

UNIVERSITY OF NAIROBI.

COLLEGE OF HEALTH SCIENCES

SCHOOL OF NURSING SCIENCES

TITLE:

FACTORS CONTRIBUTING TO THE MORTALITY OF LOW BIRTH WEIGHT  
INFANTS IN THE NEW BORN UNIT, KENYATTA NATIONAL HOSPITAL,  
NAIROBI.

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A PROPOSAL SUBMITTED IN PARTIAL FULFILLMENT OF REQUIREMENTS  
FOR THE DEGREE OF BACHELOR OF SCIENCE IN NURSING OF THE  
UNIVERSITY OF NAIROBI.

DATE: JANUARY, 2010.

**DECLARATION**

I Muraguri MaryTriza declare that this research proposal is my original work and has not been presented or produced in any other university or any other institution presented for award of degree or examination purposes.

Name .....


Reg. No. ....

Signature .....

Date .....

**CERTIFICATE OF APPROVAL**

This research proposal has been submitted in partial fulfillment of award of degree in BSc. (nursing) with my approval as the University of Nairobi supervisor.

Signed  .....

Date 30/6/2010 .....

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Assistant Director school of nursing sciences

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## **DEDICATION**

This work is dedicated to my beloved mother and father who have sacrificed a lot to educate me.

## **ACKNOWLEDGEMENT**

I would like to acknowledge the following; my supervisor Mrs. Odero for the support and technical advice offered to me during the development of my proposal, Mrs. Bitok and Prof. Karani for laying the right foundation for me in research. I am also grateful for my colleagues and classmates for their continued support and encouragement and God by whose strength I have come this far.



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## **LIST OF ABBREVIATIONS**

- KNH – Kenyatta National Hospital.
- LBW – Low birth weight.
- LBWI – Low birth weight infants.
- WHO – World Health Organization.
- UNICEF – United Nations Children’s Fund.
- SPSS – Statistical Package for the Social Sciences.
- NBU – New Born Unit.
- ANC – Antenatal clinic

## **DEFINITION OF TERMS**

- Morbidity events:

The number of infants who were ill, the illnesses the infants experienced and the duration of the illnesses.

- Mortality:

The proportion of deaths among the infants in the new born unit.

- Low birth weight:

Weight at birth of less than 2500grams irrespective of gestational age.

- Kangaroo mother care:

Skin to skin contact between a mother and her newborn, frequent and exclusive breastfeeding or nearly exclusive breastfeeding and early discharge from hospital.

- Medical care:

These refer to the interventions given to low birth weight infants including respiratory support, laboratory investigations, drug administration, temperature regulation and nutritional support.

- Antenatal care:

Any information given to pregnant mothers about pregnancy in the Antenatal clinic.

## **EXECUTIVE SUMMARY**

This is a retrospective, cross-sectional descriptive study based on determining factors contributing to low birth weight infant (LBWI) deaths in Kenya. About 15.5% of all infants born worldwide (20 million) are born with low birth weight (LBW), that is, a weight of less than 2500grams (United Nation's Children Fund (UNICEF) & World Health Organization(WHO), 2004). 96% of these LBWIs occur in the developing world, South Asia having the highest number with a LBW incidence of 31%. In Africa, the Middle East/ Northern region has an incidence of 15% while sub-Saharan Africa has an incidence of 14%. In Kenya, the percentage of infants with LBW is at 10 % ( UNICEF & WHO, 2004). These infants have little chance of survival (Beck et al, 2010) hence the causes of their deaths need to be studied and resolved so as to reduce their mortality rates.

The main objective of the study is to determine the factors contributing to mortality of LBWIs in the New Born Unit of Kenyatta National Hospital, Nairobi, Kenya. The study aims to determine the main causes of LBWI mortalities and find out the extent to which medical care, morbidity events and infant nutrition affect the outcomes of LBWIs in the New Born Unit of Kenyatta National Hospital.

The study is based in Nairobi Province in Kenyatta National Hospital (KNH), Kenya's largest national referral and teaching hospital with a bed capacity of 1800. The hospital's New Born Unit (NBU) will be the centre of the study. Cross-sectional descriptive study design will be used. The study population will consist of all infants born in KNH then admitted to the NBU due to LBW and died while still in the unit. A sample size of 196, determined by the Fisher's formula, will be used for the study. Systematic and simple random sampling methods will be used to choose the required samples. A checklist, for collecting data from records and an interview guide, for obtaining information from health workers will be used as data collecting instruments. Four fourth year Bachelor of Science in Nursing students will be recruited and trained as research assistants.

Data will be cleaned and analyzed using the Statistical Package for the Social Sciences (SPSS) and presentation will be in form of tables and pie-charts. The findings of this study will aid in reducing LBWI mortality rates in the country and adding to the body of knowledge in the care of LBWIs. The study is expected to take a period of nineteen weeks with an estimated budget of Kshs. 123,976.



