DETERMINANTS OF UTILIZATION OF ACTIVE MANAGEMENT OF THIRD STAGE OF LABOUR AMONG SKILLED BIRTH ATTENDANTS IN KIAMBU COUNTY, KENYA

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MAY 2015
DECLARATION

This thesis is my original work and has not been presented for a degree in any other University or for any other award.

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DEDICATION

I dedicate this thesis to the children who have been robbed off motherly love and care by post partum haemorrhage.
iv

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I also acknowledge my husband Eliphas Gitonga for giving me moral support in writing the thesis and going an extra mile to coach me on use of Stata in data analysis.
TABLE OF CONTENTS

DECLARATION ............................................................................................................................ ii
DEDICATION .......................................................................................................................... iii
ACKNOWLEDGEMENT ........................................................................................................ iv
TABLE OF CONTENTS ............................................................................................................. v
LIST OF TABLES .................................................................................................................. viii
LIST OF FIGURES ................................................................................................................ ix
DEFINITION OF TERMS ......................................................................................................... xi
ABBREVIATIONS AND ACRONYMS ................................................................................... xiii
ABSTRACT ............................................................................................................................... xv

CHAPTER ONE: INTRODUCTION .......................................................................................... 1
  1.1 Background Information ................................................................................................. 1
  1.2 Problem statement ........................................................................................................... 3
  1.3 Justification ...................................................................................................................... 4
  1.4 Research Questions ......................................................................................................... 4
  1.5 Hypotheses ...................................................................................................................... 5
  1.6 Objectives ....................................................................................................................... 5
    1.6.1 Broad Objective: ........................................................................................................ 5
    1.6.2 Specific Objectives: .................................................................................................. 5
  1.7 Significance and Anticipated Output .............................................................................. 5
  1.8 Conceptual framework ................................................................................................. 6

CHAPTER TWO: LITERATURE REVIEW ................................................................................. 8
  1.1 Introduction .................................................................................................................... 8
  1.2 Maternal mortality and morbidity status ...................................................................... 8
  1.3 Importance of PPH as a cause of maternal mortality and morbidity ........................... 9
  1.4 Description of AMTSL .................................................................................................. 10
  1.5 Practice of AMSTSL ....................................................................................................... 12
  1.6 Determinants of AMTSL utilization ............................................................................. 15
    2.6.1 Health facility factors and AMTSL ........................................................................ 15
    2.6.2 Birth attendant factors and AMTSL ..................................................................... 19
  2.7 Summary ....................................................................................................................... 21
CHAPTER THREE: MATERIALS AND METHODS .................................................................23
3.1 Introduction ...........................................................................................................23
3.2 Research design ....................................................................................................23
3.3 Variables ................................................................................................................23
3.4 Location of study ....................................................................................................24
3.5 Study population ....................................................................................................25
3.6 Inclusion criteria ....................................................................................................25
3.7 Exclusion criteria ....................................................................................................25
3.8 Sampling techniques and Sample size ....................................................................25
   3.8.1 Sampling Techniques .......................................................................................25
   3.8.2 Sample size .......................................................................................................28
3.9 Construction of research Instruments ....................................................................29
3.10 Pre-testing .............................................................................................................29
3.11 Validity and reliability ..........................................................................................29
3.12 Data Collection Techniques ..................................................................................30
3.13 Data entry and analysis .........................................................................................30
3.14 Logistical and Ethical Considerations ...................................................................31

CHAPTER FOUR: RESULTS .........................................................................................32
4.1 Introduction .............................................................................................................32
4.2 Demographic characteristics of the respondents ......................................................32
4.3 AMTSL utilization status ........................................................................................33
4.4 Health facility factors that influence utilization of AMTSL .......................................35
4.5 Birth attendant factors that influence utilization of AMTSL: ....................................46
4.6 Determinants of utilization of AMTSL ....................................................................59

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS ..........61
5.1 Introduction .............................................................................................................61
5.2 Discussion ...............................................................................................................61
5.3 Conclusion ..............................................................................................................67
5.4 Recommendations .................................................................................................67
5.5 Areas of further research .......................................................................................68
 vii

REFERENCE.........................................................................................................................69

APPENDICES ..........................................................................................................................72
  APPENDIX I: QUESTIONNAIRE .........................................................................................72
  APPENDIX II: OBSERVATION CHECKLIST .......................................................................76
  APPENDIX III: ETHICAL CLEARANCE ............................................................................78
  APPENDIX IV: APPROVAL FOR THE STUDY (NCST) ..................................................80
  APPENDIX VI: APPROVAL FOR THE STUDY (MOH) .....................................................81
  APPENDIX VII: MAP OF KIAMBU COUNTY .....................................................................82
LIST OF TABLES

TABLE 4.1: DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS ........................................32

TABLE 4.2: FREQUENCY OF SUPPLIES STOCK OUTS BY TYPE AND LEVEL OF HEALTH FACILITY .................................................................38

TABLE 4.3: AVAILABILITY OF SUPPLIES AT THE POINT OF USE BY TYPE AND LEVEL OF HEALTH FACILITY .................................................................41

TABLE 4.4: AVAILABILITY OF AMTSL STANDARDS DOCUMENTS BY LEVEL AND TYPE OF HEALTH FACILITY .................................................................45

TABLE 4.5: BIRTH ATTENDANTS BY LEVEL AND TYPE OF FACILITY ........................................46

TABLE 4.6: CADRE OF BIRTH ATTENDANTS BY LEVEL AND TYPE OF HEALTH FACILITY ..........47

TABLE 4.7: ASSOCIATION BETWEEN EXPERIENCE AND UTILIZATION OF AMTSL .................49

TABLE 4.8: ASSOCIATION BETWEEN DURATION SINCE TRAINING AND UTILIZATION OF AMTSL .................................................................................................55

TABLE 4.9: KNOWLEDGE OF SKILLED BIRTH ATTENDANTS ON AMTSL BY LEVEL AND TYPE OF HEALTH FACILITY .................................................................55

TABLE 4.10: KNOWLEDGE OF BIRTH ATTENDANTS BY YEARS OF EXPERIENCE ......................58

TABLE 4.11 LOGISTIC REGRESSION OF FACILITY FACTORS .....................................................60

TABLE 4.12 LOGISTIC REGRESSION OF SKILLED BIRTH ATTENDANT FACTORS .......................60
LIST OF FIGURES

FIGURE 1.1: CONCEPTUAL FRAMEWORK ........................................................................ 7
FIGURE 4.1: UTILIZATION OF AMTSL .................................................................... 33
FIGURE 4.2: LEVEL OF AMTSL UTILIZATION. ...................................................... 34
FIGURE 4.3: UTILIZATION OF INDIVIDUAL COMPONENTS OF AMTSL .................. 35
FIGURE 4.4: ASSOCIATION BETWEEN TYPE (MANAGING AUTHORITY) AND UTILIZATION OF AMTSL ........................................................................ 36
FIGURE 4.5: ASSOCIATION BETWEEN LEVEL OF HEALTH FACILITY AND UTILIZATION OF AMTSL ........................................................................ 37
FIGURE 4.6: ASSOCIATION BETWEEN FREQUENCY OF SUPPLIES STOCK OUTS AND UTILIZATION OF AMTSL ................................................................. 38
FIGURE 4.7: NO. OF BIRTH ATTENDANTS AUTHORISED TO ORDER SUPPLIES BY TYPE OF HEALTH FACILITY ................................................................. 39
FIGURE 4.8: ASSOCIATION BETWEEN NUMBER OF BIRTH ATTENDANTS AUTHORIZED TO ORDER SUPPLIES AND UTILIZATION OF AMTSL ......................................................... 40
FIGURE 4.9: ASSOCIATION BETWEEN AVAILABILITY OF SUPPLIES AT THE POINT OF USE AND UTILIZATION OF AMTSL ................................................................. 42
FIGURE 4.10: AVAILABILITY OF A FRIDGE BY LEVEL OF HEALTH FACILITY ........ 42
FIGURE 4.11: AVAILABILITY OF A FRIDGE BY TYPE OF HEALTH FACILITY ............ 43
FIGURE 4.12: ASSOCIATION BETWEEN AVAILABILITY OF A FRIDGE AND UTILIZATION OF AMTSL ........................................................................ 44
FIGURE 4.13: ASSOCIATION BETWEEN AVAILABILITY OF AMTSL STANDARDS DOCUMENTS AND UTILIZATION OF AMTSL ........................................................................ 45
FIGURE 4.14: ASSOCIATION BETWEEN TYPE OF BIRTH ATTENDANT AND UTILIZATION OF AMTSL

FIGURE 4.15: ASSOCIATION BETWEEN CADRE OF BIRTH ATTENDANT AND UTILIZATION OF AMTSL

FIGURE 4.16: TRAINING OF BIRTH ATTENDANTS BY LEVEL OF HEALTH FACILITY

FIGURE 4.17: TRAINING OF BIRTH ATTENDANTS BY TYPE OF HEALTH FACILITY

FIGURE 4.18: TRAINING OF BIRTH ATTENDANTS ON AMTSL BY TYPE OF BIRTH ATTENDANT

FIGURE 4.19: TRAINING OF BIRTH ATTENDANTS ON AMTSL BY CADRE OF BIRTH ATTENDANT

FIGURE 4.20: ASSOCIATION BETWEEN TRAINING OF BIRTH ATTENDANTS AND UTILIZATION OF AMTSL

FIGURE 4.21: ASSOCIATION BETWEEN TYPE OF TRAINING AND UTILIZATION OF AMTSL

FIGURE 4.22: KNOWLEDGE OF AMTSL BY TRAINING STATUS

FIGURE 4.23: KNOWLEDGE OF BIRTH ATTENDANTS BY TYPE OF TRAINING

FIGURE 4.24: KNOWLEDGE OF BIRTH ATTENDANTS BY TYPE OF BIRTH ATTENDANT

FIGURE 4.25: KNOWLEDGE OF BIRTH ATTENDANTS BY AVAILABILITY OF AMTSL STANDARDS DOCUMENTS

FIGURE 4.26: ASSOCIATION BETWEEN KNOWLEDGE AND UTILIZATION OF AMTSL
DEFINITION OF TERMS

1. **Maternal death**: Death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental causes.

2. **Maternal mortality ratio**: The number of maternal deaths per 100,000 live births in a specified period.

3. **Skilled birth attendant**: Accredited health professional such as a midwife, clinician or nurse who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, child birth and immediate post natal period and in the identification, management and referral of complications in women and newborns.

4. **Non-skilled attendants**: Birth attendants who have not been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, child birth and immediate post natal period and in the identification, management and referral of complications in women and newborns.

5. **Postpartum haemorrhage**: Blood loss of $\geq 500$ mL after vaginal delivery of a baby, or $\geq 1000$ mL after caesarean section or any other amount that leads to deterioration in condition of the mother.

6. **Determinant**: A variable that influenced utilization of AMTSL, either positively or negatively on logistic regression at statistically significant level ($p<0.05$).

7. **Standards document**: Any written, printed or electronic matter describing AMTSL components put in a prominent (readily seen) place.
8. **Active Management of Third Stage of Labour**: A technique that involves the following; administering oxytocin within one minute of child birth, delivering the placenta using controlled cord traction, massaging the uterus immediately after birth of the placenta and after every 15 minutes for the first 1-2 hours after delivery.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AGOG</td>
<td>Association of Gynaecologists and Obstetricians of Guatemala</td>
</tr>
<tr>
<td>AIDS</td>
<td>Acquired Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>AMTSL</td>
<td>Active Management of the Third Stage of Labour</td>
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<tr>
<td>APHRC</td>
<td>African Population and Health Research Centre</td>
</tr>
<tr>
<td>CO</td>
<td>Clinical Officer</td>
</tr>
<tr>
<td>DRH</td>
<td>Division of Reproductive Health</td>
</tr>
<tr>
<td>FBO</td>
<td>Faith Based Organization</td>
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<tr>
<td>FIGO</td>
<td>International Federation of Gynecology and Obstetrics</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>ICF</td>
<td>Inner City Fund</td>
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<td>ICM</td>
<td>International Confederation of Midwives</td>
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<td>KDHS</td>
<td>Kenya Demographic and Health Survey</td>
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<tr>
<td>KNBS</td>
<td>Kenya National Bureau of Statistics</td>
</tr>
<tr>
<td>L3</td>
<td>Level three health facility</td>
</tr>
<tr>
<td>L4</td>
<td>Level four health facility</td>
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<tr>
<td>MCHIP</td>
<td>Maternal Child Health Integrated program</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>MMR</td>
<td>Maternal Mortality Ratio</td>
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<tr>
<td>MOMS</td>
<td>Ministry of Medical Services</td>
</tr>
<tr>
<td>MOPHS</td>
<td>Ministry of Public Health and Sanitation</td>
</tr>
<tr>
<td>NCAPD</td>
<td>National Coordinating Agency for Population and Development</td>
</tr>
<tr>
<td>PATH</td>
<td>Program for Appropriate Technology in Health</td>
</tr>
<tr>
<td>POPPHI</td>
<td>Prevention of Postpartum Haemorrhage Initiative</td>
</tr>
<tr>
<td>PPH</td>
<td>Post Partum Haemorrhage</td>
</tr>
<tr>
<td>PRV</td>
<td>Private</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>WHO</td>
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ABSTRACT

