Describing Mothers' Compliance to Kangaroo Mother Care at a Selected Hospital in Southern Malawi.

By

Christina Tiyankhulenji Mathias

(Student #: 215053728)

Submitted in Fulfilment of the Requirements for the Degree of

Masters of Nursing (Nursing Research)

School of Nursing & Public Health, Faculty of Health Sciences

University of KwaZulu-Natal, Durban, South Africa.

2016

DEDICATION

This work is dedicated to my late lovely mother, Nelly-Marie, and my late sweet sister, Egily-Yvonne, who always wished me well and encouraged me to work hard. Sister, I wish you were around to see how your "Little Ribbon" is really adding beauty to the family, friends and community. May your lovely souls continue resting in God's glory.

To my husband, Maxwell and our adorable daughter Watipatsa Nicole-Louise, I owe you my heart.

DECLARATION

I, Christina Tiyankhulenji Mathias, declare that the research project titled: "**Describing Mothers' Compliance to Kangaroo Mother Care at a Selected Hospital in the Southern Malawi"** is my own work. References used or quoted have been indicated and acknowledged by means of complete reference. This work has not been submitted for any degree or examination in any university.

STUDENT'S NAME: Christina Tiyankhulenji Mathias

SIGNATURE: ……

DATE: ……

SUPERVIOR'S NAME: Dr. Emelda Zandile Gumede

SIGNATURE: ……….

DATE: ……

ACKNOWLEDGEMENT

I would like to extend my sincere gratitude and appreciation to Almighty God for the gift of life, health, family, education and endurance. He has been faithful unto me; never did He leave my side. He guides and directs me with Love. Psalm 119: 105 enlightens: “your word is a lamp for my feet, a light on my path”. I really need more of you God in my profession, career and in all aspects of life.

Thanks to my research supervisor, Dr. E.Z. Gumede, for her tireless academic support and guidance. She made sure all the details were seen to. Honestly, I have learned a lot from her. May God bless and provide more wisdom in her profession and career.

Thanks to Queen Elizabeth Central Hospital’s (QECH) Director, the Head of Obstetrics and Gynaecology Department, the Nursing in-charge Kangaroo Care Unit, and all the hospital personnel who made this research project a success.

My heartfelt gratitude goes to all the mothers who practise *Kangaroo Mother Care*, in order to maximize their low birth weight babies’ survival. Thumbs up mothers, you are the heroes! Special thanks to all mothers who participated in this research study.

My love goes to Alice Singo, Christina Banda, Esther Wanko, Loveness Mathias and Lucy Chingwenembe for blessing me with their emotional, spiritual and physical support.

ABBREVIATIONS

ANC: Antenatal Care

BREC: Biomedical Research Ethics

CDC: Centers for Disease Control

DoH: Department of Heath

EBSCO: Elton B. Stephens Co.

HBM: Health Belief Model

JSTOR: Journal Storage

KMC: Kangaroo Mother Care

LBW: Low Birth Weight

MDGs: Millennium Development Goals

NGOs: Non-Governmental Organizations

NHRSC: National Health Sciences Research Committee

SDGs: Sustainable Development Goals

SPSS: Statistical Package for the Social Sciences

UKZN: University of KwaZulu-Natal

UNICEF: United Nations Children's Fund

WHO: World Health Organization

WWW: World Wide Web

ZCH: Zomba Central Hospital

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF GRAPH

LIST OF TABLES

ABSTRACT

Background: Studies have shown that *Kangaroo Mother Care* (KMC) is one of the low-cost, effective measures practiced in low income settings to enhance the survival of low birth weight babies. Since its development in 1979 in Bogota, Colombia by Dr. Rey as an incubator alternative in caring for low birthweight (LBW) babies, KMC practice has shown numerous empirically evident advantages over LBW babies' lives. The success of KMC rests on key players, namely, the mother. However, there are limited investigations of compliance to *Kangaroo Mother Care* in Malawi targeting key players in KMC practice. Therefore, full involvement in KMC practice by mothers is of significance in facilitating LBW survival in order to yield high LBW babies' survival rate through total involvement of mothers as significant players.

Aim of the study: The aim of this study was to describe mothers' compliance to Kangaroo Mother Care at a selected hospital in Southern Malawi. A descriptive, quantitative research study was conducted on N=50 KMC mothers who were practising KMC at QECH in Malawi. Data was collected using a questionnaire, which comprised of demographic data and questions pertaining to KMC knowledge, practice and compliance. The data was analysed by SPSS version 24. A central hospital in the Southern Malawi, which is the main teaching hospital for the University of Malawi, College of Medicine.

Findings: The study results show that all the KMC mothers had prior knowledge to KMC, which enhanced their KMC compliance. Although 21 (42%) of the KMC mothers initiated KMC late, due to a lack of support from the nurses and family members, 34 (68%) of the KMC mothers were compliant to KMC, as they practised continuous KMC during their hospital stay, and they noticed KMC benefits on their LBW babies, including increased body weight gain. Four (8%) of the KMC mothers managed to put their babies in KMC position for less hours in a day, due to a lack of support in putting the baby in KMC position, and as a result, their LBW babies did not gain any weight, and no other KMC benefits were noticed. Nevertheless, 45 (90%) of the KMC mothers were very eager to continue with KMC practice at home, and 41 (82%) of the mothers emphasised continuing with KMC follow-up care. Due to KMC compliance, mothers witnessed good KMC outcomes, and as such, they were keen on recommending KMC to others.

Key Words: LBW globally, LBW in Sub-Saharan countries, KMC practice in Sub-Saharan countries, neonatal mortality, MDGs and SDGs, KMC protocol, KMC compliance and KMC in Malawi.

1.0. CHAPTER 1
INTRODUCTION OF THE STUDY

1.1. Introduction of the Study

Low birth weight (LBW) is the leading cause of neonatal deaths and under-five child mortality. Fifteen million LBW babies are born each year, with numbers increasing every year, and its complications claiming about one million lives (World Health Organization (WHO) 2016). The increase in LBW babies annually emphasising on neonatal health care programmes significant, in order to minimise neonatal deaths (Martines, Paul, Bhutta, Koblinsky, Soucat, Walker, Bahl, Fogstad & Costello 2005). In terms of the operational categories of this study, 'neonatal' describes the age of 0 to 28 days of life, 'child' describes the age of 28 days to five years, and an 'under-five child; falls between zero days to five years of age (Chopra, Daviaud, Pattinson, Fonn & Lawn 2009, p. 839).

LBW is associated with intra-uterine growth interruption related to preterm birth of a baby, usually with a birth weight of 2500 grams and below (Bergh, Kerber, Abwao, Johnson, Aliganyira, Davy, Gamache, Kante, Ligowe, Luhanga, Makarugwiro, Ngabo, Rawlins, Sayinzoga, Sengedo, Sylla, Taylor, Rooyen, & Zoungrana 2014; WHO 2003). LBW can also manifest in the premature birth of a growth restrained foetus, hence, the words LBW and preterm birth can be used interchangeably (Lawn, Cousens & Zupan 2005). In this study, LBW will be used to refer to babies with birth weight of less than 2500 grams.

Ballot, Potterton, Chirwa, Hilburn and Cooper (2012) and Lawn *et al.* (2005) highlight that LWB babies suffer from neurodevelopmental defects, such as cerebral palsy, this exacerbates respiratory distress, hypothermia, hypoglycaemia, and severe apnoea. LBW babies are also at a high risk of acquiring infections, which predispose them to a high risk of mortality (Lawn *et al.* 2005). The prematurity health related problems are empirically evident in reducing the survival rate of preterm babies.

1.1.1. *Kangaroo Mother Care*

Studies have shown that Sub-Saharan African countries register increased numbers of neonatal mortality rates due to financial constraints in managing neonatal complications (Kinney, Kerber, Black, Cohen, Nkrumah, Coovadia, Nampala & Lawn, 2010). The neonatal mortality figures are high in Sub-Saharan African countries as the child deaths are fourteen times more than in children born in developed countries. This is attributed to low economic income secondary to poverty, poor health seeking behaviour and weak links in health systems (World Health Organization & UNICEF 2013, p. 7; WHO 2016, p. 1). In principle, prevention of or management of child mortality causes depends on the economic capability of a country, because all effective health programmes need finances to be available.

Lawn, Blencowe, Oza, You, Lee, Waiswa, Lalli, Bhutta, Barros, Christian, Mathers and Cousens (2014) and WHO and UNICEF (2013) remark that on average, 95% of neonatal deaths happen in low economic countries, where society cannot afford to manage low-birth weight babies through use of incubators. Instead, an alternative, cost-effective technique known as *Kangaroo Mother Care* is employed to improvise incubation. *Kangaroo Mother Care* (KMC) is a simple technique that involves putting a medically stable pre-term baby in a straight-up position, dressed only in a nappy, in- between a mother's bare breasts to facilitate maintenance of the neonate's body temperature through skin to skin body contact (Blencowe & Molyneux 2005; Ruiz, Charpak & Figueroa 2002). KMC technique mimics the in-utero environment to enhance the growth of the baby to a supposedly full term.

In 1978, Rey and Martinez introduced KMC in Colombia to cater for increased numbers of neonates, since its inception, there have been numerous evidence-based studies that report its effectiveness. Feldman, Weller, Sirota and Eidelman (2003, p. 23) point out that with skin to skin practice, mothers are adjusting to perceiving their preterm babies as humans. This perception helps in the development of a good mother to infant relationship, optimal social development of the baby, as well as family bonding. Previously, mothers perceived premature babies as 'lesser' infants as compared to full term born babies, which initiates the manifestation of anxiety and depression (Lawn, Mwansa-Kambafwile, Horta, Barros and Cousens 2010; Feldman *et al.* 2003). The practice of KMC allays a mother's anxiety manifested from giving birth to LBW baby.

Darmstadt, Kumar, Yadav, Singh, Singh, Mohanty, Baqui, Bharti, Gupta, Misra, Awasthi, Singh and Santosham (2006) assert that KMC helps to keep the neonate warm, and it provides the baby with a feeling of safety, contentment and love, promoting maternal and newborn bonding. It is evident that KMC is more effective than the use of incubators in the prevention and or minimising of pre-term complications. Conde-Agudelo, Belizán and Diaz-Rossello (2011) and Lawn, Kerber, Enweronu-Laryea and Cousens (2010) justify that *Kangaroo Mother Care* helps to prevent neonatal deaths arising from complications due to preterm births. It also reduces neonatal infections, and minimises LWB babies' risk of contracting nosocomial infections that occur in health facilities. KMC practice helps the mother to recognise neonatal illness early.

Flacking, Ewald and Wallin (2011, p. 195) affirm that KMC promotes neonatal weight gain, optimises breast milk uptake by the infant, minimises the workload on the nurse, and shortens hospitalisation. Skin to skin practice economises the utilisation of hospital resources, human and material resources that are already in shortage, reduces hospital stay, and facilitates early continuation of care for the mother and baby in their home setting.

March of Dimes, The Partnership for Maternal, Newborn & Child Health (PMNCH), Save the Children, WHO (2012) and Kinney, Lawn, Kerber (2009) reason that KMC has been scaled out to many countries due to its outstanding outcomes in saving low birth weight babies. KMC has evidently proven to be the best cost-effective method of reducing neonatal deaths caused by low birth weight and its complications. Darmstadt, Bhutta, Cousens, Adam, Walker and de Bernis (2005, p. 980) show *Kangaroo Mother Care* to be one of the sixteen most cost-effective evidence-based interventions to save neonates, especially with LBW.

The sixteen cost-effective interventions are outlined based on level of intervention, and these are:

A. Preconception

1. Folic acid supplementation

B. Antenatal

2. Tetanus toxoid immunisation
3. Syphilis screening and treatment
4. Pre-eclampsia and eclampsia: prevention (calcium supplementation)
5. Intermittent presumptive treatment for malaria
6. Detection and treatment of asymptomatic bacteriuria

C. Intrapartum

7. Antibiotics for preterm premature rupture of membranes
8. Corticosteroids for preterm labour
9. Detection and management of breech (caesarian section)
10. Labour surveillance (including partograph) for early diagnosis of complications
11. Clean delivery practices

D. Postnatal

12. Resuscitation of the new-born baby
13. Breastfeeding
14. Prevention and management of hypothermia
15. Kangaroo Mother Care (low birthweight infants in health facilities)
16. Community-based pneumonia case

Kangaroo Mother Care optimises neonatal survival and can effectively help to achieve Sustainable Development Goal (SDG) number three. Millennium Development Goal (MDG) number four has been replaced with SDG number three in order to continue addressing Millennium Development Goals (MDGs) from 2016 to 2030. SDG number three aims to "ensure healthy lives and promote wellbeing for all at all ages", in which its health target number 3.2 expects the countries to register 25 deaths per 1,000 live births for under five children and 12 deaths per 1000 live births for neonates. The intention

of target number 3.2 is to end new-born deaths, and those of under-five that can be prevented by 2030 (WHO 2016:4).

1.1.2. *Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs)*

United Nations Inter-agency Group for Child Mortality Estimation (UN IGME), UNICEF, WHO, World Bank and United Nations Population Division (2015) explain that Millennium Development Goal number four (MDG) was strategically put in place fifteen years ago to reduce deaths in children under the age of five by the year 2015. Global statistics indicate that in 1990, MDG number four, which aimed at the reduction of under-five child mortality, registered 12.7 million child deaths and 5.1 million neonatal deaths. In 2015, 5.9 million children died, amongst which 2.7 million were neonatal deaths (WHO 2016, p. 1; WHO 2015a).

March of Dimes *et al.* (2012, p. 1) describe that achievement of global child health and survival mainly depends on the reduction of neonatal mortality. In general, global health facilities are registering decreased child (age range of 28 days to five years old) mortality rates by putting much emphasis on implementation of many under-five evidence-based interventions. WHO (2016, p. 1-3) and UN IGME *et al*. (2015:1) remark that although there seems to be a remarkable reduction in child deaths, the world has not yet attained the targeted two-third reduction of child mortality, which was set for the years 2000 to 2015, measured against the child mortality rate of the year 1990.

The failure to attain the MDGs led the United Nations to introduce Sustainable Development Goal (SDGs) to continue addressing Millennium Development Goals (MDGs) from 2016 to 2030. SDG number three includes all health related issues, unlike in the MDG era, where maternal health was at MDG 5, and was different from child health, which was at MDG 4. In SGD three the specific health issues that can help to achieve health for all ages has been addressed under SDG number three. Each health problem has been given a goal and its health target. Currently, MDG number four is part of SDG number three, and it is addressed as SDG number three goal 3.2 (WHO 2015d). In the current study, MDG number four and SDG number three goal 3.2 will be used in reference to the strategy of improving neonatal and under-five child health.

Black, Cousens, Johnson, Lawn, Rudan, Bassani, Jha, Campbell, Walker, Cibulskis, Eisele, Liu and Mathers (2010, p. 1969) evidently predicted on MDG number four not being achieved by 2015 due to the less emphasis put in Sub-Saharan African countries on the use of Kangaroo Mother Care in the management of babies equal to or less than 2500g birth weight. The WHO, UNICEF and WORLD BANK (2015) add that the world will not achieve the SDGs, as it did not with MDGs, unless the international community, especially its low-income countries, intensify the implementation of low-cost and effective techniques for child health and survival.

It is beneficial to put much effort and emphasis on *Kangaroo Mother Care* as a low-cost effective intervention in managing LBW in developing countries, which cannot afford the use of incubators (WHO & UNICEF 2013; WHO 2016). Accessibility and utilisation of KMC will not only address neonatal deaths in these countries, but will also facilitate addressing global child mortality and attaining SDG number three's target by 2030.

1.1.3. *Kangaroo Mother Care Training*

KMC training is one of the formal strategies employed to disseminate KMC knowledge among health professionals since its inception in Bogota, Colombia in 1978 by Rey and Martinez. Chan, Labar, Wallb and Atuna (2016) imply that training of health workers in KMC protocol is one of the basic essentials in the successful implementation of KMC. There is no standardised model in KMC education and training, where each institution follows the stipulated universal aspects of the KMC training to develop the education model that best fits their setting. Bergh, Charpak, Ezeonodo, Udani and Van Rooyen (2012) further explain that the flexibility of KMC training procedure has led a number of African countries to introduce a KMC module in their teaching hospitals.

Solomons and Rosant (2012) assert that 50% of South African nurses, at one of the hospitals in the country, were trained in KMC. In Malawi, KMC providers initially undergo training before implementing the service (Blencowe & Molyneux 2005). In India, health workers undergo a 7-15 day intensive essential new born care training and KMC is included in their training package (Kumar, Mohanty, Kumar, Misra, Santosham, Awasthi, Baqui, Singh, Singh, Ahuja, Singh, Malik, Ahmed, Black, Bhandari & Darmstadt 2008).

KMC messages are passed on by trainers and educators to the KMC providers through other avenues, besides that of structured formal KMC training. These avenues include ward rounds, nurses' international meetings, supervision, coaching, onsite training and mentorship (Bergh, Charpak, Ezeonodo, Udani and Van Rooyen (2012); Chopra *et al.* 2009). Effective management of LBW babies not only depends on the acquisition of KMC knowledge through training, but also through the upgrading of nurses and midwives' educational statuses, in order to be conversant with current evidence-based information on managing a preterm baby (Solomons & Rosant 2012. Bergh, Charpak, Ezeonodo, Udani and Van Rooyen (2012) narrate that professional training, structured formal training, in-serving/on job training and/or informal training are some of the used avenues to pass on KMC knowledge to nurses, midwives and clinicians across the world. Integrating KMC in new born care to reduce neonatal mortality is one of the core values (Zimba, Kinney, Kachale, Waltensperger, Blencowe, Colbourn, Mwansambo, Joshua, Chanza, Nyasulu, Mlava, Gamache, Kazembe & Lawn 2012).

1.1.4. *International Perspective*

1.1.4.1. *Australia*

WHO (2008, p. 132) confirm that Australia is among one of the high-income countries with a very low neonatal death rate. Currently, Australia is registering an under-five mortality rate of nine per 1,000 live births and two neonatal deaths per 1,000 live births (UN IGME *et al.* 2015:19). The figures in under-five and neonatal mortality rates translate to the fact that 22% of under-five mortality is contributed by neonatal deaths. In rich countries that record small numbers of neonatal deaths, due to their sophisticated measures, *Kangaroo Mother Care* benefits can also be employed in their setting, in order to increase the chances for pre-term baby survival (Nyqvist, Anderson, Bergman, Cattaneo, Charpak, Davanzo, Ewald, Ludington-Hoe, Mendoza, Pallás-Allonso, Peláez, Sizun & Widström 2010).

Australian society not only uses high technological measures to save neonates, but also practices some aspects of KMC to enhance neonatal survival. Catling-Paull, Coddington, Foureur and Homer (2013, p. 617), in their six-year Australian study, recorded a neonatal mortality rate of 3.3 and 97% among mothers that breastfed their babies soon after delivery. Breastfeeding facilitates skin- to skin contact and it promotes maternal and infant bonding, hence it is part of KMC (Victora, Rubens & GAPPS Review Group 2010). Following the study by Catling-Paull *et al.* (2013), it has been concluded that KMC is implicitly practiced in rich countries in addition to the use of high technology. Costello, Osrin and Manandhar (2004) and WHO & UNICEF (2013) justify that KMC is practiced globally, although it is intensely practiced, and protocols followed in developing countries, due to poverty and financial constraints.

1.1.5. *African Context*

1.1.5.1. *The Republic South Africa*

According to UN IGME *et al.* (2015, p.2; 25), South Africa is one of the Sub-Saharan African countries that reduced child mortality rate. Although it did not attain the MDG 4 it managed to reduce child mortality rate by one-third. It had an under-five mortality rate of 41 per 1,000 live births from 60 children dying per 1,000 births in 1990. The neonatal mortality rate is at 11 per 1,000 live births. It ought to be born in mind that prematurity is the global main cause of neonatal deaths. In South Africa, the leading cause of neonatal mortality is also preterm deaths, it contributes 40% to neonatal mortality (Chopra *et al.* 2009).

South Africa introduced KMC practice in 1995, though KMC policy came into play in 2000 with the aim of reducing neonatal deaths. KMC is initiated to all health facilities, which provide new born care

(UN IGME *et al.* 2015; Desai, Hann, Ryan, Kirsten, Bergman, Kamfer, Baxen, Swanepoel, Van Der, Walt, Thomas, Noach, Lenga, Olivier & Prins 2011). South African society practices the KMC technique at a large scale, in more than half of the country's hospitals (Victora *et al.* 2010, p. 14; March of *Dimes et al*. 2012, p. 72).

In 2005, thirty-four hospitals in the Kwazulu-Natal province were practicing KMC in the initiative called "Ukugona (cuddle) Outreach" (Pattinson, Arsalo, Bergh, Malan, Patrick & Phillips 2005). The widespread practice of KMC in the country shows that many nurses, midwives and clinicians are trained in KMC. Every single facility that practices the technique has a trained KMC provider. Solomons and Rosant (2012) agree in their study, conducted at one of the district hospitals in Cape Town, and they support this fact. They confirm that 50% of the nurses underwent KMC training and they are committed to the implementation of KMC.

Victora *et al*. (2010, p. 14), March of Dimes *et al.* (2012) and Chopra *et al.* (2009) theorise that commitment alone in the implementation of KMC cannot assist in saving LBW babies. Commitment, coupled with the availability of package materials, continuous onsite supervision, and facilitation, are of paramount importance in KMC implementation. Vesel, Bergh, Kerber, Valsangkar, Mazia, Moxon, Blencowe, Darmstadt, Johnson, Dickson, Pelaez, Von Xylander and Lawn (2015) add that mothers are the key providers of KMC practice for optimal and quality LBW babies' care. KMC practice is a two-way process, whereby the provider supports the mother with up-to-date information on KMC practice and the mother does the practice by following the KMC protocol, in the long run optimising preterm babies' chances of survival.

Chopra *et al.* (2009) have empirically shown the successes of supervision and onsite facilitation on KMC practice. The study asserts that Limpopo midwives and clinicians formed an initiative by the name of "Limpopo Initiative for New-born Care". The initiative was established solely to integrate KMC new-born care into the facility interventions. Through supervision, coaching, and conducting onsite training and mentorship, the initiative reduced by 15% LBW baby mortality, which in turn helped to reduce the neonatal death rate from 12 to 10 deaths in 1, 000 live births. March of Dimes *et al.* (2012, p. 74) further confirm another South African province reaching sixteen hospitals with KMC protocols, through training and mentorship under the initiative called "Neonatal Experiential Learning". The initiatives in the country translate to national commitment in reducing neonatal deaths.

The rate of neonatal deaths in South Africa evidently shows that midwives and nurses have got the capacity to implement KMC and also that mothers comply in practicing KMC. The commitment of KMC providers and compliance by mothers has led to the effective and efficient managing of LBW babies and increasing their survival probability, in turn reducing neonatal and child mortality rates. By

2030, South Africa will surely be one of the countries, if it should not backslide, contributing to the SDG target of 12 neonatal deaths per 1,000 live births, and a child mortality rate of 25 per 1,000 live births.