## CHAPTER ONE

### 1.1 BACKGROUND INFORMATION

Globally, about 130 million babies are born every year. Of these, about 4 million die in the first four weeks of life- the neonatal period (Zupan and Aahman, 2005). More than 20 million infants worldwide, representing 15.5% of all births are born with (LBW) (United Nations Children's Fund and World Health Organization, 2004). LBW is an important indirect cause of death (Lawn, Cousens & Zupan, 2005). In many developing countries, infants weighing less than 2000 grams (corresponding to about 22weeks of gestation in the absence of intrauterine growth retardation) have little chance of survival (Beck et al, 2010). South Asia has the highest number of low birth weight infants (LBWIs) in the world, with an incidence of 31% (UNICEF and WHO, 2004).

More than 96% of low birth weights occur in the developing world, reflecting the higher likelihood of these babies being born in poor socio-economic conditions, where women are more susceptible to poor diet and infection and are more likely to undertake physically demanding work during pregnancy. The level of LBW in these developing countries (16.5%) is more than double the level in already developed regions (7%) (UNICEF and WHO, 2004).

In Africa, where many countries are still developing, the incidence of LBW in the Sub-Saharan region is 14% while in the Middle East/North African region, it is at 15% (UNICEF and WHO, 2004).

In Kenya, the percentage of infants with LBW, between the years 2003-2008 has been reported at 10% (UNICEF and WHO, 2004).

In Nairobi, Kenyatta National Hospital (KNH), the largest teaching and referral hospital in Kenya, has been known to offer newborn services for quite sometime. However, morbidity and mortality of low birth weight infants in this unit is still high. Many a times, the hospital's new born unit (NBU) which has a bed capacity of between 45 and 60 accommodates more infants than it is supposed to hold. Neonatal survival rates of low birth weight infants are still much lower than those observed in developed countries as far back as the early 1970's. The big proportion of deaths occurring during the first week, and in particular the first day is due to lack of neonatal intensive care facilities and inadequate obstetric services (Were, 2002).

Mortality of low birth weight infants in KNH has deteriorated between 1978 and 2002 rising from about 270/1000 admissions in 1978 to 574/1000 admissions in the year 2000.

This poor outcome is not only attributed to increased patient number (overcrowding) and understaffing but appears to be a direct result of inadequate care (Simiyu, 2004).

At the population level, the proportion of babies with a low birth weight is an indicator of a multifaceted public health problem that includes long term maternal malnutrition, ill health, hard work and poor healthcare in pregnancy. On an individual basis, low birth weight is an important predictor of newborn health and survival (WHO statistical information system, 2010).

In a previous study carried out by Simiyu (2004) in Kenya, some of the leading diagnoses at admission or death of LBWIs included; respiratory distress, apnoeic attacks, suspected sepsis, jaundice, hypothermia and anaemia among others.

This study will be focused on finding out the specific factors contributing to deaths in low birth weight infants in Kenyatta National Hospital's New Born Unit.

## **1.2 PROBLEM STATEMENT**

Four million newborns die each year, 99% in developing countries. 28% of newborn deaths are attributed to LBW and prematurity and 26% to severe infections including pneumonia (Sloan et al 2008). Therefore, LBW is an important indirect cause of death (Lawn, Cousens & Zupan 2005).

Though some researches have suggested a decrease in the infant mortality rate, there still remains the questions as to what are the causes of these LBWI deaths, and why their mortality rates are still high. One such research includes that done in Washington showing that the Kenya infant mortality rate was 63.36% in 2003, 61.47% in 2005 and is currently about 54.7% as of September 2009; with a male incidence of 57.56 deaths per 1000 live births and a female incidence of 51.58 deaths per 1000 live births (Central Intelligence Agency World Fact book, 2009).

According to Simiyu (2004) the mortality of low birth weight infants in KNH has increased between 1978 and 2002 rising from about 270/1000 admissions in 1978 to 574/1000 admissions in the year 2000.

Research is hence needed to find out the factors that are contributing to these increased LBWI mortality rates in this hospital's newborn unit.

The study will therefore be aimed at determining the causes of low birth weight infant mortalities in Kenyatta National Hospital- Newborn unit.

### **1.3 RESEARCH QUESTIONS**

- 1.) What are the main causes of mortality in the LBWIs?
- 2.) Does medical care given to LBWIs affect their outcomes?
- 3.) To what extent do morbidity events occurring in LBWIs affect their outcomes?
- 4.) Does nutrition have any effect on LBWI outcome?

### **1.4 OBJECTIVES**

#### **BROAD OBJECTIVE**

To determine the factors contributing to the mortality of low birth weight infants in the newborn unit of Kenyatta National Hospital, Nairobi.

#### **SPECIFIC OBJECTIVE**

1. To determine the causes of mortality in LBWIs.
2. To determine the effect of medical care on LBWIs outcome.
3. To determine the extent to which morbidity events affect LBWIs outcome.
- 4.) To determine the influence of nutrition on LBWI outcome.

### **1.5 STUDY JUSTIFICATION**

There is need to identify and prioritize the strategy for improving neonatal survival among low birth weight infants at this unit and indeed the whole country (Were, Mukhwana & Musoke, 2002). More than 96% of LBWs occur in the developing world, reflecting the higher likelihood of these babies being born in poor socio-economic conditions, where women are more susceptible to poor diet and infection and are more likely to undertake physically demanding work during pregnancy (UNICEF and WHO, 2004).