Maternal mortality is a major concern worldwide and more so in Kenya which ranks eleventh country with highest maternal mortality ratio (530 per 100,000) worldwide. Post partum haemorrhage is one of the main causes of maternal death contributing 34% of maternal death in Kenya. Active management of third stage of labour (AMTSL) is an inexpensive and effective technique of preventing post partum haemorrhage. In spite of this technique being adopted in Kenya and internationally, its actual utilization and factors influencing it’s utilization were yet to be established. In Kiambu County 78% of women were delivering in health facilities, however, post partum haemorrhage was still causing two maternal deaths monthly besides causing serious morbidities e.g. shock and anaemia. This study aimed at assessing determinants of AMTSL utilization in Kiambu county. Specifically the study aimed at establishing the status of utilization of AMTSL and determining the health facility and birth attendant factors influencing utilization of AMTSL in Kiambu county. The study used cross-sectional design. The study population was 431 birth attendants working in maternity units in Kiambu County. Multistage sampling technique was used to sample 203 birth attendants. Data was collected using questionnaires and observation checklists and was analysed using STATA version 11. Descriptive statistics were used to generate proportions and frequencies while chi square, Fisher’s exact test were used to draw inferences. Logistic regression was used to identify the determinants of utilization of AMTSL. The results show that (68.5%) of the birth attendants do not utilize AMTSL. Oxytocin (76.9%) administration and controlled cord traction (96.5%) were the most utilized components. The variables that influenced AMTSL (those that had statistically significant association) included type of health facility, level of health facility, authorization to order supplies, availability of a fridge, availability of standards documents, training, type of training and knowledge on AMTSL. Utilization of AMTSL was higher in government health facilities (37.4) and in level 4 and 5 facilities (49.5%). Utilization of AMTSL was higher in facilities with AMTSL supplies at the point of use (92.1%), facilities with a fridge (44.5%), facilities with more staffs authorised to order supplies (34.9%) as well as facilities with AMTSL standards documents (68.0%). Looking at birth attendant factors, utilization was higher among the trained birth attendant (44.2%) than those who were not trained (13.2%). Also, utilization of AMTSL was higher among those who had pre-service training (60.7%) than those with in-service training (39.1%). Utilization of AMTSL was higher among birth attendants who knew AMTSL; however majority (71.9%) of the birth attendants did not know the components of AMTSL. In conclusion, majority of birth attendants in Kiambu County do not utilize AMTSL. Both facility and birth attendant factors influence utilization of AMTSL in Kiambu county.
CHAPTER ONE: INTRODUCTION

This chapter sheds light on the status of maternal mortality globally, regionally, nationally and locally. It has also highlighted the trends in maternal mortality in Kenya as well as the common causes of maternal death and specifically points out the importance of PPH as a cause. It describes AMTSL technique and relates it to prevention of PPH. It has also identified the problem in the area of study and described it in terms of magnitude. The chapter also has the rationale of the study and outlines the research questions, hypotheses, objectives and the conceptual framework.

1.1 Background Information

Maternal mortality has remained high despite the fact that most maternal deaths are avoidable. According to WHO (2010), about 1000 women die from pregnancy and childbirth related complications around the world every day. Most of these deaths occur in developing countries. More than half of the deaths occur in sub-Saharan Africa and one third occur in South Asia. Women in developing countries have on average many more pregnancies than women in developed countries hence the lifetime risk of death due to pregnancy is higher in developing countries (1 in 120) than in developed countries (1 in 4300).

WHO ranks Kenya as the eleventh country with the highest maternal mortality worldwide with a maternal mortality ratio of 530 per 100,000 live births and a lifetime risk of 1 in 38 (WHO, 2010). Kenya Demographic Health Survey reported MMR at 488 per 100,000 live births (KNBS and ICF Macro, 2010). Looking at this statistics, maternal mortality in Kenya is high using the WHO scale that regards MMR high when it is equal to or higher than 300 maternal deaths per 100,000 live
births. On average 6 women die in Kiambu County every month due to child birth related complications (HIS, 2011).

There is increased attention worldwide to reduce maternal mortality, however not much has been achieved especially in developing countries. For instance, in the Millennium Development Goal 5 (MDG5), countries had committed to reduce maternal mortality ratio by three quarters between 1990 and 2015. However, between 1990 and 2005 the maternal mortality ratio declined by only 5% globally (WHO, 2008). In Kenya the maternal mortality seems to have no significant change for the last 10 years; 414 per 100,000 in 2003 KDHS and 488 per 100,000 in 2008/2009 KDHS (KNBS and ICF Macro, 2010).

Causes of maternal death include haemorrhage, puerperal sepsis/infections, hypertensive disorders, obstructed labour/ruptured uterus, complications of unsafe abortions, severe anaemia, malaria, HIV/AIDS, and tuberculosis. (NCAPD et al., 2010). Haemorrhage accounts for between one quarter and one third of obstetric deaths with an estimated mortality rate of 140 000 per year (Shakur et al., 2010). According to Leduc, et al. (2009) one maternal death occur every 4 minutes globally. The majority of these deaths occur within 4 hours of delivery which indicates that they are a consequence of the third stage of labour (Leduc at el., 2009). Bleeding (PPH) is the most common complication during the third stage of labour.

About 70% of cases of PPH are due to failure of the uterus to contract, which can be prevented by use of AMTSL (PATH, 2004). International health organisations such as WHO, FIGO, ICM have recommended utilization of AMTSL in all deliveries, and this has been adopted by the Ministry of Health in Kenya. According to the Ministry of Health, Kenya guidelines, AMTSL involves three basic procedures: Administering
oxytocin within one minute of child birth, delivering the placenta using controlled cord traction and massaging the uterus immediately after birth of the placenta and after every 15 minutes for the first 1-2 hours after delivery (DRH, 2013).

This study intended to determine the factors influencing the utilization of this vital practice in Kiambu county. According to KDHS 2008/2009, central province of Kenya, from which the county was mapped out, had most deliveries (73%) taking place in a health facility (KNBS and ICF Macro, 2010). With such high health facility based deliveries, routine use of AMTSL can avert maternal deaths and morbidity due to PPH in this province.

1.2 Problem statement

PPH though preventable is still a main cause of maternal death causing 34% of maternal death in developing countries like Kenya (Khan, et al., 2006). PPH is also the most common complication of third stage of labour (Smith, 2010) affecting 14 million women per year of which 2% die (Shakur, et al., 2010).

Besides death, PPH also causes serious morbidities such as respiratory distress syndrome, coagulopathy, shock, loss of fertility, and pituitary necrosis and anaemia in the mother. Many women who develop PPH require blood transfusion which sometimes can transmit blood borne infections such as HIV/AIDS or cause adverse reactions. These morbidities have been documented by Abalos (2006).

In Kiambu County on average 6 women die per month and this translates to 2 women dying every month due to PPH (Districts quarterly reports, 2011). This situation was so despite numerous studies that had proven the effectiveness of AMTSL in prevention of PPH and its endorsement by Ministry of Health and international health organisations. However, implementation status of AMSTL as well as factors influencing its utilization in Kiambu County had not been established.
1.3 Justification

PPH as a cause of maternal health is a major concern of both governmental and non-governmental organizations worldwide. Use of AMTSL by a skilled provider has been shown to decrease the incidence of PPH by up to 66% (Khan, et al., 2006). AMTSL is advocated for by major international health organisations such as International Federation of gynaecologists and Obstetricians (FIGO), International Council of Midwives (ICM) and World Health Organisation (WHO). The ministry of health in Kenya also endorses use of AMSTL as recommended by WHO.

In Kiambu County most deliveries (73%) are health facility based and therefore routine use of AMTSL can help in reducing maternal death due to postpartum haemorrhage in the County.

This study sought to generate information on status of utilization of AMTSL and on health facility and birth attendant factors that influence its utilization. Since most of the deliveries in Kiambu County are hospital based, knowledge of these factors will inform the designing of specific strategies to improve the utilization of AMTSL. This in turn will result in most mothers receiving AMTSL hence decrease incidence of postpartum haemorrhage.

1.4 Research Questions

1. What is the status of AMTSL utilization by skilled birth attendants working in health facilities in Kiambu County?

2. Which health facility factors influence utilization of AMTSL by birth attendants working in health facilities in Kiambu County?

3. Which birth attendant factors influence AMTSL utilization by birth attendants working in health facilities in Kiambu County?
1.5 Hypotheses

1. Health facility factors do not significantly influence utilization of AMTSL by birth attendants working in health facilities in Kiambu County.

2. Birth attendant factors do not significantly influence utilization of AMTSL by birth attendants working in health facilities in Kiambu County.

1.6 Objectives

1.6.1 Broad Objective:

To assess the determinants of utilization of AMTSL by birth attendants working in health facilities in Kiambu County.

1.6.2 Specific Objectives:

The specific objectives were to;

1. Determine status of AMTSL utilization among birth attendants working in health facilities in Kiambu County.

2. Determine the health facility factors that influence utilization of AMTSL by birth attendants in Kiambu County.

3. Determine the birth attendant factors that influence utilization of AMTSL by birth attendants in Kiambu County.

1.7 Significance and Anticipated Output

The study sought to generate information on utilization of AMTSL among birth attendants working in health facilities in Kiambu County. This is of importance taking into account that the proportion of deliveries attended by skilled birth attendants in Kenya is on the rise; from 41% in 2003 KDHS to 44% in 2008/2009 KDHS (KNBS and ICF Macro, 2010).

The study assisted in identification of the gaps in the use of AMTSL which will help in identifying specific strategies to increase AMTSL utilization. Increased utilization
of AMTSL results in reduced cases of postpartum haemorrhage which directly contribute to the reduction in maternal mortality and morbidity and by extension improve child health. This will contribute towards achieving of Kenya’s vision 2030 goal of reducing maternal and child mortality (NCAPD, et al., 2010).

1.8 Conceptual framework

The conceptual framework used in this study was a modification of a framework developed by Prevention of Postpartum Hemorrhage Initiative (POPPHI) in 2006. The POPPHI framework described three determinants of AMTSL that is, policy factors, supplies and logistics and provider factors.

The policy factors identified were; inclusion of uterotonic drugs in the essential drug list, presence of AMTSL content in pre-service training and availability of AMTSL protocols in hospital. The Provider factors were; knowledge, skills and motivation. Supplies and logistics factors were; availability of high-quality uterotonic drugs, needles and syringes in health facilities as well as availability of appropriate conditions during transport and storage.

This study by the virtue of it not being a national but a local(county) based study modified the POPPHI framework. The modification entailed regrouping the three determinants in two by combining policy and supplies and logistics determinants under one title ‘facility factors’ and retaining provider factors but renamed it birth attendant factors.

Facility factors include; type of governing authority of the facility, availability of standard documents, level of health facility, availability of uterotonic drugs, needles, and syringes in health facilities and appropriate drug storage conditions (in a fridge). Birth attendant factors include; type of birth attendant, cadre of birth attendants and training on AMTSL. These factors influence AMTSL utilization which will in turn
reduce incidences of PPH. Reduced PPH incidences will directly result in reduction of maternal morbidity and mortality. Figure 1.1 illustrates this conceptual framework.

Adapted from Prevention of Postpartum Hemorrhage Initiative (POPPHI), 2006

Figure 1.1: Conceptual framework
CHAPTER TWO: LITERATURE REVIEW

1.1 Introduction

This chapter contains a comparison of the status of maternal mortality and morbidity as documented by different authors. It has also detailed PPH as a main cause of maternal mortality and morbidity. The descriptions of AMTSL from different sources is also included in this chapter as well as the differences between former and current AMTSL guidelines. It has also shed light on research methodologies used by other researches to study AMTSL. Factors that influence utilization of AMTSL (health facility and birth attendant factors) documented by other researches has also been described in this chapter.

1.2 Maternal mortality and morbidity status

Maternal mortality remains a key public health issue globally with developing countries accounting for 99% of the deaths. Sub-Saharan Africa and South Asia accounts for 87% of the global maternal deaths (WHO, 2010). Kenya’s MMR is almost double the global figure estimated at 488 per 100,000 by KDHS 2008/2009 (KNBS and ICF Macro, 2010) and more than double according to WHO (2010) estimates. These findings by KDHS relates with findings by Kenya Service Provision Assessment (KSPA) that ranked deaths during and just after birth (maternal deaths) the third most common cause of death in Kenya, contributing 9% of deaths. HIV/AIDS is ranked most common cause of death contributing (29%) followed by respiratory infections at 14%. (NCAPD, et al., 2010).

