

**FACTORS INFLUENCING DELIVERY OF MATERNAL HEALTHCARE
SERVICES IN PUBLIC HEALTHCARE FACILITIES IN NAIROBI
COUNTY, KENYA: A CASE OF KENYATTA NATIONAL HOSPITAL.**

BY

MUEMA CAROLINE MWENDE

**A Research Project Report Submitted in Partial Fulfilment of the Requirements
for the Award of the Degree of Master of Arts in Project Planning and
Management, University of Nairobi.**

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DECLARATION

This research project report is my original work and has not been submitted for examination in any other university.

Signature.....

Date.....

MUEMA CAROLINE MWENDE

L50/ 73323/2014

This research project report has been submitted for examination with my permission as the University supervisor.

Signature.....

Date.....

Prof. Harriet J. Kidombo

UNIVERSITY OF NAIROBI

DEDICATION

This research project report is in memory of my late grandmother Monica Veke Katukuyu who once saw my today before I could fathom it; may her soul rest in peace. It is dedicated to my parents Catherine Muema and Christopher Muema Kasimu and to my siblings Charles, Mercy and Lucy for their support and love. It's also dedicated to Peter Mwangangi for his continuous support and encouragement towards my post graduate degree.

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LIST OF ACRONYMS AND ABBREVIATIONS

DRH:	Division of Reproductive Health
HIPC:	Highly Independent Poor Countries
HMIS:	Health Management Information System
HSSF:	Health Sector Services Fund
KDHS:	Kenya Demographic Health System
KHPF:	Kenya Health Policy Framework
KNH:	Kenyatta National Hospital
MDGs:	Millennium Development Goals
MMR:	Maternal Mortality Rate
MNCH:	Maternal Neonatal Child Healthcare
MOH:	Ministry of Health
MOMS:	Ministry of Medical Services
MOPHS:	Ministry of Public Health and Sanitation
NHIS:	National Health Insurance Scheme
NHSSP:	National Health Sector Strategic Plan
TBA:	Traditional Birth Attendants
WHO:	World Health Organisation
WOCBA:	Women of Child Bearing Age

ABSTRACT

According to World Health Organization (WHO) more than 585,000 women of reproductive age (15-49 years) die each year from pregnancy related causes worldwide whereby 99 per cent of these deaths occur in third world countries. There is a movement globally and particularly in African regions to reduce maternal mortality rates through escalation of maternal healthcare interventions. The focus of this study is on factors influencing delivery of maternal healthcare services in public healthcare facilities in Nairobi County, Kenya with emphasis on several objectives which include; to determine the patients' background factors influencing delivery of maternal healthcare services in public healthcare facilities, to establish the healthcare facilities factors influencing delivery of maternal healthcare services in public healthcare facilities, to examine the influence of medical devices in delivery of maternal healthcare services in public healthcare facilities and to determine the influence of staffing in delivery of maternal healthcare services in public healthcare facilities. The study was linked to realism theory. The target population was drawn from KNH Maternity wing which include 340 mothers, 30 nurses, 10 doctors and 15 biomedical engineers. The main data collection tools used for this particular study include: questionnaires and in-depth interviews. The sample size was achieved using the Krejcie and Morgan, 1970 table from the target population and a cross sectional descriptive research design was used. Validity of the research instruments was determined by construct of the instruments while reliability of the research instruments was determined through internal consistency method. Responses from open ended questions in the questionnaire and in depth interviews was categorized based on emerging themes which was used to supplement quantitative data and conclusion of the study. The data collected was analysed using qualitative and quantitative methods while SPSS was used for analysis of such data. Results of the quantitative data were presented through tables. The study revealed that based on healthcare workers perspective, patients' background factors especially cost influences delivery of maternal healthcare services in the hospital. Both healthcare workers and mothers did not see travel time and cultural beliefs as influencing delivery of maternal healthcare services in the hospital. The study also established that in healthcare workers' view, public healthcare facility factors especially hospital management and financial resources influence delivery of maternal healthcare services in the hospital. The mothers also viewed public healthcare facility factors as an influencing factor to delivery of maternal healthcare services especially because hospital management influences how maternal healthcare services are delivered to mothers in the hospital. However, mothers did not see availability of maternal healthcare information to mothers in the hospital and financial resources' availability as influencing delivery of maternal healthcare services. The findings of this study have shown that based on healthcare workers perspective, maternal healthcare devices factors have a direct relationship to delivery of maternal healthcare services. Mothers were in agreement with the healthcare workers on the importance of maternal healthcare devices in maternal healthcare services delivery and emphasized on availability of these devices in hospitals. Staffing factors according to both healthcare workers and mothers play an important role on delivery of maternal healthcare services delivery. The healthcare workers and mother emphasized the importance of good or respectful relationship between mothers and healthcare providers in the hospital and opportunities for career advancement for the staff.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Delivery of maternal healthcare services is critical for the health sector and economic growth of any given country. The World Health Organization states that more than 585,000 women of reproductive age (15-49 years) die each year from pregnancy related causes worldwide whereby 99 per cent of these deaths occur in third world countries; Sub Saharan countries recording the highest rate of maternal mortality in sub-Saharan Africa in the world estimated at 68 per 100,000 live births (Elizabeth Lule, March 2005).

Globally, an estimate of 20 million girls and women of child bearing age suffer from maternal morbidities annually surviving childbirth but enduring chronic ill-health thereafter. While every North African country has reduced maternal mortality rate by at least 5.5 per cent annually since 1990, only Rwanda which is one of the Sub-Saharan African countries has achieved an average annual reduction of more than 4 per cent and progress has been quite slow in some countries (Golooba-Mutebi, 2011). Of the world's estimated annual 130 million births, 60 million births occur at home each year and the pregnancy outcomes appear considerably worse than births that occur in healthcare facilities (Garcés, 2012). A study conducted in 7 sites using a sample of birth attendants conducting home or out-of-facility deliveries in India, Pakistan, Guatemala, Democratic Republic of the Congo, Kenya and Zambia reveals that the proportion of births occurring at home ranged from 14 per cent in Nagpur, India to 74 per cent in the Equateur Province of DRC (Garcés, 2012).

In USA, the likelihood of a woman dying during childbirth is five times higher in Greece, four times greater in Germany and three times greater in Spain. More than two women die every day in the USA from pregnancy-related complications compared to African American women who are at a higher risk with four times higher risks of death arising from such complications (Alter et al, 2004). Maternal mortality rate remains high in Pakistan at 276 per 100,000 live births with mothers dying every 20 minutes. Many countries are caught up in such challenges even with the intervention of Safe Motherhood initiative introduced in 1987 and the introduction of the MDGs. An examination of Pakistan Demographic and Health Survey in 1991 and 2006 data reveals that more than 50 per cent of women seeking maternal healthcare services prefer Traditional Birth Attendants to skilled birth attendants and of all the births, 39 per cent are attended by skilled birth attendant and only 34 per cent of the births

take place at a healthcare facility (Jafarey SN, 2002). However, despite the slow reduction rate and high geographical inequality in global Maternal Mortality Rate in the past 15–20 years, exciting progress has been made in many developing countries and many efficient interventions have been proved to remarkably reduce MMR in many developing countries. Examples include strengthening control of infectious diseases in Sri Lanka, conducting of contraceptive strategies in Bangladesh, improving accessibility to in-hospital care and midwife services in Malaysia, Thailand, Egypt and Honduras as well as the Maternal Mortality Reduction Strategy in Mongolia (Liang J, 2012).

In Kenya according to Kenya Demographic Health System 2008/2009 the maternal mortality rate still remains very high at 488 per 100,000 live births and still progress remains very low even with the introduction of Millennium Development Goals; with MDG 5 seeking to achieve 75 per cent reduction by the year 2015 which was not achieved. These deaths are due to direct causes related to pregnancy and childbirth such as severe bleeding, infection, hypertensive disorders and complications of unsafe abortions and obstructed labour which could be reverted if timely appropriate care was provided (Gage, 2007). The government's 2009 National Road Map for accelerating the attainment of the MDGs related to Maternal and Neonatal health and Development Strategy 2008- 2015 outlined various bottlenecks hindering the program implementation among these being poor accessibility, lack of skilled attendance during pregnancy, child birth and post birth period. Even with these roadmaps, the deadline for the achievement of the MDGs elapsed in 2015 and unfortunately Kenya continues to struggle with the drastic maternal mortality rates (Gage, 2007).

1.1.1 The healthcare system in Kenya

As defined by the International Organization of Standard, quality is a concept whose inherent characteristics meet the customer requirements and satisfaction. Like any other sector, the health sector quality may comprise of appropriate treatment of patients, high staff to patient ratio affordability, effectiveness and efficiency of the services being provided (Reinartz, 2004) and this draws a clear picture on the need for quality healthcare services. The sector provides services to its clients through a network of public facilities with 4,700 facilities within the country with public facilities accounting for 51 per cent of the overall facilities. Referral hospitals, provincial general hospitals, district hospitals, health centres and dispensaries are the various levels of the public facilities. The health facilities in the country have been working through the national level and the county level with a hierarchy of health

structures from the national level to the county level (Njuki R, 2013). Since 1994, the Kenya health sector development agenda has been guided by the Kenya Health Policy Framework Paper up to 2010 whose vision for development was quality healthcare that is acceptable, affordable and accessible to all. The government also came up with an implementation strategy for health policy that has been devised in a series of two five-year policies: the National Health Sector Strategic Plan between 1999 to 2004 and the second covering 2005 to 2010 which emphasized on the need to better coordinate health programs and activities across the country by adopting a Sector Wide Approach. This approach brings together all the stakeholders including non- governmental institutions and private partners on a common platform for healthcare priorities coordination (Nicole Bourbonnais, 2013). Therefore in June 2006, a Program of Work and Funding was designed whose intention was to map the implementation of the SWAp and a list of 17 donors developed a joint Assistance Strategy for 2007- 2012. The health sector system is also informed by other several policies among these being the Medium- Term Poverty Reduction Strategy Paper (2000 and 2005) which is stipulated as part of the lending criteria of the World Bank and the International Monetary Fund and the Vision 2030 whose goal is driving change in National development across the country (Nicole Bourbonnais, 2013).

1.1.2 Vision 2030

The health sector is one of the components of delivering the Vision 2030's Social Pillar. It is a critical component of maintaining a healthy and skilled workforce necessary to drive the country's economy. Vision 2030 is the long term development blueprint for Kenya which aims at transforming the country into a globally competitive and prosperous middle income country by providing a high quality life to all its citizens in a clean and secure environment by the year 2030. To realise this goal, the health sector defined priority reforms as well as flagship projects and programmes including the restructuring of the sector's leadership and governance mechanisms and improving the procurement process and availability of essential health products and technologies (Mwangome, 2012).

The country's health sector is presently faced with challenges of accessibility to healthcare eservices, availability of services especially in rural areas and affordability where the services are available. Vision 2030 looks at these issues from a point of geographical access, financial access and socio-cultural barriers to healthcare service delivery. Regional disparities are viewed in terms of the quality of service delivery systems, quality and quantity of health

sector personnel, healthcare inputs and health sector knowledge generation through research. The health sector vision seeks to overcome the current constraints in the sector by the year 2030 and its vision is equitable and affordable healthcare system of the highest possible standards.

The strategies for the sector are categorized into three strategic pillars namely Health structures, Healthcare service delivery and partnerships and Equitable Health financing mechanism. The objective of the health structures seeks to provide a functional, efficient and sustainable health infrastructure network while delivery and partnerships structure seeks to improve quality of healthcare delivery to International Standards. Finally equitable financing objective seeks to introduce a purchaser provider system (Chuma J, 2009). In totality, the focus of all the interventions aims at providing preventive healthcare services for all Kenyans while reducing healthcare inequalities and reversing the downward trend in the health related impacts and outcome indicators. The vision looks at having all existing health facilities rehabilitated and well equipped, having a fully functional healthcare system in every urban centre, increasing access to healthcare services and enhancing promotion of individual health and lifestyle.

However, even with the well stipulated interventions and policies, the maternal mortality rates of the country are still high. However, according to the According to the Fourth Annual Progress Report of 2011 to 2012 on implementation of the First Medium Term Plan of Kenya Vision 2030, a decline of 51 per cent in 2007 was reported with only 43.8 per cent of births in Kenya being attended to by trained health personnel against a target of 90 per cent in 2015. Therefore, vision 2030 plays a critical role in ensuring delivery of maternal healthcare services towards improving maternal healthcare indicators for a healthier population (Mungai, 2015).

1.2 Statement of the problem

While the number of women dying from pregnancy and childbirth complications has greatly reduced, research done by the World Health Organization shows that 585,000 women die every year globally due to pregnancy and child birth complications and 99 per cent of these deaths occur in developing countries. Notably, every woman who dies during childbirth in Kenya, many more other women suffer serious injuries or disabilities due to complications during pregnancy and childbirth in their lifetime (Joyce Cheptum, 2014). It's therefore

critical to come up with a holistic approach and laying out holistic strategies as well in order to tackling maternal healthcare complications. According to the Kenya National Commission on Human Rights (2012), for every woman who dies in childbirth in Kenya, an estimate of 20-30 women suffer serious injuries or disability due to complications during pregnancy and delivery. These high rates have persisted despite improvements in other health indicators over the past decades where access to skilled delivery is a challenge with only 44 per cent of births in Kenya being delivered under the supervision of a skilled birth attendant, way below the target of 90 per cent of deliveries by 2015 which was not achieved. Therefore, there is need for a holistic approach to the implementation effective and efficient maternal healthcare services which highly depends on improved hospital infrastructure, availability of resources, staffing and improved remuneration packages for healthcare professionals. This study therefore sought to examine factors influencing delivery of maternal healthcare services in public healthcare facilities in Nairobi County, Kenya in a case of Kenyatta National Hospital.

1.3 Purpose of the study

This study sought to examine the factors influencing delivery of maternal healthcare services in public healthcare facilities in Nairobi County, Kenya in a case of Kenyatta National Hospital.

1.4 Objectives of the study

The following were the objectives of study:-

1. To determine the influence of patients' background factors on delivery of maternal healthcare service in public healthcare facilities.
2. To establish the influence of public healthcare facilities factors on delivery of maternal healthcare services in public healthcare facilities.
3. To examine the influence of medical devices on delivery of maternal healthcare service in public healthcare facilities.
4. To determine the influence of staffing on delivery of maternal healthcare services in public healthcare facilities.

1.5 Research Questions

1. How do patients' background factors influence delivery of maternal healthcare service in public healthcare facilities?