It is hoped that the study will be useful to the healthcare profession since it will generate information about the causes of LBWI deaths that will be useful to the medical and nursing staff. The study is also expected to provide useful information for evidence based practice in the healthcare sector and interventions used in the care of LBWIs will be focused on those factors which improve the outcome of these infants rather than those which increase their mortalities.

### **1.6. STUDY BENEFITS**

- The findings of this study will lead to some useful changes in the care of LBWIs, reducing their mortality rates.
- Also, addressing the issue will lead to a decrease in the country's infant mortality rates.
- The study findings will substantially extend the existing knowledge about the causes of LBWI deaths.
- The findings will also help in policy development regarding the reduction of LBW infants.

### **1.7 CONCEPTUAL FRAMEWORK WITH RESEARCH VARIABLES**

a.) Dependent variable:

- ❖ Mortality.

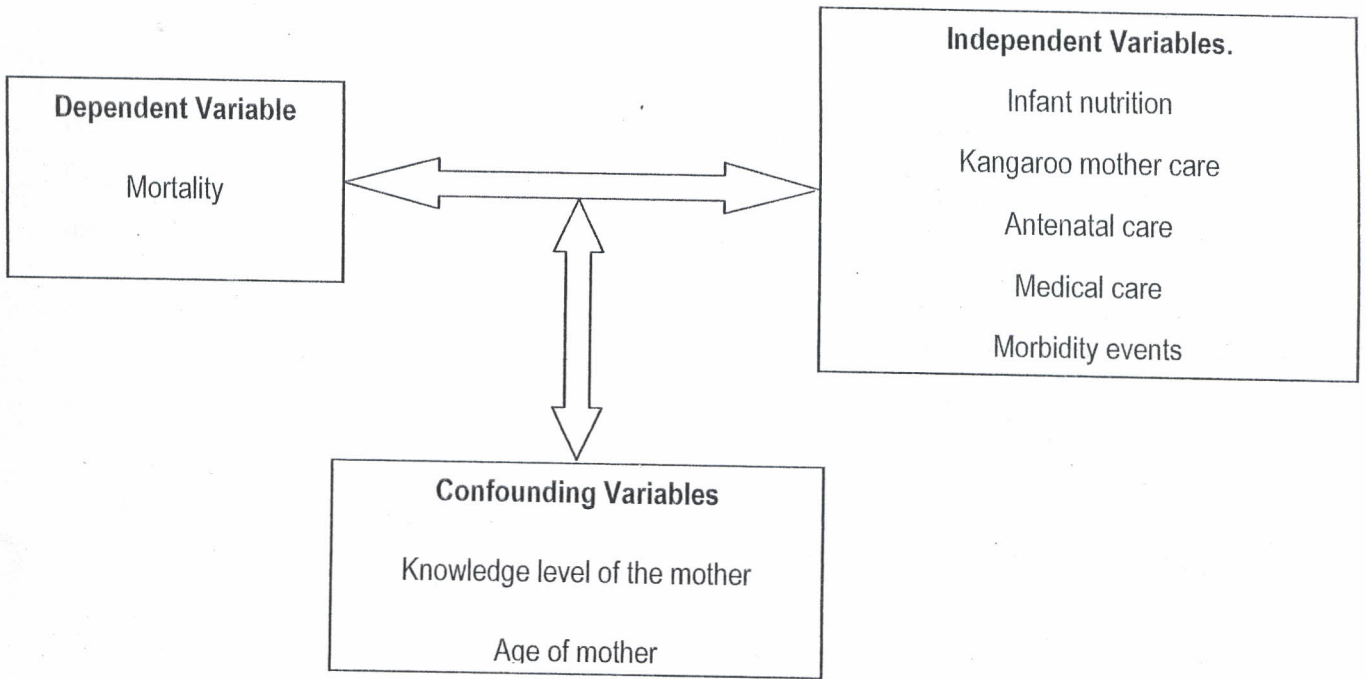
b.) Independent variables:

- ❖ Infant nutrition.
- ❖ Kangaroo mother care.
- ❖ Antenatal care.
- ❖ Medical care.
- ❖ Morbidity events.

c.) Confounding variables:

- ❖ Knowledge level of mother.
- ❖ Age of mother

These variables are interrelated.



## CHAPTER TWO

### 2.0 LITERATURE REVIEW

#### 2.1 Introduction

Four million newborns die each year, 99% in developing countries. 28% of newborn deaths are attributed to LBW and prematurity and 26% to severe infections including pneumonia (Lawn, Cousens & Zupan, 2005). Regardless of the cause, LBW is associated with higher neonate morbidity and mortality; in fact, these neonates are 20 times more likely to die within the first month of life. LBW can also signal a life threatening emergency (Williams & Wilkins, 2006).

There is a large body of literature showing that the world wide problem of low birth weight (LBW), i.e. infants weighing <2500g, is among the strongest determinants of infant mortality and morbidity (Elshibly & Schmalisch, 2008).