A critical analysis of the KSPA finding would actually rank maternal deaths as the most common considering that these deaths are only affecting a specific group (women of reproductive age) in the population. In other words many women must be dying to contribute the 9% of deaths in the whole population.
Looking at the trends of maternal mortality, the annual percentage decline in MMR between 1990 and 2008 was only 2.3% globally. In Kenya the situation is worse with an annual increase of 1.8% comparing with neighbouring countries such as Tanzania (0.6 annual reduction) and Uganda (2.5 annual decline) (WHO, 2010). This trend unless it takes an about turn may compromise the achievement of the fifth MDG that targets to reduce MMR by 75% between 1990 and 2015 that is, it seeks to achieve a 5.5% annual decline in MMR from 1990. Kenya’s Vision 2030 goal of reducing the maternal mortality ratio from 488 deaths per 100,000 live births in 2008-09 to 147 deaths per 100,000 live births by 2012 may also be difficult to accomplish.

Just like mortality, the maternal morbidity is worrisome. Out of 136 million women who give birth every year, about 20 million experience pregnancy-related illness after childbirth (WHO, 2008). This is worrying considering that maternal health also affects neonatal and infant health.

1.3 Importance of PPH as a cause of maternal mortality and morbidity

PPH is one of the direct causes of maternal mortality and morbidity. Other direct causes include; puerperal infections, hypertensive disorders, obstructed labour, ruptured uterus, complications of unsafe abortions. Indirect causes comprise of severe anaemia, malaria, HIV/AIDS, and tuberculosis (NCAPD et al., 2010).

Postpartum haemorrhage is responsible for about 140,000 maternal deaths per year, or 1 maternal death every 4 minutes (Leduc, et al., 2009). According to WHO (2008), severe bleeding after birth can kill even a healthy woman within two hours if she is unattended. About 14 million women have PPH each year world wide and 2% of them die (Shakur, et al., 2010). The situation is worst in Africa where PPH accounts for 34% of all maternal deaths (Khan, et al., 2006).
PPH also causes serious morbidity in many women. Complications of PPH include respiratory distress syndrome, coagulopathy, shock, loss of fertility, and pituitary necrosis and anaemia in the mother. Many women who develop PPH require blood transfusion which sometimes can transmit blood borne infections such as HIV/AIDs or cause adverse reactions (Abalos, 2006).

There are several causes of PPH. Such as uterine atony, retained placenta, inverted or ruptured uterus, and cervical, vaginal, or perineal lacerations. These causes of PPH have been ranked differently by different researches. According to MCHIP (n.d), failure of the uterus to contract is the most common cause of PPH and accounts for 80% of immediate PPH. This view is similar to that of WHO (2007). On the other hand, POPPHI (2006) ranked retained placenta as the most frequent cause (39.5%), followed by failure of the uterus to contract (26.8%).

1.4 Description of AMTSL

AMTSL is an evidence-based, low-cost intervention used to prevent postpartum haemorrhage (WHO, 2006). There is a general agreement that AMTSL is a package comprising several interlocking interventions to assist in expulsion of the placenta with the intention to prevent or decrease blood loss. In contrast, expectant or physiological management involves spontaneous delivery of the placenta, with subsequent intervention, if necessary such as uterine massage and use of uterotonics (WHO, 2007).

Bristol and Hinchingbrooke did the original trials and identified use of uterotonics, early clamping of the umbilical cord, and controlled traction of the cord as the components of AMTSL (Cited in POPPHI, 2006). ICM and FIGO (2004) and Ludec, et al. (2006) in addition to use of uterotonic and controlled cord traction include
uterine massage and exclude early cord clamping. The latter recommend delayed cord cramping for 1 to 3 minutes after delivery of the baby.

WHO (2007) points out that though there have been general agreement on the beneficial effects of active management of the third stage of labour, there are several issues which were yet to be resolved such as clear definitions of the individual components of AMTSL.

To resolve these issues, WHO held a technical consultation on the Prevention of Postpartum Haemorrhage in October 2006 to discuss the various issues related to prevention of PPH and recommended the following components for AMTSL; administration of an uterotonic (oxytocin) soon after birth of the baby, delayed cord clamping and cutting for 3 minutes after delivery of the baby unless the baby requires resuscitation, delivery of the placenta by controlled cord traction, followed by uterine massage.

In case oxytocin is not available, ergometrine or a drug containing both oxytocin and ergometrine should be offered. Misoprostol can also be used in low doses but this needed more trials (WHO, 2007). Abalos 2006,WHO 2007 explains that early cord clamping is not recommended because delaying cord clamping and cutting is beneficial for the baby. Both Ludec, et al. (2006) and WHO (2007) recommends that in the absence of active management of the third stage of labour, a uterotonic drug (oxytocin or misoprostol) should be offered. This shows that use of uterotonic drug without performing the other components is not AMTSL.

The Ministry of Health Kenya adopted WHO recommendations. The ministry’s division of reproductive health (DRH) included AMTSL in the revised national standards documents for maternal and newborn care. The national guideline documents the components of AMTSL as; administering oxytocin within one minute
of child birth, delivering the placenta using controlled cord traction, massaging the uterus immediately after delivery of the placenta and massaging the uterus after every 15 minutes for the first 1-2 hours after delivery. (DRH, 2013).

This study regarded the four components in the national guideline as the MOH AMTSL standards. These components defer from previous DRH guidelines that indicated that oxytocin could be administered either after birth of anterior shoulder or immediately after delivery of the baby. The previous guidelines also included CCT and uterine massage immediately after delivery of placenta but did not include subsequent uterus massage for the first 1-2 hrs.

According to Prendiville et al. (2007) and WHO (2007) several trials have been done overtime that have confirmed that AMTSL is associated with reduced risks of maternal blood loss and shortened third stage of labour. Side effects of AMTSL are minor such as maternal nausea, vomiting and raised blood pressure when ergometrine is used. No advantages or disadvantages are apparent for the baby. POPPHI, (2006) also points out that AMTSL also helps decrease other complications that can occur during child birth, including retained placenta.

1.5 Practice of AMSTL

2.5.1 Research methodology used to study utilization of AMTSL

Despite recommendations and adoption of AMTSL globally, studies on its utilization are few. In Kenya there is no study that has been published on utilization of AMTSL. The closest study is Kenya Service Provision Assessment survey that has generated information on delivery care services. The survey used varied data collection methods and tools. Data on provider knowledge of common signs of postpartum haemorrhage was collected using a questionnaire. Observation method was used to assess the
standards of care for normal deliveries as well as management of PPH (NCAPD, et al., 2010).

In the East African region, Godfrey, et al. (2009) conducted a national survey in Tanzania on health facility-based AMTSL. This study used three data collection methods, that is, observation of management of third stage of labour and reviewing standards treatment documents (STG), the essential drug list and medical and midwifery school curricula and and interviewing key informants.

Prevention of postpartum haemorrhage initiative (POPHI) has carried out several studies on AMTSL practices to identify major barriers to its use in different countries such as Guatemala in Latin America (POPHI, 2006a) and Ceroboni district in Indonesia (POPHI, 2006b).

In Ceroboni, two data collection methods were used. One of the methods was observation of home-based deliveries and methods of uterotonic drug storage. The second method was interviewing of village midwives to assess their knowledge on storage of uterotonic drugs and logistics.

The Guatemala study assessed policy, birth attendant factors and supplies and logistics at national and health facility level. Data collection methods used included observation (of hospital based deliveries), review of records (clinical care standards documents, essential drug list, and medical and midwifery school curricula) and interviews (for pharmacists and hospital directors). This methodology is similar to the one used by Godfrey, et al. (2009) in Tanzania.

Stanton, et al. (2009) carried out a study on use of active management of the third stage of labour in seven developing countries Benin, El Salvador, Ethiopia, Honduras, Indonesia, Nicaragua and the United Republic of Tanzania. The study involved a review of national policy documents, the observations and administration of
questionnaires. A two-stage, probability-based sample of vaginal deliveries was selected.

2.5.2 Utilization of AMTSL.

Though there is no published study on AMTSL utilization in Kenya, studies done in other countries have shown low utilization of AMTSL in most countries. In Tanzania Godfrey, et al. (2009) reported 7% correct utilization of AMTSL while Stanton, et al. (2009) reported even lower utilization at 0.5%.

AMTSL. Stanton, et al., (2009) conducted a study covering several countries and similar to Godfrey, et al. (2009) findings by in Tanzania the utilization was low in all the countries with AMTSL being practiced in only 17.6% (Benin) and 4.5% (Ethiopia) of the deliveries. A study carried out in Guatemala public facilities reported similar results with only 7% of deliveries benefiting from correct use of AMTSL (POPHI, 2006a).

Another study in a large public teaching hospital in Egypt reported utilization of AMTSL in 15% of all deliveries (Cherine et al., 2004). A study in Ceroboni unlike the aforementioned studies recorded high utilization of AMTSL with 75% of deliveries utilizing AMTSL (POPHI, 2006b). However the Ceroboni study observed home-based deliveries and not health facility based like the other studies.

Utilization of individual component varies. In Guatemala only 21% of deliveries had correct administration of uterotonic drug. In Ceroboni, 80% percent of the village midwives administered oxytocin correctly. In Tanzania, Godfrey, et al. (2009) reported that 25% deliveries observed received oxytocin. A study carried out in three maternity hospitals in Istanbul and Turkey, documented the use of oxytocics in 95% of deliveries during the third stage of labour (Turan et al., 2005).
Controlled cord traction (CCT) was practiced in 34% of deliveries in Guatemala (POPHI, 2006a) while in Ceroboni it was practiced in all observed deliveries (POPHI, 2006b). In Tanzania according to Godfrey S, et al. (2009) birth attendants performed CCT in over two-thirds (69%) of observed deliveries.

Uterine massage immediately following delivery of the placenta was practiced in 88% of deliveries in Guatemala (POPHI, 2006a). However, immediate uterine massage, plus palpation of the uterus at least twice during the first 30 minutes after delivery of the placenta was recorded in only 32% of the deliveries.

All deliveries in Cereboni according to POPPHI (2006b) benefited from uterine massage immediately following delivery of the placenta, and 94 percent benefited from uterine massage every 15 minutes. In Tanzania according to Godfrey, et al. (2009) 88% of deliveries benefited from immediate uterine massage. The study however did not document palpation of the uterus at 15 minute intervals following delivery of the placenta.

1.6 Determinants of AMTSL utilization

POPHI (2006a) describes a conceptual framework developed from findings of qualitative studies in several countries identified several determinants of the routine use of AMTSL. These determinants are; training of birth attendants, knowledge and skills of birth attendants, logistics to include availability and storage of supplies and availability of AMTSL standards documents/protocol in health facilities. This study classified all these factors into two; health facility factors and provider factors.

2.6.1 Health facility factors and AMTSL

Delivery services are provided by facilities at every level of the Kenyan healthcare system but only about 30% of facilities offer normal delivery services. Only 13% of facilities in Central province in which Kiambu county was mapped out provide
normal delivery services (NCAPD, et al., 2010). According to MoMS and MoPHS (2010), level 2 facilities in Kenya (dispensaries and medical clinics) should not provide routine delivery services since they are not adequately equipped.

**Supplies and Equipment**

Availability of supplies and equipment is one of the health facility factors that influence utilization of AMTSL standards documents. ICM, et al. (n.d), states that availability of logistics system support (for example cold or cool chain) and supplies (e.g. oxytocin, needles, and syringes.) are vital in implementation of AMTSL.

POPHI (2006) also identifies the same essential supplies for routine use of AMTSL. A qualitative study done by Chodzaza E and Bultemeier K (2010) reported inadequate supplies as a major factor contributing to the provision of poor quality obstetric care. This is similar to another qualitative study done by Efstathiou (2011) that found out that availability of equipment or storage of such equipment in places far from where care is provided is a barrier to provision of nursing care.

There is no study that has documented the association between supplies and utilization of AMTSL in Kenya. However, most facilities in Kenya have been reported to have adequate supplies. The Kenya Service Provision Assessment Survey revealed that 71% of health facilities in Kenya have oxytocin and 96% of the health facilities have syringes and needles within reach in delivery room (NCAPD, et al., 2010).

This is similar to Tanzania where 97% of observed deliveries occurred in facilities with an uterotonic drug available in the labor ward (Godfrey, et al., 2009). Outside Africa supplies for AMTSL are fairly adequate; In Guatemala 93.3% of health facilities had oxytocin. (POPHI, 2006a). These studies however, didn’t test the association between availability of supplies and utilization of AMTSL.
Besides availability of equipment and supplies effective use of AMTSL also requires appropriate conditions during transport and storage to ensure the use of chemically-active drugs. Oxytocin is more heat stable than ergometrine. However, manufacturers and the official compendia, the *U.S. Pharmacopeia* and *British Pharmacopeia*, recommends that oxytocin should be kept at temperature between 2°–8°C (36°–46°F) and not more than 30 days at 15°–25°C (59°–77°F) for it not to lose potency. This means refrigeration is important to provide an appropriate storage condition for the oxytocics.

There are no published reports on storage of oxytocin in Kenya but in Tanzania according to Godfrey, et al. (2009) storage conditions are not proper since 28% of uterotonic drugs (including ergometrine) were stored at room temperature. In Ghana, Ghana Food and Drugs Authority (2013) observed that almost all of the oxytocics were not stored according to the recommended storage conditions. In Guatemala 74% of the facilities stored oxytocin above 8°C (POPHI, 2006a).