2. What are the healthcare facilities factors influencing delivery of maternal healthcare services in public healthcare facilities?
3. What is the influence of medical devices on delivery of maternal healthcare service in public healthcare facilities?
4. How does staffing influence delivery of maternal healthcare services in public healthcare facilities?

1.6 Significance of the study

This study might enable the Government of Kenya to evaluate various interventions being implemented to reduce maternal mortality rates in the country on whether such interventions are worthy investing in and implementing including free maternity services policy. The findings of this study might also be valuable to researchers and scholars as it would form a basis for further research. The research could also be used by students to form the basis of their discussions and also, this study may be an additional resource to update the studies done by previous scholars.

1.7 Delimitations of the Study

The study was carried out in KNH the largest referral and training hospital in the country and therefore the findings were a representation of the maternal healthcare situation in the country. The study being done after the introduction of free maternity policy in the country also plays a critical role in finding out whether any improvement in maternal healthcare outcomes has been achieved since then and whether the free maternity policy was the way to go or there needed clear strategies to deal with the gaps first.

1.8 Limitations of the study

The study was only focusing on maternal healthcare and might not have brought out the overall views of the public healthcare facilities. The study was also carried out in a public healthcare facility and therefore might not have brought out the views of private healthcare facilities. At the same time, most users of the KNH facilities especially maternity wing are women from low socio- economic status in the country who are in most cases victims of maternal morbidities.

1.9 Assumptions of the study

The assumptions of this study were that the sample used for the study would represent the population which is a contributing factor to achieving valid and accurate results as intended. It was also assumed that the data collection instruments would be valid and reliable and measuring the desired constructs, the respondents would be responsive and cooperative in answering questions correctly and truthfully. It was also an assumption that the results and findings of the study would be achieved within the set time period to achieve its intended purpose.

1.10 Definition of significant terms

The following terms were used in the study and for the purposes of the study they were defined as follows:-

Healthcare policies: blueprints for developing and managing healthcare services in a country.

Maternal healthcare: The health of women during pregnancy, childbirth and the postpartum period; it's the integrated continuum of care that delivers tools and treatments to mothers and their infants at critical points.

Maternal morbidity rate: medical complications in a woman caused by pregnancy, labour and child birth.

Maternal Mortality rate: The number of registered maternal deaths due to birth or pregnancy related complications per 100,000 registered live births.

Medical devices: instruments, apparatus or machines used in the prevention, diagnosis or treatment of illness or disease or for detecting, measuring, restoring, correcting or modifying the structure or function of the body for health purposes.

Patients' background: the factors associated with mothers that influence their access to maternal healthcare services e.g. physical access, socio- cultural beliefs and cost challenges.

1.11 Organisation of the study

The study has been organized in the following main sections for clarity, sequence and ease of compilation. Chapter one provides background of the study, statement of the problem, purpose of study, research objectives, research questions, significance of the study, limitations of the study, delimitations of the study, assumptions of the study, definition of significant terms and organization of the study.

Chapter two reviews various literatures on factors influencing delivery of maternal healthcare services in public healthcare facilities. It also incorporates maternal healthcare services delivery and free maternity services as well as the objectives of the study which include, to determine the influence of patients' background factors on delivery of maternal healthcare services in public healthcare facilities, to establish the healthcare facilities factors influencing delivery of maternal healthcare services in public healthcare facilities, to determine the influence of medical devices on delivery of maternal healthcare services in public healthcare facilities and to examine the influence of staffing on delivery of maternal healthcare services in public healthcare facilities. This chapter also covers theoretical/conceptual framework, the relationship between variables, the gaps in literature review and summary of the literature review.

Chapter three covers the research method used, research design, target population, sample size and sampling technique, data collection instruments, validity of instruments, reliability of instruments, data collection procedure, data analysis techniques, ethical consideration and operational definition of the variables. Chapter four covers the study findings, questionnaire return rate, characteristics of respondents and data analysis while chapter five presents and provides summary of findings, discussion of the findings, conclusion of the study, recommendations of the study and suggested area for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section of the study presents the available literature materials related to delivery of maternal healthcare services reviewed. The review covers a range of studies globally, Africa and Kenya to be specific which include the concept of maternal healthcare services delivery and also the constraints healthcare facilities face among others. Governments and international agencies are moving towards investing and promoting maternal healthcare services globally. WHO estimates that for every maternal death, 30 to 50 women suffer pregnancy related health problems such as vesicovaginal, infertility and depression which can be permanently destructive to their lives and in addition to the risk of dying during pregnancy and childbirth, many more women suffer from short and long term illnesses and maternal disabilities in their lifetime (Akin and Munevver, 1996).

2.2 Delivery of maternal healthcare services

Globally, more than 70 per cent of maternal deaths are due to five major complications which include haemorrhage (25 per cent), infection (15 per cent) and complication of unsafe abortion (13 per cent), hypertension (12 per cent) and obstructed labour (8 per cent). These complications can occur at any given time during pregnancy and childbirth often requiring immediate access to emergency obstetric care for their management (Bailey P, 2006).

In Sub-Saharan Africa, the total death toll for developing countries is more than 50 per cent and lifetime risk of dying from pregnancy is extremely high; for every 26 mothers, one mother dies as a result of pregnancy and childbirth in Sub-Saharan Africa. This frequency is about 281 times more than the maternal death in developed countries in which one mother dies from 7300 mothers. Between 1990 and 2015, the number of maternal deaths per 100,000 live births has globally reduced by only 2.3 per cent annually. In some countries, annual decline in maternal mortality in 2000 to 2010 was above 5.5 per cent with a focus to achieving the MDGs (Cohen, 2000).

According to Global Burden of Disease estimates for 2004, India contributes to 21 per cent of the disability adjusted years due to lives lost to maternal conditions. Public health initiatives over the last two to three decades have helped India improve health indicators such as life expectancy and total fertility rate to a great extent but some crucial indicators like Maternal

Mortality Ratio and Infant Mortality Rate have stagnated at around 400 per 100,000 live births and 60 per 1,000 live births respectively in the 1990s (Birken S., 2012). Ethiopia is one of the Sub-Saharan African countries that experience the highest maternal mortality ratios in the world with 673 per 100,000 live births and more than fourteen thousand mothers die as a result of pregnancy related complications each year. In addition, more than 400,000 women suffer long-term disabilities due to complications during pregnancy, delivery or postpartum periods. At the same time uptake of ANC services, delivery and postnatal services by Ethiopian women is one of the lowest in the world. Almost all births take place at home in Ethiopia (94 per cent) with only 6 per cent of women delivering in health institutions and only 28 per cent of such mothers receive prenatal care from a trained health professional (Desalew Zelalem Ayele, 2014).

Nigeria has experienced some progress in the last two decades in reduction of maternal deaths but still the number of women dying during pregnancy and childbirth from complications arising from childbirth remains high. The country has the 10th highest MMR in the world according to United Nations estimates of 630 women dying per 100,000 birth a higher proportion than in Afghanistan or Haiti and only slightly lower than in Liberia or Sudan (Ibid., 2008). It is estimated that about 97 per cent of the pregnant women in developed countries receive ANC and 99 per cent use skilled obstetric service at delivery, whereas in developing countries only 65 per cent and 53 per cent of women use ANC and seek skilled obstetric care services respectively (Desalew Zelalem Ayele, 2014). Maternal mortality rate in Kenya is at 488 deaths per 100,000 live births, noting that the lifetime risk of maternal death in 2009 was 1 in 39 women making it among the most highly ranked countries in the world. KDHS 2008/2009 reported that 92 per cent of women received ANC from a skilled provider especially those who were more educated and resided in urban areas. The report further showed that 83 per cent of women who visited public healthcare facilities were required to pay for antenatal services, which may explain why only 47 per cent of women attended the recommended four visits of antenatal care (Onesimus Kipchumba, 2012).

2.3 Introduction of free maternity services

Globally, there is a growing advocacy to reduce financial barriers to healthcare generally but with special emphasis on high priority services and vulnerable groups. In the recent decades, a growing consensus has emerged that user fees are regressive and undermine equitable access to essential healthcare services and may negatively impact lives of pregnant women

(Borkowski, N. , 2005). In Japan, maternal mortality rate reduced in 1960 to 1970 declining from 130 to 50 and their success is traced in three critical factors which include access to skilled delivery through training of professional midwives and nurses and also ensuring their availability to women during pregnancy and delivery at no cost. Today, 100 per cent of deliveries in Japan occur with the help of healthcare professionals in healthcare facilities (Nagaya, 2000).

In Sierra Leone, the Government abolished healthcare costs for pregnant women, new mothers and children under-five in April 2010. As a result, many more pregnant women, new mothers and their young children have been able to access such services in healthcare facilities (Desalew Zelalem Ayele, 2014). Free services for pregnant women and the under-fives in Burundi were introduced in 2006 and utilisation appears to have increased as a result, although no formal evaluation has been undertaken. In Zambia, maternal fee was suspended for rural districts in 2006 due to various challenges that the government faced then. In Burkina Faso, 80 per cent subsidy policy for deliveries was launched in 2006 and since then other countries have followed the same though with varying target groups and all still at the stage of being elaborated (Blas, 2001).

Exemptions were introduced for delivery care in Ghana in 2004, first in five regions and then across the country. This policy was later superseded in 2008 by free coverage of all pregnant women within the National Health Insurance Scheme (NHIS) which had started in 2005 and this shows that most of the countries in Africa are moving towards the introduction of free maternity services (Agyepong I. &., 2008,). This policy was intended to cover all facility costs for intrapartum care in both public and private facilities. Initially payment was effected through the local government administration but later through the health system, funding was provided from a debt relief fund under the Highly Indebted Poor Countries (HIPC) initiative. This was gradually phased out and was replaced with the health insurance in 2008 (Agyepong I. A., 2011).

Upon the directive of free maternity services in Kenya in June 2013, the government committed Kes 3.8 billion to implement free maternity services together with an additional Kes 700 million for free access to public facility centres and dispensaries; Kes 3.1 billion for recruitment of community nurses per constituency and also Kes 522 million for recruitment of 10 community healthcare workers per constituency. The government also set aside Kes1.2

billion for provision of housing units to healthcare workers and therefore in the overall allotment, Kes 10.6 billion was budgeted for in the FY 2013/14 in the national budget. Aside from the Kes 10.6 billion, the county governments were also allocated Kes 60 billion which makes it Kes 95 billion for the health sector in that particular year (Nicole Bourbonnais, 2013). However, less changes have been experienced and hence implementation of such policies should be influenced by factors such as the hospital infrastructure, maternal services knowledge and appropriate information, staff threshold and positive attitude by both mothers and the caregivers which should work inter-twined to ensure that the situation is improved within the country and later replicated to the surrounding regions (Mehrotra, 2002). It's also important to note that free maternal healthcare influences lives of mothers and that of their families as it ensures all have access to theatre services, midwife services and medication to enable them deliver successfully. Free postnatal care enables mothers to access free counselling and family planning options, free gynaecology service as well as free medication critical for maternal healthcare (Ong'ech, 2012).

2.4 Patients' background factors and delivery of maternal healthcare services

Delivery of essential services concentrates on improving the quality of staff skills, protocols of treatment, availability of supplies and environment of healthcare facilities. Yet while these interventions are important, they do not address many of the barriers of access to services faced by patients in low-income countries. Whether and where to go for treatment starts way before arrival in a health facility and entails complex and potentially confusing choices to be made. Often healthcare services of a reasonable quality exist but few mothers use them. Just as important are the physical and financial accessibility of services, knowledge of what providers offer, education about how to best utilize self and practitioner-provided services and cultural norms of treatment (Demery, 2000).

Patients' background factors in this study are those factors that hinder mothers from accessing maternal healthcare services and in return influence delivery of maternal healthcare services in healthcare facilities leading to barriers that hinder delivery of such services hence contributing to high maternal mortality rates. Patients' background factors vary from community to another and from one individual to another and they include far distances to the health facilities, costs associated with deliveries in a health facility, socio cultural beliefs and attitudes of mothers towards facility based maternal healthcare services (Gertler P, 1990). Studies in Bangladesh, India and Côte d'Ivoire show that girls were much more likely to visit

healthcare facilities and benefit from public and household healthcare expenditure compared to boys. Another study in India found that while a bias to boys existed, this was reduced when the household head was more highly educated. The reason for these differences is related to both cultural patterns and social factors within the household and the wider community which influence delivery of maternal healthcare services in public healthcare facilities (Narayan, 1997).

Geographical access to healthcare focuses on location of healthcare facilities and the time it takes to travel to facilities when in need which tends to be associated with the number of healthcare facilities available to the communities and/or the availability of transport systems whenever a need arises (Dixon, 2014). The distance mothers live from a healthcare facility; transportation and total travel time, waiting time as well as the available services play a critical role on delivery of maternal healthcare services in public healthcare facilities (Hjortsberg, 2002). In Andean, Bolivia where travel times are greater than one hour by walking, limited physical access to healthcare facilities was found to be a major obstacle in improved healthcare and delivery of such services. Physical access is a challenge to various countries especially in rural areas where there are fewer healthcare facilities and communities may be physically isolated. In Zambia, 56 per cent of rural households surveyed perceived distance as an obstacle (Hjortsberg, 2002). In the same study, only 17 per cent of individuals living more than 40 kilometres from a facility sought healthcare services when sick compared to 50 per cent of individuals living less than five kilometres away. Another barrier in the rural areas is that travel time takes longer per kilometre than in urban areas due to poor road infrastructure and the burden of having to use several modes of transportation which affects access and delivery of such services (Perry, 2000).

In Mali, geographical challenges are also being faced by mothers due to poor transportation infrastructure which affects the access to maternal healthcare services in public health facilities. Most of the populations have to walk several kilometres to reach the health facilities making it difficult to access such services (Gage, A.J.,2007). In Ghana, one out of three women live two hours or more away from a health facility that can provide primary obstetrical emergency care and half of these women live with a similar situation and hence unable to access healthcare facilities. Due to these distances, one third of women are subject to maternal death due to pregnancy related complications as a result of living long hours away from a well-equipped healthcare facility (Gething, 2012). A study carried out by

Mutebi in Rwanda in 2011 shows that 23 per cent of patients in Rwanda walk more than an hour or five kilometres in order to reach the nearest health facility. These barriers contribute to the high number of home based deliveries and maternal deaths and in return influence delivery of such services in healthcare facilities (Golooba-Mutebi, 2011).