1.1.5.2. *The Republic of Malawi*

UN IGME *et al.* (2015, p. 23) highlight that in 1990, Malawi had an under-five child mortality rate of 106 per 1,000 live births and a neonatal mortality rate of 49 deaths per 1,000 live births. The statistics of under-five mortality rate compare to neonatal mortality rate indicates that 49% of under-five child mortality was contributed by neonatal deaths. Zimba *et al.* (2012) confirm that the use of few incubators in neonatal units, which could not carter for the increasing number of the LBW babies, exacerbated neonatal deaths. The inadequate use of incubators in the neonatal unit prompted midwives to nurse more than one neonate in a single incubator. Hypothermia and cross-infections among the neonates became the main cause of neonatal deaths.

Blencowe and Molyneux (2005) explain that in 1999, Malawi introduced KMC intervention, which is a cheap and sustainable method to care for low birth weight babies, as compared to the use of incubators. Bergh, van Rooyen, Lawn, Zimba, Ligowe and Chiundu (2007, p. 36) further explain that in Malawi, KMC was first introduced at Zomba Central Hospital (ZCH) by Dr. Charlotte Adamcsick, who attended a KMC international meeting in Bogota, Colombia. Dr. Adamcsick noticed that the problems that led to the development of KMC technique in Bogota to be the same as those ZCH was encountering. Zimba *et al.* (2011) describe problems of neonatal unit congestion, inadequate incubators, and neonatal deaths, due to infections and hypothermia.

In 2002, ZCH was officially opened as a KMC training centre. The KMC trainings that were taking place from 2002 to 2004 depended on the materials that the trainers' developed. In 2005, the Malawi Ministry of Health (MoH) developed a KMC training manual to formalise and standardise the training content. The KMC training manual facilitated dissemination of uniform KMC knowledge (Bergh *et al.* 2007; Zimba *et al*. 2012).

Malawi MoH and international Non-Governmental organisations (NGOs) supported the scaling up of KMC implementation through in-service training (Zimba *et al.* 2012). Nursing and medical college syllabi included KMC package to enhance acquisition of KMC knowledge during the students' professional education. The inclusion of KMC in formal education aided the country in having more KMC trained providers and enhanced the implementation of KMC by trained providers (. Bergh, Charpak, Ezeonodo, Udani and Van Rooyen, 2012; Bergh *et al.* 2007).

Victora *et al.* (2010) and Blencowe, Kerac and Molyneux (2009) cited in Bergh *et al.* (2014) narrate that despite the slow progress in scaling up of KMC practice in Malawi, implementation of KMC has been intensified by incorporating KMC into the health care initiatives. Zimba *et al.* (2012, p. iii93) describe the initiatives Essential New Born Care and the national multi-year initiative of 2005-2015 terms as 'Road Map for Accelerating Reduction of Maternal and Newborn Mortality and Morbidity in Malawi' (hereafter Road Map).

Malawi has trained KMC providers and it is practicing the technique over incubators for it is evidently cheap, sustainable, efficient and effective in reducing neonatal infection, hypothermic and neonatal respiratory problems as justified by (Conde-Agudelo, Belizán & Diaz-Rossello 2011). KMC trainings and neonatal care initiatives have helped KMC units grow from one to 121 KMC units. LBW babies are tracked, monitored and evaluated to optimise preterm babies' chances of survival, as noted by. Bergh, Charpak, Ezeonodo, Udani and Van Rooyen. (2012) and Bergh *et al.,(*2007).

Currently, Malawi is among the twelve low-income countries to have achieved the two-third reduction of under-five child mortality. The country has a child mortality rate of 64 deaths per 1,000 live births, of which 34% of it is contributed by neonatal deaths. The introduction and implementation of KMC has helped the country to achieve MDG number 4 (UN IGME *et al.* 2015; WHO 2015a).

In the realm of intensifying implementation of KMC in order to give a LBW baby the chance to survive, at the same time working towards an SDG three target of 12 neonatal deaths per 1,000 live births by 2030. Malawi is to renovate ten district hospitals' neonatal care units and extend one of the tertiary level hospital's KMC unit to have a bed occupancy of 40 (WHO 2015c).

1.2. Problem Statement

Blencowe and Molyneux (2005) highlighted that KMC mothers were allegedly not compliant with KMC protocol. Bergh, Banda, Lipato, Ngwira, Luhanga and Ligowe (2012) made the recommendation to strengthen either intermittent or continuous Kangaroo Mother Care, in order to prevent neonatal deaths resulting from LBW complications. The recommendation was made following the observation that they made during the KMC service evaluation in 14 facilities across Malawi, including the hospital that Blencowe and Molyneux (2005) conducted a study. In 57% of the evaluated hospitals, the mothers were practicing KMC as it was reported by the nurses. In another 43% of the hospitals, nurses indicate that they used KMC in the neonatal unit, but when the assessors visited the neonatal units, they observed no mother practicing KMC. The assessors did not manage to enquire from mothers with regards to compliance. Chisenga, Chalanda and Ngwale (2014) conducted a study to review mothers' experiences of KMC in two facilities, which Bergh, Banda, Lipato, Ngwira, Luhanga and Ligowe, (2012) had

assessed two years earlier. The study highlighted areas that may be presumed to have affected the alleged non-compliance to KMC practice, despite mothers being knowledgeable with regards to KMC protocols. In turn, the core of addressing SDG number three is defeated, since low birth weight deaths contribute significantly to child mortality rate.

UN IGME *et al.* (2015) point out that in 2015, Malawi's neonatal deaths contributed 35% to under-five mortality. In 2013, 34% of under-five deaths were from neonatal deaths. According to these statistics, Malawi reduced neonatal deaths by 1% between 2011 and 2015. This clearly proves that there is indeed a need to intensify implementation of the cost-effective intervention, KMC, as a post-neonatal programme (Martines *et al.* 2005). WHO (2015b) further, shed light on the need to intensify KMC in the country, as the article narrates that Malawi is the top-most country in the world, with the highest preterm birth rate of 18.1 per 100 live births.

The highest preterm birth rate in Malawi, possible non-compliance of mothers in KMC, coupled with the non-intensification of KMC, poses a need to conduct a research study on the key providers of KMC, mothers, in order to help in the reduction of neonatal deaths. Van Ekdoma, Stenberg, Scherpbier and Niessen (2011) point out that the measure of the world's development and health is dependent on the health of children. In order to reduce under-five child mortality through optimisation of preterm babies' survival, it is appropriate to enhance the implementation of KMC with evidence-based information. Therefore, it is ideal to describe KMC mothers' compliance in the implementation of the service.

Currently, 2015 global statistics indicate that neonatal deaths contribute 46% to under-five children's deaths as compared to the data for 2013 where neonatal death accounted for 40% of under-five child deaths (WHO & UNICEF 2013). The increase in the percentage at which neonatal mortality is occurring, confirms that neonatal deaths are the main contributors to raised figures of under-five children deaths. Implicitly, neonatal deaths have largely contributed to the non-attainment of MDG number four. KMC needs to be widely implemented in order to address reduction of child mortality, hence facilitating the attainment of SDG number three target 3.2.

1.3. Aim of the Study

The aim of this study is to describe mothers' compliance to *Kangaroo Mother Care* at a selected hospital in southern Malawi.

1.4. Research Objectives

- To describe mothers' knowledge of the KMC concept and protocol
- To describe mothers' practice of KMC
- To describe mothers' compliance with KMC protocol

1.5. Research Questions

- What knowledge do mothers have on KMC?
- What do mothers' practice in KMC?
- What are the compliance indicators of KMC protocol that mothers conform to?

1.6. Significance of the Study

1.6.1. *Nursing and Midwifery Practice*

The findings of this study will help in bridging the KMC theoretical and practical gap so as to give way to improved quality on KMC practice.

1.6.2. *Nursing and Midwifery Research*

In this study, the areas which need further research will be identified, thereby helping to inform future research.

1.6.3. *Nursing and Midwifery Education*

The study findings will be utilised by KMC trainers to incorporate into the basic KMC training guidelines for in-service training.

1.6.4. *Government*

The study results will inform the development of KMC policy in the realm of reduction of neonatal death, which will be attributed by quality implementation of KMC service.

1.7. Definition of terms

1.7.1. *Low Birth Weight*

WHO (2015e) describes LBW as a baby born with birth weight of 2500 grams or less. In this study, a LBW baby is referred to as the baby weighing 2500 grams and below, irrespective of gestation age at birth.

1.7.2. *Preterm Baby*

A preterm baby is defined as any baby born before 37 weeks of gestation age (WHO 2003).

1.7.3. *Kangaroo Mother Care*

Vesel *et al.* (2015, p. 2) define KMC as "an approach to the care of preterm and/or LBW infant, which engages and empowers mothers and families as the main providers of the biological (warmth and food) and psycho-emotional (contact, caring, bonding and comfort) needs of their new-born." In this study, KMC will be referred to as nursing a LBW baby in an up-right position unto the chest of its mother, in skin-to- skin contact, as is the essence of KMC (Vesel et al. 2015).

1.7.4. *Compliance*

Cramer, Roy, Burrell, Fairchild, Fuldeore, Ollendorf and Wong (2008) describe compliance as conforming or adhering to the stipulated recommended protocol, in order to yield the possible desired outcome. In this study, compliance will be referred to as a mother adhering to KMC protocol.

1.7.5. *Neonatal Unit*

Bencowe and Molyneux (2005) define a neonatal unit as a ward/unit where LBW babies are nursed whilst at the health facility. In this study, a neonatal unit will be referred to as the unit in the health facility set aside to accommodate and nurse babies with a birth weight of 2500 grams and below.

1.8. Conceptual Framework: Health Belief Model (HBM)

1.8.1. *History and Orientation of HBM*

HBM is a popular and widely used model in research studies (Burke 2010). It was developed in 1952 by three social psychologists, working with United States (U.S) Public Health Service namely Godfrey Hochbaum, Irwin Rosenstock and Stephen Kegels. The model was initiated in line with the U.S Public Health Service, which stressed the prevention of diseases over the treatment of illnesses. The originators

of HBM observed that although much emphasis was placed on preventive health interventions, most people were not utilising these preventive services (Hochbaum, Rosenstock & Kegels 1952).

The HBM was developed to describe persons' behaviours pertaining to engaging in a health preventive measure, in relation to an individual's knowledge and beliefs (Burke 2010; Janz &Becker 1984). Individual perception of the risk of acquiring the disease and the perceived benefit when action is taken play a crucial role in the motivation to access the service (Hochbaum *et al.* 1952).

The model was later applied in research studies dealing with individuals' compliance of prescribed regime in the prevention and/or treating of diseases. Hence, this research study's choice of HBM, to help describe compliance of mothers' in the practice of KMC (Janz & Becker 1984; Tarkang & Zotor 2015; University of Twente (UTwente) 2012).

1.8.1.1. HBM's Essential Assumptions

UTwente (2012) narrates that HBM is understood on the premise that an individual takes a health-related action based on the following:

- An individual has a feeling that a health problem is avoidable. In relation to this research, a mother feels that neonatal death due to LBW is avoidable.
- An individual expects a positive outcome when she carries out the recommended health-related action, in this way, avoiding a health-related problem. Pertaining to this study, a mother feels that performing KMC will help in preventing the death of her preterm baby.
- An individual believes that she can perform the recommended health action successfully, comfortably and with confidence. In this study, the mother believes that she can practice KMC comfortably and confidently, in order to yield the desired outcome, and optimising LBW babies' survival.

1.8.2. HBM's Concepts

Hochbaum *et al.* (1952) and UTwente (2012) explain that HBM rests on four main concepts, viz.: perceived susceptibility, severity, barriers and benefits. These four concepts help an individual to make a decision to act. Glanz, Marcus and Rimer (1997, p. 19), to narrate that these concepts have an influence on a person's "readiness to act". Glanz, Rimer and Viswanath (2008) narrate that there are certain variables/modifying factors that may indirectly influence individuals to engage in health-related behaviour. These are age, gender, ethnicity, personality, socioeconomics and knowledge. Rosenstock, Strecher and Becker (1988) further explain that aside from the four perceptual concepts, there are

internal and/or external forces that activate an individual to act. These concepts are called cues to action and self-efficacy.

Below is a diagrammatic representation of HBM, revealing and how the six concepts influence an individual to perform a health-related action.

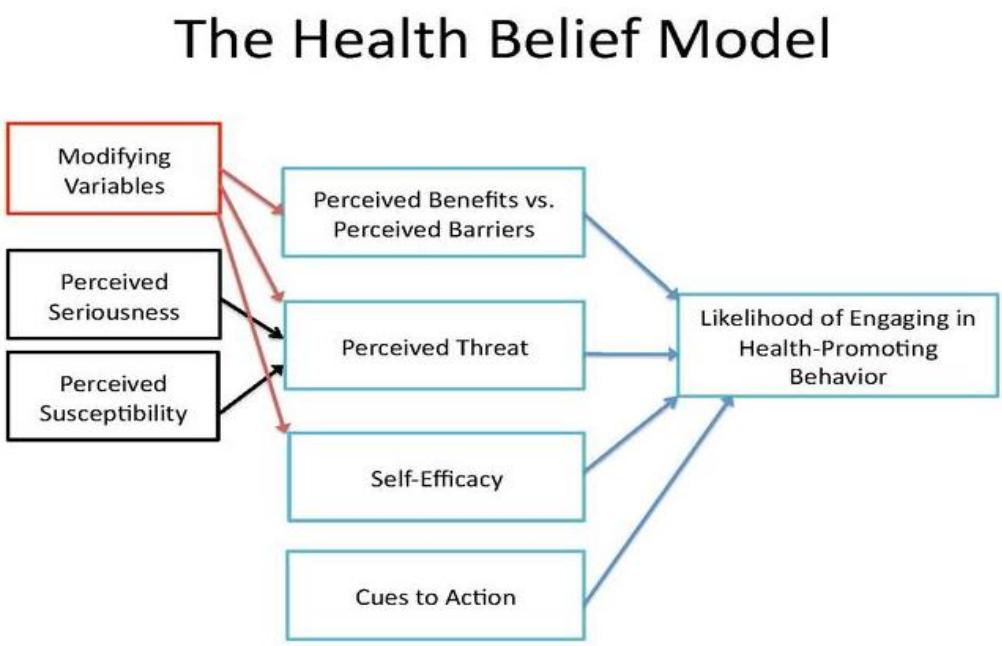


Figure 1: Conceptual Framework (HBM).

Extracted from https://za.pinterest.com/pin/101823641551978759/

1.8.2.1. Perceived Susceptibility

Hochbaum *et al.* (1952) define perceived susceptibility as individual's opinion on the probability of acquiring a health condition that would affect one's health. Lawn *et al.* (2014) and March of Dimes *et al.* (2012) narrate that a LBW baby is at high risk of contracting infections and becoming hypothermic due to its undeveloped body systems. To engage in prescribed health interventions, in order to prevent hypothermia and infections in a preterm baby largely depends on the KMC mother's perception o her preterm baby's susceptibility to infections and hypothermia. Pertaining to this study, when the mother perceives that a LBW baby is highly susceptible to infections and hypothermia, there is a likelihood that a mother will comply with prescribed KMC protocol, in order to prevent her preterm baby from contracting infections and becoming hypothermic.

1.8.2.2. Perceived Severity

Glanz *et al.* (1997) refer to perceived severity as one's view on the seriousness and the severity of the outcome of the viewed health condition. When an individual realises the challenges that the health condition will bring, there is high probability of engaging in the prescribed health activity (Hochbaum *et al.* 1952). Hypothermia and infections in LBW baby poses a high risk of neonatal death (Lawn *et al.* 2005). According to this study, when a mother realises that LBW is a severe condition that places a preterm baby at high risk of dying, if not conforming to KMC protocol, she will definitely comply with KMC practice.

1.8.2.3. Perceived Benefits

Perceived benefit is described as one's view of the efficacy and likelihood of the recommended health action in reducing the severity of the health condition (Janz & Becker 1984). The acceptance of an individual being susceptible to a health condition and perceived severity will not drive an individual to engage in a health action unless the individual views the action as effective in preventing the health condition (Loke, Davies & Li 2015). In this study, when a mother views that practicing KMC will help in reducing the possibility of her preterm baby from contracting infections, subjected to dyspnoea and hypothermia, the mother is more likely to practice KMC, according to recommended KMC protocol, in order to optimise LBW baby's chances of survival.

1.8.2.4. Perceived Barriers

Janz and Becker (1984) describe perceived barriers as an individual's opinion on the issues he views as challenges that will prevent him from taking a health action. Hochbaum *et al.* (1952) and Abolfotouh, BaniMustafa, Mahfouz, Al-Assiri, Al-Juhani and Alaskar (2015) further explain that although an individual perceives that engaging in a recommended health action is beneficial, the opinion on the challenges that hinder to engage in a health action plays a role in decision making. The challenges may be viewed as inconvenience, unpleasantness and expensiveness of the treatment. In this study, the mother needs a cloth, a baby hat, socks and her commitment to implement the KMC. Rimer and Glanz (2005) narrate that encouragement and support aids in overcoming perceived barriers. The implementation of KMC will also depend on the mother's ability to manage the perceived barriers (Rosenstock *et al.*1988).

1.8.2.5. Cue to Action

Tarkang and Zotor (2015) describe cue to action as the internal and/or the external factors that prompts an individual to take a recommended health action. Taylor, Bury, Campling, Carter, Garfield, Newbould and Rennie (2007) narrate that cue to action plays a role in reminding an individual who perceives he/she is susceptible to a condition and its outcomes are detrimental to one's health, hence engaging in prescribed health action to be critical. In this study, pictures of a mother practicing KMC, printed materials about KMC, advice on KMC by family members and nurses are one of the motivators to take health-related action (Glanz *et al.* 1997; Jeihooni, Hidarnia, Kaveh, Hajizadeh & Askari 2016).

1.8.2.6. Self-Efficacy

Rosenstock *et al.* (1988) refer to self-efficacy as one's self-confidence in being able to perform the recommended health action. The self-confidence is shown when the individual consistently and correctly complies with the recommended health action, until the benefits of the prescribed action manifest (Glanz *et al.* 1997). In this study, the mother has to have self-confidence in practising KMC and persist in complying with KMC protocol in order to achieve the perceived benefits of KMC practice.

1.8.3. Application of the Theory in the Study

Table 1: The summary of six HBM concepts and application to mothers' compliance to KMC practice adapted from Glanz *et al.* (2008, p. 48).

Concept	**Perceived susceptibility**	**Perceived severity**	**Perceived benefits**	**Perceived barriers**	**Cues to action**	**Self-efficacy**
Application and implication regarding this research study	Mother's perception that her LBW baby is prone to contracting neonatal infection and could easily be hypothermic.	Mother's perceive that neonatal infection and hypothermia are serious conditions in an LBW baby. These conditions minimise an LBW baby's chances of survival.	Mother's perception of compliance in KMC practice maximises LBW baby's survival.	Mother's perception of the barriers to KMC practice and how they can be managed.	Reminders that a mother encounters that pertain to KMC practice.	Mother's confidence and ability in complying to KMC practice.

Perceived susceptibility, perceived seriousness of LBW and perceived benefits of KMC compliance coupled with motivators to engage in health-related activities help the mother to find ways of dealing with the perceived barriers, in order to facilitate in the LBW baby's survival.

1.9. Layout of the Study

- Chapter One consist of introduction of the study, problem statement, aim of the study, research objectives, research questions, significance of the study, definition of terms, conceptual framework and application of the theory to the study.

- Chapter Two represents the literature review that highlights the relevant literature pertaining to the research topic.

- Chapter Three comprise of research methodology used that facilitated analysing and description of mothers' compliance to KMC at a selected central hospital in the Southern region of Malawi. The research methodology includes: research approach, design, philosophical paradigm, research setting, study population, inclusion criteria of the participants, sample and sampling technique, data collection and tool, pre-testing study, validity and reliability of the study, data analysis, data management, data dissemination and ethical considerations.

- Chapter Four presents the quantitative data analysis, presentation and interpretation of the study results in the forms of graphs and pie charts.

- Chapter Five is the discussion of the research findings, recommendations and limitations of the study.

1.10. Conclusion

In summary, this chapter introduces the study, pin-pointing the core of the study, outlining the aim of the study research, as well as the research objectives and questions. It also narrates the significance of the study, defining key terms of the study, and it describes them in relation to the study. Finally, the chapter discusses the conceptual framework, in line with the study topic and in order to get a theoretical understanding of the study. Chapter Two consists of literature review.

2.0. CHAPTER 2
LITERATURE REVIEW

2.1. Introduction

The literature search of this study is based on describing a phenomenon, its interpretation is centred on testing a given phenomenon, which translates into positivism theoretical perception as the core of this study (Brink, Van de Walt & Van Rensburg 2012:122). The LBW births, which is the leading cause of neonatal mortality, led to the development of KMC model so as to minimise neonatal mortality caused by LBW health outcomes. Therefore, the study is primarily concerned with enhancing ways to facilitate implementation of KMC in reducing neonatal mortality through describing the mothers' compliance to KMC.

The chapter briefly explains the relevant literature pertaining to the research topic.

The following sources were used in the literature search:

- Printed materials, journals and books: Research books, ethics journals and research journals
- References were obtained from the reference listed at the end of journal articles and books.
- Electronic databases: Google-scholar, eBsco, World Wide Web (WWW) and JSTOR.
- International health-related websites: World Health Organisation and CDC

The Harvard referencing system has been used throughout this document. The search words used in retrieving relevant material include: LBW globally, LBW in Sub-Saharan countries, KMC practice in Sub-Saharan countries, neonatal mortality, MDGs and SDGs, KMC protocol, KMC compliance and KMC in Malawi.

The chapter briefly explains the relevant literature pertaining to the research topic. The outline is as follows:

- History of KMC
- KMC protocols/guidelines/components
- Advantages of KMC
- Global LBW mortality
- KMC in Sub-Saharan African countries
- KMC compliance
- KMC implementation in the Republic of Malawi
- Conclusion

2.2. Scope of Literature Review

2.2.1. History of KMC

In late 1970s in Bogota Colombia, Drs. Rey and Martinez introduced mother and infant skin to skin contact care (KMC) in response to increased neonatal deaths due to overcrowding of neonatal unit, insufficient incubators and cross infection among the low birth weight babies (Bergman 2015; Bergh *et al.* 2007; WHO 2003). Since KMC conception, governments and non-governmental organisations across the world have taken part in the implementation and scaling up of KMC services (Vesel *et al.* 2015).

2.2.1.1. A brief history of Kangaroo Mother Care

Table 2: A brief history of Kangaroo Mother Care. Adapted from Bergman (2012-2016, p. 1).

Year	Activity
1979	Drs. Rey and Martinez started the programme in Bogota, Colombia, in response to shortage of incubators and severe hospital infections.
1983	UNICEF brings attention to the programme.
1985	Number of visits from USA, UK and Scandinavia, first English report published in *The Lancet* by Whitelaw and Sleath, May 1985.
1986 onwards	Research in Europe and USA. Implementation widespread in Scandinavia and German. Early implementation in Mozambique and other African countries.
1991	First review of research published by Gene Cranston Anderson.
1996	First International workshop, Trieste, Italy, hosted by Adreano Cattaneo and team. Noted over thirty different terms used, agreed to use KMC (Kangaroo Mother Care), defining the programme of skin-to-skin contact, breastfeeding and early discharge. The term "KC" refers only to intervention "intrahospital maternal-infant skin-to-skin contact".
1998	First International Conference on Kangaroo Care, Baltimore, Maryland, USA, arranged by Susan Ludington-Hoe.
1998	Second International Workshop, Bogota, Colombia, arranged by Nathalie Charpak and team; focus on research and implementation.
2000	Third International Workshop, Yogyakarta, Indonesia.