**Standards documents**

POPHI (2006a) conceptual framework identifies availability of AMTSL protocol in hospital as a one of the determinants of the routine use of AMTSL. Studies in Kenya have indicated that, most of the standards documents still remain unavailable at the point of use in most health facilities. This is in spite of WHO developing several evidence based standards documents and subsequent adoption by the Ministry health in Kenya.

There are no studies that have been published on availability of AMTSL standards documents in Kenya and the association between availability of such documents and utilization of AMTSL. However, according to Kenya Service Provision Assessment survey only 25% of facilities nationally and 27% of facilities in central province have
service standards documents (or protocols) for emergency obstetric care, NCAPD, et al. (2010). This is unlike Guatemala where 66.7% of facilities have standards documents that included AMTSL (POPHI, 2006a).

Besides unavailability, standards documents can be conflicting or outdated. For instance Stanton, et al. (2009) reported availability of multiple and conflicting standards documents about the active management of the third stage of labour in six out of seven countries. In some cases, the multiple standards documents were outdated but still used at the facilities.

**Type of health facility**

Although there are no published studies on association between utilization of AMTSL and type of health facility in Kenya, health facility based studies have revealed that care delivery vary across different types/levels of health facilities. Availability of supplies also varies across different types of facilities. Service provision survey by NCAPD, et al. (2010), revealed that hospitals are more likely (55%) to have delivery room infrastructure as well as routine training of health workers (50%) than health centres and maternity homes. In addition, government and faith based managed facilities were likely to have delivery care guideline documents than private managed facilities. Hospitals (72%) and private and FBO facilities (68%) were more likely to have all medicines and supplies for delivery available than other health facility types.

A study done in Guatemala reported that birth attendants in district hospitals (100%) are more likely than those working in health centers (66.7%) to follow the AMTSL standards documents (POPHI, 2006a).
2.6.2 Birth attendant factors and AMTSL

WHO (2007) recommends that AMTSL should be provided only by skilled birth attendants. In Kenya, only doctors, clinical officers, midwives and nurses are regarded as skilled birth attendants (NCAPD, et al., 2010).

In central province 74% of the deliveries are conducted by a skilled birth attendant with doctors conducting a higher proportion of deliveries (45%) than nurses (28%). However, nationally (62.4%) of deliveries are conducted by nurse/midwives (NCAPD, et al., 2010).

In other countries like Benin, Ethiopia and Tanzania according to finding by Stanton, et al. (2009) most deliveries are conducted by nurse/midwives who conduct between 69-94% of the deliveries. This relates well to Godfrey, et al. (2009) who did not include physicians in their study citing that physicians in Tanzania tend to manage instrumental or more complicated deliveries. In other countries like Mali community health workers attend majority of births and have been trained on AMTSL (Capacity project, 2009).

Training

Training has been identified by several studies as a determinant to implementation of standard care. Kiningu (2013) recommended training of health care providers as a strategy to improve utilization of standards documents. Efstathiou (2011) cited lack of knowledge and training as contributing factor to low utilization of standard standards documents.

Nyakanda (2012) also identified training as a necessity for implementation of standards documents and specifically highlighted the need for specialised training and not only coaching by experienced health workers. In central province, only 43% of health facilities have been reported to carry out routine training of health care
providers on various aspects of delivery care but this did not include training on AMTSL (NCAPD, et al., 2010).

A study in Ceroboni reported that 81.3% of community midwives had been trained on AMTSL and almost all midwives had received training on AMTSL. In Guatemala in-service training programs that included AMTSL were conducted in 50% the health facilities. In Ceroboni, pre-service trained midwives utilized AMTSL slightly more (76.1%) than in-service trained midwives (75.7%) (POPHI, 2006a and POPPHI, 2006b). There is no published information on association between training on AMTSL and utilization of AMTSL.

**Working experience**

Working experience can affect adherence to standard documents. Efstathiou (2011) in a qualitative study found out that more experienced nurses were unlikely to follow standards documents. The explanation given was that when nurses gain enough experience they are very confident about their capabilities and therefore, certain standards documents may not be followed. This can explain the findings by POPPHI (2006b) in Ceroboni that midwives with less than a year of working experience were more likely (86%) to follow AMTSL standards documents than midwives with more than 15 years of work experience (68%).

**Knowledge**

Knowledge is key in practice of any procedure or guideline. Unfortunately, researches done on knowledge of health workers on delivery care have shown that most do not have sufficient knowledge on various aspects of obstetric care.

According to Kenya Service provision survey by NCAPD et al. (2010), knowledge of providers of delivery care on different aspects of prevention and management of post partum haemorrhage is wanting. The survey reported that the proportions of delivery
care providers who correctly mentioned the items for monitoring of labour and delivery was 3%. Only 7% correctly mentioned items to assess in a woman who presents with bleeding after delivery. NCAPD et al. (2010) reports shows that knowledge of both signs of and management of postpartum haemorrhage is wanting; only 7% of midwives were able to comprehensively mention the key signs to look for in a woman who develops PPH after delivery. This has been the case for the last six years since in 2004 KSPA only 6% of the most experienced midwives were able to spontaneously name all signs of postpartum and only 12% were able to spontaneously name all four expected interventions for postpartum haemorrhage.

In East Africa region the situation is not different since only 9% of delivery care providers in Tanzania made correct statements regarding the all three components of AMTSL as reported by Godfrey, et al. (2009).

**Type and cadre of birth attendant**

Utilization of AMTSL has been reported to vary by type and cadre of birth attendants. In Ceroboni nurses were more likely to administer oxytocin (78.0%) than doctors (24.1%). Also nurses were more likely (73.8%) to do uterine massage than doctors (56.2%). On the other hand doctors were more likely (13.1%) to utilize all aspects of AMTLS as per the FIGO and ICM definition than nurses (0.0%) (POPPHI, 2006a).

In Guatemala nurses are likely to have in-service training (60%) than doctors (53%). In Cerbooni the level of training (cadre of birth attendant) did not seem to influence utilization of AMTLS since midwives trained for 1 year and those trained for 3 years showed no difference in utilization.

**2.7 Summary**

MMR in Kenya has been ranked high by several studies and the decline has been very minimal. The original AMTLS components identified by the original trials have been
modified. The Ministry of health Kenya has adopted the WHO guidelines but left out delayed cord cramping. Research on AMTSL utilization is scanty in Kenya. All the studies reviewed documented prevalence of the factors and lacked the association between AMTSL utilizations and the factors.
CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter has stated the research design that the study employed and explains the sample selection and calculation as well as the inclusion and exclusion criteria. It further describes the data collection instruments and provides an explanation of the statistical procedures used to analyze the data. It also has an explanation on how data validity and reliability was ensured and how research ethical principles were upheld.

3.2 Research design

This study used cross-sectional design. This design described the status of and determinants of utilization of AMTSL at the time of study. Cause effect relationship was not established.

3.3 Variables

3.3.1 Independent variables

The independent variables were grouped in to two; Health facility factors and birth attendant factors

1. Health facility factors included; type of health facility, level of health facility, availability of AMTSL standard documents in labour ward, number of staffs authorised to order AMTSL supplies, availability of supplies and availability of a fridge.

2. Birth attendant factors included; type of birth attendant, cadre of birth attendant, training of birth attendants on AMTSL, type of training and knowledge of the birth attendant on AMTSL.

3.3.2 Dependent Variable

Utilization of AMTSL was the dependent variable in the study. The care givers were grouped into two i.e. those who utilized and those who did not utilize. Utilization was
determined by observing birth attendants conduct third stage of labour using an observation checklist. A care giver was said to have utilized AMTSL if he/she did all the following;

1. Administered oxytocin within one minute of child birth
2. Delivered the placenta using controlled cord traction
3. Massaged the uterus immediately
4. Massaged uterus after every 15 minutes for the first 1-2 hours after delivery.

This criterion was developed using the Ministry of Health guideline on components of AMTSL (DRH, 2013).

3.4 Location of study

The study was carried out in Kiambu County. The county was purposively sampled because it is based in Central province. Central province was purposively sampled because most mothers deliver in health facilities. According to KDHS (2008/2009), central province had approximately 74% of the deliveries taking place in health facility. This was only second to Nairobi province (89%), however, central province has more women of reproductive age (1, 007,212) than Nairobi (848,051) (District population estimates, 2010).Kiambu county was sampled purposively since it had the highest population of women of reproductive age among the 5 counties mapped out in the former central province. The county had 378,574 women of reproductive age. The county has nine (9) sub counties namely; Kikuyu, Lari, Kiambu West, Kiambu East, Githunguri, Ruiru, Thika West, Thika East and Gatundu. The main economic activity in Kiambu County is agriculture. The Kikuyus are the dominant tribe in the county.

There were a total of 417 health facilities in the county comprising of hospitals (level 4&5 facilities), nursing homes, maternity homes, health centres and dispensaries. The study was carried out in maternity units in the county. The county had a total of 52
health facilities offering routine delivery services in the county (MOH, 2012). Appendix VII shows the map of Kiambu county.

3.5 Study population

The study population was skilled birth attendants working in maternity units in Kiambu County. According to the districts health records (2011) and staff records in health facilities there were approximately 431 skilled birth attendants working in maternity units in the county.

3.6 Inclusion criteria

Birth attendants working in health facilities that offered routine delivery services in Kiambu county (according to the master health facility list, 2010) were included.

3.7 Exclusion criteria

Birth attendants under training (students) were excluded.

Birth attendants working in maternity unit who were not skilled according to WHO definition were excluded.

Birth attendants working in Level 2 facilities were excluded. This was based on information by MoMS and MoPHS (2010) that level 2 facilities in Kenya (dispensaries and medical clinics) do not have maternity units and do not offer routine delivery services.

Birth attendants working in health facilities not approved by the ministries of health (i.e. those not in the health facilities list) were excluded.

3.8 Sampling techniques and Sample size

3.8.1 Sampling Techniques

Multistage sampling was used. At the first stage, the birth attendants were stratified into six strata. Stratification was done using the type and the level of health facility.
The type of health facility was determined using the type of governing authority while the level was determined using the ministry of health standard classification of health facilities. The six strata were:

**Stratum 1**: Birth attendants working in Government Level four and five facilities

**Stratum 2**: Birth attendants working in Government Level three facilities

**Stratum 3**: Birth attendants working in Faith Based Level four and five facilities

**Stratum 4**: Birth attendants working in Faith Based Level three facilities

**Stratum 5**: Birth attendants working in Private Level four and five facilities

**Stratum 6**: Birth attendants working in Private Level three facilities

At second stage, the birth attendants in each stratum were clustered according to the health facility where they worked i.e. each health facility was regarded as a cluster. The clusters were as follows:

**Stratum 1**: Birth attendants working in Government Level four and five facilities

The total number of birth attendants in this stratum was 112 working in 9 health facilities. The birth attendants were grouped in 9 clusters.

**Stratum 2**: Birth attendants this stratum was 148 working in 19 health facilities. The birth attendants were working in Government Level three facilities

The total number of birth attendants in grouped in 19 clusters.

**Stratum 3**: Birth attendants working in Faith Based Level four and five facilities

The total number of birth attendants in this stratum was 73 working in 6 health facilities. The birth attendants were grouped in 6 clusters.

**Stratum 4**: Birth attendants working in Faith Based Level three facilities

The total number of birth attendants in this stratum was 43 working in 6 health facilities. The birth attendants were grouped in 6 clusters.

**Stratum 5**: Birth attendants working in Private Level four and five facilities
The total number of birth attendants in this stratum was 17 working in 2 health facilities. The birth attendants were grouped in 2 clusters.

**Stratum 6: Birth attendants working in Private Level three facilities**

The total number of birth attendants in this stratum was 36 working in 10 health facilities. The birth attendants were grouped in 6 clusters.

Simple random sampling using ballot method was used to sample the clusters included in the study from each stratum. Clusters were randomly selected until the proportionate number of birth attendants in the respective stratum was reached. A total of 28 clusters (health facilities) were sampled. All the birth attendants on duty (not on leave) during data collection in each of the 28 sampled clusters were interviewed. The proportionate sample and clusters sampled in each sample were as follows;

**Stratum 1: Birth attendants working in Government Level four and five facilities**

The total number of birth attendants in this stratum was 112. The proportionate sample was 112/203X100= 53. This number was reached after randomly sampling 6 clusters.

**Stratum 2: Birth attendants working in Government Level three facilities**

The total number of birth attendants in this stratum was 148. The proportionate sample was 148/203X100= 70. This number was reached after randomly sampling 10 clusters.

**Stratum 3: Birth attendants working in Faith Based Level four and five facilities**

The total number of birth attendants in this stratum was 73. The proportionate sample was 73/203X100= 34. This number was reached after randomly sampling 4 clusters.

**Stratum 4: Birth attendants working in Faith Based Level three facilities**
The total number of birth attendants in this stratum was 43. The proportionate sample was 43/203X100=21. This number was reached after randomly sampling 4 clusters.

**Stratum 5: Birth attendants working in Private Level four and five facilities**

The total number of birth attendants in this stratum was 17 working in 2 health facilities. The birth attendants were grouped in 2 clusters. The proportionate sample was 17/203X100= 8. This number was reached after randomly sampling 1 cluster.