Kenya is not an exception on barriers of access to maternal healthcare services and these challenges reduce the impact of maternal healthcare interventions including free maternity policy which doesn't cover transportation between the women's home to the healthcare facility. The government has invested in referral systems through ambulances together with support from charities and private partners. However, these are only applicable during inter-facility referrals and at the same time, challenges of poor fleet management and coordination have been experienced contributing to the report by KDHS 2008 that only 46 per cent of pregnant women are able to access skilled birth attendance (Kitui & Davey, 2013) influencing delivery of such services in a public healthcare facility.

Cultural perspective of mothers and their families is also critical in determining their uptake of maternal healthcare services and in return influence delivery of such services in public healthcare facilities (Leslie and Gupta, 2009). Their socio-cultural beliefs and practises determine whether they utilize maternal services or not (Addai I., 2000). Studies conducted in Europe reveal that women's attitude towards maternal healthcare is important in determining their level of adoption of the maternal healthcare services. Some of the factors determining the women's attitude include culture, religion and ignorance, the observation of the operations of the maternal healthcare and socio-economic factors (Hosseinpoor, 2011).

In most of the African countries, maternal healthcare has been termed to be exclusively women affairs which exclude men from seeking maternal healthcare services with their families. It therefore becomes an obstacle for mothers to visit facilities for maternal healthcare services as they have to ask for permission from their husbands and family members. Falling under a similar social pall is reproductive health services which in some countries have a similar reputation and it is only with some creative management that certain issues have been resolved such as in rural Bangladesh where attendance was increased in women's reproductive healthcare services by integrating men's reproductive healthcare into the previously female-focused facilities and hence allowing joint decision making in families regarding uptake of maternal healthcare services (Ubaidur, 2004).

In South African rural communities, maternal healthcare services are provided traditionally with indigenous healthcare services with the help of midwives (Addai I., 2000). In areas where such culture is upheld, uptake of maternal healthcare services is very low which influences delivery of such services in healthcare facilities. In other cases, utilization of modern maternal healthcare services in such a context is often influenced by individual perceptions, the religious beliefs of individual women and influence by family members, opinion shapers and community leaders. Studies carried out in Addis Ababa, Ethiopia established that women who did not receive maternity care were often poor, illiterate and unmarried with limited knowledge of maternity care services and at the same time, their beliefs and values influenced their uptake of such services. In a nationally representative sample survey in Ethiopia, receipt of maternity care was found to vary by age, residence and other socio economic factors (Central Statistical Agency (CSA), 2006). Studies in Ethiopia show that women who followed traditional beliefs had a 50 per cent lower chance of receiving antenatal care compared with those who followed other faiths (Dagne, 2010).

The KDHS report, 2010 estimates that 1 in 25 women are at risk of dying from pregnancy and child birth related complications in their life time. Utilization of maternal healthcare services is an effective approach in reducing the risk of maternal morbidity and mortality and especially in places where general health status of women is poor and especially in areas where cultural belief and practices exist. Although overall antenatal care coverage shows improvement and especially for the first ANC visit, many women make their first ANC visit late into the pregnancy as compared to the recommended 14 weeks of pregnancy (Gage. A.J.,2007).

The ability to pay for services determines the uptake of healthcare services and hence lack of finances makes it difficult for mothers to pay for such services and hence inability to utilize them. In addition, low income has been a contributing factor to health seeking behaviour for mothers and this includes maternal healthcare services and can create an overwhelming financial burden for some (Gotsadze, G., Bennet, S., Ranson, K., & Gzirishvili, D., 2005). In terms of the actual costs of healthcare services, one of the reasons there is such controversy over the introduction of cost-sharing and cost-recovery programs in developing countries is the effect these programs have on the lower income groups. Studies and surveys carried out showed that this method merely brought further disadvantages to the more vulnerable groups (Oliveira-Cruz, 2003). It's vital to note that some countries have made efforts to reduce the

burden of maternal healthcare services and especially on elimination of user fees on maternal healthcare services. Even then, professional healthcare still remains a challenge for many mothers. Research has shown that women of West African countries had over half listed costs and this made them not to seek healthcare in public healthcare facilities which directly influences delivery of such services in various healthcare facilities and in return (Stewart, K., & Sommerfelt, E. , 1991) mothers opted to seek for services from Traditional Birth Attendants (TBAs) instead of healthcare facilities (Akin and Munevver, 1996).

In Ghana, Switzerland, Zaire and Uganda research shows a decline in use of healthcare services as a result of introduction of user's fees. In Tanzania, a decline of 53.4 per cent in antenatal care was reported while Nigeria reported a 56 per cent rise in maternal mortality after the introduction of user fees (Bennett, 2001). In Zambia, several studies show that low income populations have higher chances of illness and studies showed an increase in the cost of healthcare services which affects the poorer mothers who need to make return visit to a healthcare facility. Also, as women in many developing countries are expected to conform to social and gender roles and remain at home to perform household chores, they are unable to develop economic independence and as a result, they cannot afford such services especially since essential goods such as food and education must be purchased before healthcare thus making their access to maternal healthcare services limited hence influencing delivery of such services in public healthcare facilities (Hjortsberg, 2002).

A research conducted by (Deolitte, 2011) reveals that more than half of women in Kenya give birth at home and without skilled care. Although 92 per cent of pregnant women receive antenatal care (ANC), only 43 per cent give birth in health facilities and even though there has been limited improvement since 2003, where 40 per cent of women delivered in a health facility nationally, only 44 per cent of women are delivered by a doctor, nurse or midwife. Many are assisted by TBAs (28 per cent), relatives or friends (21 per cent). High healthcare costs and low income reflects low rates of skilled births and low uptake of such services and hence maternal healthcare services are not delivered effectively as required (Deolitte, 2011).

2.5 Healthcare facilities factors and delivery of maternal healthcare services

Many public healthcare facilities in third world countries continue to face challenges that directly influence delivery of maternal healthcare services to mothers. Many countries have therefore opted to advocate for decentralisation of services to drive health sector reforms with

a focus on maximising on the existing resources within their context and environment (Celik, 2000). In the course of the 1980s any progress that was being made in health development and in public healthcare provision in post-colonial sub-Saharan Africa faltered in a setting of economic recession, financial indebtedness, structural adjustment measures and political instability. On one hand the economic problems caused by International Monetary Fund (IMF) and World Bank imposed austerity measures which negatively affected household livelihoods including possibilities to seek for any treatment in case of health problems while on the other hand, fewer funds became available for the daily running of government healthcare thereby influencing delivery of maternal healthcare services (C. Anyinam, 1989).

Access to information is critical in ensuring that mothers seek maternal healthcare services and this is because the kind of information available deter or captivate mothers to seek such services. Previous literatures show that appropriate information on maternal education has a positive correlation to delivery of maternity care services. Communication therefore becomes an important aspect to delivery of services as it ensures that uptake of such services is smooth while achieving patient satisfaction. There is a need to educate women on pregnancy, monitor their own health and that of their children, follow up with medical check-ups, critical updates and post-delivery support through the appropriate channels of communication accessible to them (Addai I., 2000).

In the United States of America, research shows that women who were informed and educated on maternal healthcare services were most likely able to seek such services in a health facility as well as adopt the appropriate maternal healthcare practices and interventions. The Level of education of the women also increases their ability to understand the maternal education whereby, women of higher level of education exhibit increased ability to understand the information passed to them by the healthcare institutions and consequently are able to take up the maternal care services in healthcare facilities (Leslie and Gupta, 2009). The knowledge of mothers on maternal issues plays a critical role on their utilization and delivery of maternal healthcare services.

A research study carried out in Australia in 2009 also showed that women who utilized and preferred to use public funded maternal healthcare services were outlined to be well informed on the meaning and importance of maternal care, they knew what it meant by normal delivery and also recognized the complications that were likely to arise when deliveries were

administered by unqualified personnel. On the other hand, women who did not utilize the maternal care services had a low understanding of these issues and its importance (Teate, 2011). Women as well as their families need to possess the right information about maternal healthcare services from various facilities around them that offer such services, any cost implications to such services as well as the importance of seeking skilled support during pregnancy and thereafter. This information enables them and those concerned to make informed decisions. Health education programmes and sessions during antenatal clinic should also be provided to inform the women about reproductive health, knowledge related to sexuality, nutrition, family planning among others (Lesser, Soya Barnett, 2003).

Numerous studies have shown that lack of adequate information about maternal healthcare service, laboratory tests results and dangers of late bookings or not attending ANC services at all are some of the contributing factors to poor delivery and uptake of maternal healthcare services due to information deficit. Inadequate information about these services and their benefits to the mother's and the infant's health may also negatively influence the utilization of maternal healthcare services. Sometimes pregnant women may not know the implication related to poor or non- utilization of maternal healthcare services (Leslie and Gupta, 2009).

In East Africa, a study conducted in Tanzania on knowledge, attitude and practices on maternal and new-born health revealed a strong positive correlation between knowledge on the importance of pregnancy care, antenatal care and hospital deliveries and postnatal care and delivery of maternal healthcare services and in this case mothers were more engaged in good breast feeding practices and regularly sought postnatal care services (Chung, 2013). In Kenya, a study explored the effects of 'Kangaroo Mother Care' training on information, attitude and practice of healthcare providers in selected district hospitals in North Rift Region and it was realized that with increase in knowledge about the Kangaroo mother care services training, women were engaged more in breast feeding and other postnatal care services such as regular visits to the healthcare facilities (Joy E Lawn, 2015) and this in turn influences delivery of maternal healthcare services.

Leadership and management of healthcare facilities on delivery of maternal healthcare services is fundamental. The management team is critical in administration of healthcare and in ensuring that services are appropriately utilized and this influences delivery of maternal healthcare (Champagne, 2006). For instance in Canada, maternal healthcare services are

administered by Medicare in line with the set principles and guidelines in the Canada Health Act and healthcare is provided to all Canada citizens for free and recently this policy has been focusing on strengthening primary healthcare as well as adoption of technology in the health sector. This clearly reflects the management, accountability mechanisms and leadership put in place compared to the third world countries that have struggled with management and accountability mechanisms challenges (Alter et al, 2004).

In Africa, delivery of maternal healthcare also depends to a large extent on the health care management in ensuring healthcare services are uniformly spread even to the rural areas. In Egypt, (Koblinsky, 2003) explains a huge disparity witnessed and identified in provision of antenatal and postnatal care in the rural and urban areas in that, rural areas have very few obstetrics, doctors and healthcare facilities. This leads to congestion of the few facilities and resources available hindering mothers from accessing such services due to high populations. With investment in the number of hospitals and healthcare professionals, delivery and utilization of maternal healthcare services in the public hospitals in urban areas has increased significantly as a result of the management team's role on delivery of such services (Yount, 2004).

South Africa is credited for having the highest per capita investment on maternal care in Africa (Myer, 2003). However ensuring the availability of healthcare facilities and enough qualified staff is not enough to guarantee delivery of maternal healthcare services in any given setting (Champagne, 2006). The country still has records of low indicators of performance by having high maternal mortality rates because their women and communities are not empowered to contribute actively to improving maternal healthcare. There is no clear legislation and policy to support the free maternal healthcare strategy and the general illiteracy of women in rural South Africa is high. In August 2009, the Minister of Health in Sierra Leone declared plans for providing free maternal healthcare to women and children and established an advisory committee of international NGOs and donor agencies with most of the NGOs willing to support such initiative in order to increase women's access and delivery to maternal healthcare. However, due to weak healthcare systems, uncoordinated activities and mismanagement of resources, international donors have been reluctant to disburse funds without evidence of changes to strengthening the system (Kandeh, 2002) thereby influencing delivery of such services.

Major re-organisation of the health system based on principles of decentralisation, community participation and inter-sectoral collaboration began in the mid-1980s when District Health Management Teams were established in Kenya. It continues today, promoted through the community health strategy and the Health Sector Services Fund and has further been re-emphasised in 2013 with the devolution of government functions from national level to the counties countrywide. These governance and community accountability changes have enormous implications on delivery of maternal healthcare services at county and health facility level (Myer, 2003).

Resource management is critical for healthcare services delivery. Sachs states that service delivery is an immediate output of the input into the health systems and these include health workforce, supplies and finances and so increased input should lead to improved services. Ensuring availability and access to maternal healthcare services is one of the main functions of healthcare systems. However, this has been an obstacle to other functions that contribute to delivery of maternal healthcare services especially in developing countries (Sachs J D, 2008). The need to adopt enlightened approach to resource management in service delivery is important. In particular, there is a need to distinguish good costs that improve institutional capabilities and quality maternal healthcare service delivery from costs that increase bureaucracy hence becoming obstacles to delivery of such services (Sun, 2005).

Studies carried out in Malawi shows that the country spends 13 per cent of its GDP on healthcare which is lower than the 15 per cent of the Abuja Declaration recommendation. Healthcare in the country is mostly managed by the government and the country has continued to face resource constraints hence lagging behind on matters of health which immensely affects delivery of maternal healthcare services. This has continued to reflect in maternal mortality rate whereby in 2004, MMR was estimated at 984 deaths per 100,000 live births one of the highest mortality rates in Africa (Allen, 2013). Resource allocation remains a constraint in Kenya health sector where its current allotment of Kes 95 billion for health represents only 5.7 per cent of the total budget way below the 15 per cent requirement for the Abuja Declaration. This contradicts the Jubilee Coalition's manifesto which promised to increase the health budget line progressively to reach 15 per cent. The current budget is a decrease from rates of 7.2 per cent in 2010, 6.1 per cent in 2011 and 5.9 per cent for 2012. It also falls far short of the Ministry of Health's 2012 task force report which called for a minimum of Kes 217 billion for a three-year health stimulus package. The lack of sufficient

funds could seriously impact the success of the maternal healthcare programs and interventions as well as delivery of such services (Nicole Bourbonnais, 2013). Insufficient and slow distribution of the resources available for maternal healthcare interventions and programs could also create intense challenges and setbacks in achieving the right maternal outcomes. Although some public healthcare facilities in Kenya have reportedly been provided with extra capital to cover the influx of deliveries, others have remained in uncertain circumstances of how to balance the free maternity care policy and their need to cover costs (Matua, 2004).

2.6 Medical devices and delivery of maternal healthcare services

The availability, accessibility and appropriate use of medical devices is key in achieving the health systems performance goals one of these being delivery of maternal healthcare services. Due to inadequate medical devices, many African countries have opted for devolution of resources as an important factor to drive health sector reforms with a view to maximizing the limited resources to ensure delivery of services (M.Sohail., 2003). One of the studies carried out in a large hospital in USA found that 32 per cent of adverse events in a large hospital are linked to medical devices mal-function (Nuckols TK, 2008) while a study conducted in a district hospital in India demonstrated that only 39 per cent of the required number of maternal medical devices was available for use in public healthcare facilities (Banerjee, 2001).