2002	Fourth International, Workshop Cape Town, South Africa.
2004	Fifth International Workshop, Rio de Janeiro, Brazil.
2006	Sixth International Workshop, Cleveland, USA.
2008	Seventh Intercalation workshop, Uppsala, Sweden.
2010	Eighth Intercalation Workshop, Quebec, Canada.

2.2.2. KMC Protocol

The main components of KMC are: kangaroo position, nutrition, support and discharge and follow up (Charpak and Ruiz-Peláez 2006; Woods, Theron, Bergh, Bergman, Bonnici, Christie, Hann, Hofmeyr, Honikman, Kirsten, Kreft, Ryan & Strydom 2016).

2.2.2.1. KMC Position

Initiation of KMC practice depends on the medical condition of the LBW baby (Blencowe & Molyleux 2005). Babies who are born at a small gestational age (LBW) have medical complications, however, "the more preterm and small for gestational age the infant is, the more frequent the problems are" as such encouraging mothers to initiate KMC early after ruling out medication problems before initiation of KMC is of essence (WHO 2003, p. 19).

KMC practice should be initiated as early as possible, in order to prevent neonatal deaths, which mostly occur in the LBW baby's early days of life (Lawn, Mwansa-Kambafwile, Horta, Barros and Cousens 2010). The mother ought to practice KMC for the period of 18 hours to 24 hours a day (continuous KMC) or less than 18 hours a day (intermittently) to as low as 30 minutes per day, which should gradually be increased from days to weeks of practice depending on the medical condition of the baby (WHO 2003; Vesel *et al.* 2015).

Vesel *et al.* (2015) narrate that the longer the LBW is kept in KMC possible the good the outcome. WHO (2003) further agree that the effectiveness of KMC practice largely rests on early initiation, how long the LBW stays in KMC per day, and finally, the general duration the LBW baby spends on KMC position. The LBW baby ought to be nursed in KMC position until it is allegedly 40 weeks of gestation and/or it reaches 2500g body weight, able to control its body temperature and it is no longer tolerates being in skin to skin position (Charpak & Ruiz-Peláez 2006; WHO 2003).

2.2.2.2. Nutrition

Feeding is one of the necessities that the LBW baby receives whilst in KMC position. Initially, feeding is either through expressed breasting milk, taken by cup, expressed into the baby's mouth or nasogastric

tube, and/or breastfeeding, depending on the baby's gestation age. The amount and number of feds largely depends on the baby's body weight. The LBW baby who is fed at least eight times a day is likely to gain weight as compared to its counterpart who is fed less than eight times a day. As such, an LBW baby is fed day and night (Charpak & Ruiz-Peláez 2006; WHO 2003). Breastmilk supplementation is also used in some conditions (Ruiz *et al.* 2002; Charpak & Ruiz-Peláez 2006).

2.2.2.3. Support

Mothers, fathers and family members are the primary providers of KMC, as such supporting the mother in KMC practice facilitates adherence to KMC protocol as the care is uninterrupted (Chan *et al.* 2016, p.131).

2.2.2.4. Discharge and Follow up

Discharging the LBW baby from the hospital depends on its body weight and excluding any medical conditions. The LBW baby continues to be nursed in KMC position in the home setting and is scheduled for follow up appointments at the hospital, in order, to monitor its growth (WHO 2003).

2.2.3. Advantages of KMC

There are numerous advantages of KMC, for simplicity purpose the advantages are grouped for LBW baby, mother and facility.

2.2.3.1. LBW Baby

KMC provides warming to the LBW baby, hence preventing hypothermia and promotes regulation of normal body temperature (36.5 degrees Celsius to 37 degrees Celsius). KMC also normalises heart rate and regulates breathing in LBW babies, as such, reduces the occurrence of apnea (WHO 2003; Ludington-Hoe, Hadeed & Anderson 1991). Charpak, Ruiz-Pela´ez, Figueroa de C and Charpak (1997) conducted a study to assess the effectiveness of KMC over traditional care. The study was interrupted due to severe effects on the traditional care group. The study found that KMC reduced neonatal mortality and morbidity over conventional care. LBW babies who were under conventional care had incidence of nosocomial infections, unlike LBW babies in the KMC group. Exclusive breast feeding was shown in KMC group, as compared to the conventional care group, where episodes of mixed feeding were experienced. Therefore, KMC promotes exclusive breast feeding over traditional care. Lawn, Mwansa-Kambafwile, Horta, Barros and Cousens, (2010) agree that KMC promotes breastfeeding, weight gain in LBW babies and reduces neonatal morbidity and mortality by 95 percent.

2.2.3.2. Mother

Lawn, Mwansa-Kambafwile, Horta, Barros and Cousens, (2010)) narrate that KMC reduces maternal anxiety by promoting comfortability in nursing LBW baby, as well as mother and baby bonding, and care. KMC reduces mother's time spent in the hospital (Charpak *et al.* 1997). KMC allows the mother to be in the leading role for the caring of her LBW baby's physical and emotional requirements (Ruiz-Peláez, Charpak and Cuervo 2004).

2.2.3.3. Facility

Charpak *et al.* (1997) and Lawn, Mwansa-Kambafwile, Horta, Barros and Cousens, (2010) found that KMC reduces number of days the health workers nurse the LBW babies, thereby minimising workload and congestion of neonatal units. Charpak and Ruiz-Peláez (2006) add that KMC facilitates in less utilisation of hospital resources.

2.2.4. Global LBW Mortality

UN IGME *et al.* (2015, p. 1) highlight that globally, the rate of neonatal mortality reduction has been slower as compared to the reduction of deaths in children of more than 28 days to five years of age. Martines *et al.* (2005, p. 1195) justify that much emphasis has been placed on post-neonatal child programmes rather than on the neonatal programmes (between the age 0 to 28 days of life). The emphasis of post-neonatal programmes has led to the slow progress in reducing the neonatal mortality rate and failure of attaining MDG number four (Lawn, Kerber, Enweronu-Laryea and Cousens, 2010) In order to achieve the targeted SDG neonatal mortality rate by 2030, it is of efficiency to identify countries that are contributing much to the figures of child mortality so as to put more effort in those countries (WHO, 2016). Child mortality is high in Sub-Saharan African countries, as such encouraging implementation of low-cost and effective measures in these countries, such as KMC, will enhance child survival, hence facilitating the achievement of SDG number 3.2 by 2030 Kinney *et al.* 2010; WHO & UNICEF 2013)

2.2.5. KMC in Sub-Saharan African Countries

In a study done in Ghana by Bergh, Manu, Davy, Van Rooyen, Asare, Williams, Dedzo, Twumasi, and Nang-Beifubah, 2012 (p. 8, 2012) noted that initiation of KMC in 38 health facilities was effective in reducing neonatal deaths, in the sense that most of the health facilities in which KMC was initiated were not using incubators prior to introduction of KMC practice. Hence, the reduction was largely contributed by the facilities that took KMC as their only measure of caring for LBW babies.

Bergman and Jurisoo (1994) agree that at a mission hospital in Zimbabwe, KMC enhanced the survival rate of babies below 1500 grams from 10-50 percent. The survival rate of babies with birthweight ranged from 1500 grams to 1999 grams ranged from 70-90 percent. As such, KMC improves the survival rate of low birth weight babies in developing countries, hence, is a recommended method to enhance LBW babies' survival in the settings without incubators.

Cannoodt, Kayinamura, Van Kerschaver, Nambajimana and Rudasingwa (2014) expound that to KMC enhanced LBW babies' survival in Rwanda, as evidenced by 80.3% survival of the LBW babies who enrolled in a KMC study. Feucht, Van Rooyen, Skhosana and Bergh (2016) enhanced the implementation of KMC by establishing the South African "district clinical specialist team" in order to improve the survival rate of LBW babies.

2.2.6. KMC Compliance

Studies have shown that some of the mothers in Sub-Saharan countries default to implement KMC, although it seems KMC is an effective technique in managing preterm births and it is less costly to use. Defaulting to practice KMC has contributed to increased numbers of neonatal deaths (UN IGME *et al,* 2015). Victora *et al.* (2010) expound on the evidence based studies on defaulting of mothers to practice KMC. Charpak *et al.* (1997) observed in their Colombian study that was assessing importance of KMC over conventional care that 11% of the mothers under study were not compliant to the KMC components. Darmstadt *et al.* (2005) narrate in a Mozambique study that mothers default at almost every stage of KMC. Kumar *et al.* (2008) agree that in India, not all mothers comply with KMC protocol.

In Nguah, Wobil, Obeng, Yakubu, Kerber, Lawn and Plange-Rhule. (2011) study in Ghana, even though mothers were under observation for KMC, they still found more defaulters. There are no specific studies done in Malawi assessing KMC compliance by mothers. Malawian mothers are allegedly defaulting to practice KMC, as shown through self-reporting, observation and conclusions (Blencowe & Molyneux 2005; Bergh, Banda, Lipato, Ngwira, Luhanga and Ligowe *et al.* 2012; Rylance &Ward 2013; Chisenga *et al.* 2014).

During observational study, individuals are aware that they are being monitored or observed, as such they behave consciously. In a control group individuals act naturally, where defaulting is inevitable (Brink *et al.* 2012; Varkevisser, Pathmanathan, and Brownlee (2003); Burns & Grove 2011; Brink & Wood 1998). Sloan, Ahmed, Mitra, Choudhury, Chowdhury, Rob and Winikoff (2008) agree that in the Bangladesh study it was observed that less than a percentage of mothers practiced KMC. This is the evidenced based reality on the ground. Individuals were behaving normally, not knowing they were under observation. Blencowe *et al.* (2009) observed that 40% of the defaulters do not survive. As such,

more of the defaulters are part of the raised numbers in neonatal deaths. However, KMC compliance is enhanced when the KMC mothers are supported by the nurses, fathers, family members and community (Blomqvist, Rubertsson, Kylberg, Jö Reskog and Nyqvist.. 2012, p. 1994 & Chan *et al.* 2016, p.131).

2.2.7. KMC implementation in the Republic of Malawi.

Malawi introduced KMC services 17 years ago (Bergh, Banda, Lipato, Ngwira, Luhanga and Ligowe (2012). 77% of 87 hospitals in Malawi provide in-patient KMC service (Chavula 2015). Despite 88.5% of the Malawian facilities implementing KMC service, LBW accounts for 35% of neonatal deaths and is the leading cause of under-five mortality in Malawi (UN IGME *et al.* 2015). Although Malawi has managed to achieve the two-third reduction of under-five child mortality, neonatal death is the leading cause of under-five mortality (UN IGME *et al.* 2015). The WHO (2015c, p. 2) agrees, as the article cites the Malawi Ministry of Health Director of Reproductive Health commenting on the achievement of MDG number four, noting that "we realize we could have done even better if we had focused more on new-born health." This indicates that much emphasis was not placed on neonatal programmes (Martines *et al.* 2005). As a strategy to enhance LBW babies' survival, the Malawi Ministry of Health is to renovate one of the central hospitals' neonatal units, in order to accommodate and nurse more of LBW babies (WHO 2015c).

2.3. Conclusion

This chapter describes a brief history of KMC how it has revolved over the years, KMC protocol, advantages of KMC, global LBW mortality, KMC in Sub-Saharan African coutries, KMC compliance and KMC implementation in Malawi. Several studies have shown the advantages of KMC not only in the enhancement of LBW babies' survival but also to mother and hospital (Lawn, Mwansa-Kambafwile, Horta, Barros and Cousens, 2010). Compliant to KMC protocols by the key player, mother, is the essence in KMC practice (Vesel *et al.* 2015). Therefore, describing mothers' compliance to KMC is important in facilitating LBW babies' survival. The next chapter deals with research methodology that will aid in validity and reliability of the study results.

3.0. CHAPTER 3
RESEARCH METHODOLOGY

3.1. Introduction

Taylor, Bogdan and DeVault (2016) describe research methodology as the steps followed to conduct studies, in order to find answers to the problem at hand. The type of research method relies on the beliefs, purpose and assumption of the study, which in turn guide a researcher on the choice of the theoretical perception and research design. In this study, the research design was selected to guide in the provision of relevant information regarding description of mothers' compliance to KMC. Therefore, in order to yield the empirical evident research findngs, this chapter describes the research approach, research design, philosophical paradigm, research setting, study population, inclusion criteria, sampling and sampling technique, pre-testing study, data collection and data collection tool, validity and reliability, threats to validity and reliability, data analysis, data management, data dissemination, ethical issues and the summation of the this chapter.

3.2. Research Approach

Polit and Beck (2012) explain that in quantitative research empirical evidence rests on objective reality, in which information is numerically gathered through formal structured tools and statistically analysed. Creswell (2014) further narrates that quantitative research uses structured measures to facilitate collection of numerical data, which is statically analysed in order to arrive at the phenomenon under study. In this research study, the Health Belief Model and the questionnaire have been used to facilitate understanding and interpretation of the phenomenon based on objectively empirical evidence, rather than the researcher's beliefs, which have lessened bias and maximized validity (Polit & Beck 2012).

3.3. Research Design

Brink *et al.* (2012) define a descriptive study as "research studies in which phenomena are described, or the relationship between variables is examined; no attempt is made to determine cause and effects relationship". In this study, the aim was to described KMC, hence there was no determination of relationship of variable.

3.4. Philosophical Paradigm

Polit and Beck (2012) further explain that positivists' goal is to uncover empirical evidence through "objective reality", which are not the "personal beliefs of the researcher". In this study, the researcher did not influence the outcome of the study, as she was not in any way part of the enties under study.

3.5. Research Setting

Malawi has three regions, namely the Northern Region, the Central Region and the Southern Region. The research study took place in the Southern Region at a selected Central Hospital, which is one of the government tertiary and largest hospital in Malawi. The hospital is located in the centre of the Malawi's industrial city, Blantyre. This particular Central Hospital is the main teaching hospital for University of Malawi College of Medicine.

3.6. Study Population

Polit and Beck (2012) define population as the whole set of entities that possess uniform characterises. LoBiondo-Wood and Haber (2010, p. 222) cited in Brink *et al. (*2012, p.131) further add that the target population is "the entire set of elements about which the researcher would like to make generalization [sic]". The focus was placed on KMC mothers admitted in neonatal unit, as well as KMC mothers that were coming for KMC follow up visit in the neonatal unit.

3.7. Inclusion Criteria

Eligibility of participation was based on:

- KMC mother who was practicing KMC at selected central hospital
- KMC mother admitted in neonatal unit
- KMC mother coming for KMC follow up visit at neonatal unit
- KMC mother is 18 years and above

3.8. Sample and Sampling Technique

Polit and Beck (2012) describe a sample as a portion of the population the researcher is interested to study. In this study, the sample was all the KMC mothers admitted at a selected hospital's neonatal unit and those under KMC programme coming for their KMC follow up visit at the neonatal unit.

Brink *et al.* (2012) narrate, sampling is a process of picking prospective participants in order to come up with a study sample. Sampling process depends on the type of research design and the attributes of the prospective participants the given researcher (Creswell 2014). The researcher assumed that the participants had knowledge of the phenomenon under study, which was KMC, as such, they were able to provide the researcher with in-depth information pertaining to KMC. Polit and Beck (2012) categorise this type of sampling as purposive sampling, which falls under non-probability sampling technique, the authors describe purposive sampling as the strategy of targeting a specific kind of

participants, who are allegedly knowledgeable about the issue to be researched. Hence, the researcher pursued a non-random choice of prospective participants through purposive sampling technique.

In this study, the researcher recruited 50 KMC mothers as the study sample. The study size was arrived at based on the sampling strategy of recruiting the participants that are supposedly knowledgeable with the phenomenon under study (purposive sampling technique) as well as the data collection time frame of a month. The sample size was enhanced by the average number of 57 LBW babies recorded per month, in the facility KMC programme's monthly register. Therefore, the 57 recorded LBW babies was the population of the sample. Based on 95% confidence level and 5% margin of error, a sample of 50 KMC mothers was calculated using the electronic *SurveyMonkey* tool. (SuveryMonkey 1999-2016 copyright). The researcher had three consultations with the statistician, who helped with the determination of the sample size.

3.9. Pre-testing Study

Pre-testing study was done to measure the data collection tool's validity and reliability. The pre-testing study was done two days before the study and the amendments of the tool were done, in order to facilitate that the tool accurately measures what it was supposed to measure and yield consistent results if used repeatedly and in another context (Brink *et al.* 2012; Polit & Beck 2012).

The researcher conducted the pre-testing study at the same site as the main study. As such, the participants involved in the pre-testing study did not take part in the main study, where this prevented biased responses and altering of the result of the study. Re-administering the questionnaire to the participants involved in a pre-testing can predispose them to changing their prior incorrect responses. Brink *et al.* (2012, p. 110) agree that "prior exposure to a test or measurement technique can bias a particular response". Therefore, the researcher ensured that none of the participants in the pre-testing participate in the main study.

The purpose of the pre-testing was to identify, refine and amend the shortfalls of the questionnaire. The questionnaires for pre-testing study were collected in one day, where issues identified in the pre-testing study were taken into consideration in amending the questionnaire for the main data collection. The study tool was amended as follows:

- Section A on educational status, one of the participants said "*sindinaphunzire*", which literally translates to "I never attended any formal education". This caused the researcher to add a column which read "Not attended school". This subsection accommodated the participants without formal schooling.

3.10. Data Collection and Data Collection Tool

Systematic data collection is obtained by the use of data collection tool (Polit & Beck 2012). In this study, the structured questions were formulated by the researcher to help in the collection of data from the KMC mothers. The *Kangaroo Mother Care* protocol was used to inform the structure of the questions used in the questionnaire. The KMC protocol includes kangaroo position, nutrition, support and discharge and follow up. The questions were phrased using a Likert-type scaling, in which compliance to KMC was measured by the level of intensity in relation to the Likert scale (McLeod 2008). Appendix 1 is the questionnaire, which has two sections. Section A is for demographic data and Section B contains questions to describe KMC mothers' knowledge and practice, which helped to describe compliance in KMC.

Below is a summary of questions according to the objective of the study.

Table 3: Questionnaire questions according to research objectives

Objective	Questionnaire #	Analysis table
Knowledge	3,4,12	2
Practice	5,8,9,11	3
Compliance	6,7,10,13,14,15,16	4

The data was collected in December 2016. During data collection, the research made a courtesy call to the neonatal nurse in-charge. The in-charge was given a copy of amended questionnaire. Adequate stationary for the main data collection was set, in a set of fifty information sheets, informed consent forms and questionnaires. An introductory session was made in which the researcher introduced the research topic, its purpose and emphasis was made on the ethical considerations.

During completion of the questionnaire, the participants individually used the neonatal unit's spare room and the weighing room to fill in the questionnaire. The spare room is used on Tuesdays for *Kangaroo Mother Care* follow-up. As such, privacy was ensured and maintained during completion of the questionnaire, and throughout the data collection process. The participants spent approximately 10 minutes to complete the questionnaire rather than the 20 minutes planned for.

The researcher had no challenges in receiving the signed informed consent forms from the respondents, as none of the KMC mothers who were approached declined from taking part in the study. This was possible because it is in the nature of Malawians to take part in health promotion activities when approached. Approximately, fifteen questionnaires for the main study were collected per week, and thus, fifty questionnaires took approximately three weeks to be collected. The questionnaires were numerically labelled before issued to the respondents. After completion they dropped them in a box. The researcher collected the questionnaires at the end of the day. Analysis representation and interpretation of the study results was made on fifty questionnaires.

3.11. Validity and Reliability

3.11.1. Validity

Validity is the extent to which a study measures what it intends to measure (Roberts, Priest & Traynor 2006, and p.41). The content validity was used which aided the measurement of description of the mothers' compliance to KMC.

3.11.1.1. Content Validity

This is used to measure the validity of a tool to assess if it contents all the components of the variables to be measured (Brink *et al.,* 2012). In this study, the supervisor's expertise facilitated that all the variables needed to be measured are covered in the questionnaire, which aided in describing the mothers' attitude towards KMC compliance.

3.11.2. Reliability

Brink *et al.* (2012, p. 169) define reliability as "the degree to which the instrument can be depended upon to yield consistent results if used repeatedly over time on the same person, or if used by two researchers". The researcher used equivalence characteristic which facilitated testing the reliability of the tool.

3.11.2.1. Equivalence Reliability

Brink *et al.* (2012, p. 170) note of equivalent reliability that "this test attempts to determine whether similar test given at the same time yield the same results". The researcher does not intend to involve in the main study those who participated in the pre-tetsing study, to avoid chances of changing the responses due to memorisation of the questions.

3.12. Threats to Validity and Reliability

Reliability is part of validity, where if a design does not produce a reliable outcome, it cannot be considered valid (Brink *et al.,* 2012, p.109). Validity is "a degree to which an instrument measures what it is supposed to be measuring." Reliability is the when an instrument produces the uniform results if used in a different setting or persons. Therefore, validity cannot be separated from reliability if the researcher is to have a valid and reliable result (Polit & Beck p. 328, 2012). In this study, the researcher worked with KMC mothers at a selected central hospital, which were the representation of the KMC mothers in Malawi, therefore the design used to describe mothers' compliance to KMC is ought to produce the uniform results when used in a different health facility

3.12.1. Threat to Internal Validity

Creswell (2014) describes threats to internal validity as the attributes of the participants that may affect the collection of appropriate information from the study population that will help in addressing the study phenomenon. The perceived threat to internal validity of the proposed study is mortality, whereby the participants tend to dropout during data collection (Polit & Beck 2012). The simplicity and elaborately designed questionnaire and the flexibility of responding to the questions at the participants' convenience aided in preventing participants dropping out during data collection, and as such, the researcher managed to collect the proposed sample size.

3.12.2. Threat to External Validity

The perceived threat to external validity is the Hawthorne effect. It affects the findings of the study when the participants are aware that they are being observed, especially if there is use of unusual apparatus to collect data (Brink *et al.*, 2012). In the proposed study, the researcher used a simple questionnaire, which did not need the participants to be observed when they were providing answers and it was not an invasive tool that caused harm to their lives.

3.13. Data Analysis

The data was analysed using the SPSS, version 24. Simple descriptive statistical analysis of the data was used, as the study was to describe variables. The questions were phrased using a Likert-type scale, in which compliance to KMC was measured by the level of intensity in relation to the Likert scale (McLeod 2008; Creswell 2014).

3.14. Data Management

The data obtained from the research was kept by the research supervisor in her lockable room. During the study, the data was stored on the researcher's computer, access to which was by a code only known to the researcher. All data will be kept for five years, and then destroyed by shredding.

3.15. Data Dissemination

Polit and Beck (2012) highlight that the research study is considered complete when the study results are shared. The copies of the research findings have been distributed to the institution where data was collected as well as to UKZN following the university's protocols. The researcher is in the process of publishing an article with the recognised editors, in order to share the study results publicly. This strategy will indirectly facilitate dissemination of the study results to the participants and directly to the mothers practicing Kangaroo Care. These measures have facilitated the dissemination and utilisation of the study results.

3.16. Ethical Issues

3.16.1. Introduction

Ethical principles ought to be considered and followed in a study in order to protect the human rights of the prospective participants (Brink *et al.* 2012; Polit & Beck 2012*)*. Throughout the research process of this study, the researcher has used ethical principles to prevent infringing on the human rights of the prospective participants. Emanuel, Wendler, Killen and Grady (2004, p. 931) and Department of Health (DoH) (2015, p. 15) clarify eight ethical principles to be employed in research process in order to respect human rights. The following are the listed ethical principles: fair selection of study population, favourable risk-benefit ratio, independent review, informed consent, and respect for recruited participants.