**Stratum 6: Birth attendants working in Private Level three facilities**

The total number of birth attendants in this stratum was 36. The proportionate sample was 36/203X100= 17. This number was reached after randomly sampling 5 clusters.

### 3.8.2 Sample size

The target population for this study was 431 birth attendants. Sample size was calculated using the Fisher et al. (1983) formula when the population is less than 10,000 which is;

$$nf = n/(1+n/N)$$

Where,

$nf=$ sample size when the total population is less than 10,000.

$N=$ estimated total population less than 10,000

$n=$ estimate sample when the total population is more than 10,000 (384).

The value of $n$ was calculated using Fisher et al. (1983) formulae

$$n=z^2pq/d^2$$

$n=$ desired sample size

$z=$standard normal deviate (1.96) that corresponds to 95% confidence level.

$p=$ the proportion in the target population estimated to have a particular characteristic (utilization of AMSTL). In the current context there was no known estimate so 50% (0.5) was used.
q=1.0-p

d= the degree of accuracy desired (0.05 was used in the current case)

\[ n = \frac{((1.96)^2 \times (0.5 \times 0.5))}{(0.05)^2} \times \frac{(3.8416 \times 0.25)}{0.0025} = 0.9604/0.0025 = 384 \]

The sample of birth attendants was therefore;

\[ n_f = \frac{384}{1+384/431} = 203 \]

Each of the health worker sampled was observed managing third stage of labour and therefore 203 deliveries were observed.

3.9 Construction of research Instruments

Observation check list was used to collect information on practice of AMTSL (objective one). Interviewer administered questionnaires were used to collect data on birth attendants factors and health facility factors (objective two and three).

3.10 Pre-testing

A pre-test was done in Githunguri health centre and Nazareth Mission Hospital. These health facilities had similar characteristic with the study population. They were purposively selected for pretesting since they were not selected at the sampling stage and they are also accessible. The data collection tools were adjusted accordingly before use.

3.11 Validity and reliability

Interviewer administered questionnaires were used rather than self-administered questionnaires to ensure validity. The questionnaires and the observation checklist were tested in a similar group and adjusted accordingly to improve their ability to collect appropriate data.
To avoid hawthorne effect during observation of deliveries, the birth attendant were not informed of the specific skills being observed. Also observation of a birth attendant conducting third stage of labour was done before interviewing the birth attendant. The research assistants were qualified health workers who had been trained on AMTSL. The data collectors also underwent training on how to use the questionnaires and the checklists to ensure consistency.

### 3.12 Data Collection Techniques

Four (4) research assistants were involved in data collection after individual comprehensive training on the specific data collection. The research assistants were trained skilled birth attendants at diploma and degree levels. Non-participant observation of management of third stage of labour was done for 203 deliveries to collect data on utilization of AMTSL. Interviews using questionnaires were conducted for 203 birth attendants who conducted the afore mentioned deliveries to collect data on birth attendant factors and health facility factors.

### 3.13 Data entry and analysis

Data was entered into STATA version 11. Descriptive statistics were used to generate frequencies and proportions. The dependent variable was organised as a binary variable with two categories; Utilized and not utilized AMTSL. Chi square and fisher’s exact at 95% confidence interval were used to test the association of the independent and dependent variables. The variables that had statistically significant association using chi square were subjected to logistic regression to generate the odds ratios.
3.14 Logistical and Ethical Considerations

Ethical approval was sought from Kenyatta University Ethics Review Committee. Research assistants were licensed reproductive health providers. Approval was sought from both then National Council for Science and Technology and ministry of health to carry out the study. Permission was also sought from the various authorities to include District’s Medical Officers of health and heads of the various facilities.

At the respondent level, voluntary and informed consent was also sought from each respondent as well as from each mother with an assurance of confidentiality. The respondents were explained the extent, the benefits and the risks of the study. The respondents were also informed that participation was voluntary and they could choose to or not to participate and could choose to pull out at any point of the study.

The respondents were given a consent form to sign and were also given the contacts of the principal investigator, the supervisors and the chairman of Kenyatta University Ethics Review Committee. The respondents were informed that there are no direct individual benefits but through implementation of the feedback by the facilities, the community can benefit. Names of the respondents and those of the mothers were not written in any of the data collection tools for confidentiality.
CHAPTER FOUR: RESULTS

4.1 Introduction

The findings are organised according to the objectives that is status of AMTSL utilization, health facility factors and birth attendant factors. However, demographic characteristics of the respondents are presented first. Results under status of AMTSL utilization are presented next followed by results on health facility factors and lastly results on birth attendant factors are presented.

4.2 Demographic characteristics of the respondents

Females were 81.8% of all respondents. 35.0% of the respondents aged between 31-40 years (35.0%). 92.6% of the respondents were nurses and the others (8.4%) were clinical officers. Majority of the birth attendants were diploma holders (69.0%).

Table 4.1 shows the demographic characteristics of the respondents.

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<tr>
<td></td>
<td>51-60</td>
<td>16</td>
<td>7.9</td>
</tr>
<tr>
<td>Profession</td>
<td>Nurse/midwife</td>
<td>188</td>
<td>92.6</td>
</tr>
<tr>
<td></td>
<td>Clinical officer</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td>Level of education</td>
<td>Certificate</td>
<td>56</td>
<td>27.6</td>
</tr>
<tr>
<td></td>
<td>Diploma</td>
<td>140</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Degree</td>
<td>7</td>
<td>3.4</td>
</tr>
</tbody>
</table>
4.3 AMTSL utilization status

Utilization status is presented in three aspects. The first aspect is the proportion of birth attendants utilizing all components of AMTSL. The second aspect is the level of utilization of AMTSL components. The level was determined by the number of components utilized i.e. birth attendants who utilized any one component were regarded to be in level one, those who utilized any two components were regarded to be in level two, those who utilized any three components were regarded to be in level three and those who utilized all the four components were regarded to be in level four. The last aspect was proportions of birth attendants utilizing each of the components of AMTSL.

4.3.1 Proportion of birth attendants utilizing AMTSL

Only 64 (31.5%) The birth attendants who utilized all the components of AMTSL as stipulated in the Ministry of Health guidelines were 64(31.5%). Figure 4.1 shows utilization of AMTSL.

![Figure 4.1: Utilization of AMTSL](image-url)
4.3.2 Level of AMTSL utilization.

All (100%) the birth attendants utilized at least one of component of AMTSL (level 1) but only 31.5% utilized all the four components of AMTSL (Level 4). Figure 4.2 shows level of AMTSL utilization.

![Levels of AMTSL Utilization](image)

**Figure 4.2: Level of AMTSL utilization.**

4.3.3 Utilization of individual components of AMTSL

Among the four components of AMTSL outlined by MOH standard’s documents, Controlled cord traction was the most utilized component with 96.5% of the care givers utilizing it. Uterine massage after every 15 minutes for 1-2 hours (subsequent massage) was the least utilized component with only 33.1% of birth attendants utilizing it. Figure 4.3 shows Practice of individual components of AMTSL.
4.4 Health facility factors that influence utilization of AMTSL

The health facility factors that were assessed are; type of health facility, level of health facility, AMTSL supplies stockouts, number of birth attendants authorised to order AMTSL supplies (oxytocin, syringes and needles), availability of AMTSL supplies at the point of use (Labour ward), availability of a fridge and availability of AMTSL standards documents in the labour ward.

4.4.1 Type of health facility

The facilities type was determined using managing authority. The proportion of birth attendants utilizing AMTSL was highest among those working in government health facilities (37.4%) and was lowest was among those working in private health facilities (8.0%). The association between type of health facility and utilization of AMTSL was statistically significant at 95% confidence level (logistic regression $p=0.006$). Figure 4.4 shows association between type of health facility and utilization of AMTSL.

Figure 4.3: Utilization of individual components of AMTSL(n=203)
4.4.2 Level of health facility

The level of health facility was determined using the Ministry of Health classification of health facilities (MOH, 2006). The proportion of birth attendants utilizing AMTSL was higher among birth attendants working in level 4 and 5 facilities at 49.5% than in level 3 facilities (15.7%). There was a statistical significant association between level of health facility and utilization of AMTSL at 95% confidence interval ($\chi^2 = 26.6414$, $DF=1$, $P<0.001$). Figure 4.5 shows Association between level of health facility and utilization of AMTSL.
Figure 4.5: Association between level of health facility and utilization of AMTSL

4.4.3 Supplies stock outs

The birth attendants were requested to rate frequency of supply stock outs in a scale of five i.e. never, rarely, sometimes, very frequently and always. Ratings of never and rarely were regarded as ‘less frequent stock outs’ while ratings of sometimes, very frequently and always were regarded as ‘more frequent stock outs’. Supplies stock outs were less frequent for majority (83.7%) of the birth attendants.

a. Frequency of supplies stock outs by type and level of health facility.

Birth attendants from faith based (2.9%) and government (7.6%) managed level four facilities are the least likely to have more frequent stock outs. Table 4.2 shows frequency of supplies stock outs by type and level of health facility.
Table 4.2: Frequency of supplies stock outs by type and level of health facility

<table>
<thead>
<tr>
<th>Frequency of stock out</th>
<th>Govt L3 (n=70)</th>
<th>Govt L4 (n=53)</th>
<th>FBO L3(n=21)</th>
<th>FBO L4 (n=34)</th>
<th>PRV L3 (n=17)</th>
<th>PRV L4 (n=8)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>More frequent</td>
<td>14(20.0%)</td>
<td>4(7.6%)</td>
<td>5(23.8%)</td>
<td>1(2.9%)</td>
<td>5(29.4%)</td>
<td>4(50.0%)</td>
<td>33(16.3%)</td>
</tr>
<tr>
<td>Less frequent</td>
<td>56(80.0%)</td>
<td>49(92.4%)</td>
<td>16(76.2%)</td>
<td>33(97.1%)</td>
<td>12(70.6%)</td>
<td>4(50.0%)</td>
<td>170(83.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>70(100.0%)</td>
<td>53(100.0%)</td>
<td>21(100.0%)</td>
<td>34(100.0%)</td>
<td>17(100.0%)</td>
<td>8(100.0%)</td>
<td>203(100.0%)</td>
</tr>
</tbody>
</table>

b. Association between frequency of supplies stock outs and utilization of AMTSL

Utilization of AMTSL was higher (34.7%) among birth attendants who had less frequent stock outs compared to care givers who experienced more frequent stock outs (15.1%). The association between supplies stock outs and utilization of AMTSL was statistically significant at 95% confidence interval ($\chi^2 = 4.8950$, DF=1, P=0.027). Figure 4.6 shows association between frequency of supplies stock outs and utilization of AMTSL.

![Figure 4.6: Association between frequency of supplies stock outs and utilization of AMTSL](image-url)
4.4.4 Authorization to order supplies

a. Number of birth attendants authorized to order supplies by type and level of health facility.

Government managed facilities are more likely (93.5%) than other facilities to have more than two birth attendants authorised to order supplies. Figure 4.7 shows number of birth attendants authorised to order supplies by type of health facility.

Figure 4.7: No. of birth attendants authorised to order supplies by type of health facility

b. Association between number of staff authorized to order supplies and utilization of AMTSL

Most birth attendants (84.7%) worked in health facilities with more than 2 staff authorized to order supplies. Utilization of AMTSL was highest (34.9%) among birth attendants who worked in facilities with more than two staff authorised to order supplies. The association between number of staff authorized to order supplies and utilization of AMTSL was statistically significant at 95% confidence interval
Figure 4.8 shows association between number of birth attendants authorised to order supplies and utilization of AMTSL.

### Figure 4.8: Association between number of birth attendants authorized to order supplies and utilization of AMTSL

#### 4.4.5 Availability of supplies at the point of use

Availability of needles, syringes and oxytocin in labour ward was observed. The supplies were regarded as ‘not available’ if they were not available at the point of use (in labour ward) irrespective of their available in other places e.g. the store.

**a. Availability of supplies at the point of use by type and level of health facility**

Government level 4 facilities are most likely to have the supplies for AMTSL available at the point of use than other types of facilities. Table 4.3 shows availability of supplies at the point of use by type and level of health facility.
Table 4.3: Availability of supplies at the point of use by type and level of health facility

<table>
<thead>
<tr>
<th>Availability of supplies</th>
<th>Govt L3 (n=70)</th>
<th>Govt L4 (n=53)</th>
<th>FBO L3 (n=21)</th>
<th>FBO L4 (n=34)</th>
<th>PRV L3 (n=17)</th>
<th>PRV L4 (n=8)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td>1 (1.4%)</td>
<td>0 (0.0%)</td>
<td>3 (14.3%)</td>
<td>3 (8.8%)</td>
<td>5 (29.4%)</td>
<td>4 (50.0%)</td>
<td>16 (7.9%)</td>
</tr>
<tr>
<td>Available</td>
<td>69 (98.6%)</td>
<td>53 (100.0%)</td>
<td>18 (85.7%)</td>
<td>31 (91.2%)</td>
<td>12 (70.6%)</td>
<td>4 (50%)</td>
<td>187 (92.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>70 (100%)</td>
<td>53 (100%)</td>
<td>21 (100%)</td>
<td>34 (100%)</td>
<td>17 (100%)</td>
<td>8 (100%)</td>
<td>203 (100%)</td>
</tr>
</tbody>
</table>

b. Association between availability of supplies at the point of use and utilization of AMTSL.