Availability of functional medical devices is therefore an essential component of delivery of maternal healthcare services. Studies reveal that medical devices are often unavailable in low resource settings owing to the challenges of cost, imported or donated medical devices that are not tailored to meet context needs, limited human resource and lack of standardized regulatory protocols. In some cases when the devices are available, they are often in a state of disrepair and non- functionality for multiple reasons including prohibitive costs for procurement of replacement devices and spare parts, supply chain inefficiencies and devices designs that are not tailored to meet local needs (Bailey P, 2006). WHO documented essential interventions; commodities and guidelines for management of reproductive healthcare and many of such interventions require access to medical devices considered essential for normal delivery, caesarean section as well as case management of maternal complications and a post-operative care for both mothers and new-borns. WHO also outlines that such services offered through the medical devices should be affordable for those who need them both individuals

and communities in public healthcare facilities. It's estimated that two million people do not have access to medical devices and four million people could be saved annually in Africa and Southeast Asia if the right, quality and appropriate medical devices were available and functioning appropriately (M.Sohail., 2003).

In most of sub-Saharan African countries, healthcare facilities are not well equipped with medical devices and these compromises on the quality of care and coverage because of economic factors and scarce resources. This has prompted many countries to advocate for decentralization as a key factor to drive health sector reforms with a view to maximizing the use of available resources in improving access and quality of healthcare services provided (M.Sohail., 2003). In Senegal, health centres face problems due to insufficient medical devices and facilities. For instance the number of available delivery beds is inadequate where pregnant women are often forced to share beds during labour. Necessary devices such as scissors and forceps are in short supply and as a result are often not properly sterilized (Graham WJ, 2001).

Since 1990's Ghana has continued to face tremendous challenges of medical devices and especially maternal healthcare devices which has contributed to the increasing mortality rate in the country. The state of their medical devices continues to deteriorate while basic medical devices are sometimes unavailable. However, with various strategies and policies to improve the situation, this has seen the medical department work hand in hand with the government and private institutions including offering training for various biomedical engineering departments in the country. In 1989, the performance of medical devices was at 64.3 per cent compared to 2006 where the performance has improved to 88.6 per cent and this has continued to improve maternal healthcare situation in the country. However the country still meddles with challenges such as lack of regulatory systems for medical devices and difficulties in standardizing on trusted medical devices models which influences delivery of maternal healthcare services (Zienaa, 2006).

Public healthcare facilities in Kenya have long suffered from insufficient medical devices just like many of the developing countries in Africa. Recent research shows that only 36 per cent of the public facilities offering maternal healthcare services had all the basic delivery room's infrastructure and medical devices with lower level facilities ill- equipped to handle deliveries and pregnancy related emergencies and complications. Only one in three facilities offers

basic maternity services and only one in ten hospitals offer basic obstetric care services; fewer provide comprehensive obstetric care services. Only 9 percent of facilities providing delivery services can perform all signal functions for basic obstetric care. Few of these facilities can offer blood transfusion, caesarean section and life-saving interventions for mothers and new-borns and this means that there is a deficit of such important medical devices (Mwangome, 2012).

Medical devices that are tailored to fit the setting for which they are supposed to function contributes highly to maternal healthcare outcomes in any given country. Studies conducted in Ghana reveals that a number of innovative maternal healthcare technologies for resource-limited environments were built in the United States and Europe, a few in Asia and two in Sub-Saharan Africa and these couldn't fit the environments for which they were intended to function in. While the local innovations and technologies is a potential way for improving delivery and uptake of maternal healthcare services, additional research is needed to understand how to suitably create such innovations and adequate environment that will transfer its benefits to those who most need it. Studies indicate that locally produced and manufactured simple medical devices can be more affordable than foreign imports and at the same time, they can be capable of meeting the local need. They can also reduce transportation costs, nurture local supplier networks, build health security by increasing a reliable supply of medical products, reduce the cost of repairing broken equipment and contribute to a more robust health ecosystem that meets local healthcare needs (Thai, 2001).

Kenya is not an exception in challenges of context fit medical devices and medical engineers in the country have faced immense challenges in repairing specifically maternal medical devices manufactured outside the country's context. The medical engineers continue to deal with maintenance and management of all medical and hospital equipment which includes electrical, civil, mechanical works and plants and hence maternal healthcare devices are not given enough time and attention arising from lack of understanding and awareness of medical devices complexity and at the same time, different staff are involved in making decisions which at times affects the viability of medical devices (Joyce Cheptum, 2014).

Procurement of medical devices plays an important role on delivery of maternal healthcare services. In public healthcare facilities, public procurement is an important function of government, aiming to satisfy requirements for goods, works, systems and services in a

timely manner. Ideally public procurement should meet the basic principles of good governance which is transparency, accountability and value for money (Wittig, 2003). Low and middle income countries face tremendous challenges on lack of medical devices and also medical devices being faulty within such settings due to lack of resources. It's also important to note that medical devices manufacturers target high income economy countries for their higher returns and profits thus medical devices design are restricted to products and specifications suitable for deployment settings with advanced infrastructure and technologies making it difficult for developing countries to afford such medical devices hence affecting delivery of maternal healthcare services (MOHSW, 2008).

The Government's effort to undertake public procurement reforms in Tanzania Mainland started in 1992 and consequently in 2001 new version of Public Procurement Act was introduced. Due to changing environmental factors, the modified versions of Public Procurement Act were introduced in 2004 and again in 2005. Even with such changes, procurement procedure in such health facilities are mostly not followed to ensure the right medical devices are procured. Without such a system, the government may not exactly know the needs. Studies show that public healthcare facilities are also unable to use such devices effectively despite the confirmation to the specifications. This is perhaps due to the lack of consideration by the procuring body to the infrastructure and context requirement for use and maintenance of such medical devices which in most cases are not fully functional. It is quite evident that by merely ensuring the physical supply of the technical devices, delivery and uptake of healthcare services cannot be guaranteed (Thai, 2001). Studies conducted in 2004 WHO reveals that processes of medical devices planning, procurement and management in public hospitals in Kenya are challenging and it was observed that procurement and management of health medical devices required change in the approach and its strategies as it influences the quality of the healthcare services (Kachieng'a, 2004).

2.7 Staffing and delivery of maternal healthcare services

Skilled healthcare professionals are in short supply across sub-Saharan Africa which strongly influences delivery of maternal healthcare services in healthcare facilities. For instance, WHO estimates that Tanzania should have a medical workforce of about 92,000 staff and the government even aspires to have approximately 140,500 skilled health workers by 2019. At present the country only has about 25,400 healthcare workers and one of the major contributing factors is the shortage of sufficient number of training programs. Tanzania has

fewer than 100 training institutions which when put together produce fewer than 4,000 graduates annually. There is a need for selective hiring of qualified healthcare professionals as well as successful recruitment and retention processes of staff that should be tied to the empowerment package in the hospital operations as well as providing opportunities for advancement (Brown, 2003).

In Asia and sub-Saharan Africa, only one skilled attendant is available for every 300,000 people resulting in a ratio of one skilled attendant for every 15,000 births (MacDonald, 2002). In addition, a few incentives exist for skilled workers to work and live in rural areas, small urban areas and remote regions. Moreover, in some developing countries, skilled medical professionals are lured by higher incomes in western countries contributing to the overall brain drain of healthcare professionals from developing countries which immensely influence delivery of maternal healthcare services among others (Heller, 2002). Highly skilled physicians, nurses, administrators and in general the healthcare staff are critical to producing high-quality outcomes in delivery of maternal healthcare services and quality improvement hence hospital growth. To improve efficiency and delivery of maternal healthcare services, public health facilities need to build the capacity of their staff through attracting and employing an adequate number of high-quality nurses to be able to achieve delivery of maternal healthcare services (Argote, 2000).

Women are often unable to access quality maternal healthcare services when they need them due to highly overburdened workforce in healthcare facilities. The government- managed healthcare facilities are under-financed and characterized by shortages of most basic essentials including a dire shortage of human resource where only 15 per cent of all Kenyan health workers providing maternal healthcare services have received any type of in-service training in treating delivery-related complications and yet 83 per cent of expectant mothers access the facilities during delivery. According to the Kenya Health Sector Strategic and Investment Plan (2008/2009), the current staff levels meet only 17 per cent of the minimum requirements needed for effective operation in a health system with 7 nurses per 4,000 residents contrary to World Bank recommendation of 14 nurses per 4,000 residents and therefore the sector is unable to provide maternity services appropriately to mothers (Nicole Bourbonnais, 2013).

Appropriate training and education of healthcare workforce is critical for delivery of maternal healthcare workforce because availability of enough qualified healthcare professionals is a necessary backbone for delivery of such services. Ethiopia is one of the countries with the least number of physicians in the world. Overall the current stock of physicians is 0.03 per 1,000 people which is insufficient to reach both national and international benchmarks and not close to the 0.55 doctors per 1,000 people required to achieve 80 percent of coverage of live births. Although intake of students into medical school has increased significantly in recent years, doctors much more than nurses tend to migrate abroad due to unfavourable working conditions and dissatisfaction with existing salary levels and lack of opportunities for further education and career development (Abdosh, 2006).

According to Kenya workforce report of 2012, 9,177 nurses started training in 2003 to 2007 and in those trainings, two out of 10 started certificate programs while 7 out of 10 trained at diploma level courses and only 1 per cent pursued a degree programme with 109 health workers per 100,000 people way below the recommended international standards of 235 nurses per 100,000 persons. Therefore, health institutions do not only need to consider the number of nurses available but also the quality of their training which would then influence delivery of maternal healthcare services. There is need for nurses to be more qualified to match the needs for the healthcare sector. Of all Kenyan nurses 39 per cent are certificate holders and therefore the Nursing Council of Kenya is seeking to have diploma as minimum level of education (Joyce Cheptum, 2014).

Globally, countries have faced challenges of staff remuneration and this has resulted into brain drain where healthcare professionals migrate to different areas in search for greener pastures. Poor remuneration is frequently cited as the primary cause of the shortage of human resources. Low levels of pay and allowances have a demotivating effect on existing staff as well as discouraging individuals from seeking employment in the public health service in most countries in Africa. Remuneration in the Malawian civil service is low even by regional standards though the government recognises that wages have been significantly eroded in real terms and therefore has developed a strategy for increasing the remuneration of civil servants over the medium term (Valentine, 2003). This strategy includes the consolidation of salaries and regular allowances as well as plans to simplify the grading and pay structure of healthcare workers. At the same time, the government has initiated a donor-financed programme for supplementing the salaries of public health professionals (Allen, 2013).

A study carried out in Zambia reported that 15 per cent of staff had not always received the salary payment that was due to them and 80 per cent had received late payments while 10 per cent of staff had to pay expediter's fee to obtain their salaries which led to discouragement and brain drain with most of the staff moving to other areas in search for better terms. This in return influences delivery of healthcare services among others maternal healthcare services with very few professionals available to meet the healthcare needs of the huge population (Labette R., 2006). Many of the healthcare professionals in Kenya have migrated from rural areas to urban areas for the same reason hence contributing to the limited workforce in the country. This leads to serious challenges in terms of skilled labour loss as well as loss on government's investment through the subsidised education of their healthcare workers and in return influencing delivery of maternal healthcare services (Kirigai JM, 2006).

The patient- healthcare provider relationship is a key pillar towards quality healthcare. A good and respectable relation encourages mothers to seek for maternal healthcare services and also ensures that services are delivered effectively to those who need them. Globally, studies show that one third of deliveries take place at home without the assistance of a skilled birth attendant. In Africa, less than 50 per cent of deliveries are attended by a skilled healthcare worker and despite an increase from 43 per cent to 57 per cent between 1990 and 2005 in all developing regions, two million women have died in Africa during childbirth since 2000 and some of these challenges have been attributed to the attitude of healthcare providers hindering mothers from seeking maternal healthcare services in public healthcare facilities (Zienaa, 2006).

Research carried out in India reveals that when women accessed care, they often chose traditional birth attendants and private practitioners on account of privacy, anonymity, accessibility and the provision of more patient-centred care. Most of them feared to be socially alienated on the basis of their social status such as marriage status. This has continued to be a hindrance to uptake and delivery of maternal healthcare services in healthcare facilities (Heller, 2002). Studies conducted in South Africa found out that women appreciated continuous care from providers, being treated with respect and facilities cleanliness while some delivered unattended and providers insulted others and this influenced delivery of maternal healthcare services. In addition, verbal abuse and beatings to women during labour and delivery often occurred which hindered mothers from seeking such services from public healthcare facilities (Bazant, 2008). In Kenya, recent trends have

emerged focusing on mothers' interactions with TBAs and/or nurses. A common trend is fear of harsh treatment, rude and unfriendly attitudes of nurses and other healthcare providers in healthcare facilities leading to a barrier in delivering maternal healthcare in public healthcare facilities (Matua, 2004).

2.8 Theoretical framework

This particular study was guided by the realism theory established by Pawson and Tilley (Pawson, 1997) and this particular theory was used to analyse the factors influencing delivery of maternal healthcare services in public healthcare facilities in Kenya. According to Kitui & Davey 2013, it's an approach grounded on a school of thought which asserts that both the material and the social worlds are real and can have real influence and in this case being the factors influencing delivery of maternal healthcare services. These factors include availability of resources crucial for delivery of maternal healthcare services to the given population (Kitui & Davey, 2013). The government through the ministry of Health therefore has a responsibility to allocate more resources to maternal healthcare to ensure that such services are delivered appropriately to mothers and their families.

2.9 Conceptual framework

In this study, independent variables are the conditions presumed to affect the dependent variable these being the factors that influence delivery of maternal healthcare services in public healthcare facilities in Nairobi County Kenya in a case of KNH. Dependent variable for this particular study is delivery of maternal healthcare services in public healthcare facilities in Nairobi County. Moderating variables include factors that may alter the influence of independent variables on dependent variable and for this particular study, healthcare policies was identified to be the moderating variable. Intervening variables are those variables that stabilize the outcome and they affect the study even though they are not part of the study which for this particular study is attitude towards public healthcare facilities in delivery of maternal healthcare services in public healthcare facilities.

