers' knowledge or skill levels.

Obstetric care providers in Bugesera, Rwanda, demonstrated poor knowledge and practices in basic safe motherhood services (Puri et al., 2012). In this study 168 OCPs (137 A2 level nurses) had a 46.9% overall knowledge score. The poorest scores were in the management of complications (37.1%) and management of normal labor (39.3%). Other troubling results included the use of fundal pressure by 60.8% of the interviewed providers. The WHO recommends the use of active management of the third stage of labor (AMTSL) after all deliveries. Oxytocin use was reported as 80.4% (95% CL 74.9-85.9), but less than 50% of the providers preformed the other maneuvers, cord traction 40.2% (95% CL 33.0-47.3) and uterine massage 43.3% (95% CL 36.1-50.6). The majority of the OCPs were nurses. The OCPs reported a need for educational activities to improve their obstetric care knowledge. The survey instrument used in this study is the one adopted for use in the Nandi County study.

The knowledge score of routine labor (80%) in Malawi was higher than in Kenya and Rwanda (Bayley et al., 2014). However the knowledge scores of emergency obstetric care (70%) and neonatal care (58%), were below national standards. The sample in this study was relatively small compared to the two studies mentioned above. The sample was made up of 57 providers (42 nurse midwives, 2 clinical officers, 2 medical assistants, and 5 other staff), from 3 districts in Malawi. Providers reported a negative perception of the care they provide: only 50% of the providers would recommend their families and friends to receive care at the facilities where they work. Less than half the providers (42%) felt

like they gave adequate obstetric care. These results were similar to the findings of a qualitative study of the health workers' perception of the quality of and factors which impact provision of quality emergency obstetric care in Malawi (Chodzaza & Bultemeier, 2010). Fourteen providers from Mwanza district hospital rated the quality of emergency obstetric care they provide as poor. The lack of adequate resources, inadequate staffing levels, lack of team work, unsatisfactory knowledge, and insufficient supervision were some of the factors identified as contributors to the poor quality of care in the healthcare facilities.

An Ethiopian study identified healthcare providers' insufficient knowledge as the reason for continued poor quality of obstetric care (Mirkuzie et al., 2014). An evaluation of interventions implemented in Addis Ababa hospitals revealed an improvement in the infrastructure, medical supplies, and the number of personnel available to provide emergency obstetric and neonatal care, but did not reveal any significant change in the providers' competences. The interventions used included the Helping Mothers to Survive simulator for the management of PPH, and the Helping Babies Breath simulator for the neonatal resuscitation training. Using simulators for training can be expensive and unattainable for many hospitals in developing countries. The study suggests that the training should be designed to address specific needs depending on the individual facility.

A major limitation in the studies reviewed is the small sample sizes used. The majority of the OCPs in the studies were nurses. The studies were not able to examine and compare the knowledge and practices of OCPs by cadre. There are no published studies on knowledge, attitudes, and practices of obstetrics care providers providing

intrapartum care in rural Kenya. However there is a probability that the knowledge, attitudes, and practices of OCPs are below international standards. Finding out what the OCPs know, how they feel about the care they give, and how the practice intrapartum care can help identify areas that need improvement. In this study the OCPs will provide information on their knowledge, attitudes, and practices in intrapartum care and the results will be examined to identify problematic areas.

CHAPTER THREE: METHODS

This chapter presents a description of Nandi County, study sample characteristics, instrumentation, data collection procedures, data analysis, and the study's ethical consideration. The study was a descriptive cross-sectional survey study targeting obstetric care providers working in healthcare facilities offering maternity care in Nandi County, Kenya. The appropriate permissions and human protective approvals were obtained before the study. A convenience sample drawn from healthcare facilities providing 24 hours emergency obstetric care in the county was used.

Sample Characteristics

The study target population was doctors, nurses, midwives, and clinical officers involved in intrapartum patient care. The goal was to include all the active OCPs (100%) on duty at the selected facilities on the data collection days.

Inclusion criteria: Obstetric care providers who provide any intrapartum care such as, triaging pregnant patients, labor support, deliveries, and immediate newborn care were to be included in this study.

Exclusion criteria: Obstetric care providers who did not provide any intrapartum care were to be included from this study.

Obstetric care providers in Kenya include Specialists, Medical Officers, Doctors, Clinical Officers, and Nurses. There are three levels of nursing training approved by the

Nursing Council of Kenya, Certificate, Diploma and Degree. All health care providers are certified and registered by their respective professional associations. The Health Information System Officer of Nandi County reported that there are 464 OCPs in Nandi County (Table 2). There is a possibility that inactive providers have been included in the stated 464 providers. Therefore, information on the number of active OCPs at each selected facility was collected to ensure an adequate sample size.

Table 2: Nandi County Obstetric Care Providers

Provider	Number
Doctors	13
Nurses	390
Midwives (373)	
Nurses (17)	
Clinical officers	61
Specialist (24)	
General (37)	
Total	**464**

In Nandi County there are two District Hospitals, three Sub-County Hospitals, two Nursing Homes, seventeen Health Centers, ninety six Dispensaries, five Private Clinics, and four Mission Hospitals. Both public and private healthcare facilities are included in that tally, and this roster includes facilities affiliated with the Government, Faith Based Organization (FBO), Quasi-Government, For-Profit Organization, or Not-For-Profit Organization. The government-run hospital system is made up of six levels. The highest level of care is Level 6- National Referral Hospital (tertiary), which provides specialized services at the national level, training for specialized cadres of health works,

serves as a center for research, and receive patients from other hospitals and institutions within and outside Kenya. Level 5- Provincial and General Hospitals (secondary) provide specialized care including comprehensive obstetric care, intensive care and life support. Level 4- Sub-District Hospital and District Hospitals (primary) usually provide comprehensive medical and surgical services, and some facilities offer Caesarian delivery. Level 3- Health Centers, including Maternity and Nursing Homes, provide many of the ambulatory health services, curative, inpatient, maternity, and referral services. Level 2- Dispensary and Clinics mainly provide outpatient curative and preventative care. Level 1- Community units include activities in the village or community which encourage healthy behaviors and help the community identify signs and symptoms that need to be referred to other levels of care (Luoma et al., 2010). For this study, all selected facilities provide maternity care services daily for 24 hours a day.

Instrumentation

A self-report survey was used in this study. The survey had been used in the study *Knowledge, attitudes, and practices in safe motherhood care among obstetric providers in Bugesera, Rwanda* (Puri et al., 2012). The focus of this study was intrapartum care, therefore 20 knowledge questions on antenatal and postpartum care were eliminated from the survey. All other questions were included in both the Rwanda and the Kenya questionnaires. The survey was developed from *Jhpiego Guidelines for assessment of skilled providers after training in maternal and newborn health* (Blouse, 2004). Jhpiego is an international non-profit health organization affiliated with The Johns Hopkins University, dedicated to improving the health of women and families in developing

countries. Jhpiego and WHO training manuals have been used extensively in the training of healthcare providers in developing countries including Kenya, as such this instrument was appropriate for this study.

Information about the facilities was collected from each facility using a facility information form. The researcher inquired about the type of facility, facility affiliation, availability of a blood bank, and number of maternity beds, cost to receive care, ability to perform services, number of trained personnel, number of births in 2014, and the availability of the Ministry of Health reference guide at the facility.

Data Collection Procedures

For this study, a paper-and-pencil survey was used. A paper-and-pencil survey is less intrusive, time saving, cost effective, minimizes interviewer bias and reaches a larger number of people. Data were collected between November 27th and December 13th, 2015. The County Director of Health provided a letter of introduction addressed to all officers in-charge of health facilities in the county. Medical officers' in-charge of each of the selected facilities were contacted by the researcher, given the letter of introduction, familiarized with the study, and participant recruitment fliers posted on the facility notice board.

On the day of data collection, all study participants were given the survey and a commemorative lapel pin, "We're in this together." The estimated time for survey completion was estimated as 20 to 25 minutes. The participants were required to complete the survey on site and to return the completed survey to the researcher. Envelopes were available for respondents to use if they chose to return the survey in a

sealed envelope. All respondents were given a copy of *The Obstetrics, Gynecology, and Infertility Handbook for Clinicians,* as a token of appreciation. The surveys were numbered sequentially and categorized by facility. There was no personally identifiable information collected on the surveys or on the envelope.