In industrialized countries, the majority of LBW infants do well thanks to the advances of modern obstetric and neonatal care (Grimmer et al, 2002). The chances for intact survival of LBW infants is much lower in African and other developing countries due to inadequate or limited medical care including proper antenatal care (Simiyu, 2005). In low income countries, most births occur at home, neonatal intensive care is virtually unavailable, and the incidence of LBW and neonatal mortality rate is high (Sloan et al, 2008).

In a study carried out in Nigeria, preventable conditions were found to be the main causes of morbidity and mortality; identifiable causes included lack of antenatal care, low standard of available services and lack of essential equipment like ventilators and overcrowding in the unit (Ojukwu & Ogbu, 2004)

The literature review will focus on infant nutrition, kangaroo mother care given to the LBWIs, antenatal care received by the mother, medical care given to the LBWIs and the morbidity events that occur in LBWIs. These variables will be discussed in relation to their contribution in LBWI mortalities as follows.

## **2.2 Infant Nutrition**

Infants with LBW have a high need for macronutrients and micronutrients that approaches intrauterine needs; at the same time, their functionally immature gastrointestinal tract precludes adequate enteral intake (Siva & Barton, 2009).

Improving early infant feeding practices is an effective, feasible, low-cost intervention that could reduce early infant mortality in LBW infants in developing countries. These findings are especially relevant for sub-Saharan Africa where many LBW infants are born at home, never taken to a health facility and mortality rates are unacceptably high (Edmond et al, 2008).

Interventions to improve early infant feeding practices in LBWIs could be associated with considerable reductions in early infant mortality. A previous study carried out in rural Ghana suggested that both initiation of breastfeeding after day one and early prelacteal feeding were associated with a threefold increase in mortality risk in LBWIs (Edmond et al, 2008).

Enhancement of immune function and reduction in infection-specific mortality could explain the impact of early infant feeding practices on mortality in the LBWI (Anderson et al, 2003). Previous study findings suggest that early breast milk may have a direct anti-infective action and may stimulate neonatal immune function as well as decreasing the ingestion of infectious pathogens. Edmond et al (2007) suggests that breastfeeding promotion programs focusing on early initiation of breastfeeding and exclusive breastfeeding in neonatal period can significantly reduce the burden of infectious disease-related mortality in the rural African neonate.

## **2.3 Kangaroo mother care (KMC)**

Kangaroo mother care consists of:

- Continuous skin-to-skin contact between the mother and the infant: This may be continuous or intermittent and may start early or later (Charpak et al, 2005). The initiation of KMC will depend on the degree of prematurity and the severity of illness at birth.
- Exclusive breastfeeding: Supplementation is only provided if adequate weight gain is not achieved (Charpak et al, 2005).



- Early home discharge in the kangaroo position once the infant is well, thriving on mother's milk and follow up is available (Charpak et al, 2005).

Conde-Agudelo et al (2003) carried out a study comparing KMC use in LBWIs with standard neonatal care and concluded that although KMC appears to reduce severe infant morbidity without any serious deleterious effect reported, there is still insufficient evidence to recommend its routine use in LBW infants. It is now widely considered to be the most feasible, readily available and preferred intervention for decreasing neonatal morbidity and mortality in developing countries (Charpak et al, 2005).

It is important to note that although KMC has not been shown to conclusively decrease infant mortality, it reduces morbidity without apparent short or long-term negative effects (Conde-Agudelo et al, 2003; Anderson et al, 2003). Whether KMC has a role in causing mortality among LBWIs in KNH will be considered in the study.

#### **2.4 Antenatal care (ANC)**

In developing countries, a significant proportion of women do not attend ANC and majority who seek routine antenatal care often do so only late in pregnancy and or on few occasions; in keeping with conventional teaching, all pregnant women, irrespective of risk are advised to attend ANCs regularly at specified intervals (Mathai, 2002).

The chances for intact survival of LBWIs is much lower in Africa and other developing countries due to inadequate or limited medical care including proper antenatal care (Simiyu 2005). According to a study by Raatikainen et al (2007) in Finland, under-attending antenatal care appeared to be a significant contributor to LBW, and this association was chiefly the result of preterm delivery, not to growth restriction.

Mathai (2002) suggested that the large number of women to be seen in short periods of time is usually overwhelming to the few health workers available hence less individual attention and care is given and there are high chances that problems are missed.

Elshibly & Schmalisch (2008) recommended that policy makers make more emphasis on education as it imparts knowledge and thus modify dietary habits and quality of food consumed,

leading to a better nutritional status in adolescent girls and resulting in lower rates of LBW and greater reduction in infant morbidity and mortality.

However, neither preterm birth nor IUGR can be effectively prevented by prenatal care in its present form. Preventing LBW (and LBW mortalities), will require reconceptualization of prenatal care as part of a longitudinally and contextually integrated strategy to promote optimal development of women's reproductive health not only during pregnancy, but over the life course (Lu et al, 2003).