The figure below illustrates the factors influencing delivery of maternal healthcare services in public healthcare facilities in Nairobi County, Kenya in a case of KNH:

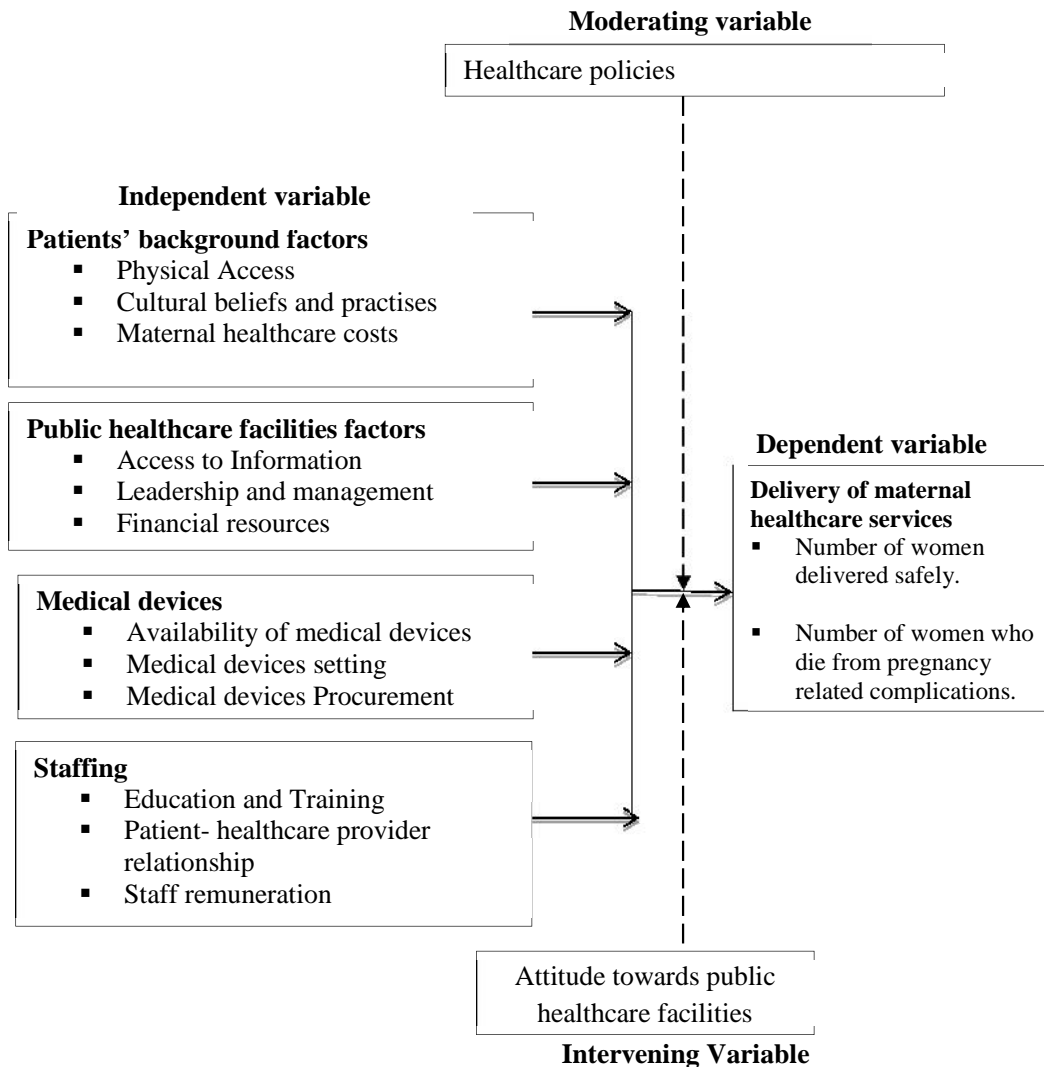


Figure 2.1: Conceptual Framework

2.10 Research gaps

This chapter reviewed various literatures in relation to delivery of maternal healthcare services in public healthcare facilities. Various literatures reviewed are summarized in the table below:

Table 2.1: Matrix Table for Summary of Empirical Literature

Author (year)	Title of the study	Findings	Knowledge gap
Chuma J, Musimbi J, Okungu V, Goodman C, Molyneux C., (2009)	Reducing user fees for primary health care in Kenya.	Need to distinguish good costs and costs that increase bureaucracy.	Limited resources and state of the infrastructure.
Gage. A.J. (2007).	Barriers to the utilization of maternal health care in rural Mali.	Barriers of Physical access to healthcare facilities a contributing factor to high maternal mortality rates.	Demand side exclusion.
Briscombe, B., Suneeta S. and Margaret S. (2010)	Improving Resource Allocation in Kenya's Public Health Sector.	Decentralization of resources critical for efficient resource allocation.	State of healthcare facilities infrastructure.
Hjortsberg, C. A. & Mwikisa, C. N. (2002).	Cost of access to health services in Zambia.	Affordable healthcare.	Exclusion of referral costs from the actual costs. Demand side exclusion
Salome Mwaura (2013)	Challenges facing medical engineering services in Kenya.	Identification of various technology components package for medical equipment maintenance.	Lack of medical devices tailored to meet the local needs. The state of infrastructure
Kirigia JM., G. Bary A, Muturi Nyon J and Seddoh A (2006)	The cost of health professionals' brain drain in Kenya.	Provision of appropriate working environment to healthcare professionals.	State of hospital infrastructure. Poor remuneration Healthcare staff Training opportunities

2.11 Summary

Literature review defines the empirical review, the theoretical framework and conceptual framework used in the study and in this case, the researcher observed the ground works and also reviewed empirical literature of various scholars. Argote, 2010 states that there is need to provide delivery of maternal healthcare services and therefore public sector hospitals must build the capacity to attract and employ adequate number of high-quality healthcare professionals (Argote, 2000). Argote 2010 also notes the importance of resource management in achieving delivery of maternal healthcare services in any given environment. According to (C. Anyinam, 1989), limited resources have led to poor management, deteriorating hospital infrastructure which ultimately leads to underfunding and poor quality of healthcare. Physical access to maternal healthcare services has for a long time remained a challenge in many African counties where women of child bearing age are often unable to access quality maternal healthcare and hence the need to distribute healthcare facilities and resources evenly to ensure appropriate access for all mothers (Gage, 2007).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the design methodology used in the study putting into perspective the characteristics of the target population, sampling procedure and sampling size as well as data collection instruments, pilot testing of the instruments, validity and reliability of the instruments, data collection procedure, data analysis techniques, ethical consideration and operationalization of the study.

3.2 Research Design

The study used a cross-sectional descriptive research design which sought to explore the factors influencing delivery of maternal healthcare services in public healthcare facilities in Nairobi County, Kenya. A cross-sectional descriptive study is a research tool used to capture information based on data gathered for a specific point in time and is appropriate where the overall objective is to establish whether significant associations among variables exist at some point in time (Kate Ann Levin, 2006). Cross sectional descriptive study design was selected for this study due to its ability to minimize biases and maximization of the reliability of evidence collected. This study involved collection of quantitative data for objective testing while qualitative was useful in explaining themes of descriptive information. Both qualitative and quantitative data from the identified population were used which were critical for triangulation of the study findings.

3.3 Target Population

The study targeted women of child bearing age in KNH maternity wing in Nairobi County. KNH has 50 wards, 22 out-patient clinics, 24 theatres (16 out of the 24 are specialized theatres) and an Accident & Emergency Department. Out of the total bed capacity of 1800, 209 beds are for the Private Wing. For this particular study, the target population consisted of 30 nurses and 10 doctors at KNH maternity wing and 340 mothers (WOCBA) seeking maternity service on daily basis at the maternity wing as well as 15 biomedical engineers who specifically support procurement of maternity ward medical devices. The study population was taken from recorded figures obtained from Kenyatta National Hospital Management Information System which is the average number of women who attend maternity clinic daily at KNH and the number of staff in the maternity wing as at May 2016. The total target population is therefore 395 which include nurses, doctors, mothers and biomedical engineers.

3.4 Sample size and Sampling Procedure

The sample size and sampling procedure for this particular study was determined using the following statistical procedures.

3.4.1 Sample size

The sample size for this particular study was determined using Krejcie and Morgan Table (1970) and in this case the sample size is 196 respondents which include 191 mothers, 28 nurses, 10 doctors and 14 biomedical engineers based on the Krejcie and Morgan Table for determining sample size.

3.4.2 Sampling Procedure

A cross sectional descriptive research design was used to conduct a study where a total of 28 nurses, 10 doctors, 191 mothers and 14 biomedical engineers were selected from the Kenyatta National Hospital maternity wing in Nairobi County, Kenya. The sampling frame was obtained from KNH maternity wing whereby, simple random sampling was used to pick mothers seeking antenatal care and postnatal care on daily basis. Simple random sampling was also used to select nurses and doctors.

3.5 Data Collection Instruments

The main data collection tools used for this particular study include in-depth interviews and questionnaires. The tools focused on the objectives of the study in that, the first section of the questionnaire focused on the background factors of the mothers, the second section on public healthcare facilities factors while the third section focused on medical devices and finally section four focused on staffing and its influence on delivery of maternal healthcare services. Two different questionnaires were used where one was administered to the nurses, doctors and the biomedical engineers by the researcher at KNH maternity wing. The other questionnaire was administered to mothers seeking maternal healthcare services in the maternity wing on daily basis. The structured in-depth interviews had guiding questions and probing questions along the four themes which were the focus of this study and this was administered to the hospital staff in maternal healthcare sector as they had important information useful for the study by the virtue of their experience and the environment of the study. The questions were systematically pre-determined as well as presented with exactly the same wording and in the same order to all respondents. The study heavily relied on secondary data and hence documents used for hospital data were reviewed as well as the

number of deaths that occur annually due to pregnancy related causes. Other documentation related to the study reviewed included books, research work and internet among other sources and this is because secondary data is unobtrusive and allows for larger scale studies on a small budget.

3.5.1 Pilot testing

In order to ensure that errors are reduced in the questionnaire, a pilot testing exercise was carried out by the researcher through collection of data from Mbagathi Hospital a week prior to the set schedule for the main study. Mbagathi Hospital is a small public hospital located in Nairobi County which has similar traits and characteristics to Kenyatta National Hospital. The findings were expected to be in accordance to those achieved from KNH. It's critical to note that the pilot test involved 10% of the sample and the results found out that the instruments were reliable and valid for collecting the data and also, for cases with unclear questions, they were corrected.

3.5.2 Validity of research instruments

Validity refers to how the questions in the instruments are phrased in terms of clarity to ensure that uncertainty or doubts are eliminated. In other words, validity is concerned with whether the findings are really the reality on the ground. Content related validity was used for this particular study specifically construct validity to ensure that the instruments measured what they intend to measure in the study. Validity of the instruments was also maintained by articulately including the research objectives into the questionnaire and reviewing the instruments intensely with the supervisor to ensure that the most appropriate indicators that measured the variables were included into the study. The study also sought opinion of the experts in the field of maternal healthcare. Validity is critical in any given study for it ensures integrity of the conclusions that are generated from any given research. It is also concerned with whether or not the items actually provide the intended information.

3.5.3 Reliability of Research Instruments

The internal analysis method was used to measure reliability of the instruments. This kind of reliability measures the extent to which all parts of the test contribute equally to what is being measured. Reliability in any given study is critical for it determines the consistency of the research instrument in its performance. Healthcare providers who offer maternal healthcare services on regular basis were randomly sampled from a list of permanent staff present on the

day of data collection. Maternal healthcare providers were listed on a roster basis and provided with a unique number; interviews were carried out with selected respondents at random to ensure that these instruments are stable and consistent in achieving the intended results.

3.6 Data collection procedure

The researcher took the respondents through the questionnaire step by step to ensure that they understand it and the researcher also answer any questions that were presented by the respondents. The questionnaires collected were cleaned for data analysis. The study used both primary and secondary data to ensure clarity in understanding the objectives in this particular study. Data collection was done after defending the proposal and obtaining a research permit from NACOSTI. Consent was also sought from KNH using a consent letter addressed to the hospital staff which was attached to the data collection questionnaire. The researcher collected data by giving out questionnaires to the selected respondents both the healthcare providers and the mothers and also coordinated in-depth interviews with a few of the maternity wing staff. The researcher also sort data from hospital staff who availed the current hospital records. The entire data collection exercise took two weeks after which analysis and editing of the report to check for errors and inconsistencies were undertaken.

3.7 Methods of data Analysis

This particular study has both quantitative and qualitative data whereby quantitative data was analysed using descriptive and inferential statistics. Descriptive statistics such as frequencies, percentages and mean scores was used to analyse quantitative data. Inferential statistics such as Pearson correlation coefficient was also used to analyse quantitative data. Qualitative data was analysed through content analysis. Responses from open ended questions in the questionnaires and structured interviews were categorized based on emerging themes within the study which was used to supplement quantitative data and conclusion of the study. Data from the questionnaires was keyed into the database programmed by SPSS and analysed. In-depth interviews were typed into Ms. Word capturing the main responses and sorting data based on emerging themes developed from the study objectives which was qualitatively analysed.

3.8 Ethical considerations

The researcher sought approval and obtained a research permit to undertake the research from National Commission for Science, Technology and Innovation (NACOSTI). The researcher also sought informed consent from the respondents and the respondents were also requested not to indicate any identifiable information in the questionnaire and at the same time, confidentiality was upheld throughout the study. The findings from this study would also be communicated to the concerned parties including interested parties upon request.

3.9 Operational definition of variables

This study has four independent variables and one dependent variable which were all measured in ordinal and nominal scales of measurement.

Table 3. 1: Operational Definition

Variable	Type of variable	Indicators	Type of Analysis	Scale of Measurement
Patients' background factors	Independent variable	Physical Access Cultural beliefs and practises Maternal healthcare services cost	Descriptive statistics	Nominal Ordinal Ordinal
Public healthcare facilities factors	Independent variable	Access to Information Management and leadership Financial resources	Descriptive statistics	Ordinal Nominal Nominal
Medical Devices	Independent variable	Availability Medical devices Medical devices setting Procurement of medical devices	Descriptive statistics	Ordinal Nominal Ordinal
Staffing	Independent variable	Education and training Patient-provider relationship Staff remuneration	Descriptive statistics	Ordinal Nominal Ordinal
Delivery of Maternal healthcare services	dependent variable	Number of women delivered safely. Number of women dying from pregnancy related complications.	Descriptive statistics	Nominal Nominal

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents data that was analysed for clear understanding of the findings. The study was conducted to examine factors influencing delivery of maternal healthcare services in public healthcare facilities in Nairobi, Kenya in a case of Kenyatta National Hospital. The data was summarized into table form to bring out clarity of the picture on the ground. The data was collected using questionnaires and in-depth interviews from maternal healthcare professionals, biomedical engineers and mothers. The data was analysed and classified into meaningful categories for better understanding and the findings were arranged as per the objectives of the study.