Data Analysis

Computer software package SPSS v. 23 was used for data entry, data cleaning, and data analysis. The surveys were evaluated for completeness and missing values identified by entering a value starting with the number 99. Surveys with 20% or more missing information in any one main variable were eliminated from data analysis. A second person confirmed the accuracy of data entry by auditing 80 (25%) randomly selected surveys.

Descriptive statistics were used to analyze and summarize the data from the facility information form in terms of the type of facility, facility affiliation, the availability of a blood bank, number of maternity beds, cost of maternity care, services providers, number of trained personnel, number of births in 2014, and the availability of MOH reference guideline.

Obstetric care providers were categorized by qualification into three groups: doctors, midwives, and nurses (Table 3). A new variable "OCPs" was created by transforming the variable "title." Descriptive statistics were analyzed to describe the OCPs demographic characteristics. The file was then split by OCPs and frequencies for gender, age, title, years of experience, and EmOC training calculated.

Table 3 Providers Qualifications

Doctors	- Specialists (Ob-Gyn) - Medical Officers (MO) - Doctors (MD) - Clinical Officers (CO)
Midwives	- Kenya Enrolled Midwife (KEM) - Kenya Registered Nurse Midwife (KRNM) - Kenya Registered Midwife (KRM).
Nurses	- Kenya Enrolled Nurse (KEN) - Kenya Enrolled Community Health Nurse (KECHN) - Kenya Registered Nurse (KRN) - Kenya Registered Community Health Nurse (KRCHN) - Bachelor of Science in Nursing (BScN)

The research questions were answered using descriptive statistics, one-way ANOVA, and Spearmans' rho correlation. To answer the questions:

(1) What is the obstetrics care providers knowledge of intrapartum care? The OCPs percentage score on the knowledge questions were calculated. One-way ANOVA was used to investigate the difference in the knowledge scores between nurses, midwives and doctors, EmOC training, clinical experiences, and gender.

(2) What are the obstetrics care providers attitudes of intrapartum care? Descriptive statistics were used to describe the OCPs attitudes on common perceptions about pregnancy, childbirth, and period immediately after childbirth; how OCPs rated their knowledge, and how they rated their coworker's knowledge; and how useful OCPs felt the educational activities for reducing maternal mortality were in the facilities where they worked.

(3) What are the obstetrics care providers intrapartum care practices? Descriptive statistics were used to describe the OCPs intrapartum practices and their opinion on their

coworker's intrapartum practices, how they rated their confidence in providing emergency obstetric care, and how much various occurrences in the facility affected the outcome of EmOC. One-way ANOVA was used to explore any differences in the same variables between different populations of participants. Spearmans' rho correlation was used to examine the relationship between the OCPs confidence in the management of obstetrics emergencies and OCPs practices.

(4) What are the associations among demographic characteristics, knowledge, attitudes, and practices of obstetrics care providers? The relationship between knowledge, attitudes, practices, and demographic characteristics was examined using Spearman's rho correlation.

Ethical Consideration

The initial approval for this study was obtained from the George Mason University Office of Research Integrity & Assurance (ORIA), after which a research permit was obtained from the National Council for Science and Technology (NACOSTI) in the Kenya Ministry of Higher Education, Science and Technology. An affiliation with Dayster University, Nairobi was confirmed in order to fulfill the NACOSTI requirement that the researcher has to be affiliated with an approved Kenyan institution before approval is granted. This study was also reviewed and approved the Kenyatta University Ethics Review Committee, a local accredited review board, before the research permit was granted.

The participants were informed that participation in the study was completely voluntary. The survey cover page served as the study consent. No signatures, names, or

any other personal identifiable information was collected or written on the survey. There was no reasonable risk of harm to the participants and there were no procedures performed during this study. As such, a waver for written consent had been requested and granted by the ORIA. Completion of the survey was an indication that the participant had consented to take part in the study. Upon completion of the study, two copies of the study report will be submitted to NACOSTI and Kenyatta University as required by the authorizing board.

Summary

After IRB authorization, data were collected from a convenience sample of obstetrics care providers working in the 16 selected Nandi County facilities. Self-reported paper-pencil surveys were completed by consenting OCPs, and a facility information form for each healthcare facility was completed by the researcher. The research questions were answered using descriptive statistics, one-way ANOVA and Speraman's rho correlation.

CHAPTER FOUR: RESULTS

The purpose of this study was to describe the knowledge, attitudes, and practices of intrapartum care among obstetric care providers in Nandi County, in rural Kenya. This chapter briefly reports on the findings of this study.

Survey

Paper-pencil surveys measuring knowledge, attitudes, and practices (KAP) were distributed to 375 obstetric care providers. The survey had a 90% response rate; 337 surveys were returned. Eleven surveys were excluded from the analyses because they were incomplete or they had more than 20% data missing in any one main variable. The final sample (N = 326) represents an 87% completion rate. The reliability statistics for the KAP instrument were acceptable; the Cronbach's alpha for the 72 survey items was 0.84 (Table 4).

Table 4 Reliability Statistics for Knowledge, Attitudes, and Practices Instrument

Reliability Statistics

Items	Cronbach's Alpha (0.84)	N of Items (72)
Knowledge	0.41	30
Normal labor and childbirth	0.35	10
Newborn	0.28	10

Complications	0.28	10
Attitudes	0.83	22
Attitudes	0.49	8
Perceived knowledge	0.91	7
Perceived coworkers knowledge	0.90	7
Educational activities	0.77	5
Practices	0.78	20
Practices providing intrapartum care	0.44	5
Perceived coworkers practices providing intrapartum care	0.54	5
Confidence in providing EmOC	0.88	5
Perception of facility events affecting EmOC	0.77	5

Facility Information

Surveys were completed by obstetric care providers working in 12 government public hospitals and 4 faith-based private hospitals. Figure 2 displays the geographic distribution of the 16 healthcare facilities surveyed in the county. All the government affiliated public hospitals offer free maternity care. Mothers are not charged any additional fees for treatment or services. According to the officers-in-charge at the facilities, there were approximately 333 trained OCPs (109 nurses, 158 midwives, 72 doctors) working across the 16 facilities. Each of the facilities kept a registry of birth. In

2014, there were 10,333 live births (9,485 spontaneous vaginal deliveries, 816 caesarean sections, and no assisted vaginal deliveries), 10 maternal deaths, 56 neonatal deaths, and 252 stillbirths recorded. None of the facilities in the county had a blood bank available on-site. The county referral hospital collects blood and blood products twice a week from the Moi Training and Referral Hospital (45 minutes' drive) in Uasin Gishu County.

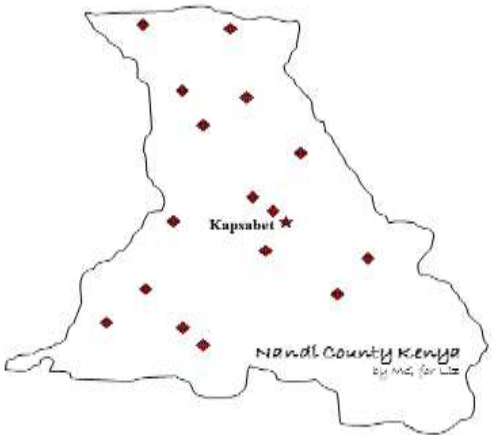


Figure 2 Location of Nandi County Healthcare Facilities included in the Study

Basic Emergency Obstetric Care (BEmOC) includes the provision of seven key functions: parental antibiotics, parenteral uterotonic drugs, parenteral anticonvulsant drugs, manual removal of the placenta, removal of retained products of conception, assisted vaginal delivery and neonatal resuscitation. Only three facilities in the county offer all of the seven key functions required for BEmOC. Four of the 16 facilities had the capability to for assisted vaginal deliveries. Comprehensive Emergency Obstetric Care (CEmOC) includes performing Caesarean deliveries and giving blood transfusions in

addition to the seven key BEmOC functions. None of the 16 facilities reported having all nine of the key CEmOC functions. Six facilities offered blood transfusions and only five facilities were equipped to perform Caesarean deliveries.