## **2.5 Medical care**

Neonatal mortality decline is much less dependent on nutrition and public health measures; rather, it requires more sophisticated medical interventions, especially to keep LBW infants alive (Encyclopedia of Death and Dying, 2010). Medical interventions given to LBW infants are based on each infant's condition and include supportive care such as respiratory support, laboratory investigations, drug administration, temperature regulation and nutritional support.

Preventing hypothermia in premature and LBWIs maybe important to survival and long-term outcome (McCall et al, 2005). Nayeri (2006) concluded that hypothermia is one of the most significant risk factors causing death in newborns. Due to their high body surface area-to-body weight ratio, decreased brown fat stores, non-keratinized skin and decreased glycogen supply, infants with LBW are susceptible to heat loss after birth through convection, conduction, radiation and evaporation; therefore, temperature control is paramount to survival and is typically achieved with use of radiant warmers or double walled incubators (Siva & Barton, 2009).

Laboratory investigations which include haemograms, culturing of bacterial sensitivity, urea, creatinine and electrolyte estimates all form an important part in ensuring infant survival since results gained from these investigations direct the interventions given to LBWIs in the unit. Use of some antibiotics to treat unconfirmed sepsis may bring about increased bacterial resistance. Also, prolonged stay of laboratory investigations may increase mortality rates as infant treatment is withheld awaiting results of the tests taken.

The respiratory status of LBWIs entails monitoring since they may have poorly developed lungs, and respiratory support may be needed incase of signs of respiratory distress (Williams &



Wilkins, 2006). If these interventions are ignored, they may pose as risk factors in causing LBWI mortalities.

## **2.6 Morbidity events**

LBWIs are susceptible to many morbidity events such as; respiratory distress, apnoeic attacks, sepsis, jaundice, hypothermia, anemia and dehydration among others (Simiyu 2004). They have less immune power and are susceptible to infections even with minor exposure to micro-organisms. Their inadequate immune competence increases their vulnerability to infectious diseases (Raqib et al 2007).

A previous study carried out by Hodgman et al (2003) suggested that infection was the leading cause of death among LBWIs (57%), followed by lethal anomalies with 20%, respiratory distress and its complications 9% and immaturity, intraventricular hemorrhage and other conditions 14%.

Mortality rate in neonatal sepsis maybe as high as 50% for infants who are not treated. Infection is a major cause of fatality during the first month of life contributing to 13-15% of all neonatal deaths (Siva & Barton, 2009). Organisms such as *klebsiella*, *citrobacter*, *enterobacter*, *coagulase- negative staphylococci (S.aureus)* and *enterococci* have previously been shown to cause neonatal sepsis in Kenya and other developing countries (Simiyu, 2004).

Infants' skin, respiratory tract, conjunctivae, gastrointestinal tract and umbilicus may become colonized from the environment. Vectors for such colonization may include vascular/ urinary catheters, other indwelling lines or contact from caregivers with bacterial colonization. Hospital acquired organisms frequently demonstrate multiple antibiotic resistances hence choice of drug requires knowledge (Siva & Barton, 2009).

Also, other factors such as overcrowding lead to an expected transmission of nosocomial infections between infants either by airborne spread or by decreased distance between infants, leading to inadvertent cross-contamination of equipment. Overcrowded nurseries allow more infants to be exposed to transmitted pathogens (Polak et al, 2004)

Respiratory distress, a breathing problem common in babies born before 34<sup>th</sup> week of pregnancy, many of who are low birth weights, remains a significant cause of morbidity and

mortality in LBWIs. A previous study carried out by Were, Mukhwana & Musoke (2002) on neonatal survival of infants less than 2000grams born in KNH showed that respiratory distress was identified in 43% of the 163 infants studied.

## **2.7 Conclusion**

LBW is a high priority public health issue associated with heightened risk of infant mortality as well as subsequent health and development problems. The goal of reducing LBW incidence by at least one third between 2000 and 2010 is one of the seven major goals in "A World Fit for Children", the Declaration and Plan of Action adopted by the United Nations General Assembly Special Session on Children in 2002. The reduction of LBW also forms an important contribution to the Millennium Development Goals for reducing child mortality.

From the above discussed literature, one can see that the causes of deaths in LBWIs may be multiple and differ from one part of the world to another. The mortality causes in the developing countries may not necessarily be the same as those in the already developed countries. Studying the specific death causes in LBWIs in KNH in Nairobi, Kenya will determine the way forward in reducing infant mortality rates in the hospital and subsequently in the country.



## CHAPTER THREE

### 3.0 METHODOLOGY

#### 3.1 STUDY DESIGN

This will be a cross-sectional descriptive study design. This design measures the prevalence of health outcomes and/ or determinants of health in a population at a point in time or over a short period of time. It will be used to determine the prevalence of the different research variables in the study so as to ascertain their contribution in causing LBWI deaths. The design was selected for the study because it would fulfill the study's main objective of finding out the causes of death in LBWIs.

#### 3.2 STUDY AREA

The study is based in Nairobi Province in Kenyatta National Hospital. Nairobi is also Kenya's capital city; it is located at 1° 16' S 36° 48' E and is 1660m above sea level. Nairobi province is one of the eight provinces in Kenya and shares common boundaries with Nairobi city. It has three districts namely Nairobi east, Nairobi south and Nairobi west. It is divided into eight divisions and fifty locations. Kenyatta National Hospital (KNH) is the country's largest national referral and teaching hospital with a bed capacity of 1800. It has over 6000 staff members and covers an area of 45.7 hectares.