Most (92.1%) birth attendants had supplies available at the point of use. Utilization of AMTSL was higher (33.2%) among birth attendants working in facilities where supplies were available at the point of use than where supplies were not available at the point of use (12.5%). At 95% confidence interval, there was no statistically significant association between availability of supplies at the point of use and utilization of AMTSL (Fisher’s Exact P = 0.100). Figure 4.9 shows the Association between availability of supplies at the point of use and utilization of AMTSL.
Figure 4.9: Association between availability of supplies at the point of use and utilization of AMTSL.

4.4.6 Availability of a fridge

a. Availability of a fridge by level and type of health facility

Faith based facilities (80.0%) and private facilities (72.0%) are more likely to have a fridge. On the other hand level 4 facilities (85.3%) are more likely than level 3 facilities to have a fridge (43.5%). Figure 4.10 and figure 4.11 shows availability of a fridge by level and type of health facility respectively.

Figure 4.10: Availability of a fridge by level of health facility
b. Association between availability of a fridge and utilization of AMTSL

Most (63.1%) of the birth attendants worked in facilities with a fridge. Utilization of AMTSL was higher (44.5%) among birth attendants who worked in facilities with a fridge than those who worked in facilities without (9.3%). At 95% confidence interval, the association between availability of a fridge and utilization of AMTSL was statistically significant ($\chi^2 = 21.1398$, $DF=1$, $P=0.001$). Figure 4.12 shows Association between availability of a fridge and utilization of AMTSL.
Figure 4.12: Association between availability of a fridge and utilization of AMTSL

4.4.7 Availability of AMTSL standards documents

Availability of standard documents in the maternity unit was observed. Absence of the documents in maternity units was termed as ‘not available’ irrespective of the presence of the documents elsewhere in the facility.

a. Availability of AMTSL standards documents by level and type of health facility

Birth attendants working in government level 4 facilities are the most likely to have AMTSL standards documents in the labour ward (83%) than others. Table 4.4 shows availability of AMTSL standards documents by level and type of health facility.
Table 4.4: Availability of AMTSL standards documents by level and type of health facility

<table>
<thead>
<tr>
<th>Availability standards documents/level</th>
<th>Govt L3 (n=70)</th>
<th>Govt L4 (n=53)</th>
<th>FBO L3(n=21)</th>
<th>FBO L4 (n=34)</th>
<th>PRV L3 (n=17)</th>
<th>PRV L4 (n=8)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>5 (7.1%)</td>
<td>9 (17.0%)</td>
<td>2 (9.5%)</td>
<td>2 (5.9%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>53 (26.1%)</td>
</tr>
<tr>
<td>Not available</td>
<td>65 (92.86%)</td>
<td>44 (83.0%)</td>
<td>19 (90.5%)</td>
<td>32 (94.1%)</td>
<td>17 (100.0%)</td>
<td>8 (100%)</td>
<td>150 (73.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>70 (100%)</td>
<td>53 (100%)</td>
<td>21 (100%)</td>
<td>34 (100%)</td>
<td>17 (100%)</td>
<td>8 (100%)</td>
<td>203 (100%)</td>
</tr>
</tbody>
</table>

b. Association between availability of AMTSL standards and utilization of AMTSL

Most (73.8%) birth attendants worked in health facilities with no AMTSL standards documents. Utilization of AMTSL was highest (68.0%) among birth attendants who worked in facilities with standards documents in the labour ward and the lowest (16.6%) among birth attendants with no standards documents anywhere in the health facility. The association between availability of standards documents and utilization of AMTSL was statistically significant at 95% confidence interval ($\chi^2=44.017$, DF=1, $P=0.000$). Figure 4.13 shows the Association between availability of AMTSL standards documents and utilization of AMTSL.

![Figure 4.13: Association between availability of AMTSL standards documents and utilization of AMTSL](image-url)

Figure 4.13: Association between availability of AMTSL standards documents and utilization of AMTSL
4.5 Birth attendant factors that influence utilization of AMTSL:

The birth attendant factors assessed included; years of experience, type of birth attendant, cadre of birth attendant, training, type of training, duration since training, knowledge of AMTSL components, attitude and skill.

4.5.1 Type of birth attendant

a. Birth attendants by level and type of health facility

Most of the birth attendants (34.5%) were working in government level three. Table 4.5 shows birth attendants by level and type of facility.

<table>
<thead>
<tr>
<th>Type of birth attendant</th>
<th>GOVT L3 (N=9)</th>
<th>GOVT L4 (N=0)</th>
<th>FBO L3 (N=21)</th>
<th>FBO L4 (N=34)</th>
<th>PRV L3 (N=17)</th>
<th>PRV L4 (N=8)</th>
<th>Total (N=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>9 (60.0%)</td>
<td>0 (0.0%)</td>
<td>4 (26.7%)</td>
<td>0 (0.0%)</td>
<td>2 (13.3%)</td>
<td>0 (0.0%)</td>
<td>15 (100.0%)</td>
</tr>
<tr>
<td>Nurse</td>
<td>61 (32.4%)</td>
<td>53 (28.2%)</td>
<td>17 (9.04%)</td>
<td>34 (18.1%)</td>
<td>13 (7.0%)</td>
<td>8 (4.3%)</td>
<td>188 (100.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>70 (34.5%)</td>
<td>53 (26.1%)</td>
<td>21 (10.3%)</td>
<td>34 (16.7%)</td>
<td>17 (8.4%)</td>
<td>8 (3.9%)</td>
<td>203 (100.0%)</td>
</tr>
</tbody>
</table>

b. Association between type of birth attendant and utilization of AMTSL

The utilization of AMTSL was higher (33.5%) among the nurses than among the clinical officers (6.7%). The association between type of birth attendant and utilization of AMTSL was statistically significant at 95% confidence interval (Fisher’s exact 0.040). Figure 4.14 shows association between type of birth attendant and utilization of AMTSL.
4.5.2 Cadre of birth attendants

a. Cadre of birth attendants by level and type of health facility

All degree holders were working in government level 4 facilities. Table 4.6 shows cadre of birth attendants by level and type of health facility.

<table>
<thead>
<tr>
<th>CADRE/LEVEL</th>
<th>GOVT L3</th>
<th>GOVT L4</th>
<th>FBO L3</th>
<th>FBO L4</th>
<th>PRV L3</th>
<th>PRV L4</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate</td>
<td>23 (32.9%)</td>
<td>10 (18.9%)</td>
<td>4 (19.1%)</td>
<td>11 (32.3%)</td>
<td>4 (23.5%)</td>
<td>4 (50.0%)</td>
<td>56 (27.6%)</td>
</tr>
<tr>
<td>Diploma</td>
<td>47 (67.1%)</td>
<td>36 (67.9%)</td>
<td>17 (80.9%)</td>
<td>23 (67.7%)</td>
<td>13 (76.5%)</td>
<td>4 (50.0%)</td>
<td>140 (69.0%)</td>
</tr>
<tr>
<td>Degree</td>
<td>0 (0.0%)</td>
<td>7 (13.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>7 (3.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>70 (100%)</td>
<td>53 (100%)</td>
<td>21 (100%)</td>
<td>34 (100%)</td>
<td>17 (100%)</td>
<td>8 (100%)</td>
<td>203 (100%)</td>
</tr>
</tbody>
</table>

b. Association between cadre of birth attendant and utilization of AMTSL

The utilization of AMTSL was highest (42.9%) among degree holders and lowest among diploma holders (30.7%). There was no statistically significant association...
between utilization of AMTSL and cadre of birth attendant at 95% confidence interval (Logistic regression $P>|Z|=0.893$). Figure 4.15 shows the association between care of the birth attendant and utilization of AMTSL.

![Figure 4.15: Association between cadre of birth attendant and utilization of AMTSL](image)

4.5.3 Years of work experience

Association between years of experience and utilization of AMTSL

Utilization of AMTSL was highest among birth attendant with years of work experience between 16-20 (45.5%) and 21-25 (45.5%). The lowest AMTSL utilization was among birth attendants with years of work experience between 31-35 (0.0%) and 36-40(0.0%). There was no statistically significance between years of experience and utilization of AMTSL (Logistic regression ($P>|z|=0.934$). Table 4.7 shows the association between experience and utilization of AMTSL.
Table 4.7: Association between experience and utilization of AMTSL

<table>
<thead>
<tr>
<th>EXPERIENCE (YRS)/UTILIZATION</th>
<th>UTILIZED</th>
<th>DID NOT UTILIZE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 and below</td>
<td>19(26.8%)</td>
<td>52(73.2%)</td>
<td>71(100.0%)</td>
</tr>
<tr>
<td>6-10</td>
<td>15(32.6%)</td>
<td>31(67.4%)</td>
<td>46(100.0%)</td>
</tr>
<tr>
<td>11-15</td>
<td>8(36.3%)</td>
<td>14(63.6%)</td>
<td>22(100.0%)</td>
</tr>
<tr>
<td>16-20</td>
<td>10(45.5%)</td>
<td>12(54.6%)</td>
<td>22(100.0%)</td>
</tr>
<tr>
<td>21-25</td>
<td>10(45.5%)</td>
<td>12(54.6%)</td>
<td>22(100.0%)</td>
</tr>
<tr>
<td>26-30</td>
<td>2(12.5%)</td>
<td>14(87.5%)</td>
<td>16(100.0%)</td>
</tr>
<tr>
<td>31-35</td>
<td>0(0.0%)</td>
<td>3(100.0%)</td>
<td>3(100.0%)</td>
</tr>
<tr>
<td>36-40</td>
<td>0(0.0%)</td>
<td>1(100.0%)</td>
<td>1(100.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>64(31.5%)</td>
<td>139(68.5%)</td>
<td>203(100.0%)</td>
</tr>
</tbody>
</table>

4.5.4 Training

a. Training by level and type of health facilities

Most (59.1%) of the birth attendants had been trained on AMTSL. Birth attendants from government level 4 facilities are more (83.0%) likely to have been trained than others. Birth attendants working in Level 4 facilities are more likely to have been trained (73.7%) than level 3 facilities. On the other hand birth attendants working in government managed facilities are more likely (65.5%) to have training on AMTSL than other facilities. Figure 4.16 shows training of birth attendants by level of health facility. Figure 4.17 shows training of birth attendants by type of health facility.
Figure 4.16: Training of birth attendants by level of health facility

Figure 4.17: Training of birth attendants by type of health facility
b. Training by type of birth attendant

Proportion of birth attendants trained was higher among nurses (62.2%) than clinical officers (20.0%). Figure 4.18 shows training of birth attendants on AMTSL by type of birth attendant.

![Training on AMTSL by type of care provider](image)

**Figure 4.18:** Training of birth attendants on AMTSL by type of birth attendant

c. Training by cadre of birth attendant

The highest proportion of birth attendants trained was among the degree holders (100.0%). Figure 4.19 shows training of birth attendants on AMTSL by type of birth attendant.
d. Association between training and utilization of AMTSL

The utilization of AMTSL was higher (44.2%) among trained birth attendants than among the untrained ones (13.2%). The association between training and utilization of AMTSL was statistically significant at 95% confidence interval (Fisher’s exact 0.001). Figure 4.20 shows association between training of birth attendants and utilization of AMTSL.

Figure 4.19: Training of birth attendants on AMTSL by cadre of birth attendant
Figure 4.20: Association between training of birth attendants and utilization of AMTSL

4.5.5 Type of training

Among those trained, majority (76.7%) had in-service training. Utilization of AMTSL was higher among those who had pre-service training (60.7%) than those who had in-service training (39.1%). The association between type of training and utilization of AMTSL was statistically significant at 95% confidence interval ($\chi^2 = 4.055$, DF=1, $P=0.044$). Figure 4:21 shows the association between type of training and utilization of AMTSL.
The mean duration since training was 17.2 months. The shortest duration since training was zero i.e. less than one month and the longest was 48 months. The duration since training was grouped as long duration and short duration using the mean. Duration longer than the mean was regarded as ‘long duration’ and the one shorter than the mean was regarded as ‘short duration’. Majority of the birth attendants (57.8%) had a long duration since training. Utilization among those with long duration was higher than among those with short duration since training. The association between duration since training and utilization of AMTSL was not statistically significant at 95% confidence interval ($\chi^2 =0.6686$, DF=1, P=0.414).