4.2 Response Rate

The researcher targeted 191 mothers, 28 nurses, 10 doctors and 14 biomedical engineers to participate in the study. 191 questionnaires were administered to mothers by the researcher and 133 were filled adequately for analysis. Out of 28 questionnaires administered to nurses, 24 were filled adequately while 8 and 10 questionnaires were collected from doctors and biomedical engineers respectively. These results are shown in table 4.1 which translated into an overall response rate of 72% which was considered adequate for analysis and making conclusions as recommended by Babbie (2002).

Table 4. 1: Response Rate

Category	Sample	Response	Response rate
Mothers	191	133	69.6%
Nurses	28	24	85.7%
Biomedical engineers	14	10	71.4%
Doctors	10	8	80%
Total	243	175	72%

4.3 Demographic Information

The healthcare workers were asked to indicate their age brackets, their occupation as well as their occupation.

4.3.1 Distribution by Age

The age of the respondents was sought to find out whether there was a relationship between the age of the staff and delivery of maternal healthcare services in Nairobi County, Kenya in a case of KNH. The results show that 33.3% were aged 21-25 years while only 4.8% were aged 26- 30 years. The results also show that 31% were aged 36-40 years of age. Respondents aged 31-35 years and 41-45 years were 9.5% each and those aged 50 years and above were 4.8%. Respondents aged 46-50 years were 7.1% of the healthcare workers who participated in this study. These results are shown in table 4.2.

Table 4. 2: Healthcare Professionals Distribution by Age

	Frequency (F)	Percent (%)	Cumulative Percent (%)
21-25 years	14	33.3%	33.3%
26-30 years	2	4.8%	38.1%
31-35 years	4	9.5%	47.6%
36-40 years	13	31.0%	78.6%
41-45 years	4	9.5%	88.1%
46-50 years	3	7.1%	95.2%
50 and above	2	4.8%	100%
Total	42	100%	

4.3.2 Distribution by Occupation

The researcher sought to find out whether there was a relationship between the highest level of occupation of the healthcare staff and delivery of maternal healthcare services in Nairobi County, Kenya. The respondents were asked to indicate their occupation. The results show that 57.1% of the healthcare workers were nurses who mostly interacted with the mothers and therefore their responses were credible as it was based on firsthand experience while 23.8% were biomedical engineers who clearly understood challenges of medical devices and their impact on maternal healthcare. Only 19% of healthcare workers were doctors who mostly handled surgeries and complications and hence their credible responses on maternal healthcare. These results are shown in table 4.3.

Table 4. 3: Healthcare Professionals Distribution by Occupation

	Frequency (F)	Percent (%)	Cumulative Percent (%)
Nurse	24	57.1%	57.1%
Doctor	8	19.0%	76.2%
Biomedical engineer	10	23.8%	100%
Total	42	100%	

4.3.3 Distribution by level of education

Information on the healthcare staff was sought in order to identify whether there was any relationship between the highest level of education and delivery of maternal healthcare services in Nairobi County, Kenya. The findings in table 4.4 show that majority of the respondents had degree level of education (71.4%) while 16.7% had diploma level of education. Only 11.9% of the respondents had post graduate level of education. The results show that the responses given by the respondents is likely to be credible as most of the respondents were literate and this also shows that staff attending to pregnant women were highly qualified and hence offering appropriate services needed.

Table 4. 4: Healthcare Professionals Distribution by Level of Education

	Frequency (F)	Percent (%)	Cumulative Percent (%)
Diploma level	7	16.7%	16.7%
Degree level	30	71.4%	88.1%
Post graduate level	5	11.9%	100%
Total	42	100%	

4.4 Patients' Background factors and delivery of maternal healthcare services

The researcher sought to know the healthcare workers perspective on the influence of patients' background factors on delivery of maternal healthcare services. The healthcare workers were given three statements regarding patients' background to indicate their agreement or disagreement with them. They were to use a five point likert scale where 1 was strongly disagree and 5 was strongly agree. The results show that healthcare workers agreed with the statement that cost influences delivery of maternal healthcare services in the hospital (M=4.24, SD=0.656). The results show that healthcare workers were neutral on the statements that travel time influences delivery of maternal healthcare services in the hospital (M=3.45, SD=0.504) and that cultural beliefs influence delivery of maternal healthcare services in the hospital (M=3.40, SD=1.014). These results are summarized in table 4.5.

Table 4. 5: Healthcare Workers Perspective on Patient Background Factors

		Travel time influences safe delivery of maternal healthcare services in the hospital		Cultural beliefs influence safe delivery of maternal healthcare services in the hospital		Cost influences safe delivery of maternal healthcare services in the hospital	
		F	%	F	%	F	%
Strongly disagree		0	0	0	0	0	0
Disagree		0	0	12	28.6	0	0
Neutral		23	54.8	5	11.9	5	11.9
Agree		19	45.2	21	50	22	52.4
Strongly agree		0	0	4	9.5	15	35.7
Total		42	100.0	42	100	42	100
N	Valid	42		42		42	
Mean		3.45		3.40		4.24	
Std. Deviation		.504		1.014		.656	

The researcher sought to know the mothers perspective on the influence of background factors on delivery of maternal healthcare services. They were given three statements regarding background factors to indicate their agreement or disagreement with them. They were to use a five point likert scale where 1 was strongly disagree and 5 was strongly agree. The results show that mothers were neutral on the statement that travel time to the hospital influences seeking maternal healthcare services by mothers in the hospital (M=3.95, SD=0.208). The results also show that mothers were neutral on the statements that socio-cultural beliefs on maternal healthcare influences seeking of maternal healthcare services by mothers in the hospital (M=3.64, SD=0.482) and that costs related to maternal healthcare services influences seeking of maternal healthcare services by mothers in the hospital (M=3.91, SD=0.288). Table 4.6 summarizes these results.

Table 4. 6: Mothers' perspective on Background Factors

		Travel time to the hospital influences seeking maternal healthcare services by mothers in the hospital		Socio- cultural beliefs on maternal healthcare influences seeking of maternal healthcare services by mothers in the hospital		Costs related to maternal healthcare services influences seeking of maternal healthcare services by mothers in the hospital	
		F	%	F	%	F	%
Strongly disagree		0	0	0	0	0	0
Disagree		0	0	0	0	0	0
Neutral		6	4.5	48	36.1	12	9
Agree		127	95.5	85	63.9	121	91
Strongly agree		0	0	0	0	0	0
Total		133	100.0	133	100.0	133	100.0
N	Valid	133		133		133	
Mean		3.95		3.64		3.91	
Std. Deviation		.208		.482		.288	

From the above statistical conclusions, it can be indicated that patients' background factors especially cost is viewed by healthcare professionals as a significant influence on delivery of delivery of maternal healthcare services in public healthcare facilities in Nairobi County, Kenya. To support this, the KNH maternal database shows that maternal death has reduced from 20 mothers per month to 5 mothers per month due to introduction of free maternity services which has seen delivery of such services. The findings also show that mothers may not have been aware of the influence of patients' background factors on delivery of maternal healthcare and thus cannot give a positive or negative response on whether patients' background factors influence delivery of maternal healthcare services.

The statistical conclusions from the in-depth interviews with the healthcare staff outlined that cost of maternal healthcare services hinder mothers from seeking maternal healthcare services. During the interviews, it was indicated that in some cases mothers admitted for maternal complications are not able to cater for such bills which becomes a huge burden to their families and the hospital management. During the discussions, it also came out clearly that socio cultural factors influenced delivery of maternal healthcare but the both mothers and healthcare professionals were a bit reluctant to deal with the issues as they go deep into the community setup and social norms.

4.5 Public Healthcare facilities factors and delivery of maternal healthcare services

The researcher sought to know the healthcare workers perspective on the influence of public healthcare facility factors on delivery of maternal healthcare services. The healthcare workers were given three statements regarding public healthcare facility factors to indicate their agreement or disagreement with them. They were to use a five point likert scale where 1 was strongly disagree and 5 was strongly agree. The results in table 4.7 show that healthcare workers were in agreement with the statements that the hospital management influences delivery of maternal healthcare services in the hospital (M=4.12, SD=0.550) and financial resources influence delivery of maternal healthcare services in the hospital (M=4.40, SD=0.587). The results also show that the healthcare workers were neutral on the statement that maternal healthcare information is available and accessible to mothers in the hospital (M=3.88, SD=0.633).

Table 4. 7: Healthcare Workers Perspective on Public Healthcare Facility Factors

	Maternal healthcare information is available and accessible to mothers in the hospital		The hospital management influences safe delivery of maternal healthcare services in the hospital		Financial resources influence safe delivery of maternal healthcare services in the hospital	
	F	%	F	%	F	%
Strongly disagree	0	0	0	0	0	0
Disagree	0	0	0	0	0	0
Neutral	11	26.2	4	9.5	2	4.8
Agree	25	59.5	29	69	21	50
Strongly agree	6	14.3	9	21.4	19	45.2
Total	42	100.0	42	100.0	42	100.0
N	Valid	42	42		42	
Mean		3.88	4.12		4.40	
Std. Deviation		.633	.550		.587	

The researcher sought to know the mothers perspective on the influence of public healthcare facility factors on maternal healthcare services delivery. They were given three statements regarding public healthcare facility factors to indicate their agreement or disagreement with them. They were to use a five point likert scale where 1 was strongly disagree and 5 was strongly agree. The results show that mothers were neutral on the statements that mothers have access to maternal healthcare information in the hospital concerning delivery of maternal healthcare services (M=3.95, SD=0.208) and that financial resources' availability in the hospital influence how maternal healthcare services are delivered to mothers in the hospital (M=3.91, SD=0.417). The results also show that mothers agreed with the statement that the hospital management influences how maternal healthcare services are delivered to mothers in the hospital (M=4.00, SD=0.000). These results are shown in table 4.8.

Table 4. 8: Mothers' Perspective on Public Healthcare Facility Factors

	Mothers have access to maternal healthcare information in the hospital concerning safe delivery of maternal healthcare services		The hospital management influences how maternal healthcare services are delivered to mothers in the hospital		Financial resources' availability in the hospital influence how maternal healthcare services are delivered to mothers in the hospital	
	F	%	F	%	F	%
Strongly disagree	0	0	0	0	0	0
Disagree	0	0	0	0	0	0
Neutral	6	4.5	0	0	18	13.5
Agree	127	95.5	133	100	109	82
Strongly agree	0	0	0	0	6	4.5
Total	133	100.0	133	100.0	133	100.0
N	Valid	133	133		133	
Mean		3.95	4.00		3.91	
Std. Deviation		.208	.000		.417	

The statistics above shows that public healthcare facilities factors especially hospital management and financial resources have influence on delivery of maternal healthcare services in public healthcare facilities in Nairobi County, Kenya. The statistics also show that mothers are aware of the influence the hospital management on delivery of maternal healthcare services.

Statistical conclusions from the in-depth interviews with the maternal healthcare professionals indicated that healthcare facilities factors influence delivery of maternal healthcare services on both the management and financial resources. The team highlighted that the managed was engaged deeply on discussions relating to maternal healthcare with other stakeholders and the government. It was also noted that maternal healthcare was already included in the hospital strategic plan with an outline of what needs to be done in order to bring down the maternal mortality rates in the hospital which will then be reflected in the country.

4.6 Maternal healthcare medical devices and delivery of maternal healthcare services

The researcher sought to know the healthcare workers perspective on the influence of maternal healthcare medical devices on maternal healthcare services delivery. The healthcare workers were given three statements regarding maternal healthcare medical devices to indicate their agreement or disagreement with them. They were to use a five point likert scale where 1 was strongly disagree and 5 was strongly agree. The results show that healthcare workers agreed with statement that maternal medical devices are satisfactorily available for use in the hospital ($M=4.12$, $SD=.670$) and that procurement process of maternal healthcare medical devices in the hospital is cost effective and timely ($M=4.17$, $SD=.621$). The results also show that healthcare workers agreed with that statement that maternal medical devices are properly functional and fit in the hospital ($M=4.26$, $SD=.627$). These results are shown in table 4.9.

Table 4. 9: Healthcare workers’ perspective on maternal healthcare medical devices factors

	Maternal medical devices are satisfactorily available for use in the hospital		Procurement process of maternal healthcare medical devices in the hospital is cost effective and timely		Maternal medical devices are properly functional and fit in the hospital	
	F	%	F	%	F	%
Strongly disagree	0	0	0	0	0	0
Disagree	0	0	0	0	0	0
Neutral	7	16.7	5	11.9	4	9.5
Agree	23	54.8	25	59.5	23	54.8
Strongly agree	12	28.6	12	28.6	15	35.7
Total	42	100.0	42	100.0	42	100.0
N	Valid	42	42	42	42	
Mean		4.12	4.17	4.26		
Std. Deviation		.670	.621	.627		

The researcher sought to know the mothers perspective on the influence of maternal healthcare medical devices factors on delivery of maternal healthcare services. They were given three statements regarding maternal healthcare medical devices factors to indicate their agreement or disagreement with them. They were to use a five point likert scale where 1 was strongly disagree and 5 was strongly agree. The results show that mothers agreed with the statement that availability of maternal medical devices influence how maternal healthcare services are delivered in the hospital (M=4.00, SD=0.000). the results also show that mothers were neutral on the statements that maternal medical devices are available for use when needed by mothers seeking maternal healthcare services (M=3.91, SD=0.288) and that maternal medical devices are properly functional and in proper condition when needed by mothers seeking maternal healthcare service (M=3.95, SD=0.208). These findings are presented in table 4.10.

Table 4. 10: Mothers’ perspective on Maternal Healthcare Medical Devices Factors

	Availability of maternal medical devices influence how maternal healthcare services are delivered in the hospital		Maternal medical devices are available for use when needed by mothers seeking maternal healthcare services		Maternal medical devices are properly functional and in proper condition when needed by mothers seeking maternal healthcare service	
	F	%	F	%	F	%
Strongly disagree	0	0	0	0	0	0
Disagree	0	0	0	0	0	0
Neutral	0	0	12	9	6	4.5
Agree	133	100	121	91	127	95.5
Strongly agree	0	0	0	0	0	0
Total	133	100.0	133	100.0	133	100.0
N	Valid	133	133	133	133	
Mean		4.00	3.91	3.95		
Std. Deviation		.000	.288	.208		

The statistics above show maternal medical devices have an influence on delivery of maternal healthcare services in Nairobi County, Kenya. The statistics also show that mothers understood the aspect of medical devices only on the availability and hence most of them were neutral on the context and procurement process of medical devices.