Demographic Characteristics

There were 326 obstetric care providers included in analyses. The OCPs self-identified qualifications were categorized into three groups (nurses, midwives, and doctors). The majority of the OCPs were nurses (*n* = 174); the remainder were doctors (*n* = 121) or midwives (*n* = 31) (Figure 3). The nurses trained in midwifery may not have identified themselves as "midwives". This could explain the larger number (158) of midwives reported by the officers-in-charge compared to midwives in the sample.

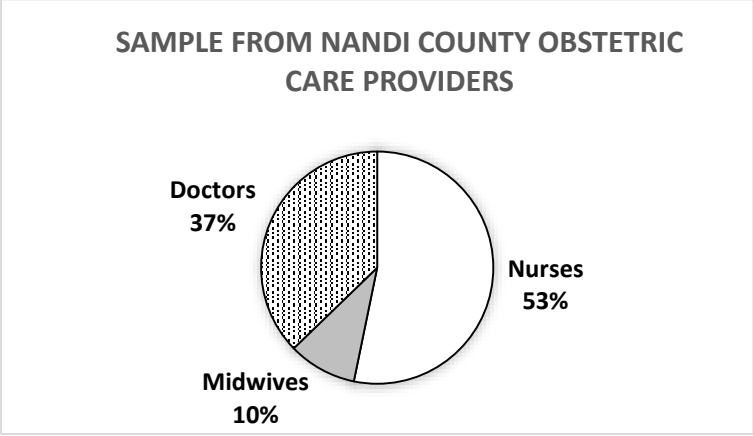


Figure 3 Obstetric Care Providers

Table 4 illustrates the sample demographic characteristics. The sample in this study consists of OCPs working in public healthcare facilities (*n* = 304, 93%) and OCPs

working in private facilities (*n* = 22, 7%). There were approximately twice as many female respondents as males. The majority of the providers were 40 years old or younger (*n*=232, 71%), and nearly half had 2-5 years of experience working in obstetric care (*n*=139, 43%).

Table 5 Demographic Characteristics

Demographics Characteristics		Obstetric Care Providers (*N* = 326)			
		Nurses *(n= 174)*	Midwives *(n=31)*	Doctors *(n = 121)*	Total *n* (%)
Sex	Male	34	8	69	111(34%)
	Female	139	23	52	214 (65%)
Age	<30	36	5	87	128 (39%)
	31-40	73	9	22	104 (31%)
	41-50	44	8	10	62 (19%)
	51-60	19	9	2	30 (9%)
	61-70	2	0	0	2 (1%)
Number of years working in OB	Up to 1 year	15	2	30	47 (15%)
	2-5 years	61	9	69	139 (43%)
	6-10 years	41	4	9	54 (17%)
	11-15 years	18	2	7	27 (8%)
	16-20 years	21	3	2	26 (8%)
	More than 20 years	16	11	1	28 (9%)
On average how many deliveries do you participate in monthly?	<5	36	4	17	57 (16%)
	5 -10	27	3	22	52 (17%)
	11–20	31	3	27	61 (19%)
	21-30	27	10	17	54 (17%)
	>30	49	9	34	92 (29%)
Number of PPH managed in the last one month	0-5	149	26	84	259 (83%)
	6-10	11	2	20	33 (11%)
	11-15	2	2	5	9 (3%)
	More than 16	10	0	3	13 (4%)
Did you ever receive education in	NO	29	5	16	50 (15%)

Demographics Characteristics		Obstetric Care Providers (N = 326)			
		Nurses *(n= 174)*	Midwives *(n=31)*	Doctors *(n = 121)*	Total *n* (%)
emergency obstetrics during your health training?	YES	144	26	104	274 (84%)
Have you ever taken a course in emergency obstetrics since being employed as a health care provider?	NO	72	12	77	161(50%)
	YES	99	19	41	159 (49%)

Knowledge of Intrapartum Care

Knowledge scores for the three subscales (normal labor, newborn care, management of complications) were calculated (Figure 4). The total knowledge scores ranged from 23% to 90% and only14 OCPs scored 80 % or higher (a minimum score of 80% is needed to demonstrate competence). The knowledge scores were normally distributed for the nurses, midwives and doctors, as assessed by visual inspection of normal Q-Q plots. Overall, obstetric care providers' mean knowledge score was 62% (*SD* = 9.8%).

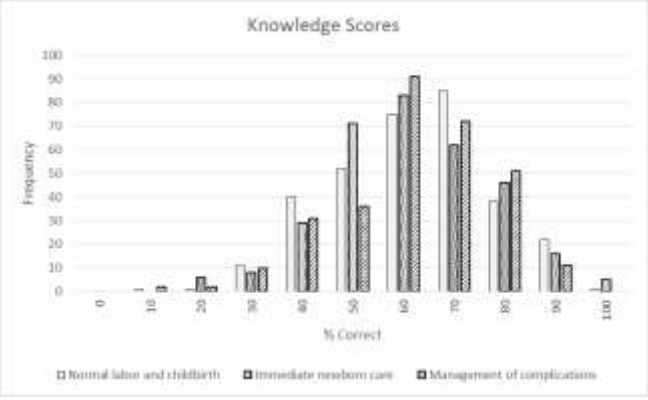


Figure 4 Knowledge Scores

Attitudes of Obstetric Care Providers

Obstetric care providers had positive attitudes towards common perceptions about pregnancy, childbirth, and the period immediately after childbirth (Table 5). The majority of the OCPs strongly agreed that a woman should plan ahead of time were she will give birth to her baby (82%) and how she will get to the place where she will have her baby (75%). More than half of the OCPs reported that it is necessary for the husband/partner to accompany his wife to antenatal care visits (57%) or when she is giving birth (53%). The majority of the OCPs *strongly* disagreed (67%) or disagreed (26%) that giving birth is a woman's matter and husbands/partners have little to contribute. Very few OCPs *strongly* agreed (4%) or agreed (16%) that it is too difficult for the woman to get to the healthcare facility. Many of the OCPs *strongly* disagreed (41%) or disagreed (30%) that the reason why women do not go to a health facility to give birth is mainly because the staff at the facility do not treat the women respectfully.

Table 6Attitudes of Obstetric Care Providers

Common perceptions about pregnancy, childbirth, and the period immediately after childbirth.	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
1. A woman should plan ahead of time where she will give birth to her baby	10 (3.1%)	1 (0.3%)	0	47 (14.5%)	267 (82.2%
2. A woman should plan ahead of time how she will get to the place where she will give birth	6 (1.8%)	6 (1.6%)	5 (1.5%)	64 (19.6%)	245 (75.2%)
3. It is not necessary for a husband/partner to accompany his wife to antenatal care visits	185 (56.7%)	91 (28%)	8 (2.5%)	26 (8.0%)	15 (4.6%)
4. When women do not go to a health facility to give birth, it is mainly because it is too expensive	172 (53.3%)	98 (30.3%)	23 (7.1%)	22 (6.8%)	8 (2.5%)

5.	When women do not go to a health facility to give birth, it is mainly because it is too difficult to get there	87 (26.8%)	114 (35.1%)	59 (18.2%)	53 (16.3%)	12 (3.7%)
6.	When women do not go to a health facility to give birth, it is mainly because the staff there does not treat women respectfully	132 (40.7%)	98 (30.2%)	53 (16.4%)	35 (10.8%)	6 (1.9%)
7.	It is not necessary for a husband/partner to accompany his wife when she is giving birth	172 (52.8%)	98 (30.1%)	23 (7.1%)	22 (6.7%)	8 (2.5%)
8.	Giving birth is mostly a woman's matter. Husbands/partners have little to contribute	217 (66.6%)	84 (25.8%)	8 (2.5%)	8 (2.5%)	9 (2.8%)

None of the OCPs rated their knowledge – or their coworkers' knowledge – as extremely poor. Many of the OCPs (45%) rated their knowledge as above average in managing obstetric emergencies; similarly, nearly half (47%) also rated their coworkers' knowledge as above average (Figure 5).