3.16.2. Fair Selection of Study Population

Brink *et al.* (2012) advocate for the participants' right to fair selection and treatment. Selection of high-risk population for the benefit of the research should be avoided (Emanuel *et al.* 2004). The selection of the prospective participants ought to be ignore religion background and education status (DoH 2015). The participants of this study were the mothers who were practicing KMC, hence no participants with diminished autonomy such as children and intellectually or mentally challenged individuals was recruited.

3.16.3. Favourable Risk-Benefit Ratio

Emanuel *et al.* (2004) confirm that principle of beneficence encourages the researcher to ensure the participants' right to protection, by securing the wellbeing of the participants from harm and discomfort in any aspect of life. DoH (2015) adds that the researcher should ensure that the research has minimum potential risk or no potential risk at all. In this study, the design was descriptive, which is one of the non-experimental designs, hence the variables were not manipulated in anyway, where, as such, there was no potential risk anticipated. The researcher merely collected data through questionnaire, preventing causing harm to the participants.

3.16.4. Independent Review

The researcher enhanced accountability and transparency of the research to its participants by use of the Ethics committees, namely, the UKZN Biomedical Research Ethics Committee (BREC) and Malawi's National Health Sciences Research Committee (NHSRC), so as to ensure that the research met the ethical requirements and that it was not exploitative in nature (Emanuel et al. 2004). The research was reviewed and approved BREC and NHSRC as it met the ethical requirements.

3.16.5. Informed Consent

The researcher ought to respect the participants' rights by addressing their right to autonomy and self-determination. The participants are autonomous human beings, hence they should be respected for their thoughts and actions (Pera & Van Tonder, 2008). It is ideal for the researcher to obtain an informed consent from the prospective participants prior to commencement of the study (DoH 2015). The researcher obtained informed consent from the participants prior to data collection.

The questionnaire was written in English and translated into Chichewa (local language) by a Linguistic lecture in the University of Malawi, this facilitated inclusion of KMC mothers who did not read and understood English. Emanuel *et al.* (2004, p. 934) advise that "disclosure of information should be sensitive to the local context that the prospective participants can understand." English and Chichewa questionnaires facilitated the understanding of the study by the accessible population, as such they were able to make an informed consent.

3.16.6. Privacy, Confidentiality and Anonymity

The right to privacy, confidentiality and anonymity, which falls under respect of the prospective participants, cannot be omitted in the research process (Emanuel *et al.* 2004; DoH 2015). Brink *et al. (*2012, p. 37) describe the right to privacy as "the right to determine the extent to which [a participant's]

private information will or will not be shared with others". The researcher addressed the right to privacy in the research instrument, where there was no request for personal data, hence the information given was not linked to any particular participant as such privacy was respected.

Brink *et al.* (2012, p. 38) describe the process of ensuring confidentiality as "the researcher's responsibility to prevent all data gathered during the study from being linked to individual participants, divulged or made available to any other person." Emanuel *et al*. (2004) agree that procedures to maintain confidentiality of the collected data should be put in place. As such, the collected data was kept in the researcher's personal computer, in which a passcode was required to gain access. The transcripts were kept in a safe and secure place (lockable locker).

3.17. Conclusion

The step-by-step measures that facilitated the conduction of this study were discussed in this chapter. The steps were as follows; research approach, research design, philosophical paradigm, research setting, study population, inclusion criteria, sample and sampling technique, data collection and tool, pre-testing study, validity and reliability, data analysis, data management, data dissemination and ethical considerations.

4.0. CHAPTER 4

DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF THE RESULTS

4.1 Introduction

This chapter describes the study results in line with the study objectives and questions, which will facilitate the description of mothers' compliance to KMC at a selected hospital in Southern Malawi. The chapter comprises of two sections; demographic profile of respondents and assessment of respondents' KMC knowledge, practice and compliance.

4.2. Demographic Profile

The table below presents the demographic details of the respondents.

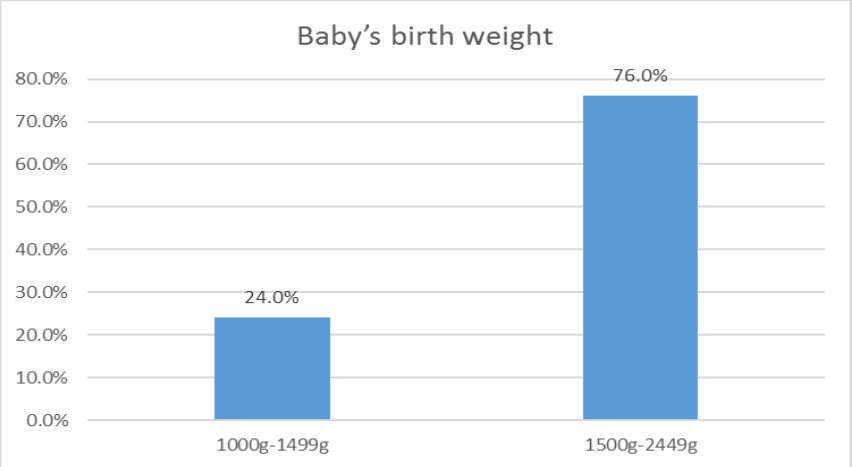
Table 4: Demographic data (N: 50)

Demographic details		**Frequencies**	**Percentages**
Age	18-21 years	13	26
	22-25 years	12	24
	26-29 years	9	18
	>30 years	16	32
Gender	Female	50	100
	Male	0	0
Religion	Christian	40	80
	Muslim	10	20
	Other	0	0
Educational status	Not attended	2	4
	Primary	23	46
	Secondary	21	42
	College	4	8
Ethnicity	African	50	100
	Indian	0	0
	Other	0	0
Language	English	0	0
	Chichewa	50	100
	Other	0	0

Table 4 narrates that, 13 (26%) of the respondents were aged 18-21 years, 12 (24%) of the KMC mothers were aged 22-25 years, 9 (18%) were aged 26-29 years, and the majority of the KMC mothers 16 (32%) were aged>30 years. Table 4 further shows that all the respondents were females, 40 (80%) were Christians and the rest of the respondents 10 (20%) were Muslims. The 2 (4%) did not attend any formal education, 23 (46%) went through Primary education, 21 (42%) attended Secondary school and 4 (8%) went as far as College. All the respondents were Africans and were Chichewa (local language) speaking.

4.3. Section B: Assessing KMC knowledge, practice and compliance

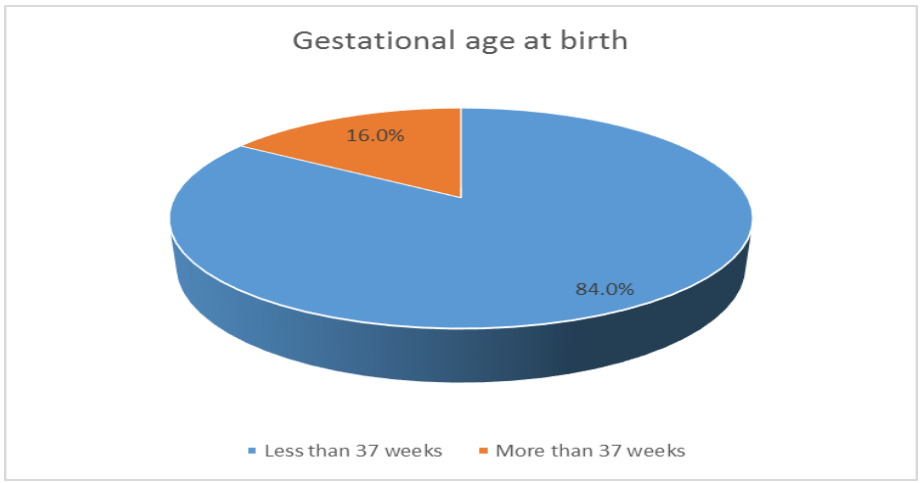
4.3.1. Birth weight of the babies (N: 50)



Graph 1: Baby's birth weight

Graph 1 shows that out of 50 correspondents, 12 (24%) of the respondents' babies birth weight was 1000g-1499g and the majority 38 (76%) were 1500g-2449g

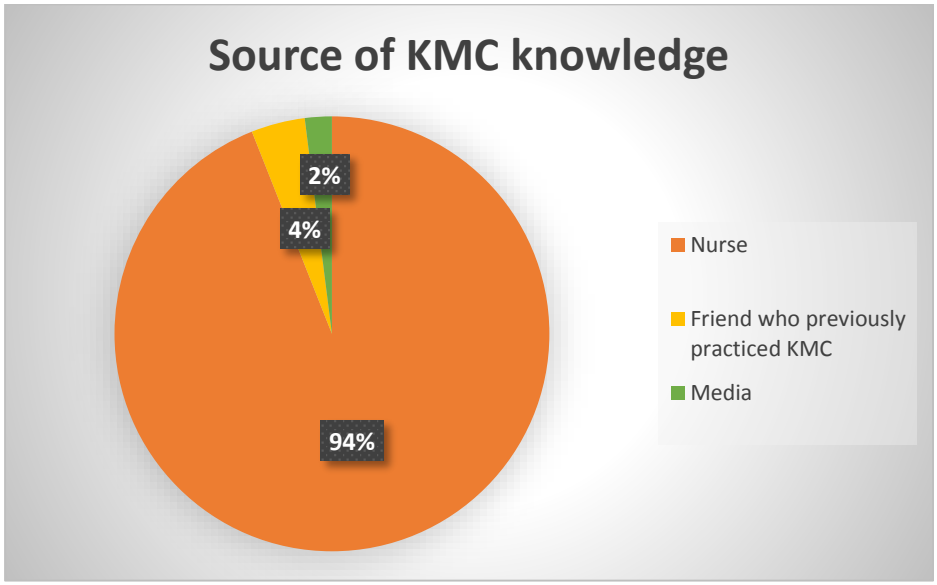
4.3.2. Gestational age at birth (N: 50



Graph 2: Gestational age at birth

Graph 2 narrates that out of 50 respondents 42 (84%) of the respondents gave birth at less than 37 weeks and 8 (16%) of the respondents delivered at more than 37 weeks of gestational age.

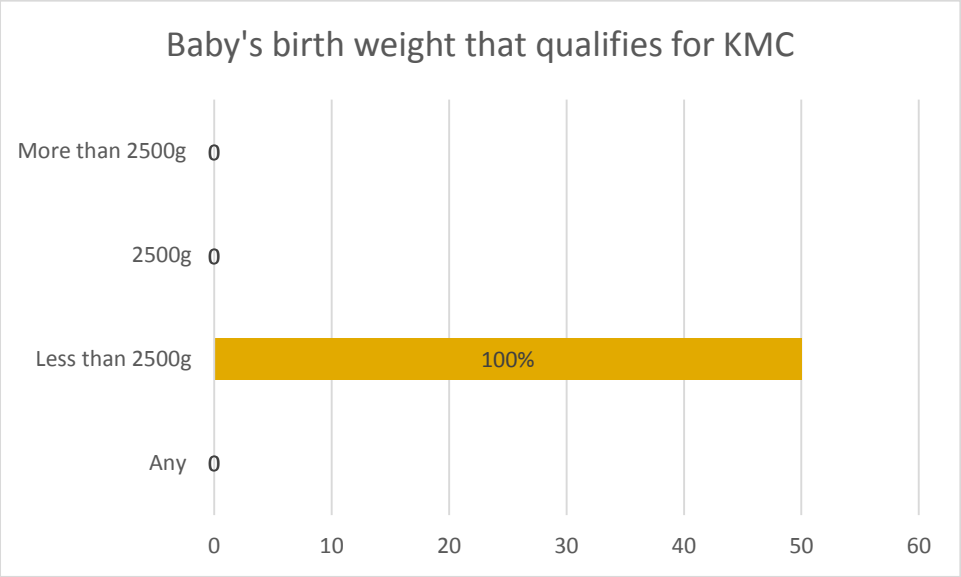
4.3.3. Source of KMC knowledge (N: 50)



Graph 3: Source of KMC knowledge

Graph 3 explains that, out of 50 respondents, the majority 47 (94%) got the KMC messages from the nurses, 2 (4%) of the KMC respondents obtained the KMC information from their friends, who once practiced KMC, the least (1; 2%) of the respondents got the KMC message from the media.

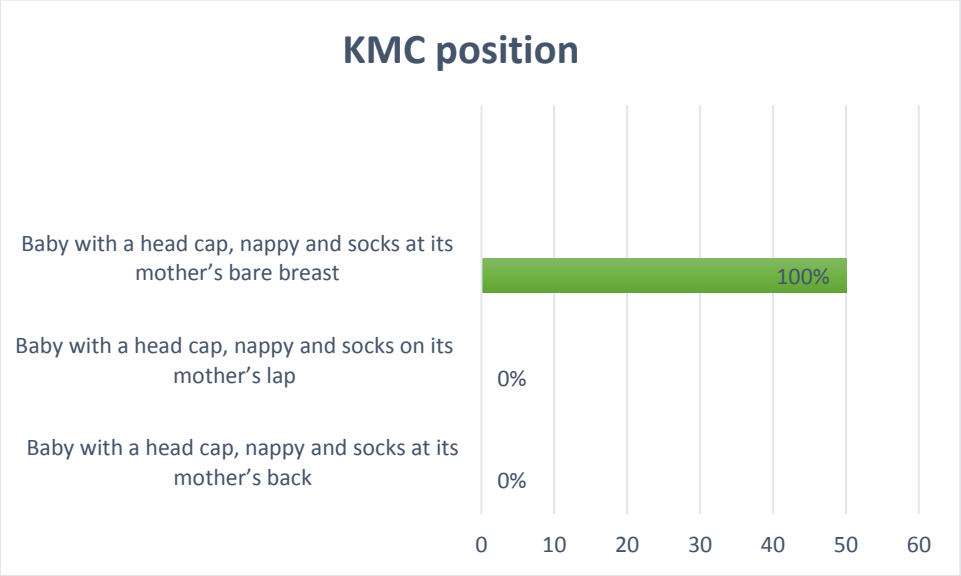
4.3.4. Baby's birth weight that qualifies for KMC (N: 50)



Graph 4: Baby's birth weight that qualifies for KMC

Graph 4 shows that 50 (100%) responded that baby weight of less than 2500g is eligible for KMC.

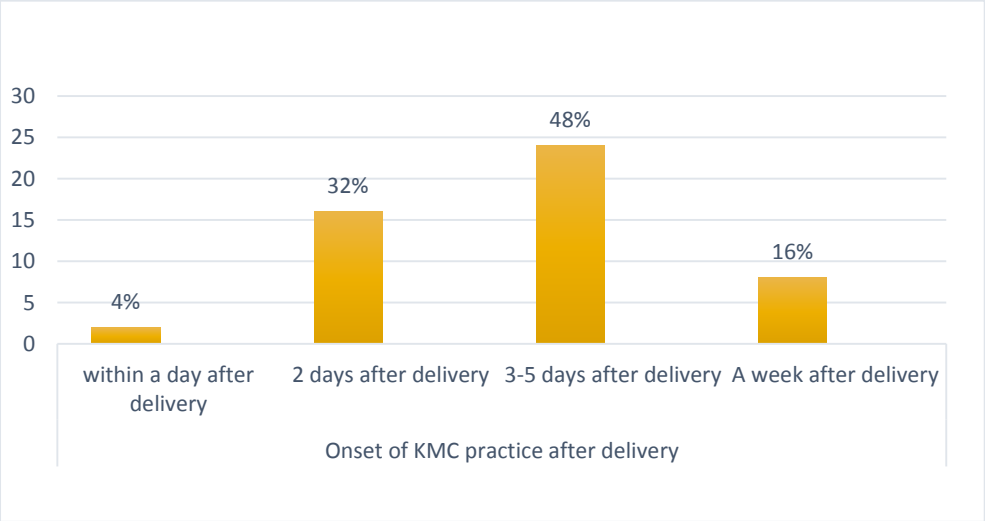
4.3.5. KMC position (N: 50)



Graph 5: KMC position

Graph 5 narrates that 50 (100%) of the respondents nursed their babies by putting them on their bare breasts with the babies donned only in a nappy and socks.

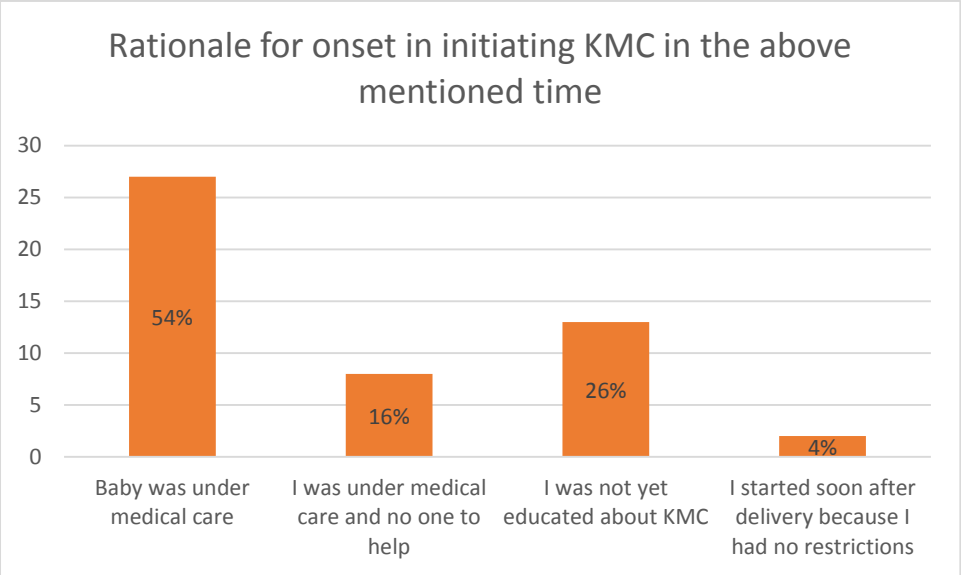
4.3.6. Onset of KMC practice after delivery (N: 50)



Graph 6: Onset of KMC practice after delivery

Graph 6 shows that out of 50 respondents 2 (4%) initiated KMC within a day after delivery, 16 (32%) initiated KMC two days after delivery, 24 (48%) started KMC three to five days after delivery and 8 (16%) initiated KMC a week after delivery.

4.3.7. Reason for initiating KMC in the above-mentioned time (N: 50)

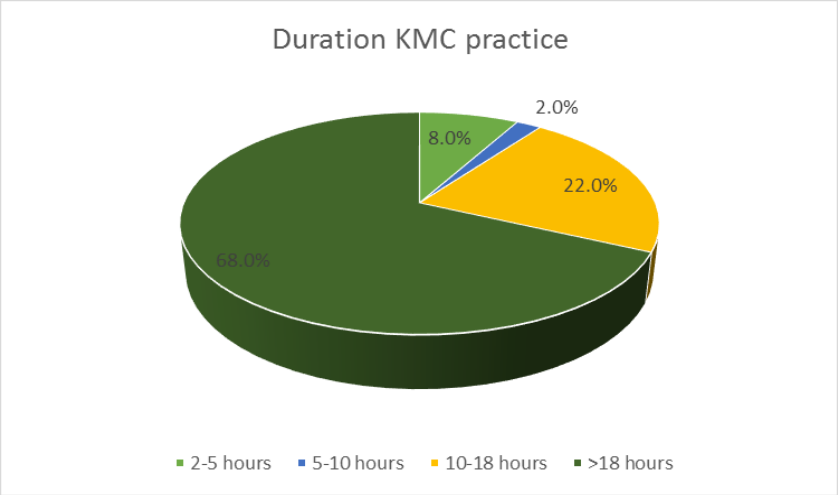


Graph 7: Reason for initiating KMC in the above-mentioned time

Graph 7 narrates that 27 (54%) responded that their babies were on medical attention, 8 (16%) were on medical help and had no one to help in putting their babies in KMC position, 13 (26%) were not

educated in time on the practicality of KMC by the nurses, and 2 (4%) respondents had no restrictions in initiating KMC, as such they initiated within 24 hours after delivery.

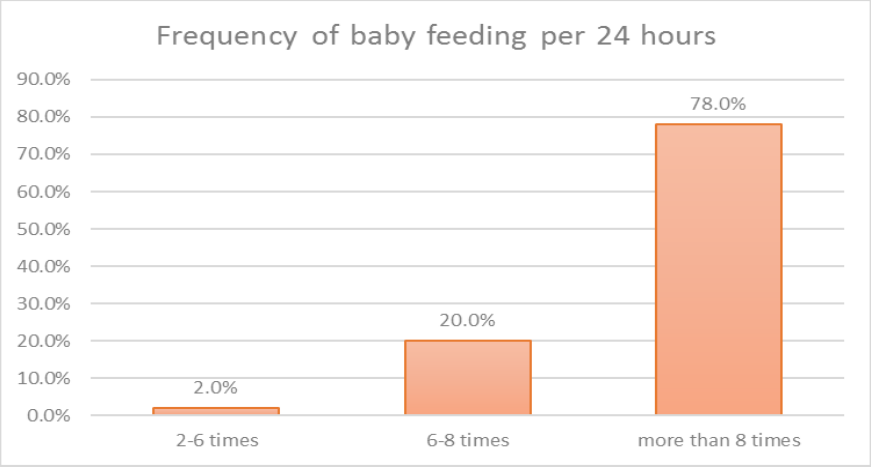
4.3.8 Duration of KMC practice in 24 hours (N: 50)



Graph 8: Duration of KMC practice in 24 hours

Graph 8 narrates, 4 (8%) respondents practiced KMC 2-5 hours a day, 1 (2%) utilise 5-10 hours per day to nurse their babies in KMC position. Eleven (22%) respondents practiced KMC 10-18 hours per day and 34 (68%) respondents dedicate >18 hours a day to nurse their babies in KMC position.

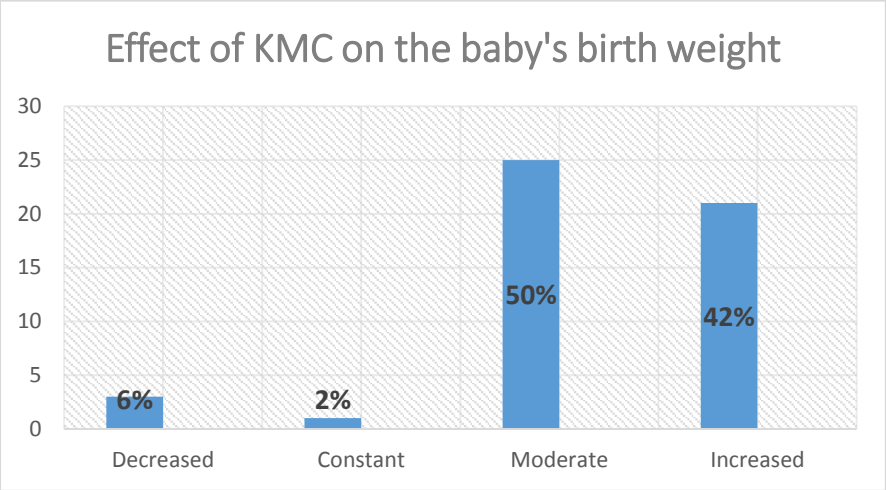
4.3.9. Frequency of baby feeding in 24 hours (N: 50)



Graph 9: Frequency of baby feeding in 24 hours

Graph 9 explains that out of 50 respondents 1 (2%) breastfed their babies 2-6 times a day, 10(20%) of the respondents breastfed their babies 6-8 times a day and 39 (78%) of the respondent's breast fed their babies more than eight times a day.