From the in depth interviews with the maternal healthcare staff, it came out clearly that maternal medical devices were critical in delivery of maternal healthcare services. The team highlighted that the hospital was working with scholars and researchers to find an innovative solution towards the prolonged procurement processes and medical devices which are shipped from abroad and not tailored for the local setting in the hospital. The staff also noted that through various programmes, they are working with engineering students to make medical devices that are locally made with the locally available materials and tailored for the local setting. There way, the public healthcare facilities can be able to purchase medical devices locally at a low cost and repairs can also be made here.

4.7 Staffing and delivery of maternal healthcare services

The researcher sought to know the healthcare workers perspective on the influence of staffing factors on maternal healthcare services delivery. The healthcare workers were given four statements regarding staffing factors to indicate their agreement or disagreement with them. They were to use a five point likert scale where 1 was strongly disagree and 5 was strongly agree. The results in table 4.11 show that healthcare workers agreed with the statements that good or respectful relationship between mothers and healthcare providers in the hospital exists ($M=4.07$, $SD=1.135$) and that opportunities exist for career advancement for the staff ($M=4.14$, $SD=1.002$). The results also show that the healthcare workers were neutral on statements that the hospital has enough number of qualified maternal healthcare staff ($M=3.69$, $SD=1.199$) and that staff are highly motivated and well remunerated in the in the hospital ($M=3.88$, $SD=1.064$).

Table 4. 11: Healthcare Workers Perspective on Staffing Factors

	The hospital has enough number of qualified maternal healthcare staff		Staff are highly motivated and well remunerated in the hospital		Good/respectful relationship between mothers and healthcare providers in the hospital exists		Opportunities exist for career advancement for the staff	
	F	%	F	%	F	%	F	%
Strongly disagree	1	2.4	0	0	0	0	0	0
Disagree	8	19	6	14.3	6	14.3	2	4.8
Neutral	8	19	8	19	7	16.7	12	28.6
Agree	11	26.2	13	31	7	16.7	6	14.3
Strongly agree	14	33.3	15	35.7	22	52.4	22	52.4
Total	42	100.0	42	100.0	42	100.0	42	100.0
N	Valid		42		42		42	
Mean	3.69		3.88		4.07		4.14	
Std. Deviation	1.199		1.064		1.135		1.002	

The researcher sought to know the mothers perspective on the influence of staffing factors on maternal healthcare services delivery. They were given two statements regarding staffing factors to indicate their agreement or disagreement with them. They were to use a five point likert scale where 1 was strongly disagree and 5 was strongly agree. The results show that mothers agreed with that statements that a qualified nurse or doctor is available to mothers in good time when needed to deliver maternal healthcare services (M=4.07, SD=.373). The results also show that mothers were in agreement with the statement that doctors or nurses offer maternal healthcare services to mothers respectfully and a good relationship between mothers and healthcare providers in the hospital exists (M=4.07, SD=.352). These results are shown in table 4.12.

Table 4. 12: Mothers' perspective on Staffing Factors

	A qualified nurse/doctor is available to mothers in good time when needed to deliver maternal healthcare services		Doctors/ nurses offer maternal healthcare services to mothers respectfully and a good relationship between mothers and healthcare providers in the hospital exists	
	F	%	F	%
Strongly disagree	0	0	0	0
Disagree	1	0.7	0	0
Neutral	2	1.5	4	3
Agree	117	88	116	87.2
Strongly agree	13	9.8	13	9.8
Total	133	100.0	133	100.0
N	Valid		133	
Mean	4.07		4.07	
Std. Deviation	.373		.352	

The statistical findings above reveal that staffing influence delivery of maternal healthcare services in public healthcare facilities in Nairobi County, Kenya. The statistics also show that both the healthcare professionals and mothers clearly understand the impact of staffing on maternal healthcare.

From the in-depth interviews with the maternal healthcare staff at the maternity ward, it was noted that staffing was critical in the hospital. It also came out strongly that after the introduction of free maternity services; the workloads had increased with many more referrals from other counties to the hospital. In this case therefore, the public maternity wing staff are almost always over loaded and hence the need for additional staff. It was also highlighted that the relationship with the healthcare professionals and the mothers was remarkable because many of the healthcare staff felt it was their responsibility to serve their clients with the uttermost respect.

4.8 Correlation Analysis Results

A correlation analysis based on healthcare workers perspective show that there was a positive statistically significant relationship between public healthcare facility factors and maternal healthcare medical devices factors ($r=0.602$, $p=000$) at 99% confidence level. The results also show that a positive statistically significant relationship between public healthcare facility factors and staffing ($r=0.618$, $p=.000$) at 95% confidence level. Maternal healthcare medical devices factors were found to have a positive statistically significant relationship with staffing factors ($r=0.653$, $p=.000$) at 95% confidence level. There was no statistically significant relationship between patients' background factors and public healthcare facility factors, maternal healthcare medical devices factors and staffing factors. These results are shown in table 4.13.

Table 4. 13: Correlation Analysis based on Healthcare Workers Perspective

		Patient background factors	Public healthcare facility factors	Maternal healthcare medical devices factors	Staffing factors
Patient background factors	Pearson Correlation	1	.082	.189	-.231
	Sig. (2-tailed)		.607	.230	.141
	N	42	42	42	42
Public healthcare facility factors	Pearson Correlation	.082	1	.602**	.618
	Sig. (2-tailed)	.607		.000	.000
	N	42	42	42	42
Maternal healthcare medical devices factors	Pearson Correlation	.189	.602**	1	.653
	Sig. (2-tailed)	.230	.000		.000
	N	42	42	42	42
Staffing factors	Pearson Correlation	-.231	.618**	.653**	1
	Sig. (2-tailed)	.141	.000	.000	
	N	42	42	42	42

** . Correlation is significant at the 0.01 level (2-tailed).

A correlation analysis based on mothers' perspective shows that there was a negative statistically significant relationship between public health facility factors and maternal healthcare medical devices factors ($r=-0.407$, $p=.000$). The other factors did not show any statistically significant relationship. These results are shown in table 4.14.

Table 4. 14: Correlation Analysis based on Mothers' Perspective

		Staffing factors	Patient background factors	Public health facility factors	Maternal healthcare medical devices factors
Staffing factors	Pearson Correlation	1	.099	.111	.147
	Sig. (2-tailed)		.259	.205	.091
	N	133	133	133	133
Patient background factors	Pearson Correlation	.099	1	-.067	-.089
	Sig. (2-tailed)	.259		.443	.307
	N	133	133	133	133
Public health facility factors	Pearson Correlation	.111	-.067	1	-.407**
	Sig. (2-tailed)	.205	.443		.000
	N	133	133	133	133
Maternal healthcare medical devices factors	Pearson Correlation	.147	-.089	-.407**	1
	Sig. (2-tailed)	.091	.307	.000	
	N	133	133	133	133

** . Correlation is significant at the 0.01 level (2-tailed).

CHAPTER FIVE
SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND
RECOMMENDATIONS

5.1 Introduction

This chapter covers the summary of the study findings and conclusions. It also presents the recommendations of the study as well as suggestions for further studies. The chapter is divided into sections which include summary of findings, conclusions and recommendations.

5.2 Summary of the Findings

The summary of the findings were guided by the various variables as follows:-

5.2.1 Patients' background and delivery of maternal healthcare services

The study revealed that based on healthcare workers perspective, patients' background factors especially cost influences delivery of maternal healthcare services in the hospital. The findings reveal both healthcare staff and mothers agreed that cost of maternal healthcare services influence delivery of maternal healthcare services at 88% and 91% respectively. Both healthcare workers and mothers did not see travel time and cultural beliefs as significantly influencing delivery of maternal healthcare services in the hospital.

5.2.2 Public healthcare facilities factors and delivery of maternal healthcare

The study established that according to the healthcare professionals' view, public healthcare facility factors especially hospital management and financial resources influence delivery of maternal healthcare services in the hospital and these they rated at 90% and 95% respectively. The findings also show that mothers indicated that both the hospital management has an influence on delivery of such services which they rated at 100%. However, mothers did not see availability of maternal healthcare information in the hospital and financial resources' availability as influencing maternal healthcare delivery services.

5.2.3 Medical devices and delivery of maternal healthcare services

The findings of this study have shown that based on healthcare workers perspective, maternal healthcare devices factors influence delivery of maternal healthcare services. Three aspects of maternal healthcare medical devices factors were recognized as critical including medical devices availability in the hospital, medical devices procurement process and functionality of medical devices in the hospital and this was highly rated by healthcare professionals;

availability (83%) procurement (88%) and functionality (90%) while mothers agreed that availability of such devices is critical for delivery of maternal healthcare services (100%).

The KNH database of medical devices reveals that maternal healthcare medical devices considered essential are often lacking for any normal labour, caesarean section or routine neonatal care and also for case management of maternal complications and advanced newborn care including post-operative care for both mothers and their babies. These shortages are often caused by high procurement and replacement costs, supply chain problems and designs that are not tailored to meet local needs of KNH hospital. Therefore, without reliable access to functional, high-quality and cost effective medical devices this makes it difficult to achieve delivery of maternal healthcare services.

5.2.4 Staffing and delivery of maternal healthcare services

Staffing factors according to both healthcare professionals and mothers play an important role on delivery of maternal healthcare services. The healthcare workers emphasized the importance of good or respectful relationship between mothers and healthcare providers in the hospital and opportunities for career advancement for the staff. However, healthcare workers did not view qualified maternal healthcare staff and motivation of staff through remuneration as influencing maternal healthcare services delivery.

The mothers also placed emphasis on good or respectful relationship between mothers and healthcare providers in the hospital as well as the essence to have a qualified nurse or doctor available to mothers in good time when needed to deliver maternal healthcare services. For this particular study, findings show that healthcare professionals and mothers agreed that a good relationship influence delivery of maternal healthcare services and this was rated at 69% and 97% respectively. Career advancement was rated by healthcare professionals at 67%.

5.3 Discussion of key findings

The discussions were guided by the variables of the study as follows:-

5.3.1 Respondents' background information

The findings of the study show that most of the health workforce professionals in the hospital are nurses with most of them being college graduates. The study also reveals that most of the healthcare staff are aged between 21- 25 years with the least aged between 26- 30 and 50 and above and this therefore shows that most of the responses were credible considering the level

of education for the healthcare staff and the fact that most of them were within the bracket of women of child bearing age.

5.3.2 Patients' background factors and delivery of maternal healthcare service

Patients' background factors have played a critical role in delivery of maternal healthcare services in public healthcare facilities especially the cost of such services. Data from KNH shows that 88 per cent of mothers seeking maternal healthcare in the hospital face cost constraints such as transport costs hindering them from accessing to such services.

KNH is well placed to offer the best maternal healthcare services in Kenya. In order to ensure that any pregnancy is healthy and smooth, the following tests need to be done which include blood type test and the Rhesus factor as well as HIV test in to ensure prevention of Mother to Child Transmission. All these tests are critical to ensure that maternal deaths are minimised and therefore, mothers are now able to access such services with the introduction of free maternity services considering that majority of these women were unable to access such service before and hence the situation has by far improved.

According to a study conducted in Nairobi Kenya in 2009 by Chuma, the cost of accessing maternal health services is a critical factor in health seeking behaviours as well as delivery of such services to mothers. This is even more critical for poor communities, such as informal settlements, that live in abject poverty. This study shows that overall, antenatal care services are paid for in nearly all the facilities where slum women seek services, with only 16% of the facilities not charging (Chuma, 2009).

According to another study conducted by KEMRI (2014), regardless of household wealth, families that experienced a maternal complications and death reported spending approximately a third of their total annual consumption expenditure to access pregnancy and child- birth care between 3 and 6 times more than households where a woman gave birth safely and this is nearly the catastrophic costs as referred by WHO which is 40% of disposable income. In this case, some families may avoid or delay emergency care because of difficulty in covering the costs of transport and services where in nearly half of all cases, families needed to look outside the household for money to pay for maternity care and even to an extend of selling property (Chuma, 2009). Nairobi County is heterogeneous cosmopolitan society which consists of individuals from different background, culture beliefs

and traditions and therefore pregnant women seeking maternity services in hospitals have long suffered in the hospitals as they are unable to pay mandatory fees and due to this, many have been detained for a long period by the hospital administrators due to failure by their relatives to pay their bills.

5.3.3 Healthcare facilities factors and delivery on maternal services

Healthcare facilities factors have played a critical role on delivery of maternal healthcare services in KNH especially the management of the hospital and financial resources. In KNH the maternal mortality ratio is estimated at 921.5 deaths per 100,000 live births with direct obstetric causes accounting for 71 per cent of all deaths as per the hospital records and the causes of these deaths include sepsis, hemorrhage, and hypertension as leading causes of death. At the same time, 49 percent of neonatal deaths occurred within 24 hours of admission to the general pediatric wards. It is important to note that KNH likely bears the burden of high maternal and neonatal mortality because it is a referral facility and receives a disproportionate number of emergency obstetric referrals from district and provincial hospitals which are unable to provide emergency obstetric care and also considering the impact of free maternity policy which has led to an increment in the number of admissions.

Studies conducted in Ghana reveal that the hospital management and leadership play a critical role in delivering services appropriately to its citizens (Agyepong, 2008). Reorganizations have been highly developed to find out how best services can be delivered. The government of Kenya reemphasized health sector reorganization in 2013 with devolution of government functions from national level to the counties countrywide. These changes on management have enormous implications on delivery of maternal healthcare services at the county and health facility level It's important to note that the government of Kenya funds the health sector through budgetary allocations to the ministry of Health and related government departments. However, tax revenues are unreliable sources of health finance, because of macroeconomic conditions such as poor growth, national debt, and inflation, which often affect health allocations (Bourbonnais, 2013). Over the past two decades, the government has pursued a policy of cost sharing to bridge the gap between actual budgets and the level of resources needed to fund public health sector activities. In 2002/2003, cost sharing contributed over 8 per cent of the recurrent expenditure and about 21 per cent of the non-wage recurrent budget of the ministry. This clearly shows that the government has limited resources due to the worsening situation of poverty and therefore the government changed the

cost sharing policy into a 10/20 policy in which dispensaries and health centers are not to charge user fees for curative care other than 10 or 20 Ksh for client cards.