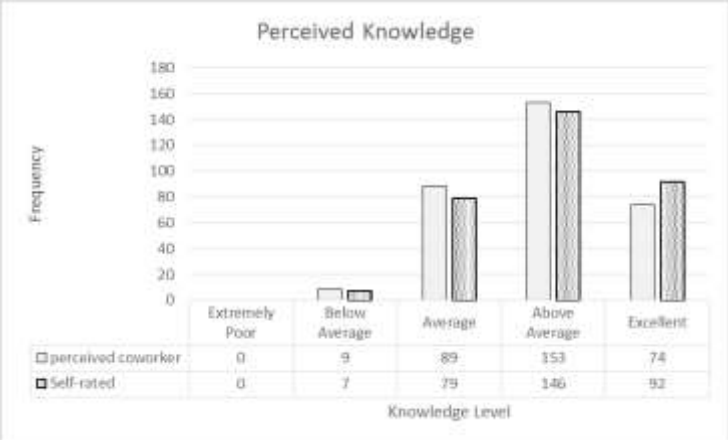


Figure 5 Perceived Knowledge of Managing Obstetric Emergencies

Obstetric care providers rated the usefulness of various educational activities for reducing maternal mortality in their healthcare facilities (Table 6). More than half the providers rated annual workshops and certification trainings in emergency obstetrics would be *extremely* useful (54%) or *very* useful (31%). Similarly many reported that having posters in the facility outlining emergency procedures would also be *extremely* useful (47%) or *very* useful (32%).

Table 7 Educational Activities to Reduce Maternal Mortality

Usefulness of educational activities for reducing maternal mortality	Not at All Useful	Somewhat Useful	Useful	Very Useful	Extremely Useful
1. Providing reading material for independent study in emergency obstetrics	7 (2.1%)	22 (6.7%)	110 (33.7%)	106 (32.5%)	81 (24.8%)
2. Guest speakers who lecture on topics in emergency obstetrics	6 (1.8%)	13 (4%)	78 (23.9%)	134 (41.1%)	95 (29.1%)
3. Having posters in the facility outlining emergency procedures	0	5 (1.5%)	64 (19.6%)	104 (31.9%)	153 (46.9%)
4. A onetime workshop teaching and practicing skills in emergency obstetrics	2 (0.6%)	6 (1.8%)	72 (22.2%)	117 (36%)	127 (39.1%)
5. Annual workshops and certification trainings in emergency obstetrics	1 (0.3%)	7 (2.1%)	42 (12.9%)	101 (31%)	175 (53.7%)

Intrapartum Practices

Obstetric care providers were asked to rate their practices, and coworkers' practices, in providing intrapartum care (Table 7). A majority of the participants reported that they obtained advice from a more senior provider, either in-person or by mobile

phone; only 10% *rarely* or *never* sought advice. In helping to facilitate the vaginal delivery of the fetus, fundal pressure is not recommended; yet only a quarter (23%) reported to never administering fundal pressure. Active management of the third stage of labor (AMTSL) should be offered to all women in labor; yet, 58% of the OCPs always practicing AMTSL (oxytocin, continuous cord traction and uterine massage).

Table 8 Obstetric Care Providers' Practices

Frequency of Obstetric Care Providers Practices

		Never	Rarely	Sometimes	Often	Always
Obtain advice from a more senior provider either in person or via mobile phone?	Provider	1.2%	9.0%	38.6%	33.6%	17.6%
	Coworker	0.6%	6.5%	31.4%	40.6%	20.9%
Administer fundal pressure in helping to facilitate the vaginal delivery of the fetus	Provider	22.7%	39.9%	27.4%	6.5%	3.4%
	Coworker	12.6%	32.9%	34.2%	14.8%	5.5%
Administer oxytocin after delivering a singleton fetus while waiting for the placenta	Provider	4.0%	6.5%	8.0%	22.2%	59.4%
	Coworker	2.2%	3.7%	8.3%	25%	60.8%
Provide cord traction after delivering a singleton fetus while waiting for the placenta	Provider	5.3%	5.6%	8.7%	22.1%	58.3%
	Coworker	2.8%	4.6%	8.3%	29.9%	54.3%
Uterine massage after delivering a singleton fetus while waiting for the placenta	Provider	9.0%	3.1%	7.4%	22.9%	57.6%
	Coworker	8.6%	2.8%	7.7%	28.7%	52.2%

Table 8 illustrates the obstetric care providers' self-rated confidence in treating a patient with various obstetric emergencies. On average, the OCPs had confidence in their skills; they rated themselves as *completely* confident (17%), *very* confident (36%), or confident (38%). Very few rated themselves as *somewhat* confident (8%) or *not at all* confident (1%).

Table 9 Confidence in Emergency Obstetric Care

Confidence in treating a patient with an obstetric emergency	Not at All Confident	Somewhat Confident	Confident	Very Confident	Completely Confident
Postpartum hemorrhage	2 (0.6%)	14 (4.3%)	117 (36.3%)	111 (34.5%)	78 (24.2%)
Shoulder dystocia:	29 (9.1%)	79 (24.7%)	122 (38.1%)	65 (20.3%)	25 (7.8%)
Sepsis	5 (1.5%)	17 (5.3%)	88 (27.2%)	100 (31%)	113 (35%)
Eclampsia	11 (3.4%)	38 (11.8%)	117 (36.2%)	95 (29.4%)	62 (19.2%)
Neonatal resuscitation	8 (2.5%)	38 (11.7%)	93 (28.7%)	94 (29%)	91 (28.1%)

The OCPs ranked the factors affecting EmOC in their facilities. Table 9 displays a displays lists' each factor by perceived impact on EmOC; the top three factors were knowledge in recognizing emergency, skills in delivering EmOC, and knowledge in appropriate management.

Table 10 Factors Affecting Emergency Obstetric Care

Factors that affect the outcome of emergency obstetric care at healthcare facilities	Not at all	Slightly	Moderately	Very Much	Extremely
1. Knowledge in recognizing an emergency	11 (3.4%)	22 (6.8%)	34 (10.5%)	125 (38.7%)	131 (40.6%)
2. Skills in delivering emergency care	16 (5%)	14 (4.3%)	41 (12.7%)	102 (31.7%)	149 (46.3%)
3. Knowledge in appropriate management	16 (5%)	22 (6.2%)	42 (13%)	112 (34.7%)	131 (40.6%)
4. Timely transfer of patients to an equipped facility:	20 (6.2%)	25 (7.8%)	39 (12.1%)	97 (30.2%)	140 (43.6%)
5. Availability of oxytocin	44 (13.7%)	27 (8.4%)	30 (9.3%)	102 (31.8%)	118 (36.8%)
6. Shortage of personnel	15 (4.8%)	34 (10.8%)	50 (15.9%)	104 (33.1%)	111 (35.4%)

7. Availability of blood products	39 (12.2%)	27 (8.4%)	41 (12.8%)	92 (28.8%)	121 (37.8%)
8. Availability of magnesium sulfate	39 (12.2%)	51 (15.9%)	40 (12.5%)	102 (31.9%)	88 (27.5%)
9. Availability of anti-hypertensive medications	35 (11%)	57 (17.9%)	69 (21.7%)	81 (25.5%)	76 (23.9%)
10. Availability of misoprostol	55 (17.3%)	46 (14.5%)	71 (22.3%)	72 (22.6%)	74 (23.3%)

Participants Perception of Problems and Solutions

On the last page of the survey, there were two open-ended questions for which the providers could provide written responses. The first question asked the participants to identify the two greatest problems facing their healthcare facility at the time of the study. The second question asked the participants to offer solutions for the problems they had identified. The textual data were imported into NVivo computer software (QSR, 2015) for management and analysis. The content analyses of 1,114 phrases describing problems facing the facilities revealed four main categories (Figure 6). The OCPs' perceived the greatest problems in their facilities to be *staffing shortage* (429 phrases), *the lack of knowledge in emergency obstetric care* (311 phrases), *the lack of essential drugs and equipment* (243 phrases), and *working in outdated facilities* (132 phrases). To address the problems at their facilities, the OCPs suggested solutions that included employing more personnel, ensuring adequate supply of essential drugs and equipment, facilitating EmOC training, and modernizing the healthcare facilities.