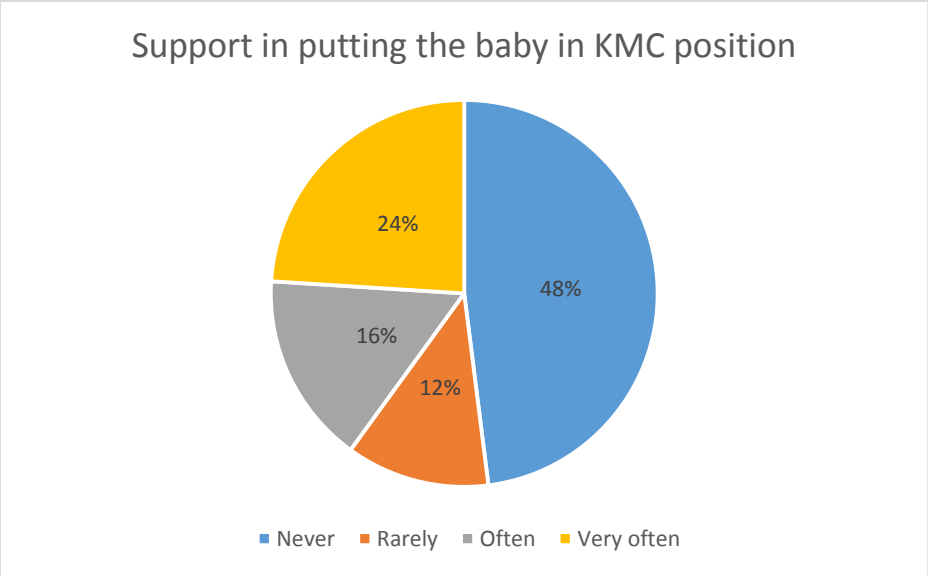
4.3.10. Effect of KMC on the baby's birth weight (N: 50)



Graph 10: Effect of KMC on the baby's weight

Graph 10 shows that 3 (6%) of the respondents noticed weigh loss in their babies, 1 (2%) reported a constant weight in their babies, 25 (50%) respondents noticed moderate weight gain in their babies and 21 (42%) noticed an increased weight gain and.

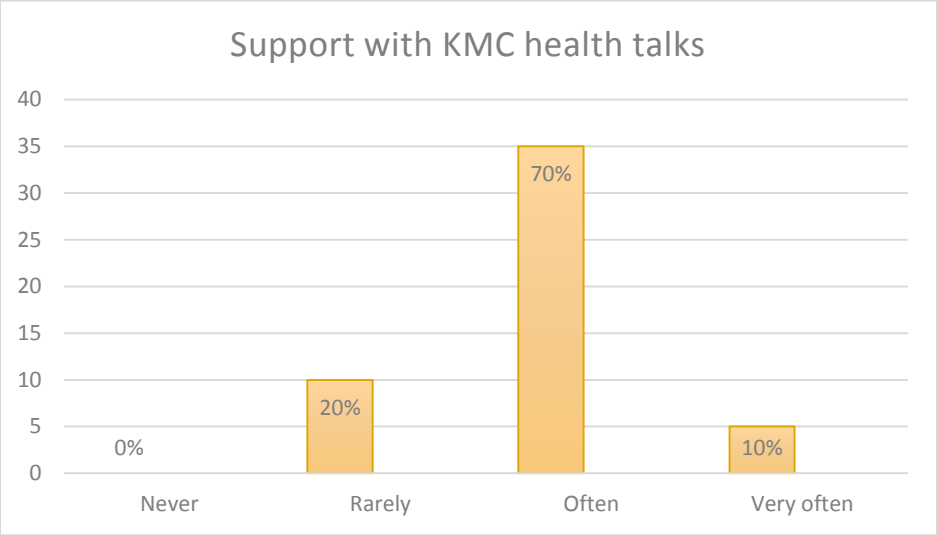
4.3.11: Support in nursing LBW baby in KMC position (N: 50)



Graph 11: Support in nursing LBW baby in KMC position

Graph 11 shows that 24 (48%) respondents were never supported in KMC practice, 6 (12%) rarely got the support in KMC practice, 8 (16%) often got support in nursing their babies in KMC position, and 12 (24%) of the respondents very often got support in practicing KMC.

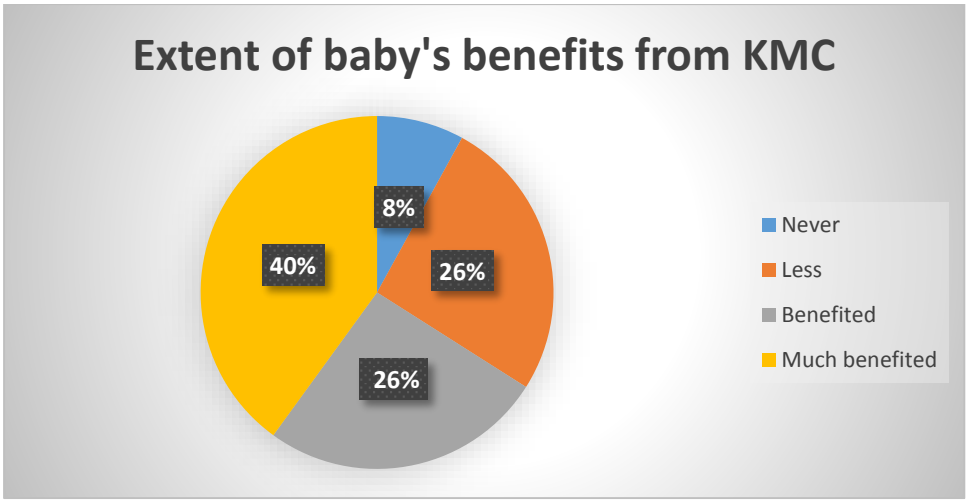
4.3.12. Support with KMC health talks (N: 50)



Graph 12: Support with KMC health talks

Graph 12 narrates 10 (20%) of the respondents rarely received KMC health education from the nurses, 35 (70%) often received KMC health talks during the hospital stay, and 5 (10%) very often received KMC talks.

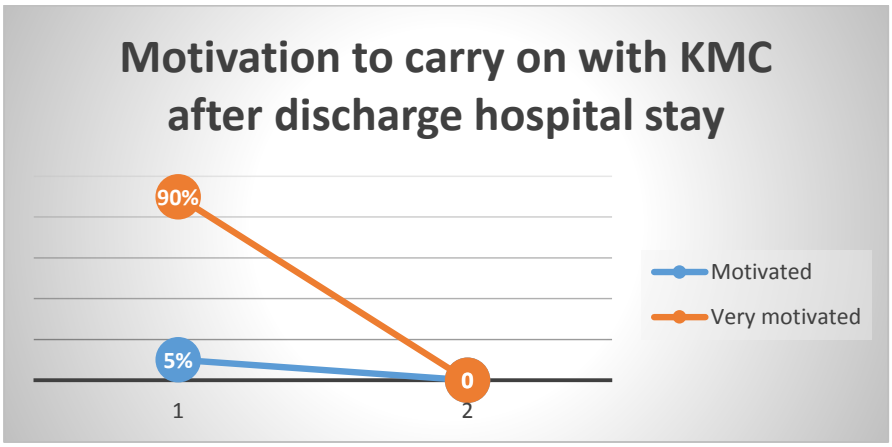
4.3.13. Extent of baby's benefits from KMC (N: 50)



Graph 13: Extent of baby's benefits from KMC

Graph 13 shows that 20 (40%) respondents said their babies had greatly benefitted from KMC, 13 (26%) benefitted from KMC, 13 (26%) had benefitted from KMC to a lesser extent, and 4 (8%) saw no benefits from KMC in their LBW babies.

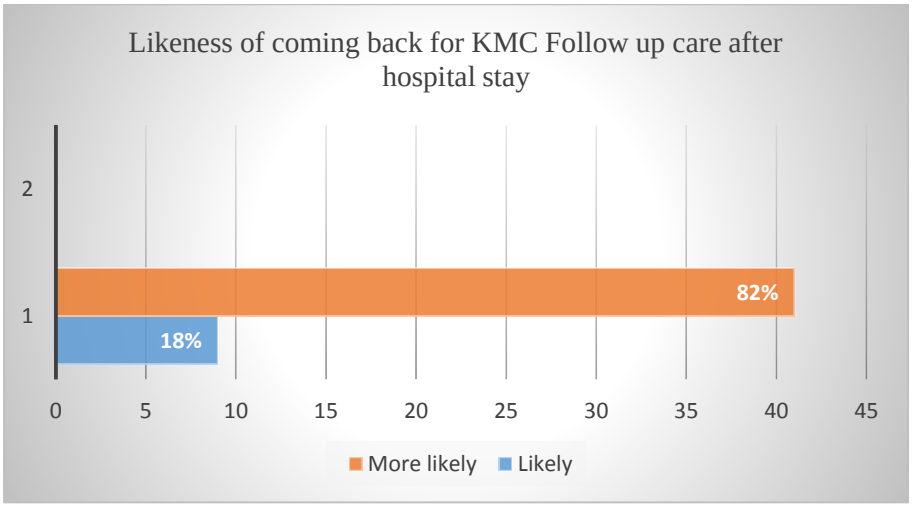
4.3.14. Motivation to carry on with KMC after hospital stay (N: 50)



Graph 14: Motivation to carry on with KMC after hospital stay

Graph 14 narrates that out of 50 respondents 45 (90%) of the mothers were very motivated to continue with KMC at home, while 5 (10%) of the mothers were motivated to carry on with KMC practice at home after hospital stay.

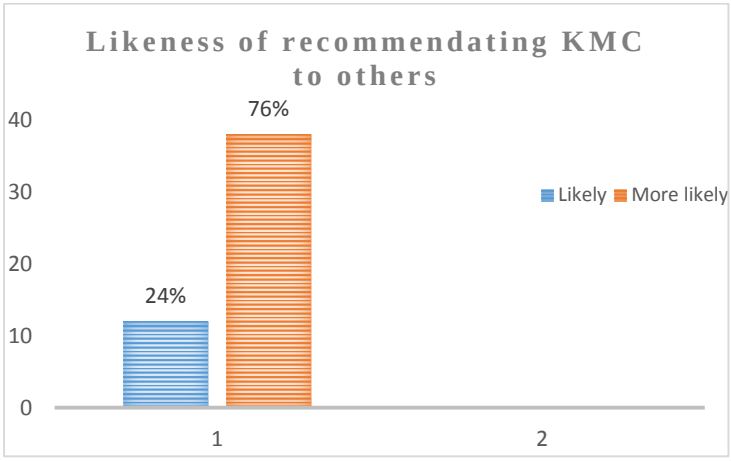
4.3.15. Likeness of coming for KMC Follow up care after hospital stay



Graph 15: Likeness of coming back for KMC Follow up care after hospital stay

Graph 15 shows that 9 (18%) responded that they were likely to be attending follow-up visits after hospital stay, and 41 (82%) were very likely to come back for KMC Follow up clinics.

4.3.16. Likeness of recommending KMC to others (N: 50)



Graph 16: Likeness of recommending KMC to others

Graph 16 narrates that 12 (24%) of the respondents saw a likelihood of recommending KMC to others and 38 (76%) were very likely to motivate others to use KMC.

4.9 Conclusion

The quantitative data was analysed using SPSS version 24. The findings of the study have been presented in this chapter using illustrations of tables and graphs. The researcher has interpreted each and every finding. Chapter Five will discuss the findings of the study, conclude and make recommendations.

5.0. CHAPTER 5
DISCUSSION OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter discusses the findings of the study, conclusions of the study, recommendations made and pointing out the limitations of the study. The discussion will be based on the findings of the respondents' demographics, KMC knowledge and practice which will facilitate in describing mothers' compliance to KMC.

5.2. Discussion of Main Findings

5.2.1. The Demographics

This study reveals that male involvement in KMC practice is a challenge, as evidenced by all respondent to this study being mothers. Naturally females are caretakers, and have an inborn empathy in them, where, as such, their involvement in KMC enhanced compliance (Demir, Atli and Kis 2016, p.79). Nevertheless, involvement of fathers in KMC facilitates compliance, as he is a male figure and regarded as the decision maker, hence KMC care cannot be uninterrupted. Blomqvist, Rubertsson, Kylberg, Jö Reskog and Nyqvist (2012, p.1994) and Chan *et al.* (2016, p.131) agree that KMC compliance is a success when fathers are involved in KMC practice, as they are primary providers of KMC.

The majority of the KMC mothers in this study were mature, literate adults, who were able to comprehend and understand the perceived severity of LBW on their babies' health and that compliance to KMC would alleviate the perceive seriousness of LBW. As such, the age and education level of the KM mothers were presumably to have facilitated KMC compliance. Glanz *et al.* (2008) narrate that level of understanding and maturity of an individual poses a likelihood of engaging in health-related behaviour.

The study results show that all the KMC mothers were from religious beliefs that do not restrain their members from engaging in health promotion activities, as a result the mothers' religious background contributed to KMC compliance. American Academy of Ophthalmology (2008) agrees that religious faith has an influence on health seeking behaviour.

5.2.2. Kangaroo Mother Care Knowledge in KMC compliance

All the babies in this study were LBW weighing 1000g-2449g irrespective of gestational age, though the majority (42;84%) of the LBW babies were born prematurely (before 37 weeks), which is mostly associated with LBW (WHO 2003). The prior knowledge that all the KMC mothers had on the KMC eligibility weight of >2500g played a role in KMC compliance. Chisenga *et al.* (2014, p. 309) argue that prior awareness and knowledge of KMC by mothers facilitates KMC compliance. Fourth-five (90%) of the KMC mothers were regularly supported by the nurses with KMC health education, which acted as a cue to practice KMC according to protocol, hence complying with KMC. Bergh, Charpak, Ezeonodo, Udani and Van Rooyen, (2012, p. 39) argue that throughout KMC programme, health care providers need to support KMC mothers with KMC information, in order to facilitate KMC compliance. Meanwhile, Vesel *et al.* (2015) and Jeihooni *et al.* (2016) add that prior KMC knowledge coupled with nurses continuous supporting the mother with KMC information acts as motivators in complying to KMC.

The majority of the KMC mothers (47;94%) knew about KMC through the nurses, which facilitated getting the detailed and up to date KMC information, as such enhancing KMC practice according to protocol. Bergh, Charpak, Ezeonodo, Udani and Van Rooyen, (2012) and Chan *et al.* (2016) agree that nurses are formally training in KMC protocol and have proven to be the best source of KMC knowledge to the community for effective KMC implementation.

5.2.3. 'Kangaroo Mothers'' practice on KMC compliance

In this study, 50 (100%) of the mothers were nursing their babies in the KMC position, which signifies that all the mothers were compliant to putting their babies in a recommended position. The core purpose of Kangaroo Mother Care is to provide a skin-to-skin contact between the LBW baby and its mother, in a way that the baby is nursed in upright position in between its mother's bare chest, which is termed the KMC position (Vesel *et al.* 2015; WHO, 2003, p.14). Even though durations of practising KMC were different, the majority of the KMC-practicing mothers (34; 68%) practised continuous KMC, by conforming to the prescribed protocol of KMC practice; practising >18 hours/day. Dickson, Kinney, Moxon, Ashton, Zaka, Simen-Kapeu, Sharma, Kerber, Daelmans, Gülmezoglu, Mathai, Nyange, Baye and Lawn (2015, p. 6) argue that KMC constitutes the best management of LBW/preterm babies, where, in order to achieve the desired outcome, the LBW baby should be placed in KMC position continuously through the day. Four (8%) of the KMC mothers practised intermittent KMC. Blomqvist, Frölund, Rubertsson and Nyqvist (2012, p. 1) further narrate that, LBW babies are nursed in KMC position either continuously throughout the day, and/or intermittently, in order to do so for few hours each day.

The study revealed that some of the KMC mothers had barriers in practicing continuous KMC. The reasons were:

- Baby was on medical attention; and
- Mother was sick with no-one to support her in KMC.

The study shows that 27 (54%) of the LBW babies were on medical attention, and that as such the baby spends most of the hours of the day in the incubator, where the mother utilises the remaining few hours to nurse her baby in KMC position, hence to some extent it is justifying intermittent KMC Nashwa, Samra, Amal, Taweel and Cadwell (2013, p. 195) agree that although continuous KMC practice is a recommended practice, exceptional LBW babies are nursed in intermittent KMC and intermitted KMC on sick babies has benefitted both the mother and the baby, for instance, when it comes to bonding and breastfeeding.

The study reveals that KMC mother's medical problem posed a barrier in complying to KMC as the mother would not practice continuous KMC. Supporting KMC mother in putting the LBW baby in KMC position facilitates complying to KMC practice, as the LBW baby is nursed in KMC position uninterrupted (Chisenga *et al.*, 2014, p. 309; Vasel *et al.*, 2015, p.2). Chan *et al.* (2016, p. 135) further explain that although continuous KMC is the ideal, the practice of enhancing the desirable outcomes, mothers may not be able to put their LBW babies on KMC position throughout the day, due to medical problems, maternal exhaustion and pain. Lack of support in KMC practice act as perceive barrier in KMC compliance, unless the father and the family members support in putting the LBW baby in KMC position, compliance to KMC will always be a challenge.

The study indicates that 26 (52%) of the mothers had someone to help them in nursing their babies in KMC position, and that as such, it enhanced compliance. Rimer and Glanz (2005) further explain that perceived barriers to KMC by the mothers are managed when the mothers get support, hence KMC compliance is achieved. The study found that, regardless of 24 (48%) of the KMC mothers not having support in KMC practice, 46 (92%) of the KMC mothers managed to nurse their babies in KMC position for more than 10 hours a day, due to the mothers' willingness and good perception of KMC outcomes. Chisenga *et al.* (2014, p. 309) found that mothers' perceived benefits to KMC practice coupled with willingness to engage in KMC practice enhances compliance to KMC, despite limited and/or no support system in KMC.

The study further revealed that almost 49 (98%) of the KMC mothers fed their babies more than six times a day, and that 46 (92%) of the KMC mothers practiced KMC (>10 hours per day), which signifies that exclusively breastfeeding is largely dependent on the duration per day in which the LBW baby is kept in KMC position. As such, the KMC mothers who practiced continuous KMC not only complied

to KMC but also exclusively breastfed their babies. Hardly, (2011, p. 119) and Johnson (2016, p. 3) narrate that exclusive breast feeding is dependent on the frequency and/or the duration engaged in KMC practice, as the mere act of putting the LBW in KMC position influenced the increase in breast milk volume by the KMC mothers, as compared to those mothers not practising skin to skin contact. Lothian, (2005, p. 43) explain that KMC facilitated milk let down, hence exclusive breastfeeding is possible in LBW who are continuously nursed in the KMC position. As such, KMC mothers who continuously practice KMC subject their LBW babies to benefit from exclusive breastfeeding more so than those that are nursed in intermittent KMC (Nyqvist *et al.*, 2010, p. 814).

5.2.4. KMC Compliance

The study reveals that 2 (4%) of the LBW babies were initiated soon after delivery, and that as such, they followed the prescribed KMC protocol. Park, Choi, Lee, Son, Seol and Lee (2014, p.240) argue that initiating KMC soon after delivery and continuing throughout the day is of paramount importance in KMC programme. Although early initiation of KMC is ideal, sometimes there are barriers to early initiation of KMC, as 27 (54%) of the KMC mothers did not initiate KMC soon enough after delivery, due the medical conditions of their babies, which is a contraindication to early initiation of KMC. WHO (2003, p. 19) and Blencowe and Molyneux (2005, p. 39) agree that the LBW is initiated on KMC when there are no any medical restrictions, as such the LBW baby can be started on KMC few days or weeks after delivery depending on the medical stability of the baby. Therefore, 29 (58%) of the KMC mothers complied to KMC as they initiated KMC according to protocol.

The study further found that 21 (42%) of the mothers did not comply to early initiation of KMC although their LBW babies were medically stable. The reason for this was that some KMC mothers were medically not stable enough to practice KMC, and that as such, lack of support system betrayed them in early initiation of KMC, where the rest of the KMC mothers did not know the practicalities of KMC, becoming delayed in early initiation of KMC, as they were waiting for the nurse to teach them how to nurse their babies in the KMC position. Chan *et al.* (2016, p. 135) emphasise that mothers can not comply to KMC when they are sick, unless father and/or family members support in putting the LBW in KMC position to ascertain continuity of KMC practice. Bergh, Charpak, Ezeonodo, Udani and Van Rooyen, (2012, p. 43) further explain that to facilitate early initiation of KMC and compliance, nurses should teach mother to provide KMC. Blomqvist, Frölund, Rubertsson and Nyqvist (2012, p. 4) further add that due to work overload, nurses do not educate KMC mothers on how to provide KMC in time. This facilitates delay in KMC initiation and increases changes of neonatal deaths, which mostly occurs in the early days of life of the LBW baby (Lawn, Mwansa-Kambafwile, Horta, Barros and Cousens, 2010). Therefore, 21 (42%) of the KMC mothers were non-compliant to early initiation of KMC due to lack of support from the nurses and family members.

The majority of the KMC mothers practiced KMC for more than 10 hours a day, as such, 46 (92%) of the LBW babies benefited from KMC and had their body weight increased. Lawn, Mwansa-Kambafwile, Horta, Barros and Cousens, (2010, p. i149) reviewed 524 papers and reported several benefits of KMC including weight gain in the LBW babies whose mothers complied to KMC protocol. Venancio and de Almeida (2004, p. 175) and Charpak, Ruiz-Peláez, Figueroa de and Charpak (1997, p. 683) confirm that KMC mothers who comply to KMC protocol experience an increase in daily weight gain in their LBW babies. The daily increase in weight is due to continuous KMC practice, which facilitates exclusive breast feeding, as the LBW who are nursed in KMC position for long hours in a day benefit from frequent feds and warmth as a result LBW babies gain weight (Nyqvist *et al.*, 2010). Therefore, the majority of the mothers practised KMC for more hours a day (>10-hours/day), hence the experience with LBW babies' increase in body weight due to exclusive breastfeeding associated with KMC practice.

Desired outcomes are further seen when KMC practice continues at home after hospital stay until the baby is discharged from the KMC programme at KMC follow-up clinic. The KMC mothers who complied with KMC protocol during hospital stay witnessed benefits in their LBW babies, as such they are more likely to continue with KMC practice at home and willing to attend KMC follow clinic, as they perceive that continuation of KMC compliance till discharge from KMC programme will maximise their babies' survival. The WHO (2003, p.3) agrees that continuation of KMC at home largely dependents on the mother' willingness and perceived benefits, which are manifested during a hospital stay. The research results show that 45 (90%) of the KMC mothers were eager to continue with KMC, as they stressed KMC continuation at home, and hence, compliant with KMC. Blencowe and Molyneux (2005, p. 41) further explain that continuation of KMC at home is feasible when the mother has support in KMC practice. This concurs with the findings of this study on late initiation of KMC practice, due to lack of family support, which translates to noncompliance of KMC practice even at home, as the mothers will have no one to help in putting the babies in KMC position.