The hospital's New Born Unit is located on the first floor of the Tower Block, and operates under the paediatric department which has a staff capacity of 11 medical specialists, 18 clinical officers, 250 nurses and 59 supportive personnel.

#### 3.3 STUDY POPULATION

The target population for the study will be all the dead infants who had been admitted in the NBU of KNH with a low birth weight (birth weight <2500grams).

##### 3.3.1 INCLUSION CRITERIA

- Infants born in KNH and admitted in the NBU due to LBW.
- Infants born in KNH and admitted in the NBU due to LBW and other medical reasons.

### 3.3.2 EXCLUSION CRITERIA

- Infants admitted to the NBU due to other medical reasons rather than LBW.
- Infants admitted into the unit after being born outside the health facility.

### 3.4 SAMPLING METHOD

Systematic and simple random sampling methods will be used in the study. Clinical records of all infants admitted into the new born unit between the months of January and December 2009 with birth weights <2500grams will be accessed in the department's database and all mortality cases selected. The sampling frame will be divided by the pre-determined sample size so as to get the sampling interval to use in choosing the records to study. Simple random sampling method will then be used to select a starting point.

### 3.5 SAMPLE SIZE DETERMINATION

To obtain a representative sample, Fisher's formula will be employed (Fisher et al, 1983).

That is;

$$nf = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

Where

- n- desired sample size if target population is >10,000
- nf- desired sample size if target population is < 10,000
- N- estimated population size of LBWI mortalities

Mortality of LBWIs as studied by Simiyu (2004) is 574/1000 admissions and the estimated population of LBWIs admitted in a year is about 700. 57.4% of the 700 usually die and this is about 401 infant mortalities in a year.

Therefore;

Error prepared to accept is 0.05.

$$nf = \frac{n}{1+n/N}$$

$$nf = \frac{384}{1+384/401}$$

$$nf = \frac{384}{1+0.958}$$

$$nf = 196.1$$

196 records of LBWI mortalities will be used as study samples.

To obtain the sampling interval;

$$\frac{\text{Sampling frame}}{\text{Sample size}} = \frac{401}{196}$$

For every 2 medical records, one will be selected for the study. Simple random method will be used to determine the starting point.

### **3.6 DATA COLLECTION**

#### **3.6.1 RESEARCH INSTRUMENTS**

A checklist and an interview guide will be used as research instruments to aid in data collection for the study. The guided and structured checklist will be used to collect information from the medical records relating to the research variables under study. The interview guide will be used on the health care givers (nurses working in the NBU) to collect information about the unit which cannot be found in the records.



### **3.6.2 RESEARCH ASSISTANTS**

Fourth year BSc. Nursing students will be recruited and trained to assist in data collection. These students will be trained on how to use the checklist in collecting information from the clinical records. They will also be trained on how to carry out the interviews with the nurses in the NBU.

### **3.6.3 STUDY TOOL PRETEST**

The study tool will be pretested for appropriateness in Pumwani Maternity Hospital- NBU under similar circumstances to the ones of the study.

### **3.7 STUDY ASSUMPTIONS**

The study assumes that there are good existing medical records. It also assumes that after information on the benefits of the study has been given to the nurses, they will take the matter seriously and give correct information.

### **3.8 STUDY LIMITATIONS**

The limitations of this study include; information bias, whereby the use of the clinical records could lower the validity and reliability of the study since information in the records may be incomplete or distorted in some way. This will be overcome by using interviews, from which any missing information will be collected. Secondly, the informant may also not reveal the appropriate response during the interview due to fear of consequences or to maintain the good image of the institution. To overcome the latter, the interviewer will aim to establish a good rapport with the nurses before conducting the interview.

### **3.9 DATA MANAGEMENT**

#### **3.9.1 DATA CLEANING**

Every checklist and interview data will be checked after collection for completeness and correctness of information collected by research assistants as required.

### **3.9.2 DATA ANALYSIS**

Data will be analyzed using SPSS version 17.0. The package covers a broad range of statistical procedures that allow data analysis e.g. (computer means and standard deviations), determine whether there are significant differences between groups (analysis of variance) and examine the relationships between variables (e.g. correlate and multiple regression).

### **3.9.3 DATA PRESENTATION**

All data will be presented in form of tables, pie-charts etc. The findings will be presented in medical conferences and published in medical journals for dissemination.

### **3.10 ETHICAL CONSIDERATIONS**

The study tackles a problem of major public health importance in Kenya and aims to improve health worker knowledge and practice.

Permission to proceed with the study will have to be granted by the hospital's Ethics and Research committee.

Informed consent will be obtained from the nurses in the NBU before partaking in the study. Names and list of files will be kept only by the principal investigator and shall not be revealed to any other persons.