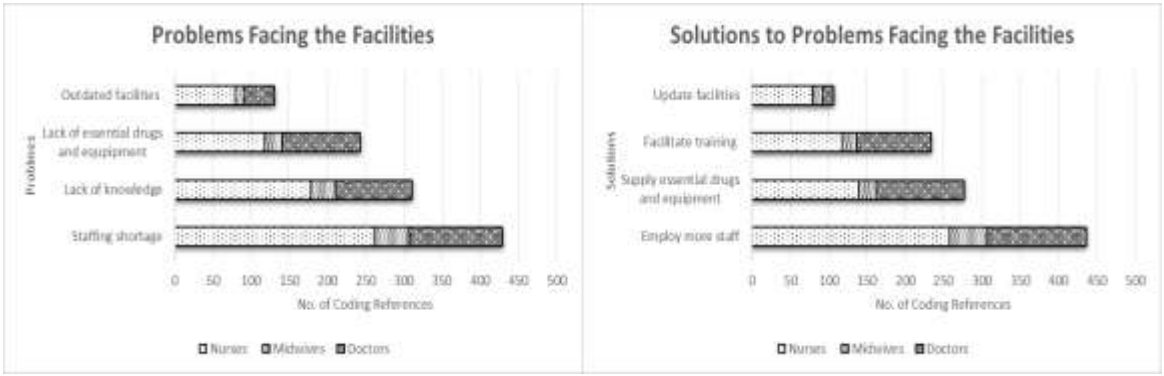


Figure 6 Perceived Problems and Solutions

CHAPTER FIVE: DISCUSSION

No woman should die giving birth. Frequently, mothers die from complications of pregnancy and childbirth due to delays in receiving the necessary care (Knight, Self, & Kennedy, 2013; Ronsmans, Graham, group, & others, 2006; Thaddeus & Maine, 1994). This chapter briefly discusses some of the factors related to the knowledge, attitudes, and practices in intrapartum care reported by OCPs in this study in relation to the Three Delay model. Implications of the findings, and recommendations for education and practice, are offered. Additional detailed information can be found in two manuscripts that have been approved for submission to professional journals.

First delay. Women may delay seeking care because they do not recognize that they need medical attention, someone else in the household is the decision maker, or they do not have the money to pay for services (Knight et al., 2013; Thaddeus & Maine, 1994). Maternity care is completely free in Kenya. As of 2013, mothers are not charged fees for services at government healthcare facilities.

The participation of husbands or partners is encouraged during pregnancy and childbirth to increase the percentage of women accessing timely care. The OCPs in this study disagreed that husbands or partners have "little to contribute"; they also believed that the males should accompany the woman when she goes to deliver. Some studies have reported that male partners are reluctant to accompany mothers in labor due to the

healthcare workers' negative attitudes towards male participation (Kwambai et al., 2013). Community health education and OCP training on the benefits of male involvement could be encouraged (Ministry of Health, Kenya, 2012). The majority of the healthcare facilities may need to modify the design of the delivery unit to accommodate male participation.

Second delay. The second delay (identifying and accessing a healthcare facility) may be a result of obstacles beyond the woman's control. In this study, the OCPs reported that a woman should plan ahead by identifying where she will give birth and how she will get there. Some of the County facilities in the study were located in remote areas with unpaved roads. These roads may be impassable, especially during the rainy season, making it difficult for women in labor to reach the healthcare facility. Appropriate care may also be delayed because of challenges faced by lower-level healthcare facilities when transferring women in labor to a higher-level facility. Although the no-cost maternity care policy in Kenya has a provision that allows for women in labor to receive transportation to a healthcare facility, there is a limited number of ambulances in the county. The providers in this study did not appreciate the difficulties that women face that lead to a second delay in appropriate care. The OCPs, the community and other stakeholders can be encouraged to develop innovative solutions to shorten the time it takes for a woman in labor to reach an appropriate facility.

Third delay. The lack of knowledge and skills in emergency obstetric care could lead to poor outcomes in maternal health. Comparable to other studies in Africa (Bayley et al., 2014; Kagema et al., 2010; Puri et al., 2012), the OCPs in this study did not

demonstrate competency in intrapartum care (Blouse, 2004). Overall, the knowledge scores were significantly below the acceptable level needed to demonstrate competency in basic obstetric care. Even when OCPs could correctly identify what the EmOC recommendations, they did not consistently provide evidence-based care. It has been shown that EmOC training improves providers' knowledge and practices in EmOC (Ameh & Van den Broek, 2015; Green, Rider, Ratcliff, & Woodring, 2015). Recommendations may include displaying posters with easy-to-follow algorithms and providing routine EmOC trainings in rural healthcare facilities. Stakeholder meetings with county government officials, OCPs, and representatives from the community and healthcare facilities could address the personnel shortages and the lack of essential drugs and equipment. Furthermore, the appropriate officials could develop a strategic plan for the modernization of existing facilities.

Study Limitations and Strengths

The data in this study were limited to Nandi County and may not be generalized to all obstetric care providers in Kenya. As this study did not collect data linked to clinical outcomes, such as the utilization and outcomes of emergency obstetric care, it is not possible to demonstrate a causal relationship between OCPs knowledge, attitudes, and practices and maternal outcomes. This study demonstrates that it is possible to obtain meaningful data from busy OCPs in remote rural facilities in Kenya. The response rate in this study was very high; the study participants commented that this study was relevant and addressed crucial areas in maternal health.

Manuscripts

Two manuscripts have been approved for submission to professional journals by the dissertation committee. The first manuscript, *Knowledge of Intrapartum Care among Obstetric Care Providers in Rural Kenya,* reports on the OCPs knowledge. The second manuscript, *Intrapartum Practices among Obstetric Providers in Rural Kenya,* reports on the OCPs reported practices.

Conclusions

Maternal mortality is a global challenge. Efforts to prevent maternal deaths may require improving the obstetric care providers' knowledge, attitudes, and practices in intrapartum care. An evaluation of current policies and procedures on emergency obstetric care and EmOC training in Nandi County may be necessary. If Kenya is to meet its projected goal of reducing the maternal mortality ratio, there needs to be concerted efforts to reduce the three delays that contribute to poor maternal-child outcomes.

APPENDIX A: IRB AUTHOURIZATION

Office of Research Integrity and Assurance

Research Hall, 4400 University Drive, MS 6D5, Fairfax, Virginia 22030
Phone: 703-993-5445; Fax: 703-993-9590

DATE:	September 28, 2015
TO:	R. Kevin Mallinson, PhD, RN, AACRN, FAAN
FROM:	George Mason University IRB
Project Title:	[750823-1] Knowledge, Attitudes and Practises of Intrapartum Care among Obsteric Care Providers in Rural Kenya
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	September 28, 2015
REVIEW CATEGORY:	Exemption category #2

Thank you for your submission of New Project materials for this project. The Office of Research Integrity & Assurance (ORIA) has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

Please remember that all research must be conducted as described in the submitted materials.

Please note that any revision to previously approved materials must be submitted to the ORIA prior to initiation. Please use the appropriate revision forms for this procedure.

If you have any questions, please contact Bess Dieffenbach at 703-993-5593 or edieffen@gmu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within George Mason University IRB's records.

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/15/52050/8600**

Date: **25th November, 2015**

Elizabeth Wanjugu Itote
George Mason University
USA.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Knowledge, attitudes, and practices of intrapartum care among obstetric care providers in rural Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Nandi County** for a period ending **25th November, 2016.**

You are advised to report to **the County Commissioner, the County Director of Education and the County Coordinator of Health, Nandi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. S. K. LANGAT, OGW
FOR: DIRECTOR GENERAL/CEO

Copy to:

The County Commissioner
Nandi County.

The County Director of Education
Nandi County.

The County Coordinator of Health
Nandi County.