KMC mothers' continuation of KMC at home, coupled with KMC, follow clinic attendance enhances KMC benefits. This study revealed that mothers were willing to continue with KMC at home and carry on with attending to KMC follow up clinics till being discharged from KMC programme, as 41 (82%) of the KMC mothers were keen to bring their babies to KMC follow up clinics after a hospital stay, which leaves them a likelihood of complying with KMC. The WHO (2003, p. 5) explains that KMC follow-up is among the most important aspects in KMC protocol, hence non-follow up of LBW babies affects the KMC outcome. Bergh, Charpak, Ezeonodo, Udani and Van Rooyen, (2012, p. 26) emphasise that willingness and attending of KMC follow up clinics by KMC mothers goes hand in hand. Therefore in this study, the willingness of KMC mothers to bring their LBW babies to follow up care signifies comply with KMC protocol.

The majority of the KMC mothers perceived seriousness of LBW and witnessed KMC benefits through their compliance as such they were motivated with KMC outcomes, as a result they were keen to recommend KMC to mothers who will give birth to LBW babies. Rosant (2009, p. 33) agree that mothers who once had LBW babies and complied to KMC do mentor their fellow mothers and encourage them to practice KMC in order to optimise their LBW babies' survival.

Recommendations

Based on the shortfall identified here, the recommendations are made to Nursing and Midwifery Practice, Nursing and Midwifery Research, Nursing and Midwifery Education and Government.

Nursing and Midwifery Practice: Continuous KMC is the recommended practice in order to have the desired outcome. The research reveals that some of the KMC mothers were not able to comply with KMC, as they would not manage to nurse their babies in KMC opposition for the whole day, due to illness. In a practical sense, nursing the LBW babies in KMC position for 24 hours a day is not feasible. Due the mother's medical condition, exhaustion and fatigue. In this case, family support should step-in, in order to have a continuous KMC practice, as such complying with KMC by bridging the theoretical and practical gap.

Nursing and Midwifery Research: The study results revealed that all respondents were females, which shows that in Malawi, male involvement in KMC practice is a challenge, constituting a contributory factor to KMC non-compliance. Therefore, encouraging Antenatal Care (ANC) male involvement will facilitate male KMC uptake, as fathers will be educated on the expectations of pregnancy, which may include delivering of LBW babies and how it is managed. During ANC, the expectant fathers will be clarified on the taboos and myths surrounding male KMC involvement.

Nursing and Midwifery Education: The study shows that, due to late support from the nurses in teaching the KMC mothers the practicality of KMC, some of the KMC mothers initiated KMC practice late, even though their babies had no contraindications to be place in KMC position. It is ideal to train and/or orient all the health workers in the maternity ward, so that KMC mothers are taught the practical aspect of KMC whilst they are in the labour ward, or as soon as they are admitted in the KMC unit, rather than waiting for days to be oriented by specific nurses. Therefore, health workers who are not trained in KMC should be oriented in order to facilitate in early initiation and comply with KMC, thereby optimising LBW babies' survival. The least of the KMC mothers indicated that they rarely received KMC health talks whilst they were admitted in the hospital, where this may have led to their lack of investment in complying with KMC, where health talks function to motivate KMC compliance. Pregnant mothers ought to be treated and managed as high risks, as such involving them in health

education programmes will facilitate acquisition of KMC knowledge and practice. Therefore, training and/or orienting more nurses, including support staff and newly-recruited, in the Maternity unit and involving pregnant mothers in education programmes can aid in provision of KMC support to KMC mothers without interruptions, facilitating compliance.

Government: The study results show that media to be the medium least used in facilitating KMC awareness. Considering that Malawi is the top-most country with low birth weight deliveries, KMC awareness through media would be likely to hasten KMC awareness in reaching out to the majority of the Malawians, where hospital medium is currently predominantly used. Ferguson, Inglis, Newton, Cripps, Macdonald and Davidson (2014) agree that media is the most efficient and effective way to acheive rapid dissemination of information. As such, through media awareness, family members will have KMC knowledge and be able to support KMC practice, thereby facilitating a LBW babies' survival through KMC compliance. Therefore, the government should strengthen KMC sensitisation, coupled with KMC male involvement, through media, in order to reach out to each and every Malawian, and as a result, enhancing KMC compliance through family members and community support. Through training and/or orientation of nurses and support staff, the government should strengthen early initiation of KMC by consistently funding the maternity units with training materials, in order to ensure the constant availability of KMC providers, aiding in the facilitation of KMC compliance.

The government should benchmark best practices in the Republic of South Africa on KMC dissemination and sensitisation. National health calendar should be reinforced every month on KMC education, as pregnancy is not a seasonal illness

Limitations of the Study

The aim of the quantitative research is to generalise the findings. In this study, generalisation of the findings is a challenge due the following reasons;

- The intention of the study was to fulfil the Masters degree's requirement. The time frame of the study was limited as the researcher was working against the academic calendar, as a result there was a limited time frame allocated to data collection.
- the researcher had financial constraints as such it was a challenge to afford research assistants to help with data collection in more than one site, in order to have a large study sample in a short period of time; and
- The research was done at one site due to the time factor and financial challenges. Recommendations have been made to the study site on the identified shortfalls, in order to

facilitate the improvement of KMC service delivery, even though the study results will not be generalised across the country.

5.3. Conclusion

The aim of the study was to describe mothers' compliance to *Kangaroo Mother Care* at a selected hospital in Southern Malawi. The study finds out that almost half of the KMC mothers were compliant to KMC protocol, which was evident through their prior knowledge to KMC that facilitated KMC compliance, and mothers' KMC practice that was in line with prescribed KMC protocol. Through the KMC mothers' compliance in practising KMC according to its prescribed protocol, the mothers noted several benefits of KMC for their babies, including increasing body weight. The KMC mothers witnessed good outcomes from KMC compliance, and as such, were eager to recommend KMC to others and continue with KMC practice till their babies were discharged from KMC programme. Close to half the KMC mothers were not compliant to KMC protocol due to lack of support by family members in assisting them in putting the babies in KMC position. The nurses also contributed to the KMC mothers' non-compliance to KMC, as they were not providing KMC support timeously, delaying in KMC initiating as a result mothers did not initiate the practice according to prescribed KMC protocol.

Overall, KMC mothers is still a challenge, as close to half of the respondent were not compliant to KMC, which defeats the purpose of KMC intervention; reducing and/or prevention LBW complications through skin to skin contact. The study further clarifies that when mothers are seen not practising KMC or allegedly not complying with KMC protocol, there were reasons behind their non-compliance. Therefore, the researcher has made the recommendations focusing on the shortfalls that have been identified in this study and limitations of the study were highlighted.

REFERENCES

1. Abolfotouh, M., BaniMustafa, A., Mahfouz, A., Al-Assiri, M., Al-Juhani, A. & Alaskar, A., 2015. Using the health belief model to predict breast self-examination among Saudi women. *BMC Public Health*, 15(1163), p. 1-12. DOI 10.1186/s12889-015-2510-y
2. American Academy of Ophthalmology. "Could Religious Beliefs Affect Compliance With Ocular Treatment?" 2008. *ScienceDaily*. Online November 2008 [Accessed January 2017]. Available at: www.sciencedaily.com/releases/2008/11/081109074608.htm>.
   Available at: http://www.globalmnh2015.org/portfolio/readiness-of-hospitals-to-provide-kangaroo-mother-care-kmc-and-documentation-of-kmc-service-delivery-analysis-of-malawi-2014-emonc-survey-data
3. Ballot, D., Potterton, J., Chirwa, T., Hilburn, N., & Cooper, P.A., 2012. Developmental outcome of very low birth weight infants in a developing country. *BMC Pediatrics*, 12(11), p.1-10. Doi: 10.1186/1471-2431-12-11
4. Bergh, A., Banda L., Lipato, T., Ngwira, G., Luhanga, R., & Ligowe, R., 2012. Evaluation of kangaroo mother care services in Malawi. *Report. Washington (DC): Save the Children and the Maternal and Child Health Integrated Program*, p. 1-48. Online, February 2012 [Accessed May 2016]. Available at: HYPERLINK "*www.mchip.net>Malawi KMC Report".*
5. Bergh, A., Charpak, N., Ezeonodo, A., Udani, R. & Van Rooyen, E., 2012. Education and training in the implementation of kangaroo mother care. *South African Journal of Child Health*, 6(2), p.38-45. Online, March 2012 [Accessed July 2016]. Available at: http://www.sajch.org.za/index.php/SAJCH/article/view/417
6. Bergh, A., Kerber, K., Abwao, S., Johnson, J., Aliganyira, P., Davy, K., Gamache, N., Kante, M., Ligowe, R., Luhanga, R., Makarugwiro, B., Ngabo, F., Rawlins, B., Sayinzoga, F., Sengedo, N., Sylla, M., Taylor, R., Rooyen, E. & Zoungrana J., 2014. Implementing Facility-based Kangaroo mother care services: Lessons from a multi-country study in Africa. *BMC Health Services Research*, 14(293), p. 2-10. Doi: 10.1186/472-6963-14-293.
7. Bergh, A., van Rooyen, E., Lawn, J., Zimba, E., Ligowe, R., and Chiundu, G., 2007. Retrospective evaluation of kangaroo mother care practices in Malawian hospitals.

Healthy Newborn Network Report, p.1-78. Online August 2007 [Accessed May 2016]. Available at: www.healthynewbornnetwork.org> Retrospective evaluation of kangaroo mother care practices in Malawian hospitals.

8. Bergh, A.M., Manu, R., Davy, K., Van Rooyen, E., Asare, G.Q., Williams, J.K.A., Dedzo, M., Twumasi, A. and Nang-Beifubah, A., 2012. Translating research findings into practice–the implementation of kangaroo mother care in Ghana. *Implementation science*, *7*(1), p.75. DOI: 10.1186/1748-5908-7-75
9. Bergman, N. & Jurisoo, L., 1994. The 'kangaroo-method' for treating low birth weight babies in a developing country. *Tropical Doctor,* 24(2), p. 57–60. Online, April 1994 [Accessed April 2016]. Available at: http://www.ncbi.nlm.nih.gov/pubmed/8009615
10. Bergman, N., 2012-2016. Where KMC Started-Kangaroo Mother Care: History of kangaroo mother care. Kangaroo Mother Care. Online 2012 [Accessed July 2016]. Available at: http://www.kangaroomothercare.com/beginning-KMC.aspx *2012-2016*
11. Bergman, N., 2015. Kangaroo Mother Care in African countries. *Acta Paediatria: Nurturing the chid*, 104(12), p. 1208-1210. DOI:10.1111/apa.12933.
12. Black, R., Cousens, S., Johnson, H., Lawn, J., Rudan, I., Bassani, D., Jha, P., Campbell, H., Walker, C., Cibulskis, R., Eisele, T., Liu, L. & Mathers, C. 2010. Global, regional, and national causes of child mortality in 2008: a systematic analysis. *The Lancet*, 375(9730), p.1969-1987. DOI:10.1016/S0140-6736(10)60549-17
13. Blencowe, H. & Molyneux, E., 2005. Setting up Kangaroo Mother Care at Queen Elizabeth Hospital, Blantyre: A practical approach. *Malawi Medical Journal*, 17(2), p. 39–42. Doi: 10.4314/mmj.v17i2.10873
14. Blencowe, H., Kerac, M. & Molyneux, E., 2009. Safety, effectiveness and barriers to follow-up using an 'early discharge'Kangaroo Care policy in a resource poor setting. *Journal of Tropical Pediatrics*, 55(4), p. 244-248. Doi: 10.1093/tropej/fmn116
15. Blomqvist Y.T., Rubertsson C., Kylberg E., Jö Reskog K. & Nyqvist K.H., 2012. Kangaroo Mother Care helps fathers of preterm infants gain confidence in the paternal role. *Journal of Advanced Nursing*, 68(9), 1988–1996. DOI: 10.1111/j.1365-2648.2011.05886.x
16. Blomqvist, Y.T., Fro¨ lund, L., Rubertsson, C. & Nyqvist, K.H., 2012. Provision of Kangaroo Mother Care: supportive factors and barriers perceived by parents. *Scandinavian Journal of Caring Sciences*; p.1-9. doi: 10.1111/j.1471-6712.2012.01040.x

17. Brink, H., Van der Walt, C. & Van Rensburg, G. 2012. Fundamentals of Research Methodology for Healthcare Professionals. 3rd Ed. JUTA, Cape Town.
18. Brink, P.J. & Wood, M.J. 1998. Adavanced Design in Nursing research. 2nd Ed. Boston: Jones & Bartlett.
19. Burke, E. 2010. The Health Belief Model. p. 1-3. Online [Accessed July 2016]. Available at: http://www.iccwa.org.au.files.soyf
20. Burns, N. & Grove, S. K. (2011) *Understanding Nursing Research.* 5th Ed. Philadelphia: Saunders
21. Cannoodt, L., Kayinamura, M., Van Kerschaver, E., Nambajimana. A & Rudasingwa, D. 2014. Follow up assessment of preterm and LBW infants discharged from the district hospital of Huye: preliminary results. *Paper presented at 10th International Conference on Kangaroo Mother Care. Kigali, Rwanda*, p.17-19. Online [Accessed June 2016]. Available at: http://www.vlaamsegezondheidszorg.com/sites/default/files/impore/FUAPI%20%20PPT%20KMC%20conferentie%2018-11-2014.pdf
22. Catling-Paull, C., Coddington, R., Foureur, M. & Homer, C., 2013. Publicly funded homebirth in Australia: a review of maternal and neonatal outcomes over 6 years. *Medical Journal of Australia*, 198(11), p. 616-620. Doi: 10.5694/mja12.11665.
23. Chan, G., Labar, A., Wallb, S. & Atuna, R., 2016. Kangaroo mother care: a systematic review of barriers and enablers. *Bulletin of World Health Organi*zation *2016*, 94(2), p.130-141. Doi: http://dx.doi.org/10.2471/BLT.15.157818
24. Charpak, N., & Ruiz-Pela ´ez, J.G. 2006, 'Resistance to implementing Kangaroo Mother Care in developing countries, and proposed solutions'. *Acta Pædiatrica*, 95(5), p.529-534. DOI: 10.1080/08035250600599735
25. Charpak, N., Ruiz-Peláez, J.G., Zita Figueroa de C, M.D. and Charpak, Y., 1997. Kangaroo mother versus traditional care for newborn infants≤ 2000 grams: a randomized, controlled trial. *Pediatrics*, *100*(4), p.682-688. DOI: 10.1542/peds.100.4.682
26. Chavula, K. 2015. Readiness of Hospitals to Provide Kangaroo Mother Care (KMC) and Documentation of KMC Service Delivery: Analysis of Malawi 2014 EmONC Survey Data. *Global Maternal Newborn Health Conference.* On line October, 2015 [Accessed August 2016].

27. Chisenga J., Chalanda M. & Ngwale, M. 2014. Kangaroo Mother Care: A review of mothers'experiences at Bwaila hospital and Zomba Central hospital (Malawi). *Science direct, midwifery,* 31(2), p. 305-315. Doi: 10.1016/j.midw.2014.04.008.
28. Chopra, M., Daviaud, M., Pattinson, R., Fonn, S. & Lawn, J., 2009. Saving the lives of South Africa's mothers, babies, and children: can the health system deliver? *The Lancet*, 374(9692), p. 835–846. DOI:10.1016/S01406736(09)61123-5.
29. Conde-Agudelo, A., Belizán, J. & Diaz-Rossello, J., 2011. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. *Cochrane Database of Systematic Reviews* 3(CD002771). DOI: 10.1002/14651858.CD002771.pub2
30. Costello, A., Osrin, D. & Manandhar, D., 2004. Reducing maternal and neonatal mortality in the poorest communities. *British Medical Journal*, 329(7475), p.1166-1168. Doi: http://dx.doi.org/10.1136/bmj.329.7475.1166
31. Cramer, J., Roy, A., Burrell, A., Fairchild, C., Fuldeore, M., Ollendorf, D. & Wong, P., 2008. Medication compliance and persistence: Terminology and Definitions. *International society for Pharmacoeconomics and Outcomes Research (ISPOR),* 11(1) p.44-47. Doi: 1098-3015/08/44
32. Creswell, J., 2014. Research Design: Qualitative, Quantitative and Mixed Methods Approaches. *SAGE Publications, Inc*, 4th Ed. ISBN 978-1-452202609-5
33. Darmstadt, G., Bhutta, Z., Cousens, S., Adam, T., Walker, N. & de Bernis, L., 2005. Evidence-based, cost-effective interventions: how many newborn babies can we save?'. *The Lancet*, 3659(9463), p. 977-988. Doi:10.1016/S0140-6736(05)71088-6
34. Darmstadt, G., Kumar, V., Yadav, R., Singh, V., Singh, P., Mohanty, S., Baqui, A., Bharti, N., Gupta, S., Misra, R., Awasthi, S., Singh, J. & Santosham, M., 2006. Introduction of community-based skin-to-skin care in rural Uttar Pradesh, India. Journal of Perinatology. *Journal of Perinatology*, 26(10), p.597-604. Doi:10.1038/sj.jp.7211569
35. Demir, Y., Atli, A., & Kis, A., 2016. Empathy based on gender in dissertations submitted in Turkey: A meta-analysis study. *Eurasian Journal of Educational. Research*, 64, 69-90. Doi:http://dx.doi.org/10.14689/ejer.2016.64.4
36. Department of Health (DoH) 2015. Ethics in health research: Principles, Processes and Structure 2nd Edition. *South African Ministry of Health*. p.1-83. Online, March 2015 [Accessed August 2016]. Available at: www0.sun.ac.za>Integrity_and_Ethics

37. Desai, F., Hann, M., Ryan, E., Kirsten, G., Bergman, N., Kamfer, W., Baxen, P., Swanepoel, E., Van Der Walt, H., Thomas, W., Noach, D., Lenga, O., Olivier, L. & Prins, E. 2011. Region Western Cape Government. Kangaroo Mother Care Policy and Guideline. *Africa, circular, Cape Town, Western Cape Government*, 143(2011), p. 1-65. Online [Accessed August 2016]. Available at: https://www.westerncape.gov.za>text
38. Dickson, K.E., Kinney, M.V., Moxon, S.G., Ashton, J., Zaka, N., Simen-Kapeu, A., Sharma, G., Kerber, K.J., Bernadette Daelmans, B., Gülmezoglu, A.M., Mathai, M., Nyange, C., Baye, M. &, Lawn, J.E 2015. Scaling up quality care for mothers and newborns around the time of birth: an overview of methods and analyses of intervention-specific bottlenecks and solutions. *BMC Pregnancy and Childbirth*, 15(2), p.1-19 Doi:http://www.biomedcentral.com/1471-2393/15/S2/S1
39. Emanuel, E., Wendler, D., Killen, J. & Grady, C., 2004. What Makes Clinical research in Developing Countries Ethical? The Benchmarks of Ethical Research. *The Journal of Infectious Diseases* 189(5), p. 930-937. Doi: 10.1086/381709
40. Feldman, R., Weller, A., Sirota, L. & Eidelman, A., 2003. Testing a family intervention hypothesis: the contribution of mother-infant skin-to-skin contact (kangaroo care) to family interaction, proximity, and touch. *Journal of Family Psychology*, 17(1), p.94-107. DOI: 10.1037/0893-3200.17.1.94
41. Ferguson, C., Inglis, S.C., Newton, P.J., Cripps, P.J.S., Macdonald, P.S. & Davidson, P.M., 2014. Social media: A tool to spread information: A case study analysis of Twitter conversation at the Cardiac Society of Australia & New Zealand 61st Annual Scientific Meeting 2013. *Science Direct*, 21(2), p.89–93. doi:10.1016/j.colegn.2014.03.002
42. Feucht, U., van Rooyen, E., Skhosana, R. and Bergh, A.M., 2016. Taking kangaroo mother care forward in South Africa: The role of district clinical specialist teams. *SAMJ: South African Medical Journal*, *106*(1), pp.49-52. Doi: http://dx.doi.org/10.7196/SAMJ.2016.V106I1.10149
43. Flacking, R., Ewald, U. & Wallin, L., 2011. Positive effect of kangaroo mother care on long-term breastfeeding in very preterm infants. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 40(2), p.190-197. DOI: 10.1111/j.1552-6909.2011.01226.
44. Glanz, K., Marcus, M., & Rimer, B., 1997. The Theory at A Glance. A guide for Health Promotion Practice. National Institute of Health. United States of America.

45. Glanz, K., Rimer, B. & Viswanath, K., 2008. Health Behaviour and Health Education: Theory, Research and Practice. 4th Ed. San Francisco: Jossey-Bass.
46. Hardly, W., 2011. Integration of Kangaroo Care into Routine Care Giving in the ICU. *What Is Stopping You? Advances in Neonatal Care,* 11(2), p.119-121. DOI:10.1097/ANC.0b013e3182120b04
47. Hochbaum, G., Rosenstock, I. & Kegels, S., 1952. Health belief model. *United States Public Health Service, p. 1-3. Available at: DOC infosihat.gov.my*
48. Janz, N. & Becker, M., 1984. The health belief model: A decade later. *Health Education & Behavior, 11*(1), p1-47. Doi: http://www.ncbi.nlm.gov/pubmed/6392204
49. Jeihooni, A., Hidarnia, A., Kaveh, M., Hajizadeh, E. & Askari, A. 2016. Application of the health belief model and social cognitive theory for osteoporosis preventive nutritional behaviors in a sample of Iranian women. *Iranian Journal of Nursing and Midwifery Research,* 21(2), p. 131-141. DOI: 10.4103/1735-9066.178231
50. Johnson, A-N.2016Can Skin-to-Skin Holding in the NICU Support Lactation? *Journal of Nursing and Care,* 5(4), p.1-6. DOI: 10.4172/2167-1168.1000360
51. Kinney, M., Kerber. K., Black, R., Cohen, B., Nkrumah F, Coovadia, H., Nampala, P. &, Lawn, J., 2010. Sub-Saharan Africa's Mothers, Newborns, and Children: Where and Why Do They Die? *PLoS Med*, 7(6), 1-9. Do:10.1371/ jousrnal.pmed.1000294
52. Kinney, M., Lawn, J. & Kerber, K., (eds). 2009. Science in action: Saving the lives of Africa's mothers, newborns and children. Report for the African Academy Science Development Initiative. *World Health organization: Cape Town, South Africa*. Online, November 2009 [Accessed July 2016]. Available at: www.who.int>topics>continuum>science> Report for the African Academy Science Development Initiative.
53. Kumar, V., Mohanty, S., Kumar, A., Misra, R., Santosham, M., Awasthi, S., Baqui, A., Singh, P., Singh, V., Ahuja, R., Singh, J., Malik, G., Ahmed, S., Black, S., Bhandari, M. & Darmstadt, G., 2008. Effect of community-based behaviour change management on neonatal mortality in Shivgarh, Uttar Pradesh, India: a cluster-randomised controlled trial. *The Lancet*, 372(9644), p.1151-1162. doi:10.1016/S0140-6736(08)61483-X
54. Lawn, J., Blencowe, H., Oza, S., You, D., Lee, A., Waiswa, P., Lalli, M., Bhutta, Z., Barros, A., Christian, P., Mathers, C. & Cousens, C., 2014. Every Newborn: progress, priorities, and potential beyond survival. *The Lancet,* 2014(384), p.189–205. Doi: http://dx.doi.org/10.1016/ S0140-6736(14)60496

55. Lawn, J., Cousens, S. & Zupan, J., 2005. 4 million neonatal deaths: when? Where? Why?.*The Lancet*, 365(9462), p.891-900. Doi:10.1016/S0140-6736(05)71048-5

56. Lawn, J., Kerber, K., Enweronu-Laryea, C.& Cousens, S., 2010 3.6 Million Neonatal deaths-What Is Progressing and What Is Not? P.371-386 doi:10.1053/j.semperi.2010.09.011

57. Lawn, J., Mwansa-Kambafwile, J., Horta, B., Barros, F. & Cousens, S., 2010a. Kangaroo mother care to prevent neonatal deaths due to preterm birth complications. *International Journal of Epidemiology*, 39(1), p. i144-i154. Doi:10.1093/ije/dyq031

58. LoBiondo-Wood, G. & Haber, J. (2010) *Nursing Research: Methods & Critical Appraisal for Evidenced-based Practice.* St Louis: Mosby.