### **3.11 REFERENCES**

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WORK PLAN IN GHANT CHART

ACTIVITIES	JANUARY				FEBRUARY				MARCH				APRIL				MAY					
Proposal development	█																					
Proposal approval by Ethics Committee					█																	
Administrative authority							█															
Training of research assistants									█													
Tool pretest											█											
Data collection											█		█		█							
Data analysis and report writing															█		█		█		█	
Presentation																			█			

### 3.11 STUDY BUDGET

ITEMS:	QUANTITY:	AMOUNT IN KSHS COST PER QUANTITY:	TOTAL COST: KSHS.
<b>MATERIALS:</b>			
Foolscaps	3 reams	350	1050
Duplicating papers	1 ream	300	300
Folders	5	30	150
<b>Assorted writing materials:</b>			
Rubbers, pens, rulers, sharpeners.		1000	1000
Calculators	3	600	1800
Stapler	1	200	200
Staples	5 packets	30	150
Paper punch	1	200	200
Flash disks (LG 1GB)	2	800	1600
<b>SUBTOTAL:</b>			<b>6,450</b>
<b>MANPOWER:</b>			
<b>SECRETARIAL SERVICES:</b>			
Proposal writing and typing.	38 Pages	10	380
Proposal printing	38 Pages	5	190
Photocopying the proposal	38 Pages	2	76
Binding the proposal	1 booklet	50	50
Photocopying research instruments.	5 pages * 10 copies	2	100
Report document writing and typing.	40 Pages	10	400
Report document printing	40 Pages	5	200
Photocopying the report.	40 Pages	2	80
Binding the report	1 booklet	50	50
<b>SUBTOTAL:</b>			<b>1,526</b>

<b>TIME:</b>			
Research assistants	4	@500 * 21 days	42,000
Statistician	1	10,000	10,000
Secretary	1	5,000	5,000
<b>SUBTOTAL:</b>			<b>57,000</b>
<b>TRANSPORTANDSUBSISTENCY:</b>			
Principal investigator.	1	40,000	40,000
Research assistants	4	2000	8,000
Supervisor's trip	1	1,000	1,000
<b>SUBTOTAL</b>			<b>49,000</b>
<b>TOTAL</b>			<b>113,976</b>
Miscellaneous			10,000
<b>GRAND TOTAL</b>			<b>123,976</b>

## APPENDICES

### APPENDIX A: RESEARCH INSTRUMENT (CHECKLIST)

(Tick where 'Yes' or 'No' applies.)

#### 1.) Antenatal care.

- |   |     |    |
|---|-----|----|
| a) Did the mother attend ANC?   | Yes | No |
| b) Were there any medical problems regarding low birth weight diagnosed?                    | Yes | No |
| c) If yes, were there any interventions carried out to solve the problems? (specify if any) |     |    |

#### 2.) Kangaroo Mother Care intervention.

- |                                 |     |    |
|---------------------------------|-----|----|
| a) Did the mother practice KMC? | Yes | No |
|---------------------------------|-----|----|

#### 3.) Infant Nutrition.

	Initiation time of feed	Duration of using feed	Amount of feed given
--	-------------------------	------------------------	----------------------

##### Type of feed

Breast milk

Formula milk

Cow's milk

Other (specify)

##### Mode of feeding practiced

- |                          |     |    |
|--------------------------|-----|----|
| Breastfeeding            | Yes | No |
| Nasogastric tube feeding | Yes | No |
| Cup feeding              | Yes | No |
| Breast + cup feeding     | Yes | No |



**4.) Medical care.**

a) Did the infant receive any respiratory support? **Yes** **No**

If yes, what kind of support was given?

b) What was the reason for the intervention?

c) What kind of medications did the infant receive?

	<b>Yes</b>	<b>No</b>	<b>Reason for use</b>	<b>Duration of use</b>
i) Antibiotics				
ii) Antifungals				
iii) Antivirals				
iv) Others (specify)				

d.) Use of intravenous therapy;

	<b>Yes</b>	<b>No</b>	<b>Reason for use</b>	<b>Duration of use</b>
i) Dextrose				
ii) Normal saline				
iii) Darrows				
iv) Other (specify)				

e.) Recording of infant's vital signs

	<b>Yes</b>	<b>No</b>	<b>Frequency of taking vitals (daily)</b>
i) Temperature			
ii) Pulse			
iii) Respirations			

f.) Were there any laboratory investigations carried out?      **Yes**                      **No**

g.) If yes, what were the reasons for the investigations?

<b>5.) Morbidity events</b>	<b>Presence Yes/No</b>	<b>Medical management</b>	<b>Nursing management</b>
Respiratory distress			
Sepsis			
Apnoeic attacks			
Jaundice			
Hypothermia			
Anemia			
Birth asphyxia			
Dehydration			
Convulsions			
Meningitis			
Other (Specify)			

## **APPENDIX B: INTERVIEW GUIDE**

1.)

a.) From your observations as nurses working in the new born unit, how long do laboratory investigations take (after specimen has been collected from a patient) in the laboratories before results can be obtained?

b.) In your experience as nurses in the new born unit, when a nurse or a pediatrician suspects sepsis in an infant, do you/ they always request for further laboratory investigations before starting medication, or do you/ they start medication immediately sepsis is suspected, with/ without laboratory investigations?