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Email: chairman.kuerc@ku.ac.ke
secretary.kuerc@ku.ac.ke

Website: www.ku.ac.ke

P. O. Box 43844 - 00100 Nairobi
Tel: 8710901/12
Fax: 8711242/8711575

Our Ref: KU/R/COMM/51/565

Date: 23rd November, 2015

Elizabeth Wanjugu Itote
George Mason University, Virginia, USA,
P.O Box 55159-00200,
Nairobi

RE APPLICATION NUMBER PKU/443/E37- "KNOWLEDGE ATTITUDE, AND PRACTICES IN INTRAPARTUM CARE AMONG OBSTETRIC CARE PROVIDERS IN RURAL KENYA"

1. IDENTIFICATION OF PROTOCOL
The application before the committee is with a research topic "Knowledge attitude, and practices in intrapartum care among Obstetric care providers in Rural Kenya" dated 12th November, 2015.

2. APPLICANT
Elizabeth Wanjugu Itote

3. STUDY SITE
Nandi County Health Care Facilities, Kenya.

4. DECISION
The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines AND APPROVED that the research may proceed for a period of ONE year from 23rd November,2015.

5. ADVICE/CONDITIONS
i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
ii. Serious and unexpected adverse events related to the conduct of the study are reported to this board immediately they occur.
iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
iv. Submit an electronic copy of the protocol to KUERC.

When replying, kindly quote the application number above.
If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.

23 NOV 2015
ETHICS REVIEW COMMITTEE
P.O. BOX 43844 - 00100 NAIROBI

DR. TITUS KAHIGA
CHAIRMAN ETHICS REVIEW COMMITTEE

I ELIZABETH ITOTE accept the advice given and will fulfill the conditions therein.

Signature ELIOTE CNM Dated this day of November 23 2015.

cc. Vice-Chancellor
DVC-Research Innovation and outreach

APPENDIX B: SURVEY INSTURMENTS

Knowledge, Attitudes and Practices of Intrapartum Care Survey for Obstetric Care Providers

INFORMED CONSENT

This research is being conducted to examine knowledge, attitudes and practices of intrapartum care among obstetrics care providers in rural Kenya. If you agree to participate, you will be asked to complete a 20-25 minutes paper-pencil survey. There are no foreseeable risks for participating in this research. There are no direct benefits to you as a participant. However, this research may help to inform practice and policy change to provide quality maternal health services that may save women's lives. The survey will be anonymous. No names or other identifiers will be placed on surveys or other research data. Your participation is voluntary, and you may withdraw from the study at any time and for any reason. If you decide not to participate or if you withdraw from the study, there is no penalty or loss of benefits to which you are otherwise entitled. There are no costs to you or any other party.

This research is being conducted by Elizabeth Itote, MSN, CNM, of George Mason University. For questions or to report a research-related problem you may reach Elizabeth at +254 733 64107 or Dr. R. Kevin Mallinson at +1-703-993-1941/rmallins@gmu.edu. You may contact the George Mason University Office of Research Integrity & Assurance at +1-703-993-4121 if you have questions or comments regarding your rights as a participant in the research. This research has been reviewed according to George Mason University procedures governing your participation in this research.

Please **DO NOT** write your name on the survey

By completing this survey, you are giving your consent to participate in this study.

Section A : Demographic Information

1. Gender:
   - ☐ Male [1]
   - ☐ Female [2]

2. Type of Facility:
   - ☐ Public [1]
   - ☐ Private [2]

3. Age:
   - ☐ <30 [1]
   - ☐ 31-40 [2]
   - ☐ 41-50 [3]
   - ☐ 51-60 [4]
   - ☐ 61-70 [5]
   - ☐ >70 [6]

4. Facility Affiliation:
   - ☐ Government [1]
   - ☐ Not-for-Profit Organization [2]
   - ☐ Faith-Based Organization [3]
   - ☐ For-Profit Organization [4]

5. Title:
   - ☐ KEN [1]
   - ☐ KRN [2]
   - ☐ BScN [3]
   - ☐ KEM [4]
   - ☐ KRNM [5]
   - ☐ KRM [6]
   - ☐ CO [7]
   - ☐ MD [8]
   - ☐ Specialist [9]
   - ☐ Other [10]

   If other, please specify _____

6. Is free maternity care offered?
   - ☐ YES [1]
   - ☐ NO [0]

7. How many years have you been providing obstetrical care?
   _____Years

8. In the last year, approximately how many maternal deaths occurred at your facility?
   _____Deaths at the facility

9. Understanding that maternal deaths maybe unavoidable, how many deaths have **you witnessed** as a provider in the last year?
   _____Deaths witnessed

10. In the last month how many postpartum hemorrhages have **you managed** as the primary obstetric provider?
    _____Number of postpartum hemorrhages

11. How many hours/week do you spend providing obstetrical care?
    - ☐ <5hrs[1]
    - ☐ 5 -10hrs[2]
    - ☐ 11 -20hrs[3]
    - ☐ >20hrs[4]

12. On average how many deliveries do you participate in monthly?
    - ☐ <5 [1]
    - ☐ 5 -10 [2]
    - ☐ 11 – 20 [3]
    - ☐ 21-30 [4]
    - ☐ >30 [5]

13. Did you ever receive education in emergency obstetrics during your health training?
    - ☐ YES [1]
    - ☐ NO [0]

14. Have you ever taken a course in emergency obstetrics since being employed as a health care provider?
    - ☐ YES [1]
    - ☐ NO [0]

Section B

1. Below is a list of common perceptions about pregnancy, childbirth, and the period immediately after childbirth. There is no right or wrong answer. We are only interested in hearing you opinion. Please indicate **how much you agree** with each statement:	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
A. A woman should plan ahead of time where she will give birth to her baby	1	2	3	4	5
B. A woman should plan ahead of time how she will get to the place where she will give birth	1	2	3	4	5
C. It is not necessary for a husband/partner to accompany his wife to antenatal care visits	1	2	3	4	5
D. When women do not go to a health facility to give birth, it is mainly because it is too expensive	1	2	3	4	5
E. When women do not go to a health facility to give birth, it is mainly because it is too difficult to get there	1	2	3	4	5
F. When women do not go to a health facility to give birth, it is mainly because the staff there does not treat women respectfully	1	2	3	4	5
G. It is not necessary for a husband/partner to accompany his wife when she is giving birth	1	2	3	4	5
H. Giving birth is mostly a woman's matter. Husbands/partners have little to contribute	1	2	3	4	5

2. **How useful** are the following educational activities for reducing maternal mortality in your environment:	Not at All Useful	Somewhat Useful	Useful	Very Useful	Extremely Useful
A. Providing reading material for independent study in emergency obstetrics	1	2	3	4	5
B. Guest speakers who lecture on topics in emergency obstetrics	1	2	3	4	5
C. Having posters in the facility outlining emergency procedures	1	2	3	4	5
D. A onetime workshop teaching and practicing skills in emergency obstetrics	1	2	3	4	5
E. Annual workshops and certification trainings in emergency obstetrics	1	2	3	4	5

Section C: Normal Labor and Childbirth Care Knowledge Questions

For each question, choose the best Answer.

1. One way to prevent transmission of HIV from an infected mother to her baby (vertical transmission) is to:
   1. ___Use condoms
   2. ___Give AZT to the woman after the baby is born
   3. ___Rupture membranes early in labor
   4. ___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?
   1. ___Cervical dilation of 3 centimeters
   2. ___Vaginal temperature and wetness
   3. ___Position of the presenting part
   4. ___Degree of molding

3. If a woman is admitted during the active phase of labor, cervical dilation is initially plotted on the partograph:
   1. ___To the left of the alert line
   2. ___To the right of the alert line
   3. ___On the alert line
   4. ___On the action line

4. Cervical dilation plotted to the right of the alert line indicates:
   1. ___Satisfactory progress in labor
   2. ___Unsatisfactory progress in labor
   3. ___The end of the latent phase
   4. ___The end of the active phase

5. Active management of the third stage of labor should be practiced:
   1. ___Only for women who have a history of postpartum hemorrhage
   2. ___Only for the primipara
   3. ___Only for the multipara
   4. ___For all women in labor