5.3.4 Medical devices and delivery of maternal healthcare services

In most of sub-Saharan African countries, healthcare facilities are poorly equipped with medical devices and these compromises on the quality of care due to limited resources both human and financial resources (Thai, 2001). because of these challenges of medical devices, many facilities continue to face immense maternal deaths which could be prevented if such medical devices were available. In Senegal, health centres face problems due to insufficient medical devices and facilities. For instance, the number of available delivery beds is inadequate where pregnant women are often forced to share beds during labour. Necessary devices such as scissors and forceps are in short supply and as a result are often not properly sterilized (Graham, 2001).

Medical devices are important in ensuring delivery of maternal healthcare services in public healthcare facilities and especially KNH. The findings of the study show that maternal medical devices have an influence on delivery of maternal healthcare services especially availability and procurement of such devices. Public healthcare facilities in Kenya have continued to suffer from insufficient medical devices. Only one in three facilities offers basic maternity services and only one in ten hospitals offer basic obstetric care services while a fewer provide comprehensive obstetric care services. Only 9 percent of facilities providing delivery services can perform all signal functions for basic obstetric care. In KNH, most of the equipment in the labor and delivery wards are available, functional and in good use and it was noted that doctors and nurses are the most frequent users of the medical devices. It was also noted that biomedical engineers conduct training when new medical device is procured medical equipment in the labor and delivery ward.

5.3.5 Staffing and delivery of maternal healthcare services

Findings of this study show that staffing play a critical role on delivery of maternal healthcare services and especially a good relationship between mothers and healthcare professionals which has an influence on delivery of maternal healthcare services. Staff at KNH reported that career advancement opportunities were available and trainings were held during certain shifts within the labour ward. They reported that due to an intense workload and especially after the introduction of free maternity services some of them missed such opportunities and

could only be trained by their fellow colleagues/ staff on job training. A study conducted in Kenya by (Kirigai, 2006) states that Kenya has a unique case of human resource and staffing in sub-Saharan Africa. While there is an absolute shortage of healthcare workers, the provider-population ratio of 1.69 per 1000 for all cadres of providers is relatively high for countries in the region. The most pressing problem is the drastically unequal distribution of workers, by urban/rural areas, by regions, and by level of care. Rural dispensaries have 20 per cent fill rates of their nursing establishments, while district hospitals have 120 per cent fill rates. Approximately 25 per cent of the staffing budget for the entire public sector is taken up by the two referral hospitals which is Kenyatta National Hospital and Moi referral hospital (Kirigai, 2006).

The Kenya workforce report of 2012 state that 9,177 nurses started training in 2003 to 2007 and in those trainings, two out of 10 started certificate programs while 7 out of 10 trained at diploma level courses and only 1 per cent pursued a degree programme which has highly contributed to shortage of workforce. The report also shows that there are 109 health workers per 100,000 people way below the recommended international standards of 235 nurses per 100,000 persons. KNH has employed enough number of qualified staff to monitor maternal healthcare services in the wards in the hospital and this has a great impact towards reduction of maternal motility rates as well as ensuring delivery of such services. It's also important to note that attending to pregnant women by a trained person in midwifery skill significantly decreases maternal morbidity and mortality rates (Njuki, 2013).

5.4 Conclusion

The study concluded that patients' background factors have a significant influence on delivery of maternal healthcare services in the hospital. For this particular study, cost influences delivery of maternal healthcare services in the hospital but travel time and cultural beliefs do not significantly influence delivery of maternal healthcare services.

The study concluded that public healthcare facility factors influence delivery of maternal healthcare services in the hospital. Hospital management and financial resources significantly influence delivery of maternal healthcare services. However, availability of maternal healthcare information to mothers in the hospital does not significantly influence maternal healthcare delivery services.

This study concluded that maternal healthcare devices factors are important in delivery of maternal healthcare services. Availability for use in the hospital, procurement process, functionality and context fit medical devices are critical elements of maternal healthcare devices factors and the findings of the study revealed that such elements have an influence on delivery of maternal healthcare services .

This study also concluded that staffing factors play an important role on maternal healthcare services delivery. Good or respectful relationship between mothers and healthcare providers in the hospital and opportunities for career advancement for the staff are important staffing factors that influence delivery of maternal healthcare services delivery. However, qualifications of maternal healthcare staff and motivation of staff through remuneration were not influencing maternal healthcare services delivery.

In overall, the study recorded above 50 per cent agreement by respondents to all question best pointers outlining that maternal medical devices have positively influenced delivery of maternal healthcare services in public healthcare facilities.

5.5 Recommendations

- i. The study recommends that the government should put in place measures to ensure that costs associated with maternal health are lowered or eliminated as they influence maternal healthcare services delivery so that mothers and their families can be able to seek such services.
- ii. The government should allocate more resources to public healthcare facilities particularly under the maternal healthcare arm in order to ensure that maternal healthcare services are offered more appropriately.
- iii. This study recommends that the government through the Ministry of Health should ensure maternal healthcare devices are available and functional for use in the hospitals. Public healthcare facilities should also ensure that the procurement process of medical devices is cost effective and timely as well as well as procuring medical devices tailored to meet the local needs of the hospital in the hospital as these are critical in maternal healthcare services delivery.
- iv. This study recommends that the national government and county governments should prioritize staffing of public healthcare facilities and provided streamlined opportunities

for career advance for the healthcare workforce and this will contribute further to having a good and respectable patient- healthcare provider relationship.

5.6 Suggestions for Further Studies

1. This study suggests that future scholars should investigate on the cultural beliefs and practises in the community and their influencing delivery of maternal healthcare services in Kenya.
2. Further research should also be done to establish the patients' factors influencing delivery of maternal healthcare and the understanding of both maternal healthcare staff and mothers.
3. The study suggests that further studies should be done on maternal medical devices and how they can be tailored to meet the local needs of the public healthcare facilities.
4. Further studies should be carried out on the hospital management and how this particular component influences delivery of maternal healthcare services in public healthcare facilities.

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APPENDICES

Appendix I: Letter of Introduction

11th July 2016

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: REQUEST FOR DATA COLLECTION

I Muema Caroline Mwendu, Reg. No. L50/73323/2014, I'm a post-graduate student at the School of Continuing and Distance Education, University of Nairobi. I am conducting a research titled **"FACTORS INFLUENCING SAFE DELIVERY OF MATERNAL HEALTHCARE SERVICES IN NAIROBI COUNTY, KENYA"**.

You have been selected to form part of the study and hereby request for your assistance in filling in the attached questionnaire. The information given will be treated in strict confidence and will be purely used for academic purposes. Do not indicate your names or details on questionnaire.

A copy of the final report will be availed to you upon your request.

Your assistance and cooperation will be highly appreciated.

Yours sincerely,

.....
Muema Caroline Mwendu
L50/73323/2014

Appendix II: Questionnaire: Doctors/Nurses/Biomedical Engineers

Instructions

Respondents are encouraged not to write any identifiable information on the questionnaire. Any information will be confidentially kept and only used for this particular study. The respondent is kindly requested to tick on the space provided and write on the provided space where applicable.

Section I: Background Information

Please complete this section by ticking appropriately.

1. Age of the respondent

- 20 and below
- 21- 25
- 26-30
- 31- 35
- 36- 40
- 41- 45
- 46- 50
- 50 and above

2. Occupation

- Nurse
- Doctor
- Biomedical Engineer
- Other, Specify.....

3. Level of Education

- Certificate level
- Diploma level
- Degree level
- Post graduate level
- Other, Specify.....

Section II: Patients' Background factors

Please indicate the level of your agreement on the following statements on patients' background influencing delivery of maternal healthcare services in public healthcare facilities which are measured in the Likert scale of 1-5 where 5 = Strongly Agree, 4 = Agree 3= Neutral 2= Disagree and 1 = Strongly Disagree.

el time influences delivery of maternal healthcare services in the hospital					
ultural beliefs influence delivery of maternal healthcare services in the hospital					
influences delivery of maternal healthcare services in the hospital					

Section III: Public healthcare facilities factors

Please indicate the level of your agreement on the following statements on public healthcare facilities factors influencing delivery of maternal healthcare services in public healthcare facilities which are measured in the Likert scale of 1-5 where 5 = Strongly Agree, 4 = Agree 3= Neutral 2= Disagree and 1 = Strongly Disagree.

nal healthcare information is available and accessible to rs in the hospital					
ospital management influences delivery of maternal care services in the hospital					
cial resources influence delivery of maternal healthcare es in the hospital					

Section IV: Maternal healthcare medical devices

Please indicate the level of your agreement on the following statements on maternal healthcare medical devices influencing delivery of maternal healthcare services in public healthcare facilities which are measured in the Likert scale of 1-5 where 5 = Strongly Agree, 4 = Agree 3= Neutral 2= Disagree and 1 = Strongly Disagree.

nal medical devices are satisfactorily available for use in spital					
ement process of maternal healthcare medical devices in spital is cost effective and timely					
nal medical devices are properly functional and fit in the al					

Section V: Staffing

Please indicate the level of your agreement on the following statements on staffing and its influencing on delivery of maternal healthcare services in public healthcare facilities which are measured in the Likert scale of 1-5 where 5 = Strongly Agree, 4 = Agree 3= Neutral 2= Disagree and 1 = Strongly Disagree.

hospital has enough number of qualified maternal care staff					
are highly motivated and well remunerated in the in the al					
respectful relationship between mothers and healthcare ers in the hospital exists					
tunities exist for career advancement for the staff					

Appendix III: Questionnaire: Mothers seeking maternal healthcare services

Instructions

Respondents are encouraged not to write any identifiable information on the questionnaire. Any information will be confidentially kept and only used for this particular study. The respondent is kindly requested to tick on the space provided and write on the provided space where applicable.

Section I: Patients’ Background factors

Please indicate the level of your agreement on the following statements on patients’ background and its influence to delivery of maternal healthcare services in public healthcare facilities which are measured in the Likert scale of 1-5 where 5 = Strongly Agree, 4 = Agree 3= Neutral 2= Disagree and 1 = Strongly Disagree.

time to the hospital influences seeking maternal healthcare services others in the hospital					
cultural beliefs on maternal healthcare influences seeking of maternal care services by mothers in the hospital					
related to maternal healthcare services influences seeking of maternal care services by mothers in the hospital					

Section II: Public healthcare facilities factors

Please indicate the level of your agreement on the following statements on public healthcare facilities factors influencing delivery of maternal healthcare services in public healthcare facilities which are measured in the Likert scale of 1-5 where 5 = Strongly Agree, 4 = Agree 3= Neutral 2= Disagree and 1 = Strongly Disagree.

rs have access to maternal healthcare information in the hospital ning delivery of maternal healthcare services					
ospital management influences how maternal healthcare services are red to mothers in the hospital					
cial resources’ availability in the hospital influence how maternal care services are delivered to mothers in the hospital					

Section IV: Maternal healthcare medical devices

Please indicate the level of your agreement on the following statements on maternal healthcare medical devices and its influence on delivery of maternal healthcare services in public healthcare facilities which are measured in the Likert scale of 1-5 where 5 = Strongly Agree, 4 = Agree 3= Neutral 2= Disagree and 1 = Strongly Disagree.

Ability of maternal medical devices influence how maternal healthcare services are delivered in the hospital					
Maternal medical devices are available for use when needed by mothers seeking maternal healthcare services					
Maternal medical devices are properly functional and in proper condition needed by mothers seeking maternal healthcare service					

Section V: Staffing

Please indicate the level of your agreement on the following statements on staffing and its influencing on delivery of maternal healthcare services in public healthcare facilities which are measured in the Likert scale of 1-5 where 5 = Strongly Agree, 4 = Agree 3= Neutral 2= Disagree and 1 = Strongly Disagree.

Qualified nurse/doctor is available to mothers in good time when needed over maternal healthcare services					
Nurses/ doctors offer maternal healthcare services to mothers respectfully and a good relationship between mothers and healthcare providers in the facility exists					

Appendix IV: Interview schedule

The questions below will guide the study on the interviews with the respondents.

1. How would you describe the physical access of the hospital to mothers for maternal healthcare services? Explain
2. How would you describe your experience on socio- cultural beliefs and mothers while offering maternal healthcare services to them? Explain
3. Does the hospital have all the necessary medical devices needed to deliver maternal healthcare services appropriately to mothers? Explain
4. Does the hospital management influences delivery of maternal healthcare services in the hospital? Explain
5. Are all the maternal healthcare staff fully trained to provide maternal healthcare services and does the hospital offer career advancement opportunities to them?
6. How is the healthcare provider- mother relationship like in the hospital while offering maternal healthcare services? Explain

Appendix V: Krejcie and Morgan Table

N-----n	N-----n	N-----n	N-----n	N-----n
10-----10	100-----80	280-----162	800-----260	2800-----338
15-----14	110-----86	290-----165	850-----265	3000-----341
20-----19	120-----92	300-----169	900-----269	3500-----346
25-----24	130-----97	320-----175	950-----274	4000-----351
30-----28	140-----103	340-----181	1000-----278	4500-----354
35-----32	150-----108	360-----186	1100-----285	5000-----357
40-----36	160-----113	380-----191	1200-----291	6000-----361
45-----40	170-----118	400-----196	1300-----297	7000-----364
50-----44	180-----123	420-----201	1400-----302	8000-----367
55-----48	190-----127	440-----205	1500-----306	9000-----368
60-----52	200-----132	460-----210	1600-----310	10000-----370
65-----56	210-----136	480-----214	1700-----313	15000-----375
70-----59	220-----140	500-----217	1800-----317	20000-----377
75-----63	230-----144	550-----226	1900-----320	30000-----379
80-----66	240-----148	600-----234	2000-----322	40000-----380
85-----70	250-----152	650-----242	2200-----327	50000-----381
90-----73	260-----155	700-----248	2400-----331	75000-----382
95-----76	270-----159	750-----254	2600-----335	100000-----384

Source: Krejcie and Morgan (1970:608) in Hill (1998).

Where N= Population size, and n= sample size required.

Appendix VI: Research Permit



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
when replying please quote

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

Ref. No.

Date:

NACOSTI/P/16/33684/12570

1st August, 2016

Caroline Mwendu Muema
University of Nairobi
P.O. Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Factors influencing safe delivery of maternal healthcare services in public healthcare facilities in Kenya: Case of Kenyatta National Hospital,*" I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **29th July, 2017.**

You are advised to report to **the Chief Executive Officer, Kenyatta National Hospital, the County Commissioner, the County Director of Education and the County Coordinator of Health, Nairobi 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. STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The Chief Executive Officer
Kenyatta National Hospital.

The County Commissioner
Nairobi County.

COUNTY COMMISSIONER
NAIROBI COUNTY
P. O. Box 30124-00100, NBI
TEL: 341666

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