2.) As caregivers in the new born unit, what have you observed to be some of the common illnesses/ diseases affecting the infants under your care?

3.)

a.) Are there any infection prevention measures that you as nurses are supposed to practice during the course of caring for the infants in this unit? If yes, which ones?

b.) What do healthcare givers here in the new born unit (including doctors and subordinate staff) do to prevent the spread of infections or infectious diseases among the infants?

4.)

a.) As nurses, do you give any health education to the mothers with low birth weight infants admitted to the new born unit?

b.) If yes, what kind of health education do you offer these mothers?

## APPENDIX C: LETTERS SEEKING APPROVAL

### C -1: LETTER TO THE ETHICS AND RESEARCH COMMITTEE.

Muraguri MaryTriza  
University of Nairobi  
School of Nursing Sciences  
P.O. Box, 19676  
Nairobi.  
Date: February, 2010.

The Chairman  
KNH ethics and research committee  
P. O Box 20723-00208  
Nairobi.

Dear Sir/ Madam,

RE:APPROVAL TO CARRY OUT A RESEARCH ON FACTORS CONTRIBUTING TO MORTALITY OF LOW BIRTH WEIGHT INFANTS IN THE NEWBORN UNIT, KENYATTA NATIONAL HOSPITAL, NAIROBI.

I am a fourth year BSc. Nursing student at the University of Nairobi. I would kindly request your permission to allow me to conduct research on the factors contributing to the mortality of low birth weight infants at Kenyatta National Hospital, Newborn unit. The research has no intrusive procedures to those concerned.

Attached please find my research proposal for examination and approval. Research findings will be used to review and enhance guidelines and policies governing the care of low birth weight infants at the hospital.

Your kind consideration will be highly appreciated.

Yours faithfully,

Muraguri MaryTriza.



**APPENDIX C-2: LETTER TO THE MINISTRY OF HIGHER EDUCATION**

Muraguri MaryTriza  
University of Nairobi  
School of Nursing Sciences  
P.O. Box, 19676  
Nairobi.

Date: February, 2010.

The Permanent Secretary  
Ministry of Higher Education,  
Science & Technology  
Jogoo House "B"  
P.O. Box 30040  
Nairobi.

Dear Sir/ Madam,

RE: PERMISSION TO CONDUCT A RESEARCH ON FACTORS CONTRIBUTING TO MORTALITY OF LOW BIRTH WEIGHT INFANTS IN THE NEWBORN UNIT, KENYATTA NATIONAL HOSPITAL, NAIROBI.

I am a fourth year BSc. Nursing student at the University of Nairobi. I would kindly request your permission to allow me to conduct research on the factors contributing to the mortality of low birth weight infants at Kenyatta National Hospital, Newborn unit. The research has no intrusive procedures to those concerned.

Research findings will be used to review and enhance guidelines and policies governing the care of low birth weight infants at the hospital.

Your kind consideration will be highly appreciated.

Yours faithfully,

Muraguri MaryTriza.

### APPENDIX C-3: LETTER TO THE MINISTRY OF HEALTH

Muraguri MaryTriza

University of Nairobi

School of Nursing Sciences

P.O. Box, 19676

Nairobi.

Date: February, 2010.

The Permanent Secretary

Ministry of Health

Afya House

P.O. Box 30016

Nairobi.

Dear Sir/ Madam,

RE: PERMISSION TO CONDUCT A RESEARCH ON FACTORS CONTRIBUTING TO MORTALITY OF LOW BIRTH WEIGHT INFANTS IN THE NEWBORN UNIT, KENYATTA NATIONAL HOSPITAL, NAIROBI.

I am a fourth year BSc. Nursing student at the University of Nairobi. I would kindly request your permission to allow me to conduct research on the factors contributing to the mortality of low birth weight infants at Kenyatta National Hospital, Newborn unit. The research has no intrusive procedures to those concerned.

Research findings will be used to review and enhance guidelines and policies governing the care of low birth weight infants at the hospital.

Your kind consideration will be highly appreciated.

Yours faithfully,

Muraguri MaryTriza.

**APPENDIX D: PARTICIPATION INFORMATION SHEET (NURSES)**

STUDY TITLE: FACTORS CONTRIBUTING TO MORTALITY OF LOW BIRTH WEIGHT INFANTS IN NEW BORN UNIT, KENYATTA NATIONAL HOSPITAL, NAIROBI.

My names are Muraguri Marytriza Wambui. I am a student at the University Of Nairobi, undertaking a degree in Bachelor of Science in Nursing. I am in my fourth and final year and I am required to carry out a research.

The main objective of the study is to determine the factors contributing to the mortality of low birth weight infants in the new born unit of Kenyatta National Hospital, Nairobi. The information you provide will be of great use for the study.

Your participation will be highly appreciated. If you do not wish to participate in the study, *your wish will be respected*. Utmost confidentiality shall be maintained. Please answer the questions as truthfully to the best of your knowledge.

Research participant

Signature ..... Date.....