6. The appropriate order of steps in active management of the third stage of labor include:
   1. ___Controlled cord traction, fundal massage, and oxytocin
   2. ___Intravenous oxytocin, cord clamping and cutting, and fundal massage
   3. ___Cord clamping and cutting, controlled cord traction, ergometrine administration, and inspection to be sure the placenta is intact
   4. ___Intramuscular injection of oxytocin, controlled cord traction with counter-traction 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:
   1. ___Start an IV
   2. ___Massage the uterus
   3. ___Insert a urinary catheter
   4. ___Check the placenta to make sure that it is completed

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?
   1. ___Prepare for vacuum extraction
   2. ___Encourage the mother to empty her bladder
   3. ___Sedate the mother so that she can rest
   4. ___Augment the labor with oxytocin

9. Which of the following will help to decrease the risk of infection during childbirth?
   1. ___Performing frequent vaginal examinations
   2. ___Rupturing membranes as soon as possible in the first stage of labor
   3. ___Routine catheterization of the bladder before childbirth
   4. ___Reducing prolonged labor

10. Contaminated instruments in the labor ward should immediately be:
    1. ___Washed with soap and water and boiled for 2 hours
    2. ___Soaked in 0.5% chlorine solution for 10 minutes
    3. ___Soaked in 0.5% chlorine solution for 30 minutes
    4. ___Washed with soap and water and soaked in 0.5% chlorine solution for 10 minutes

Section D

1. **How much** does each of the following affect the outcome of emergency obstetric care at **your facility**?	Not at all	Slightly	Moderately	Very Much	Extremely
A. Knowledge in recognizing an emergency	1	2	3	4	5
B. Knowledge in appropriate management	1	2	3	4	5
C. Skills in delivering emergency care	1	2	3	4	5
D. Shortage of personnel	1	2	3	4	5
E. Availability of anti-hypertensive medications	1	2	3	4	5
F. Availability of magnesium sulfate	1	2	3	4	5
G. Availability of oxytocin	1	2	3	4	5
H. Availability of misoprostol	1	2	3	4	5
I. Availability of blood products	1	2	3	4	5
J. Timely transfer of patients to an equipped facility:	1	2	3	4	5

2. Please rate **your confidence** in treating a patient with the following emergency:	Not at All Confident	Somewhat Confident	Confident	Very Confident	Completely Confident
A. Postpartum hemorrhage	1	2	3	4	5
B. Shoulder dystocia:	1	2	3	4	5
C. Sepsis	1	2	3	4	5
D. Eclampsia	1	2	3	4	5
E. Neonatal resuscitation	1	2	3	4	5

3. Please answer the following questions about **how you practice.**	Never	Rarely	Sometimes	Often	Always
A. How often do you obtain advice from a more senior provider either in person or via mobile phone?	1	2	3	4	5
B. In helping to facilitate the vaginal delivery of the fetus how frequently do you administer fundal pressure?	1	2	3	4	5
C. After delivering a singleton fetus while waiting for the placenta, how frequently do you administer Oxytocin?	1	2	3	4	5
D. After delivering a singleton fetus while waiting for the placenta, how frequently do you Provide cord traction?	1	2	3	4	5
E. After delivering a singleton fetus while waiting for the placenta, how frequently do you Uterine massage?	1	2	3	4	5

Section E: Immediate Newborn Care Knowledge questions

For each question, choose the best Answer.

1. The first step in thermal protection for the newborn includes:
   1. ___Drying the baby thoroughly immediately after birth
   2. ___Drying the baby thoroughly after the cord has been cut
   3. ___Covering the baby with a clean, dry cloth immediately after birth
   4. ___Covering the baby with a clean, dry cloth after the cord has been cut

2. Immediate care for a normal newborn includes:
   1. ___Skin-to-skin contact followed by placing the baby in a warming incubator
   2. ___Drying the baby, removing the wet cloth, and covering the baby with a clean, dry cloth
   3. ___Stimulating the baby by slapping the soles of the baby's feet
   4. ___Deep suctioning of the airway to remove mucus

3. Which of the following can contribute to hypothermia in newborns?
   1. ___The baby is not dried thoroughly immediately after birth
   2. ___The baby is bathed immediately after birth
   3. ___The baby is dried and placed in skin-to-skin contact with the mother
   4. ___A and B

4. To maintain the newborn's axillary temperature between 36.5° C and 37.5° C it is important to:
   1. ___Place the baby in an incubator
   2. ___Bathe the baby in warm water immediately after birth
   3. ___Rub the baby vigorously with a blanket
   4. ___Cover the baby's head, place the baby in skin-to-skin contact on the mother's chest, and cover with a blanket

5. Before performing an exam on a baby who is 2 hours old and who has not been bathed, the skilled provider should:
   1. ___Wash hands with soap and dry with a clean towel, then put on exam gloves
   2. ___Wash hands with soap and dry with a clean towel
   3. ___Bathe the baby with soap and water
   4. ___Put on sterile gloves

6. Care of the umbilicus should include:
   1. ___Cleansing with alcohol
   2. ___Covering with a sterile compress
   3. ___Cleansing with cooled, boiled water and leaving uncovered
   4. ___Applying antibiotic cream

7. The best way to determine if a newborn needs resuscitation is to:
   1. ___Wait until 1 minute after birth and assign the APGAR score
   2. ___Listen to the baby's heart rate
   3. ___Observe respirations immediately and begin resuscitation if they are less than 30/minute
   4. ___Perform resuscitation only if central cyanosis is present

8. Breastfeeding should begin:
   1. ___After the baby's first bath
   2. ___When the baby starts to cry
   3. ___Within the first hour following birth
   4. ___When the mother's milk comes in

9. When counseling the mother about breastfeeding, the skilled provider should tell her to:
   1. ___Avoid giving colostrum to the newborn
   2. ___Establish a schedule for breastfeeding so the baby gets plenty of sleep
   3. ___Give the baby water after each feed
   4. ___Breastfeed on demand for as long as the baby wants to feed

10. When counseling the mother about her newborn, the skilled provider should:
    1. ___Help the mother formulate a complication readiness plan for her baby
    2. ___Make sure the mother understands danger signs for her baby and where to go if they arise
    3. ___Tell the mother to bring her baby for a newborn care visit on the sixth day after birth
    4. ___All of the above

Section F

1. Please rate **your coworkers' knowledge** in the following areas:	Extremely Poor	Below Average	Average	Above Average	Excellent
A. Active management of third stage of labor	1	2	3	4	5
B. Postpartum hemorrhage	1	2	3	4	5
C. Preeclampsia and eclampsia	1	2	3	4	5
D. Puerperal infection	1	2	3	4	5
E. Shoulder dystocia	1	2	3	4	5
F. Partograms and labor management	1	2	3	4	5
G. Neonatal resuscitation	1	2	3	4	5

2. The following questions are seeking **your opinion** regarding **how your coworkers' practice.**	Never	Rarely	Sometimes	Often	Always
H. How often do your coworkers' obtain advice from a more senior provider either in person or via mobile phone?	1	2	3	4	5
I. In helping to facilitate the vaginal delivery of the fetus how frequently do you coworkers' administer fundal pressure?	1	2	3	4	5
J. After delivering a singleton fetus while waiting for the placenta, how frequently do you coworkers' administer Oxytocin?	1	2	3	4	5
K. After delivering a singleton fetus while waiting for the placenta, how frequently do you coworkers' Provide cord traction?	1	2	3	4	5
L. After delivering a singleton fetus while waiting for the placenta, how frequently do you coworkers' Uterine massage?	1	2	3	4	5

1. Please **rate your knowledge** in the following areas:	Extremely Poor	Below Average	Average	Above Average	Excellent
A. Active management of third stage of labor	1	2	3	4	5
B. Postpartum hemorrhage	1	2	3	4	5
C. Preeclampsia and eclampsia	1	2	3	4	5
D. Puerperal infection	1	2	3	4	5
E. Shoulder dystocia	1	2	3	4	5
F. Partograms and labor management	1	2	3	4	5
G. Neonatal resuscitation	1	2	3	4	5

Section G: Management of Complications

For each question, choose the best Answer.