59. Loke, A., Davies, L. & Li, S., 2015. Factors influencing the decision that women make on their mode of delivery: The Health Belief Model. *BMC Health Services Research*, 15(274), p.1-12 DOI:10.1186/s12913-015-0931-z

60. Lothian, J.A., 2005. The Birth of a Breastfeeding Baby and Mother. Journal of Perinatal Education, 14(1), p.42-45. Doi: 10.1624/105812405X23667

61. Ludington-Hoe, S., Hadeed, A. & Anderson, G., 1991. Physiological responses to skin-skin contact in hospitalized premature infants. *Journal of perinatology*: *Official journal of the California Perinatal Association.* 11(1), p.19-24. Doi: http://www.ncbi.nlm.nih.gov/pubmed/2037883.

62. March of Dimes, PMNCH, Save the Children, WHO 2012. Born Too Soon: The Global Action Report on Preterm Birth. Howson, C., Kinney, M. & Lawn, J. (eds.) *World Health Organization*, 201310(1). Doi: 10.1186/1742-4755-10-S1-S1. pmid:24625113.

63. Martines, J., Paul, V., Bhutta, Z., Koblinsky, M., Soucat, A., Walker, N., Bahl, R., Fogstad, H. & Costello, A., 2005. Neonatal survival: a call for action. *The Lancet*, 365(9465), p.1189-1197.Doi:10.1016/S0140-6736(05)71882-1

64. McLeod, S.A. 2008. Likert Scale: Simply Psychology. Online [Accessed August 2016]. Available at: www.simplypsychology.org/likert-scale.html

65. Nashwa, M., Samra, M.D., Amal E.l & Taweel, M.D. & Cadwell, K., 2013. Effect of Intermittent Kangaroo Mother Care on Weight Gain of Low Birth Weight Neonates With Delayed Weight Gain *The Journal of Perinatal Education*, *22*(4), 194–200, http://dx.doi.org/10.1891/1058-1243.22.4.194

66. Nguah, S.B., Wobil, P.N., Obeng, R., Yakubu, A., Kerber, K.J., Lawn, J.E. and Plange-Rhule, G., 2011. Perception and practice of Kangaroo Mother Care after discharge from

hospital in Kumasi, Ghana: A longitudinal study. *BMC pregnancy and childbirth*, 11(99), p.1-8. Doi: http://www.biomedcentral.com/1471-2393/11/99

67. Nyqvist, K., Anderson, G., Bergman, N., Cattaneo, A., Charpak, N., Davanzo, R., Ewald, U., Ludington-Hoe, S., Mendoza, S., Pallás-Allonso, C., Peláez, J., Sizun, J.& Widström, A., 2010 State of the art and recommendations. Kangaroo mother care: application in a high-tech environment. Breastfeeding review. *Professional publication of the Nursing Mothers' Association of Australia*, 18(3), 21-28. DOI:10.1111/j.1651-2227.2010.01794.x
68. Park, H.K., Choi, B.S., Lee, S.J., Son, I., Seol, I.J. and Lee, H.J., 2014. Practical application of kangaroo mother care in preterm infants: clinical characteristics and safety of kangaroo mother care. *Journal of perinatal medicine*, *42*(2), p.239-245. DOI 10.1515/jpm-2013-0066 J.
69. Pattinson, C., Arsalo, I., Bergh, A., Malan, A., Patrick, M., & Phillips, N., 2005. Implementation of kangaroo mother care: a randomized trial of two outreach strategies. *Acta Paediatrica*, 94(7), p. 924-927. DOI: 10.1080/08035250510028399
70. Pera, S. & Van Tonder, S., 2008. Ethics in health care. Juta & Co. Ltd
71. Polit, D. & Beck C., 2012. Nursing research: generating and assessing evidence for nursing practice. 9th Ed. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins
72. Rimer, B. & Glanz, K., 2005. The Theory at a Glance. 2nd Ed. A Guide for Promotion Practice. National Cancer Institute.
73. Roberts, P., Priest, H. & Traynor, M., 2006. Reliability and validity in research. *Nursing Standards, Art & Science*, 20(44), p.41-45. Doi: 10.7748/ns2006.07.20.44.41cc6560.
74. Rosant, C., 2009 Knowledge of and attitudes towards kangaroo mother care in the Eastern Subdistrict, Cape Town. P.1-36. Doi: URI: http://hdl.handle.net/11394/2702
75. Rosenstock, I.M., Strecher, V.J. & Becker, M.H. 1988. Social Learning theory and the Health Belief Model. *Health Education & Behavior*, 15(2), p.175-183. Doi: 10.1177/109019818801500203
76. Ruiz, J., Charpak, N. & Figueroa, Z., 2002. Predictional need for supplementing breastfeeding in preterm infants under Kangaroo Mother Care. *Acta paediatrica*, 91(10), p.1130-1134. DOI: 10.1111/j.1651-2227. 2002.tb00111.x

77. Ruiz-Pelaez, J., Charpak, N. & Cuervo, L., 2004. Kangaroo Mother Care, an example to follow from developing countries. *British Medical Journal*. 329 (7475), p. 1179-1181. Doi: http://www.jstor.org/stable/25469435.
78. Rylance, S. & Ward, J., 2013. Early mortality of very low-birthweight infants at Queen Elizabeth Central Hospital, Malawi. *Paediatrics and International Child Health*, 33(2), p. 91-96. Doi: http://dx.doi.org/10.1179/2046905513Y.0000000053
79. Sloan, N., Ahmed, S., Mitra, S., Choudhury, N., Chowdhury, M., Rob, U. & Winikoff, B., 2008. Community-based kangaroo mother care to prevent neonatal and infant mortality: a randomized, controlled cluster trial. *Pediatrics*, 121(5), p, e1047-e1059. Doi: http://pedatrics.aappublications.org/content/121/5/e1047
80. Solomons, N. & Rosant C., 2012. Knowledge and attitudes of nursing staff and mothers towards kangaroo mother care in the eastern sub-district of Cape Town. *South African Journal of Clinical Nutrition*, 25(1), p. 33-39. Doi: http//dx.doi.org/10.1080/16070658.2012.11734400
81. SurveyMonkey, 1999-2016. Sample Size Calculator. *Copyright.* [Accessed June 2016]. Available at: https://www.surveymonkey.com/mp/sample-size-calculator
82. Tarkang, E. & Zotor, F., 2015. Application of the Health Belief model (HBM) in HIV Prevention: A Literature review. *Central African Journal of Public Health*, 1(1), p. 1-8. Doi: 10.11648/j.cajph.20150101.11
83. Taylor, D., Bury, M., Campling, N., Carter, S., Garfield, S., Newbould, J. & Rennie, T. (2007). A Review of the use of Health Belief Model (HBM), the Theory of reasoned Action (TRA), the Theory of Planned Behaviour (TPB) and the Trans-Theoretical Model (TTM) to study and predict health related behaviour change. *National Institute for Health and Clinical Excellence (NICE),* p. 3-17. Online, Available at: *www2.warwick.ac.uk>healthpsychology*
84. Taylor, S., Bogdan, R. & DeVault, M., 2016. Introduction to Qualitative research methods: A Guidebook and Resources. 4th Ed. *John Wiley & Sons, Inc*., Hoboken, New Jersey. ISBN978-1-118-76721-4 (cloth) – ISBN978-1-118-767306 (epdf) – ISBN978-1-118-76729-0 (epubn)
85. United Nations Inter-agency Group for Child Mortality Estimation (UN IGME), UNICEF, WHO, World Bank & United Nations Population Division 2015. CME Info-Child Mortality Estimates. Online September 2015 [Accessed April 2016]. Available at: http://www.childmortality.org

86. University of Twente, 2012. Health Belief Model. Online, March 2012 [Accessed August 2016]. Available at: https://www.utwente.nl./cw/theorieenoverzicht/Theory%20Clusters/Health%20Communication/Health_Belief_Model/
87. van Ekdom, L., Stenberg, K., Scherpbier, W. & Niessen, W., 2011. Global cost of child survival: estimates from country-level validation. *Bulletin of the World Health Organization*, 2011(89), p.267-277. Doi: 10.2471/BLT.10.081059
88. Varkevisser, C. M., Pathmanathan, I. and Brownlee, A. (2003) *Designing and conducting health system research projects*. *Vol. 1*. KIT Publishers, Amsterdam.
89. Venancio, S.I., de Almeida, H., 2004. Kangaroo Mother Care: scientific evidences and impact on breastfeeding. *J Pediatr (Rio J)*,80(5):S173-S180. Doi: 0021-7557/04/80-05-Suppl/S173J
90. Vesel, L., Bergh, A., Kerber K., Valsangkar, B., Mazia, G., Moxon, S., Blencowe, H., Darmstadt, G., de Graft Johnson, J., Dickson, K., Pelaez, J., Von Xylander, S. & Lawn, J., 2015. Kangaroo mother care: a multi-country analysis of health system bottlenecks and potential solutions. *BMC Pregnancy and Childbirth*, 15(2), p.1-16. Doi: 10.1186/1471-2393-15-S2-S5
91. Victora, C., Rubens, C. & GAPPS Review Group 2010. Global report on preterm birth and stillbirth (4 of 7): Delivery of interventions. *BMC Pregnancy and Childbirth*, 10(1), p.1-19. DOI: 10.1186/1471-2393-10-S1-S4
92. WHO, UNICEF & WORLD BANK, 2015.Child mortality rates plunge by more than half since 1990 but global MDG target missed by wide margin. Online, [Accessed May 2016]. Available at: http://www.who.int/mediacentre/news/releases/2015/child-mortality-report/en/
93. Woods, Theron, Bergh, Bergman, Bonnici, Christie, Hann, Hofmeyr, Honikman, Kirsten, Kreft, Ryan & Strydom 2016. Mother and Baby Friendly Care. *Bettercare*. [Accessed June 2016]. Available at: http://bettercare.co.za/learning-programmes/mother-baby-friendly-care/ .
94. Word Health Organization, 2008. Health in Asia and the Pacific. Online [Accessed March 2016]. Available at:http://www.wpro.who.int/health_research/documents/Health_in_Asia_and_the_Pacific/en/

95. World Health Organization 2003, Kangaroo mother care; A practical guide. *Department of Reproductive Health and Research, Geneva*, p.1-48. Online, [Accessed June 2016]. Available at: http://www.who.int?maternal_child_adolescent/documents/9241590351/en/
96. World Health Organization and UNICEF, 2013. Countdown to 2015: Accountability for maternal, newborn and child survival: The 2013 Update Online [Accessed March 2016]. Available at: http://www.countdown2015mnch.org/country-profiles/index.php?option=com_content&view+article&aid+50160&Itemid+50423.
97. World Health Organization, 2015a. Child Mortality Estimates. Online [Accessed March 2016]. Available at: http://www.childmortality.org/index.php?r=site/graph#ID=MWI_
98. World Health Organization, 2015b. Preterm birth. Media Centre. Online, [Accessed March 2016]. Available at: http://www.who.int/mediacentre/factsheets/fs363/en/
99. World Health Organization, 2015c. Malawi: Giving the smallest babies the best chance at life. Online [Accessed April 2016]. Available at: http://www.who.int/features/2015/malawi-infant-survival/en/
100. World Health Organization, 2015d. From MDGS to SDGS: A new era for global public health 2016–2030. Online [Accessed February 2016]. Available at: http://www.who.int/mediacentre/events/meetings/2015/MDGs-SDGs-Summary.pdf
101. World Health Organization, 2015e. WHO recommendations on interventions to improve preterm birth outcomes. Online [Accessed March 2016]. Available at: http://www.who.int/iris/handle/10665/183037
102. World Health Organization, 2016. Children: reducing mortality. Online [Accessed April 2016 & March 2017]. Available at: http://www.who.int/mediacentre/factsheets/fs178/en/
103. Zimba, E., Kinney, M., Kachale, F., Waltensperger, K., Blencowe, H., Colbourn, T., George, J., Mwansambo, C., Joshua, M., Chanza, H., Nyasulu, D., Mlava, G., Gamache, N., Kazembe, A., & Lawn, J.L., 2012. Newborn survival in Malawi: a decade of change and future implications. *Health Policy and Planning*; 27(3), p. iii88–iii103. doi:10.1093/heapol/czs043S

APPENDICES

Appendix 1: English Questionnaire

Section A: Demographic Profile

Instructions: Tick the correct box

1. Age (years)

a. 18-21 ☐
b. 22-25 ☐
c. 26-29 ☐
d. >30 ☐

2. Gender

a. Male ☐
b. Female ☐

3. Religion

a. Christian ☐
b. Muslim ☐
c. Other ☐

4. Educational status

a. Not attended school ☐
b. Primary ☐
c. Secondary ☐
d. College ☐

5. Ethnicity

a. African ☐
b. Indian ☐
c. Other ☐

6. Language

a. English ☐
b. Chichewa ☐

c. Other

SECTION B: Assessing KMC knowledge, practice and compliance

Instruction: Please tick in the appropriate box

1. What is your baby's birth weight?
   a. 0g-999g ☐
   b. 1000g-1449g ☐
   c. 1500g-2449g ☐
2. How far along were you when you gave birth?
   a. Less than 37 weeks ☐
   b. More than 37 weeks ☐
3. How did you know about KMC?
   a. Nurse ☐
   b. Friend who previously practised KMC ☐
   c. Media ☐
   d. Other ☐

4. Which baby's birth weight qualifies for KMC?
   a. Any ☐
   b. Less than 2500g ☐
   c. 2500g only ☐
   d. More than 2500g ☐
5. In what position, do you put your baby under KMC?
   a. Baby with a head cap, nappy and socks at its mother's back ☐
   b. Baby with a head cap, nappy and socks on its mother's lap ☐
   c. Baby with a head cap, nappy and socks at its mother's bare breast ☐
6. When did you start practising KMC?
   a. Within a day after delivery ☐
   b. 2 days after delivery ☐
   c. 3-5 days after delivery ☐
   d. A week after delivery ☐
7. Why did you start practising KMC at the time mentioned above?
   a. Baby was under medical care ☐
   b. I was under medical care and no one to help ☐

c. I was not yet educated about KMC ☐

d. I started soon after delivery because I had no restrictions ☐

8. Approximately, how many hours per day do you nurse your baby in KMC position?

a. 2-5 hours ☐

b. 5-10 hours ☐

c. 10-18 hours ☐

d. >18 hours ☐

9. Approximately, how many times per day do you feed your baby either breastfeeding, expressed milk by cup or through nasal feeding tube?

a. Never ☐

b. 2-6 times ☐

c. 6-8 times ☐

d. more than 8 times ☐

10. To what extent has your baby's weight changed, since you started practising KMC?

a. Decreased ☐

b. Constant ☐

c. Moderate ☐

d. Increased ☐

11. How much support do you get with putting the baby in KMC position?

a. Never ☐

b. Rarely ☐

c. Often ☐

d. Very often ☐

12. How frequently do you get support with health education talks about KMC?

a. Never ☐

b. Rarely ☐

c. Often ☐

d. Very often ☐

13. How much has your baby benefited from KMC?

a. Never ☐

b. Less ☐

c. Benefited ☐

d. Much benefited ☐

14. How motivated are you to continue with KMC practice after discharge?

a. Never ☐

b. Less motivated ☐

c. Motivated ☐
d. Very motivated ☐

15. How likely are you coming back to the hospital for follow-up care after discharge?
    a. Not coming back ☐
    b. Less Likely ☐
    c. Likely ☐
    d. More likely ☐
16. How likely are you to recommend KMC to a mother who has given birth to a low birth weight baby?
    a. Never ☐
    b. Less likely ☐
    c. Likely ☐
    d. More likely ☐

Thank you for participating in the study.

Appendix 2 : Chichewa Questionnaire

Gawo A : Zokhunza inu

Langizo: Chonde chongani mubokosi loyenera ndiyankho lanu

1. Zaka
   a. 18-21 ☐
   b. 22-25 ☐
   c. 26-29 ☐
   d. >30 ☐
2. Gender
   a. Manuna ☐
   b. Mkazi ☐
3. Chipembedzo
   a. Chikhristu ☐
   b. Chisilamu ☐
   c. Zina ☐
4. Maphunziro
   a. Sindinaphunzire ☐
   b. Pulaimane ☐
   c. Sekondale ☐
   d. Koleji ☐
5. Mtundu
   a. Wachikuda ☐
   b. wachimwenye ☐
   c. Zina ☐
6. Chiyankhulo
   a. English ☐
   b. Chichewa ☐
   c. Zina ☐

Gawo B: Kuyesa maziwidwe, mchitidwe ndi kuzipereka pankhani ya "Kangaroo".

Langizo: Chonde chongani mubokosi loyenera

1. Mwana wanu analemera bwanji pobadwa?
   a. 0g-999g ☐
   b. 1000g-1449g ☐
   c. 1500g-2449g ☐
2. Munachila muli ndimiyezi ingati?
   a. Yochepera 37 weeks ☐
   b. Yoposera 37 weeks ☐
3. Munadziwa bwanji za chisamaliro chamwana cha "Kangaroo"?
   a. Namwino ☐
   b. Mnzanga amene anasamalira mwana wake kuzera mu Kangaroo ☐
   c. wailesi, kanema kapena nyuzipepa ☐
   d. Njira zina ☐
4. Ndi mwana olemera bwanji amene atha kulandila chisamaliro cha "Kangaroo"?
   a. aliyense ☐
   b. Kuchepera 2500g ☐
   c. 2500g ☐
   d. 2500g ndikuposa apo ☐
5. Kodi mwana amene tikusamalira munjira ya "Kangaroo" amayenera kunyamulidwa motani?
   a. Mwana atavala chipewa, thewera ndi sokosi ndikumuika kumbuyo kwaamai ake ☐
   b. Mwana atavala chipewa, thewera ndi sokosi ndikumufumbata mmanja mwaamai ake ☐
   c. Mwana atavala chipewa, thewera ndi sokosi ndikumuika pachifuwa pa amaiake ☐
6. Inu munayamba liti kusamalira mwan a wanu munjira ya "Kangaroo"?
   a. Tsiku limene anabadwa ☐
   b. Ali ndi matsiku awiri chibadwire ☐
   c. Pakati pa masiku atatu ndi asanu chibadwire ☐
   d. Patatha sabata limodzi chibadwire ☐
7. Chifukwa chani munayamba kusamalira mwana wanu munjira ya "Kangaroo" munthawi watchula pamwabayi?
   a. Mwana amalandira chithandizo ☐
   b. Ndimadwala, panalibe ondithandizira ☐
   c. Ndinali ndisanaphunzitsidwe zokhuza "Kangaroo" ☐
   d. Zifukwa zina ☐
8. Mwana wanu amatha maola angati patsiku ali pachisamaliro cha "Kangaroo"?

a. Maola 2-5 ☐
b. Maola 5-10 ☐
c. Maola 10-18 ☐
d. Maola oposa 18 hours ☐

9. Mumamuyamwitsa mwana wanu kangati patsiku? Kaya ndimkaka wofinyira mkapu, okumwa kudzera muchubu cha mphuno.
   a. Palibe ☐
   b. 2 kufika ka 6 ☐
   c. 6 kufika ka 8 ☐
   d. 8 Kuposa ka 8 ☐
10. Mwana wanu wasintha bwanji kalemeredwe chiyambire chisamaliro cha "Kangaroo"?
   a. Watsika malemeredwe ☐
   b. Sanasithe ☐
   c. Wasitha pang'ono ☐
   d. Akulemera kwambiri ☐

11. Anthu ena amakupeputsani mochuluka bwanji posamalira mwana wanu munjira ya "Kangaroo"?
   a. Sindithandizidwa ☐
   b. Patalipatali ☐
   c. Ndinathandizidwa ☐
   d. Ndimathadizidwa kwambiri ☐
12. Malangizo akasamaliridwe kamwana wanu munjira ya Kangaroo amakufikirani mochuluka bwanji?
   a. Samandifikira ☐
   b. Mwapatalipatali ☐
   c. Amandifikira ☐
   d. Amandifikira kwambiri ☐
13. Mwana wanu wapindula bwanji ndichisamaliro cha Kangaroo?
   a. Phindu silinayambe kuoneka ☐
   b. Pang'ono ☐
   c. Wapindula ☐
   e. Wapindula kwambiri ☐
14. Ndinu olimbikitsidwa bwanji kuti mukapitiliza kusamalira mwana wanu munjira ya "Kangaroo" mukatuluka mchipatala?
   e. Ndilibe chilimbikitso ☐
   f. Chilimbikitso ndichochepa ☐

g. Chilimbikitso ndilinacho ☐
h. Chilimbikitso ndichambiri ☐

15. Ndikotheka bwanji kubweranso ndimwanayu kuzamuonetsa kwaanamwino muka[illegible] muchipatala muno?
    e. Ndikosathekera
    f. Mwina ☐
    g. Nkothekera ☐
    h. Nkothekera kwambiri ☐

16. Mungauze amnzanu ena omwe abereka mwana osakwana masiku zaubwino wa “Kangaroo”?
    a. Ayi ☐
    b. Mwina ☐
    c. Eya ☐
    d. Kwambiri ☐

Zikomo chotenga nawo mbali mukafukufuku ameneyu.

Appendix 3: English Information Sheet

Date:

Dear Ms./Mrs./Mr.,

About the researcher: I am Christina Tiyankhulenji Mathias a Master's student in Nursing Research at the University of KwaZulu-Natal, Howard campus, South Africa. As part of my degree programme, I am required to carry out a research, which will lead to my dissertation. My research topic is **Describing mothers' compliance to Kangaroo Mother Care at a selected hospital in Southern Malawi.**

My contact details, cell: +27730793469. Email address: ctmathias@yahoo.ie.

Research supervisor's contact details: (+27) 031 260 2901.

Describing the aim of the study: *Kangaroo Mother Care* is one of the low-cost, effective measures practiced in low income settings, to enhance the survival of low birth weight babies. It is empirically evident that KMC practice has got numerous advantages over the LBW babies lives. Full involvement in KMC practice by the mothers is of significance in facilitating LBW babies' survival, yet there is little research targeting the key players in KMC practice, who are the mothers. Therefore, the researcher aims at describing mothers' compliance to KMC that negatively or positively affects KMC service. In so doing, the study will address emerging issues for the smooth running of KMC services, that will yield high LBW babies' survival rate through total involvement of the significant players, who are the mothers. The researcher intends to recruit 50 participants.

Expectations by the participant: Participation in this study is totally voluntary and the participation can be withdrawn at any time without being penalised. The participant is expected to answer a simple and elaborate questionnaire, at the participant's convenient time and in an enclosed room. The questionnaire centres on the participant's knowledge and practice in KMC, which will be translated to the participant's compliance with KMC. The researcher engages to respect the participant's time commitment. The time allocated for the discussion is 20 minutes.