Table 4.8 shows the association between duration since training and utilization of AMTSL.
Table 4.8: Association between duration since training and utilization of AMTSL

<table>
<thead>
<tr>
<th>Duration since training</th>
<th>Utilized</th>
<th>Did not utilize</th>
<th>Total</th>
<th>Statistical values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long</td>
<td>31(50.8%)</td>
<td>32(50.79%)</td>
<td>63(100.0%)</td>
<td>$\chi^2 = 0.6686$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P=0.414</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean 17.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Min 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Max 48</td>
</tr>
<tr>
<td>Short</td>
<td>19(41.3%)</td>
<td>27(58.7%)</td>
<td>46(100.0%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50(45.9%)</td>
<td>59(54.1%)</td>
<td>109(100.0%)</td>
<td></td>
</tr>
</tbody>
</table>

4.5.7 Knowledge of AMTSL

The birth attendants were classified into two; those who knew components of AMTSL and those who did not know. The birth attendants who were able to name all the components of AMTSL as per the MOH guideline were deemed to know the components of AMTSL. Those who could not name the four components were deemed not to know the components of AMTSL. Majority of the birth attendants (71.9%) did not know the components of AMTSL.

a. Knowledge of AMTSL by level and type of health facility

The highest proportion of birth attendants who knew the components of AMTSL was among birth attendants working in government level 4 facilities. Table 4.9 shows knowledge of birth attendants on AMTSL by level and type of health facility.

Table 4.9: Knowledge of skilled birth attendants on AMTSL by level and type of health facility.

<table>
<thead>
<tr>
<th>Knowledge/Level</th>
<th>GOVT L3</th>
<th>GOVT L4</th>
<th>FBO L3</th>
<th>FBO L4</th>
<th>PRV L3</th>
<th>PRV L4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Didn’t Know</td>
<td>54(77.1%)</td>
<td>27(50.9%)</td>
<td>19(90.5%)</td>
<td>23(67.6%)</td>
<td>16(94.1%)</td>
<td>7(87.5%)</td>
<td>146(72%)</td>
</tr>
<tr>
<td>Knew</td>
<td>16(22.9%)</td>
<td>26(49.1%)</td>
<td>2(9.5%)</td>
<td>11(32.4%)</td>
<td>1(5.9%)</td>
<td>1(12.5%)</td>
<td>57(28%)</td>
</tr>
<tr>
<td>Total</td>
<td>70(100.0%)</td>
<td>53(100.0%)</td>
<td>21(100.0%)</td>
<td>34(100.0%)</td>
<td>17(100.0%)</td>
<td>8(100.0%)</td>
<td>203(100.0%)</td>
</tr>
</tbody>
</table>
b. Knowledge of AMTSL by training and type of training

The highest proportion of birth attendants who knew (45.8%) the components of AMTSL was among birth attendants who had been trained on AMTSL. Figure 4.22 shows knowledge of birth attendants by training status.

![Figure 4.22: Knowledge of AMTSL by training status](image)

Figure 4.22: Knowledge of AMTSL by training status

c. Knowledge of AMTSL by type of training

Pre-service trained birth attendants (75%) were more likely to know the components of AMTSL than in-service trained ones. Figure 4.23 shows knowledge of birth attendants by type of training.
d. Knowledge of AMTSL by type of birth attendant

The highest proportion of birth attendants who knew components of AMTSL was among the nurses (28.1%). Figure 4.24 shows knowledge of AMTSL by type of birth attendant.
e. Knowledge of AMTSL by Availability of AMTSL standards documents

The highest (45.3%) proportion of birth attendants who knew the components of AMTSL was among birth attendants working in health facilities with AMTSL standards documents in the labour ward. Figure 4.25 shows knowledge of birth attendants by availability of AMTSL standards documents.

![Knowledge of AMTSL by Availability of AMTSL standard documents](chart)

**Figure 4.25:** Knowledge of birth attendants by availability of AMTSL standards documents

f. Knowledge of AMTSL by years of experience

The highest proportion (38.0%) of those who knew the components of AMTSL was among birth attendants with below 5yrs of work experience. Table 4.10 shows knowledge of birth attendants by years of experience.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Below 5 yrs</th>
<th>6-10 yrs</th>
<th>11-15 yrs</th>
<th>16-20 yrs</th>
<th>21-25 yrs</th>
<th>26-30 yrs</th>
<th>31-35 yrs</th>
<th>36-40% yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Didn’t Know</td>
<td>44 (62.0%)</td>
<td>31 (67.4%)</td>
<td>15 (68.2%)</td>
<td>20 (90.1%)</td>
<td>16 (72.7%)</td>
<td>16 (100%)</td>
<td>3 (100%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Knew</td>
<td>27 (38.0%)</td>
<td>15 (32.6%)</td>
<td>7 (31.8%)</td>
<td>2 (9.1%)</td>
<td>6 (27.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>71 (100%)</td>
<td>46 (100%)</td>
<td>22 (100%)</td>
<td>22 (100%)</td>
<td>22 (100%)</td>
<td>16 (100%)</td>
<td>3 (100%)</td>
<td>1 (100%)</td>
</tr>
</tbody>
</table>
g. **Association between Knowledge and utilization of AMTSL**

Utilization of AMTSL was higher (56.1%) among birth attendants who knew the components of AMTSL than those who did not know (21.9%). The association between knowledge and utilization of AMTSL was statistically significant at 95% confidence interval ($\chi^2 = 22.241, \text{ DF}=1, P<0.001$). Figure 4.26 shows association between knowledge and utilization of AMTSL.

![Figure 4.26: Association between knowledge and utilization of AMTSL.](image)

**4.6 Determinants of utilization of AMTSL**

The variables that had an association with utilization of AMTSL using chi square or Fisher’s test were subjected to logistic regression. Variables that influenced utilization of AMTSL, either positively or negatively on logistic regression at statistically significant level (p<0.05) were regarded as determinants of AMTSL utilization.

**4.6.1 Health facility determinants**

Working in private hospitals reduced the likelihood of utilizing AMTSL 0.5 times. Working in level 4 health facilities increased likelihood of utilizing AMTSL 5.2
times. Having more than two staff authorised to order supplies increased the likely hood of utilizing AMTSL 3.6 times. Having a fridge at health increased the likely hood of utilizing AMTSL 7.8 times. Availability of standards document in the labour ward increased the likely hood of utilizing AMTSL 3 times. Table 4.11 shows the logistic regression of facility factors at 95% confidence interval of variables.

| Variable                                      | Odds Ratio | P>| z | |
|-----------------------------------------------|------------|----|----|
| Type of facility                              | 0.502*     | 0.006 |
| Level of facility                             | 5.241*     | <0.001 |
| Stock outs                                    | 2.017      | 0.147 |
| Authority to order supplies                   | 3.616*     | 0.022 |
| Availability of a fridge                      | 7.799*     | <0.001 |
| Availability of standards documents in the labour ward | 3.037*     | <0.001 |

### 4.6.2 Birth attendant determinants

Training increased the likely hood of utilizing AMTSL 5.2 times. Pre-service training increased the likely hood of utilizing AMTSL 2.4 times. Knowledge of AMTSL increased the likely hood of utilizing it 4.6 times. Table 4.12 shows the logistic regression of birth attendant factors at 95% confidence interval of variables.

| Variable                   | Odds Ratio | P>| z | |
|----------------------------|------------|----|----|
| Type of birth attendant    | 7.056      | 0.062 |
| Years of experience        | 1.007      | 0.934 |
| Training                   | 5.178*     | 0 |
| Type of training           | 2.404*     | 0.047 |
| Knowledge                  | 4.56*      | <0.001 |
CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction
This chapter interprets the results and compares them with findings by other researchers. The discussion is organised as per the objectives i.e. it starts with a discussion on status of AMTSL utilization findings followed by discussion on facility factors influencing AMTSL findings and lastly discussion on birth attendant factors influence on AMTSL findings. This chapter also contains the conclusion based on the objectives and the findings as well as recommendations that are based on conclusions.

5.2 Discussion

5.2.1 Utilization of AMTSL status
The Utilization of AMTSL in Kiambu county was low with only (31.5%) of the birth attendants utilizing AMTSL. In neighbouring countries like Tanzania and Ethiopia the utilization of AMTSL is even lower with only (7%) and (4.5%) of the deliveries respectively benefiting from correct use of AMTSL (Stanton, et al., 2009). The adherence in Cereboni was higher with (75%) of birth attendants utilizing AMTSL correctly.

Oxytocin (76.9%) administration and Controlled cord traction (96.5%) were the most utilized components of AMTSL. This can be explained by the fact that these two components were in the former standards document (but in different formats) of management of third stage of labour. For instance the former standards documents recommended oxytocin to be administered at the birth of anterior shoulder or immediately after the birth of the baby. The current standards documents recommend oxytocin administration strictly within a minute of child birth. This means that birth attendants who followed the second option of the former guideline were correct in regard to the current guideline.
Oxytocin administration and controlled cord traction also take less time to perform and they are one off time procedures unlike uterine message after every 15 minutes for 2hrs which was the least adhered to component. The latter may be given less priority considering the shortage of birth attendants hence attention is given to the active phases of labour. A qualitative study done by Georgios Efstathiou (2011) to assess factors influencing nurses compliance to standard procedures identified ‘staff shortage’ and ‘time consuming procedures’ as reasons behind non compliance.

Other studies show varied utilization of individual AMTSL components. Godfrey, et al. (2009) in Tanzania reported low utilization of Oxytocin as only 25% deliveries observed received oxytocin. A study carried out in three maternity hospitals in Istanbul and Turkey, documented a high utilization of oxytocics as 95% of deliveries received oxytocin (Turan, et al., 2005).

5.2.2 Facility factors

There was statistically significant association between type of health facility and utilization of AMTSL in Kiambu County. The proportion of birth attendants utilizing AMTSL was highest among those working in government health facilities (37.4%). This can be related to factors such as training and availability of standards documents in labour ward as they were more available in government managed health facility than others.

Training and availability of standards documents in labour ward may have also contributed to the discrepancy between proportions of birth attendants utilizing AMTSL in level 4 and 5 facilities (49.5%) and level 3 facilities (15.7%). The two factors together with higher cadre of birth attendants became more favourable as the level of health facility increased.
AMTSL supplies (needles, syringes) are available at the point of use for most (92.1%) of the birth attendants in Kiambu county. This relates well with the finding of this study that stock outs for these supplies were not frequent for majority of birth attendants (83.7%). This agrees with Kenya Service Provision Assessment Survey that 71% of health facilities in Kenya have oxytocin and 96% of the health facilities have syringes and needles within reach in delivery room (NCAPD, et al., 2010). In Tanzania the situation is not different as Godfrey at el. (2009), reported 97% availability of oxytocin.

NCAPD, et al. (2010) reported that availability of medicines and supplies for delivery are more likely to be available in hospitals (level 4 and 5) (72 %). This is similar to findings of this study that level 4 and 5 facilities (91.7%) are more likely to have AMTSL supplies. On the other hand, the findings that government facilities are more likely to have AMTSL supplies than private and FBO facilities differs from NCAPD, et al. (2010) findings that rated private and FBO facilities (68%) better in terms of availability of medicine and other delivery supplies than government facilities. The discrepancy may be due to the fact that the survey by NCAPD, et al. (2010) assessed availability of all essential supplies for delivery including drugs but this study only assessed availability of needles, syringes and oxytocin.

Fridges are available in most facilities in Kiambu County; 63.1% of the birth attendants worked in facilities with a fridge. There was a statistically significant association between availability of a fridge and utilization of AMTSL. Fridges are important for proper storage of oxytocin.

In Kiambu county, faith based (80.0%) and private (72.0%) managed facilities are more likely to have a fridge than government facilities. Also Level 4 (85.3%) facilities are more likely than level 3 facilities to have a fridge (43.5%). This relates
well to the findings by NCAPD, et al. (2010) that revealed that hospitals (level 4 and 5 facilities), private and Faith based facilities are more likely (55%) to have delivery room infrastructure than other facilities. This can be related to the finding by NCAPD, et al. (2010) that hospitals, private and faith based facilities are more likely to have power supply than other facilities.

Availability of standards documents in most facilities in Kiambu county is low (31.5%). Other studies have had similar finding; NCAPD, et al. (2010) reported a 27% availability of obstetric care (not AMTSL) standards documents in central province. However, in other countries like Guatemala standards documents are more available in facilities (66.7 %). The association between availability of standards document and utilization of AMTSL is statistically significant.

Standards documents are more available in level 4 (48.4%) and government facilities compared to other facilities. NCAPD, et al. (2010) survey also reported higher availability of standards documents in government managed and level 4 facilities. This is likely to be due to the fact that standards documents are generated by the government and this means they are likely to be distributed to government facilities before others. In addition, a higher proportion of birth attendants in level 4 facilities and government had been trained compared to those trained in other facilities. The trained birth attendants are likely to carry back training materials to facilities where they work and these materials include standards documents. The trained birth attendants are also able to generated standards documents at health facility level.

5.2.3 Birth attendant factors

Most of the deliveries were conducted by nurses (92.6%). This is similar to a report by NCAPD, et al. (2010) that majority of deliveries are conducted by nurse/midwives. It also relates well to NCK (2010) that nurses make more than 60% of the health work
force in Kenya. However, NCAPD, et al. (2010) reports that in central Kenya a higher proportion of deliveries (45%) are conducted by doctors. In other countries like Benin, Ethiopia and Tanzania most deliveries are conducted by nurse/midwives who conduct between 69-94% of the deliveries according to finding by Stanton, et al. (2009).