1. Carry out a rapid initial assessment:
   1. ___Only for women who present with abdominal pain and vaginal bleeding
   2. ___Only for women who present with abdominal pain
   3. ___Only for women who present with vaginal bleeding
   4. ___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:
   1. ___As much as possible about the management of the emergency
   2. ___As little as possible about the management of the emergency
   3. ___What the provider thinks she/they should be told
   4. ___Nothing at all

3. Immediate postpartum hemorrhage can be due to:
   1. ___Uterine atony
   2. ___Genital trauma
   3. ___Retained placenta
   4. ___All of the above

4. The most effective way to immediately control eclamptic convulsions is to:
   1. ___Give diazepam
   2. ___Give magnesium sulfate
   3. ___Deliver the baby as soon as possible
   4. ___ Give nifedipine

5. Newborn resuscitation procedures:
   1. ___Always require the use of oxygen
   2. ___Should be started after assigning the APGAR score
   3. ___Can usually be carried out without oxygen
   4. ___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:
   1. ___The newborn's head is in neutral position
   2. ___The seal between the newborn's mouth, nose, and Ambu bag is adequate
   3. ___The baby is not covered
   4. ___Cardiac massage is being performed

7. Do not perform vacuum extraction in the case of:
   1. ___A cephalic presentation
   2. ___A face presentation
   3. ___Cervical dilation of 7 cm
   4. ___Fetal head not engaged

8. A woman with a ruptured uterus has which of the following signs and symptoms:
   1. ___Rapid maternal pulse
   2. ___Persistent abdominal pain and suprapubic tenderness
   3. ___Fetal distress
   4. ___All of the above

9. When performing newborn resuscitation with an Ambu bag and mask, ventilate at the rate of:
   1. ___20-30 breaths per minute if there is no chest in drawing
   2. ___40 breaths per minute for all babies
   3. ___60 breaths per minute if the baby is gasping
   4. ___None of the above

10. Treatment of postpartum endometritis includes:
    1. ___Discontinuation of breastfeeding
    2. ___Bed rest and adequate hydration
    3. ___Intravenous ampicillin, gentamicin, and metronidazole until fever-free for 48 hours
    4. ___B and C

Section H

1. In your opinion, what are the two greatest problems facing this health facility right now?

A:	B:

2. What are the Solutions to these problems?

A:	B:

Thank you for your participation

Facility Information Form

Facility_____ ID #_____

1. Type of Facility : Public [1]/ Private [2]
2. Facility Affiliation :
   - ☐ Government [1]
   - ☐ Not-for-Profit Organization [2]
   - ☐ Faith-Based Organization [3]
   - ☐ For-Profit Organization [4]
3. Does the facility have a blood bank? Yes[1]/No[0]
4. Number of Maternity beds _____
5. Free maternity care : Yes[1]/No[0]
   a. If yes; are there any other fees charged? Yes[1]/No[0]

Other Fees	Yes	NO	Cost
1. Provider charges	1	0	
2. Anesthesia charges	1	0	
3. Registration	1	0	
4. Complications	1	0	
5. Nursery	1	0	
6. NICU	1	0	
7. Transfer/ambulance	1	0	
8. Other	1	0	

7. Number of trained Personnel:

a. NURSES			b. MIDWIVES			c. DOCTORS			TOTAL
1. KEN	2. KRN	3. BScN	1. KEM	2. KRMN	3. KRM	1. Specialist	2. MD	3. CO	

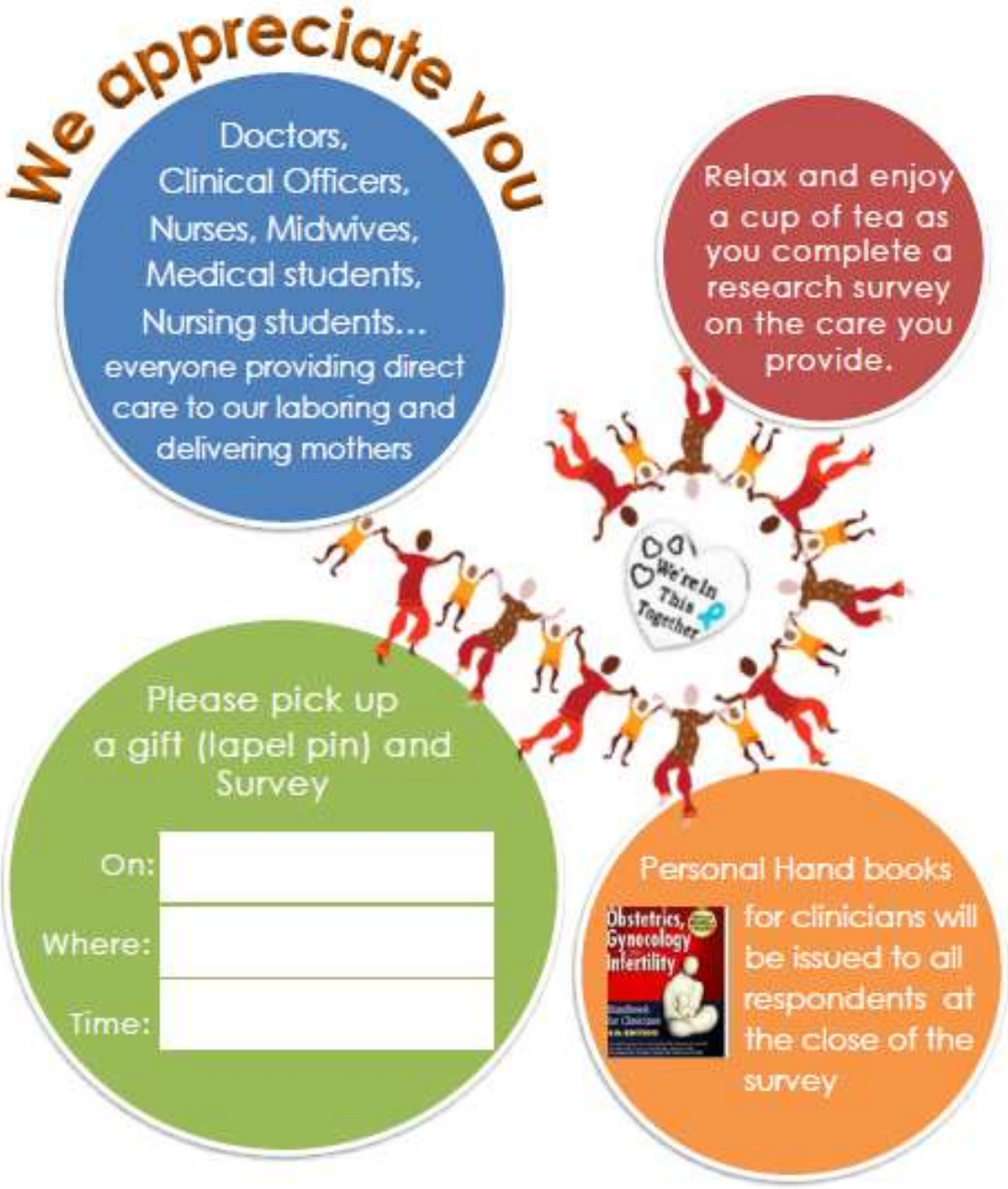
8. Did you keep a 2014 registry of births? Yes[1]/No[0]
   a. Number of live births in 2014_____

1. SVD	2. C/S	3. Assisted	4. Maternal death	5. Neonatal death	6. Still birth

9. Is a copy of the MOH National guidelines for quality obstetrics and perinatal care available? Yes[1]/No[0]

Source: _____

6. How often do you have the ability to perform the following services at the facility?	Never	Rarely	Sometimes	Often	Always
A. Parenteral antibiotics	0	1	2	3	4
B. Parenteral uterotonic drugs (e.g. oxytocin, misiprostol)	0	1	2	3	4
C. Parenteral anticonvulsants (e.g. magnesium sulphate)	0	1	2	3	4
D. Manual removal of placenta	0	1	2	3	4
E. Removal of retained products	0	1	2	3	4
F. Assisted vaginal delivery (e.g. vacuum extraction)	0	1	2	3	4
G. Blood transfusion	0	1	2	3	4
H. Caesarean section/delivery	0	1	2	3	4
I. Neonatal resuscitation	0	1	2	3	4
J. Transfer/referral transportation	0	1	2	3	4



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