Respect of anonymity and confidentiality: The questionnaire does not bear any information leading to the participant's identity. Hence, the participant is to be assured that no names will appear in the study as neither the researcher nor the supervisor will link questionnaire to an individual. The questionnaires will be kept in a lockable room, to which only the researcher and the supervisor will have access.

Safety of the study: Please note that there are no risks involved in your participation in the research as there is no invasive procedure used to collect data.

This study has been ethically reviewed and approved by Malawi National Health Sciences Research Committee (NHSRC) (approval number**: 1680**) and by the UKZN Biomedical Research Ethics Committee (approval number: **BE560/16**).

In the event of any concerns you may contact the researcher at the contact provided above or the Malawi National Health Research Committee and the UKZN Biomedical Research Ethics Committee on the following contact details:

NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE

The Chairperson

Ministry of Health (Research Department)

P.o BOX 300377

Lilongwe 3

Malawi

Tel: (+265) 6017 26422

Fax: (+265) 017 26418

Email: cmwansambo@malawi.net / rmajamanda@gmail.com

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Bulding

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

Sign the consent form if you are willing to participate in the study.

Appendix 4: English Informed Consent Form

Declaration

I have been informed about the study entitled, **Describing mothers' compliance to Kangaroo Mother Care at a selected hospital in southern Malawi**.

I understand the aim of the study and what is expected of me in this study.

I pronounce that my participation in this study is entirely voluntary and that I may withdraw at any time without attracting any penalty.

If I have any further questions/concerns or queries related to the study. I may contact the researcher at **cell: +27730793469 and/or E-mail address: ctmathias@yahoo.ie** and the research supervisor on **(+27) 031 260 2901.**

If I have any questions or concerns about my rights as a study participant, or if I am concerned about any aspect of the study or the researcher I may contact the following ethical committees:

NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE

The Chairperson

Ministry of Health (Research Department)

P.o BOX 300377

Lilongwe 3

Malawi

Tel: (+265) 6017 26422

Fax: (+265) 017 26418

Email: cmwansambo@malawi.net / rmajamanda@gmail.com

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

I pronounce that my participation in this study is entirely voluntary and that I may withdraw at any time without attracting any penalty.

_____ _____

Signature of Participant **Date**

_____ _____

Signature of witness (If applicable) **Date**

_____ _____

Researcher's signature **Date**

Appendix 5: Chichewa Information Sheet

Pempho lotenga nawo mbali pakafukufuku

<u>Kufotokonzera zakafufukufu ameneyu komanso kukupemphani kutenga nawo mbali pakafukufuku ameneyu.</u>

Tsiku:……..

Moni Mayi/Bambo,

Zokhunza ochita kafukufuku: Dzina langa ndi Christina Tiyankhulenji Mathias, wophunzira ku sukulu ku Univesite ya KwaZulu-Natal, South Africa. Kafukufukuyu ndimbali yamaphunziro anga. Mutu wa kafukufukuyu ndi **"Kufotokozera m'mene azimai omwe ali ndiana osakwakwana masiku amawasamalira kudzera munjira ya "Kangaroo".**

Cholinga chakafukufukuyu: Njira yosamalira ana osakwana masiku yotchedwa "Kangaroo" ndi njira imene ili yosaboola mthumba kugwiritsa ntchito kumaiko ochepekeredwa, pothandizira kupulumutsa miyoyo ya ana osakwana masikuwa. Zotsatira zakafukufuku wambiri zikusonyedza kuti njira ya "Kangaroo" ili ndiubwino wambiri pa ana osakwana masiku. Kudzipereka kwatunthu kwa azimai pachisamaliro cha "Kangaroo" ndi chithu chopamabana kwambiri pakuthandidza kupulumutsa miyoyo ya ana osakwana masikuwa. Ngakhale zili choncho, palikafukufuku wochepa amene anachitika wowafikira azimai amene amasamalira ana awo, obadwa masiku osakwana, munjira ya "Kangaroo". Chifukwa chachimenechi, kafukufuku ameneyu athandidzira kufotokoza m'mene azimayi amaziperekera potsata ndondomeko ya "Kangaroo", zimene zimachititsa kuthandizira kupititsa patsogolo kapena kubwenzeretsa pambuyo chisamaliro cha "Kangaroo". Kafukufuku amaneyu athandizira kukonza pamene tikulephera komanso kulimbikitsa zimene tikuchita bwino. Zimene zingathandizire kupulumutsa miyoyo ya ana obadwa masiku osakwana, kudzera pakutenga mbali kwa azimayi omwe ali eni ake achisamaliro chimenechi cha "Kangaroo". Kafukufuku ameneyu akuyembekedzera kufikira azimayi makuni anayi (50).

Zoyenera kudziwa otenga nawo mbali pakafukufuku ameneyu: simukukakamidzidwa kutenga nawo mbali pakafukufuku ameneyu, mutha kusiya kutenga nawo mbali nthawi iliyonse popanda kulandila chilango chilichonse. Mukupemphedwa kuyankha ndondomeko ya mafunso akafukufukuwu panthawi yanu, komanso mwachinsinsi. Ndondomekoyi ikufunsa zomwe mumadziwa zokhunza "Kangaroo", komanso mmene mumasamalira mwana wanu munjira imeneneyi ya "Kangaroo". Mayankho anu azathandizira kumvetsa zakuzipereka kwanu potsatira ndondomeko ya "Kangaroo". Kafukufukuyu akutengerani mphindi khumi awiri (20).

Kusunga chinsinsi chaotenga nawo mbali: Ndondomeko ya mafunsoyi mulibe gawo limene mukupemphedwa kutchula dzina lanu. Choncho mulikutsimikidzilidwa kuti zomwe muyankhe palibe amene atazadziwe kuti munayankha ndiinu. Ndiponso mayankho anu adzasungidwa mwachinsinsi.

Chitetezo pakafukufukuyu: Dziwani kuti palibe vuto limene lidzakugwereni kamba koti mwatenga nawo mbali mukafufukufu ameneyu, popeza ndondomeko yamafunsoyi ilibe chiopsyezo muyowo wanu.

Kafukufuku ameneyu wavomeredzedwa ndi mabungwe oona za ufulu waanthu otenga nawo mbali pa kafukufuku, m'Malawi muno lotchedwa "**Malawi National Health Sciences Research Committee"** (NHSRC), number yachilorezo ndi **1680.** Komanso bungwe la ku South Africa lotchedwa **"University of KwaZulu-Natal (UKZN) Biomedical Research Committee (BREC)**, number yachilorezo ndi **BE560/16.**

Komwe mungapite mutafuna kudziwa zina ndi zina: Pamene mukufuna kudziwa zina zokhunzana ndikafukufuku ameneyu musataye nthawi fikirani mkulu wakafukufuku ameneyu pa +265999261340, email: ctmathias@yahoo.ie. Ngati mukufuna kudzina zina ndi zina zokhunza ufulu wanu ngati otenga nawo mbali apezeni abungwe la ufulu wa otenganawo mbali pakafukufuku la **Malawi "NHSRC"** kapena **"UKZN BREC",** manumbala awo alamya ali m'musimu;

NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE

The Chairperson

Ministry of Health (Research Department)

P.o BOX 300377

Lilongwe 3

Malawi

Tel: (+265) 6017 26422

Fax: (+265) 017 26418

Email: cmwansambo@malawi.net / rmajamanda@gmail.com

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

Tsindikidzani papepala linalo ngati mwapanga chisankho chotenga nawo mbali pakafukufuku ameneyu.

Appendix 6: Chichewa Informed consent form

Chivomerezo chotenga nawo mbali pakafukufuku.

Kutsindika

Ndamva mutu ndi cholinga cha kafukufuku ameneyu ndinso zimene ndiyenera kuchita mukafukufuku ameneyu. Ngati ndili ndi mafunso okhunza kafukufukuyu ndizapeza mwamkulu wakafukufukuyi. Ngati ndili ndimafunso okhunza za ufulu wanga ngati otenga nawo mbali ndizawafikira a bungwe la zoona zaufulu wanga, ngati otenga nawo mbali pakafuufuku ameneyu, lotchedwa **Malawi "NHSRC**" komanso "**UKZN BREC"** panambala awa;

NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE

The Chairperson

Ministry of Health (Research Department)

P.o BOX 300377

Lilongwe 3

Malawi

Tel : (+265) 6017 26422

Fax : (+265) 017 26418

Email :cmwansambo@malawi.net / rmajamanda@gmail.com

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604769 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

Ndikuvomereza kuti sindinakakamizidwe kutenga nawo mbali pakafukufuku ameneyu. Nditha kusiya nthawi iliyonse opanda kulipila dipo lililonse.

_____ _____

Sindikidzani **Tsiku**

_____ _____

Mboni yanu ngati nkoyenera **Tsiku**

_____ _____

Ochititsa kafukufuku **Tsiku**

Appendix 7: Letter of Support to Malawi National Health Sciences Research Committee (NHSRC)

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

29th August, 2016

The Chairman

National Health Sciences Research Committee

Ministry of Health (Research Department)

P O BOX 300377

Lilongwe 3

Malawi

RE: Support for Research Study for Ms. Christina Tiyankhulenji Mathias (Student # 215053728)

Dear Sir/Madam,

I hereby confirm that the above mentioned student is currently under my supervision for her Master of Nursing (Nursing Research) research project. The research study is titled **"Describing mothers' compliance to Kangaroo Mother Care at a selected hospital in Southern Malawi".**

Ms. Christina T. Mathias is in the process of acquiring ethical clearance with the University of KwaZulu-Natal (UKZN) ethics committee and will need your institutional assistance that will warrant her to conduct a study at a selected hospital in the Southern Region of Malawi. Attached is her research proposal which has been reviewed in the UKZN Discipline of Nursing.

She has planned to collect data from 26th September to 31st October, 2016.

Please do not hesitate to contact me should you need any further information.

Yours sincerely,

Dr E.Z. Gumede

Research Supervisor

School of Nursing & Public Health
University of Kwazulu-natal
Durban South Africa, 4041
KwaZulu-Natal
Fax: 031 260 1543 Tel: 031 260 2499

University of KwaZulu-Natal, School of Nursing and Public Health,

Howard Campus, Private Bag X 54001, Durban 4000

Telephone: +27 (0) 31 260 2901 **Facsimile:** +27 (0) 31 260154 **Website: www.ukzn.ac.za**

Appendix 8: Letter of Support to Queen Elizabeth Central Hospital

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

29th August, 2016

The Hospital Director,

Queen Elizabeth Central Hospital,

P.O Box, 95

Chichiri, Blantyre,

Malawi

RE: Support for Research Study for Ms. Christina Tivankhulenji Mathias (Student # 215053728)

Dear Sir/Madam,

I hereby confirm that the above mentioned student is currently under my supervision in her Master of Nursing (Nursing Research) research project. The research study is titled **"Describing mothers' compliance to Kangaroo Mother Care at a selected hospital in Southern Malawi".**

Ms. Christina T. Mathias is in the process of acquiring ethical clearance with the University of KwaZulu-Natal (UKZN) ethics committee as well as the Malawi National Health Sciences Research Committee. She needs your assistance with institutional approval to facilitate ethical clearance of UKZN and NHSRC. Attached is her research proposal which has been reviewed in the UKZN Discipline of Nursing.

She has planned to collect data from 26th September to 31st October, 2016.

Please do not hesitate to contact me should you need any further information.

Yours sincere,

Dr E.Z. Gumede

Research Supervisor

School of Nursing and Public Health
Postal Address: University of KwaZulu-Natal, School of Nursing and Public Health, Howard Campus, Private Bag X 54001, Durban, 4000
Telephone: +27 (0) 31 2602499 **Facsimile:** +27 (0) 31 2601543 **Website:** www.ukzn.ac.za

Appendix 9: Letter to Hospital director

LETTER TO OBTAIN PERMISSION TO CONDUCT RESEARCH (GATE KEEPER'S PERMISSION)

University of KwaZulu-Natal,

College of Health Sciences,

School of Nursing and Public Health,

Durban 4041, South Africa.

29/08/2016.

The Hospital Director,

Queen Elizabeth Central Hospital,

P.O Box, 95

Chichiri, Blantyre,

Malawi

Dear Sir/Madam,

RE: PERMISSION TO CONDUCT A RESEARCH STUDY

I am Christina T. Mathias, a Malawian by nationality currently pursuing Master's student in Nursing (Nursing Research) at the University of KwaZulu-Natal, in the Republic of South Africa. As part of my programme prerequisite I am carrying out a research study titled: "**Describing mothers' compliance to Kangaroo Mother Care at a selected hospital in Southern Malawi"**.

I am interested to conduct the above study at your institution. Currently, am in the processing of obtaining ethical approval from Malawi National Health Sciences Research Committee, the finalization of the process will require your approval letter. Data collection will be commenced once the NHSRC approves the research. I intend to collect data from 26th September to 31st October, 2016.

Therefore, I am asking your permission to conduct this research at Queen Elizabeth Hospital's neonatal unit and KMC follow up clinic. The accessible population for this study are the KMC mothers who are nursing their babies at the facility's neonatal unit and those visiting the facility for follow up schedule.

I intend to conduct this study among 40 KMC mothers, by using a simple and elaborate questionnaire in English and Chichewa languages. The duration of the questionnaire interview is approximately 15 minutes.

The data collection will be done at the prospective participants' convenient time and the data collection process will respect participants' confidentiality and anonymity. No name of the participants and that of the hospital will appear in the study findings.

Informed consent will be used whereby the prospective participants will have a choice whether to agree or decline in the participation of the study without coercion or penalty being imposed on them.

The findings of the research study will be disseminated to the facility through your office, as head of the institution, for the appreciation of the impact of KMC services on neonatal lives in your facility.

I hope my request meets your favourable consideration and I am looking forward to joining you soon in facilitating LBW babies' survival through KMC service research.

Yours faithfully,

Christina Tiyankhulenji Mathias

Cell No: (+265)999261340/ (+27)730793469

E-mail: 215053728@stu.ukzn.ac.za/ctmathias@yahoo.ie

Appendix 10: Institutional Endorsement Requirement Letter

INSTITUTIONAL ENDORSEMENT REQUIRED

Statement from the Institution:

The NHSRC will only accept for review and approval research proposals that have been found scientifically acceptable by our institution. The acceptable Institutional endorsement will be that from the Institution in which the research is to be conducted or one from the institution conducting the research.

We, representing

Queen Elizabeth Central Hospital

(Name of Institution conducting the research/in which the research is to be conducted)

do certify that we have reviewed the research proposal titled

Describing mothers' compliance to kangaroo mother Care at Selected Hospitals in Southern Malawi

Submitted by

.....

We attest to the scientific merit of this study and the competency of the investigator(s) to conduct the project and do hereby recommend the proposal to the NHSRC for review and approval.

SIGNATURES

Signature Institutional representative		Date 20/
Name (Please Print)	CHIKUMBUTSO MAMBALA	
Signature : Head of Institution (or other authorized signatory)		2
Name (Please Print)	Linley Chewere	

Contact Tel. Number : 0888128592

E-mail address : chewerell@yahoo.co.uk

OFFICIAL STAMP OF INSTITUTION

QUEEN ELIZABETH CENTRAL HOSPITAL
DEPUTY HOSPITAL DIRECTOR
20 SEP 2016
P.O BOX 95, BLANTYRE

Appendix 11 Acceptance Letter from Hospital Director

Telephone: (265) 01 874 333 /877 333
Facsimile: (265) 01 876928
Email: queenshosp@globemw.net

All communications should be addressed to:
The Hospital Director

In reply please quote **No. QEC/GEN/2**

QUEEN ELIZABETH CENTRAL HOSPITAL
P.O. BOX 95
BLANTYRE
MALAWI

20th September, 2016

Ms Christina Mathias
University of Kwazulu Natal
College of Health Sciences
School of Nursing and Public Health
Durban 4041
SOUTH AFRICA

Dear Madam

RE: PERMISSION TO CONDUCT A STUDY

This is to inform you that permission has been granted to you to conduct a study entitled **"Describing Mothers'Compliance to Kangaroo Mother Care at Selected Hospital in Southern Malawi" at QECH.**

This letter serves to inform you that Management has no objection for you to conduct a research study at Obstetrics and Gynaecology Department.

Wishing you all the best in your studies.

Yours faithfully,

Dr Andrew Gonani
HOSPITAL DIRECTOR

Appendix 12: Acceptance Letter from Head of Department

Telephone: (265) 01 874 333
/8677 333
Facsimile: (265) 01 876928
Email: qech@qech.mw
All communications should be addressed to:
The Hospital Director

In reply please quote No.
QUEEN ELIZABETH CENTRAL HOSPITAL
P.O. BOX 95
BLANTYRE

16th September 2016
The Chairman
COMREC

Dear Sir,

Describing Mothers' Compliance to Kangaroo Mother Care at Selected Hospital in Southern Malawi

The department of Obstetrics and Gynecology offers its full support to Ms Christina Mathias request to conduct the above mentioned study. This study will add our knowledge on Issues of mothers' compliance to Kangaroo Care.

The department of Obstetrics and Gynecology fully supports research and would like to offer its support for the above named research protocol.

Yours Sincerely

Dr Phylos Bonongwe MBBS, FCOG (SA)
Head of Department, Obstetrics and Gynecology
Queen Elizabeth Central Hospital

Appendix 13: Application Letter for Translation

18th August, 2016

Conference Interpreters International,

C/O University of Malawi

Chancellor College,

P.O. Box 280,

Zomba,

Malawi.

RE: Translation of questionnaire and consent form from English to Chichewa

Dear Sir/Madam,

I am a Master of Nursing (Nursing Research) student in the University of KwaZulu-Natal, in South Africa. As part of my research project I am required to conduct a study at a selected hospital in the Southern Region of Malawi. The research study is titled "Describing mothers' compliance to Kangaroo Mother Care at a selected hospital in Southern Malawi".

I am therefore writing to engage your services in translating the questionnaire and consent form for my research from English to Chichewa. This will enable me to engage participants in the research in the local language and thereby gain the maximum information.

Attached are the questionnaire and consent form.

Yours sincerely,

Christina Tiyankhulenji Mathias

Appendix 14: Acceptance Letter for Translation

Ms. Christina T. Mathias,

University of KwaZulu-Natal,

College of Health Sciences,

School of Nursing and Public Health,

Durban 4041

South Africa.

Dear Ms. Mathias,

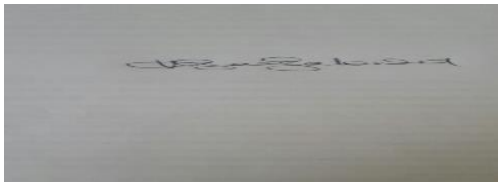
RE: Translation of questionnaire and consent form from English to Chichewa

Thank you for engaging our services in translating your research questionnaire and consent form from English to Chichewa.

Please find attached the translated documents.

We wish you the best in your research and in the continuation of your studies.

Yours sincerely,



Hurguy Kadzakalowa,

Conference Interpreters International

Appendix 15: BREC Ethical Approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

08 December 2016

Ms CT Mathias (215053728)
Discipline of Nursing
School of Nursing and Public Health Medicine
Health Sciences
ctmathias@yahoo.ie

Title: Describing mothers' compliance to kangaroo mother care at a selected hospital in Southern Malawi.
Degree: M Nursing
BREC REF NO: BE560/16

EXPEDITED APPLICATION

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application received on 05 October 2016.

The study was provisionally approved pending appropriate responses to queries raised. Your response received on 25 November 2016 to BREC letter dated 23 November 2016 have been noted by a sub-committee of the Biomedical Research Ethics Committee. The conditions have now been met and the study is given **full ethics approval** and may begin as from 08 December 2016.

This approval is valid for one year from **08 December 2016.** To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be **RATIFIED** by a full Committee at its next meeting taking place on **13 December 2016.**

We wish you well with this study. We would appreciate receiving copies of all publications arising out of this study.

Yours sincerely

Professor Joyce Tsoka-Gwegweni
Chair: Biomedical Research Ethics Committee

cc supervisor: gumedez@ukzn.ac.za
cc postgraduate administrator: ramlalm@ukzn.ac.za

Biomedical Research Ethics Committee
Professor J Tsoka-Gwegweni (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 2486 **Facsimile:** +27 (0) 31 260 4609 **Email:** brec@ukzn.ac.za

Appendix 16: Malawi NHSRC Ethical Approval

Telephone: + 265 789 400
Facsimile: + 265 789 431

All Communications should be addressed to:

The Secretary for Health and Population

In reply please quote No.

.....

MINISTRY OF HEALTH AND POPULATION
P.O. BOX 30377
LILONGWE 3
MALAWI

18th October, 2016

Christina Tiyankhuleni Mathias
University of KwaZulu Natal
South Africa

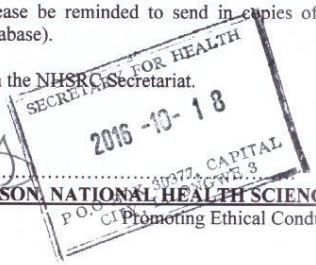
Dear Madam,

RE: PROTOCOL # 1680: 'DESCRIBING MOTHERS' COMPLIANCE TO KANGAROO MOTHER CARE AT A SELECTED HOSPITAL IN SOUTHERN MALAWI'

Thank you for the above titled proposal that you submitted to the National Health Sciences Research Committee (NHSRC) for review. Please be advised that the NHSRC has **reviewed** and **approved** your application to conduct the above titled study.

- **APPROVAL NUMBER : 1680**
- The above details should be used on all correspondences, consent forms and documents as appropriate.
- **APPROVAL DATE : 18/10/2016**
- **EXPIRATION DATE**
  This approval expires on **17/10/2017**. After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the NHSRC Secretariat should be submitted one month before the expiration date for continuing review.
- **SERIOUS ADVERSE EVENT REPORTING:** All serious problems having to do with subject safety must be reported to the NHSRC within 10 working days using standard forms obtainable from the NHSRC Secretariat.
- **MODIFICATIONS**: Prior NHSRC approval using forms obtainable from the NHSRC Secretariat is required before implementing any changes in the protocol (including changes in the consent documents). You may not use any other consent documents besides those approved by the NHSRC.
- **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the NHSRC using standard forms obtainable from the NHSRC Secretariat.
- **QUESTIONS**: Please contact the NHSRC on phone number *+265 888 344 443* or by email on mohdoccentre@gmail.com.
- **OTHER**: Please be reminded to send in copies of your final research results for our records (Health Research Database).

Kind regards from the NHSRC Secretariat.



.....

For: **CHAIRPERSON, NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE**
Promoting Ethical Conduct of Research

Appendix 17: Editor's Certificate

GENEVIEVE WOOD
P.O. BOX 511 WITS 2050 | 0616387159

EDITING CERTIFICATE
LANGUAGE EDITING SERVICES

Date: 2017/1/19

This serves to confirm that the document entitled:

Describing Mothers' Compliance to Kangaroo Mother Care at a Selected Hospital in the Southern Malawi

has been language edited on behalf of its author, Christina Mathias.

Genevieve Wood
PhD candidate
Wits University

Table 5: Research Schedule

Write Research Propossal	September 2016
Higher Degrees and Ethical Clearance	October and November 2016
Data Collection	December 2016
Data Analysis	December and January 2017
Complete Research Report and Submission of Report	January2017