Utilization of AMTSL was higher (33.5%) among the nurses than among the clinical officers (6.7%). Other researches like in Cereboni by (POPHI, 2006b) found related findings that nurses were more likely to administer oxytocin (78.0%) than doctors (24.1%) as well as do uterine massage more (73.8%) than doctors (56.2%). This can be associated by the fact that nurses perform the bulk of deliveries and are therefore likely to master the skills more. Also as per the findings of this study larger proportion of nurses had been trained and are more knowledgeable about AMTSL than clinical officers.

Most (59.1%) of the birth attendants had been trained on AMTSL. This relates well to NCAPD, et al. (2010) survey report that, 43% of health facilities carry out routine training of health birth attendants on various aspects of delivery care. Findings of the study done by POPPHI (2006b) in Cereboni reported a higher (81.3%) proportion of trained birth attendants. Those who were trained utilized AMTSL more and this association was statistically significant.

In Kiambu county, majority of those trained (76.7%) had in-service training. This can be attributed to the fact that AMTSL was introduced in the recent years and therefore in was not included in the curriculum when most of the birth attendants were in training schools. Utilization of AMTSL was higher among those who had pre-service training (60.7%) than those with in-service training (39.1%). The type of in-service training was not established. This means that the birth attendants who may have just
been given updates by those trained may have regarded themselves as trained. This may have contributed to the low utilization of AMTSL among those who were had in service training.

In Ceroboni, Pre-service trained midwives utilized AMTSL slightly more (76.1%) than in-service trained midwives (75.7%) (POPHI, 2006b). Knowledge of AMTSL was low among care givers in Kiambu county as majority of the care givers (71.9%) could not mention (did not know) the four components of AMTSL. This is not dissimilar to reports of other studies. According to Kenya Service provision survey by (NCAPD, et al., 2010), knowledge of providers of delivery care on different aspects of prevention and management of post partum haemorrhage is wanting for instance only 7% of midwives were able to comprehensively mention the key signs to look for in a woman who develops PPH.

Godfrey, et al. (2009) also reported that only 9% of birth attendants in Tanzania made correct statements regarding all the components of AMTSL. This situation is very unfortunate considering that birth attendants who had the knowledge utilized AMTSL more and the association was statistically significant.

The highest proportion of birth attendants who knew the components of AMTSL was among birth attendants working in government level 4 facilities. This may be explained by the findings that training and standards documents are more available in government facilities. The highest proportion of birth attendants who knew (45.8%) the components of AMTSL was among birth attendants who had been trained on AMTSL and those who worked in facilities with standards documents in labour ward (45.3%).
5.3 Conclusion

Utilization of AMTSL as stipulated in the standard guideline was low in Kiambu County was low. Controlled cord traction was the most utilized component of AMTSL.

Utilizations of AMTSL was significantly influenced by health facility factors such as working in government health facilities, working in level 4 and 5 facilities, working in facilities with less frequent supplies stock outs, working in facilities with more than two staff authorized to order supplies, working in facilities with a fridge and working in facilities with AMTSL standards documents in the labour ward. The null hypothesis that health facility factors do not significantly influence utilization of AMTSL was rejected.

Utilization of AMTSL is significantly influenced by birth attendant factors such as, type of birth attendant, cadre of birth attendant, training, type of training and knowledge of AMTSL components. The null hypothesis that birth attendant factors do not significantly influence utilization of AMTSL was rejected.

5.4 Recommendations

1. The county government and heads of private and faith based facilities, should put strategies to accelerate training of birth attendants on AMTSL in level three facilities

2. Heads of facilities should ensure AMTSL standards documents are available in labour ward.

3. Regulatory bodies should emphasize pre service training of birth attendants on AMTSL.
5.5 Areas of further research

1. Determinants of utilization of AMTSL in other counties
2. Outcomes of utilization of AMTSL in Kenya
3. Effects of free maternity policy and decentralization of health on utilization of AMTSL
REFERENCE


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APPENDICES

APPENDIX I: QUESTIONNAIRE

Provider consent form

I am Felarime Muiruri, a second year Masters in public health student from Kenyatta university. I am carrying out a study on determinants of utilization of AMTSL in Kiambu County. The purpose of this study is to generate information on how various factors affect utilization of AMTSL technique.

There are no direct individual benefits of participation but the information that you will give will help in designing of specific strategies to improve the utilization of active management of third stage of labour. This in turn will contribute to decreasing maternal mortality due to prevention of post partum haemorrhage.

You are requested to participate by being observed managing a mother in second and third stage of labour and also responding to the questions in this questionnaire and therefore there minimal risks associated with this study.

Your acceptance is most appreciated. However your participation is on voluntary basis i.e. you can choose to or not to participate without necessarily giving reasons for your actions. You are also free to pull out of the study at any point or not to answer the question(s) that you don’t want to.

The responses you will give will be kept completely confidential; you are requested not to write your name on this form or any information that may lead to your identification.

For any further queries or concerns you can contact me on gwfelarime@yahoo.com or 0720228352, my two supervisors Dr. Agina on okelloagi@yahoo.com and Dr. Osur on osuri@ipas.org. You can also contact Kenyatta university Ethics review committee.
on email kuerc.chairman@ku.ac.ke or kuerc.secretary@ku.ac.ke, tel: 0207803312.
P.O Box 43884-00100, Nairobi.

I have read through the above and I am willing to participate in the study

Signature of respondent………………………………………

Interviewer name:………………………………………..Date…………………………

A: **Health providers factors**

1. Gender (Observe)
   - Female (1)  Male (2)

2. How old are you?
   - 20 years and below (1)  21-30 (2)
   - 31-40 (3)  41-50 (4)  51-60 (5)

3. How many years of work experience do you have?
   - ……………………………

4. What type of a health worker are you?
   - General physician (1)  Clinical officer (2)  Nurse (3)

5. What is your qualification?
   - Certificate (1)  Diploma (2)  Degree (3)

6. Have you ever had training on AMTSL?
   - Yes (1)  No (2)
     
   If yes
   a. What kind of training?
      - In- service (1)  Pre service (2)
   b. How long ago did you have the training?
      - ……………………………
7. What are the components of AMTSL (Tick all the mentioned components. More than one response accepted)

1. Administration of oxytocin within 1 minute of child birth.
2. Delivery of the placenta through controlled cord traction.
3. Uterine massage.
4. Any other. (Specify)……………………………………………..

B: Health facility factors

8. Which is the managing authority for this health facility?
   - Government (1)
   - Faith based (2)
   - Private (3)
   - Others (4)

9. Which level of health facility is it?
   - Level three (3)
   - Level four & five (4)

10. How often do you experience stock outs of Needles, Syringes and Oxytocin supplies (put a tick in the appropriate cell);

<table>
<thead>
<tr>
<th>Item /frequency</th>
<th>Always (1)</th>
<th>Very frequently (2)</th>
<th>Sometimes (3)</th>
<th>Rarely (4)</th>
<th>Never(5)</th>
</tr>
</thead>
</table>

11. According to the hospital policy, approximately how many individuals in Maternity have the authority to order supplies?

   - None (1)
   - One (2)
   - Two (3)
   - More than two (4)
   - All qualified staff (5)
   - Don’t know (6)
12. Observe the availability of oxytocin, syringes and needles in the delivery room;

   All available (1)   Not all are available (2)

13. Observe the storage facilities for oxytocin.

   Refrigerators (1)

   Other facilities (specify) (2)………………………………………….

14. Check availability of standards documents on use of AMTSL.

   Present in the Labour ward (1)   Absent (2)
APPENDIX II: OBSERVATION CHECKLIST

Client (mother in labour) consent form

I am Felarmine Muiruri, a second year Masters in public health student from Kenyatta university. I am carrying out a study on determinants of utilization of AMTSL in Kiambu County. The purpose of this study is to generate information on how various factors affect utilization of AMTSL technique.

There are no direct individual benefits of participation but the information that you will give will help in designing of specific strategies to improve the utilization of active management of third stage of labour. This in turn will contribute to decreasing maternal mortality due to prevention of post partum haemorrhage.

You are requested to participate by the interviewer observing the birth attendant managing you in second and third stage of labour. This will interfere a bit with your privacy but the observer is a qualified birth attendant and is registered and licensed by the national regulatory body.

Your acceptance is most appreciated. However your participation is on voluntary basis i.e. you can choose to or not to participate without necessarily giving reasons for your actions. You are also free to pull out of the study at any point.

The information collected by the observer will give will be kept completely confidential; your name or any information that may lead to your identification will not be written on this form.

I have read through the above and I am willing to participate in the study

For any further queries or concerns you can contact me on gwfelarmine@yahoo.com or 0720228352, my two supervisors Dr. Agina on okelloagi@yahoo.com and Dr. Osur on osurj@ipas.org You can also contact Kenyatta university Ethics review
committee on email kuerc.chairman@ku.ac.ke or kuerc.secretary@ku.ac.ke , Tel; 0207803312, P.O Box 43884-00100, Nairobi.

Signature of respondent………………………………………………

Observer name: ………………………………………………..Date………………

**Please tick (✓) where appropriate.**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>DONE</th>
<th>NOT DONE</th>
<th>SPECIAL OBSERVATIONS IF ANY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administered Oxytocin Correctly. (within one minute of child birth)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivers placenta through CCT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Massages uterus immediately</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Massages uterus ¼ hourly for the first 2hrs or instructs the mother to do so.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX III: ETHICAL CLEARANCE

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: kuerc.chairman@kua.ac.ke
kuerc.secretary@kua.ac.ke
Website: www.kua.ac.ke

P. O. Box 43844
Nairobi, 00100
Tel: 8710901/12

Our Ref: KU/R/COMM/51/123

Date: December 17th, 2012

Felamine Muiruri
School of Public Health
Kenya University
P. O. Box 48844, Nairobi.

Dear Ms. Felamine,

APPLICATION NUMBER: PKU/683/174 OF 2012 – ‘DETERMINANTS OF UTILIZATION OF ACTIVE MANAGEMENT OF THIRD STAGE OF LABOUR (AMTSL) IN KIAMBU COUNTY, KENYA’ – VERSION 2

1. IDENTIFICATION OF PROTOCOL

The application before the committee is with a research topic, ‘Determinants of Utilization of Active Management of Third Stage of Labour (AMTSL) in Kiambu County, Kenya version 2’ dated 17th December 2012.

2. APPLICANT

Felamine Muiruri
School of Public Health
Kenya University
P. O. Box 48844, Nairobi.

3. SITE

Kiambu County, 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 is of the view that against the following elements of review,

(i) Scientific design and conduct of study,
(ii) Recruitment of research participant,
(iii) Care and protection of research participants,
(iv) Protection of research participant’s confidentiality,
(v) Informed consent process,
(vi) Community considerations.

AND APPROVED that the research may proceed for a period of ONE year from 17th December, 2012
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 revised proposal to KU-ERC.

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.


PROF. NICHOLAS K. GIKONYO
CHAIRMAN ETHICS REVIEW COMMITTEE

[Signature]

Accept the advice given and will fulfill the conditions therein.

Dated this day 12 of 2012.

cc. Vice-Chancellor
Director: Institute for Research Science and Technology
APPENDIX IV: APPROVAL FOR THE STUDY (NCST)

REPUBLIC OF KENYA

NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349, 254-020-2673550
Mobile: 0713 788 787 , 0735 404 245
Fax: 254-020-2213215
When replying please quote
secretary@ncst.go.ke

Our Ref: NCST/RCD/12A/012/193

Date: 9th January, 2013

Felamrine Muiruri
Kenyatta University
P.O.Box 43844-00100
Nairobi.

RE: RESEARCH AUTHORIZATION

Following your application dated 20th December, 2012 for authority to carry out research on “Determinants of utilization of Active Management of Third Stage of Labour (AMTLS) IN Kiambu County,” I am pleased to inform you that you have been authorized to undertake research in Kiambu County for a period ending 31st March, 2014.

You are advised to report to the District Commissioners and the District Education Officers, Kiambu 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.M.K. RUGUTT, PhD, HSc.
DEPUTY COUNCIL SECRETARY

Copy to:

The District Commissioners
The District Education Officers
Kiambu County.
APPENDIX VI: APPROVAL FOR THE STUDY (MOH)

MINISTRY OF MEDICAL SERVICES
OFFICE OF DIRECTOR OF MEDICAL SERVICES

Telegram: "MINHEALTH", Nairobi
Telephone: Nairobi 2710777 fax: 2715239

MMS/ADM/3/8/VOL.111

31st May, 2013

Felaraine Muiruri
P.O. Bs. 27691-00506
NAIROBI

RE: AUTHORITY TO CONDUCT RESEARCH IN KIAMBU COUNTY

Your request for permission to conduct research dated 21st May, 2013 refers.

The title of your study is noted to be "Determinants of Utilization of Active Management of Third Stage of Labour".

Authority is hereby granted to conduct the said research with the health facilities in Kiambu County and you are expected to notify this office of your research findings upon completion of the study.

Dr. Lucy W. Musyoka
For: DIRECTOR OF MEDICAL SERVICES
APPENDIX VII: MAP OF KIAMBU COUNTY