



**DETERMINANTS OF CARE FOR MATERNAL NEAR-MISS CASES AT KAMUZU
AND QUEEN ELIZABETH CENTRAL HOSPITALS IN MALAWI**

BY

FANNIE SOMANJE KACHALE (MRN, UCM, BSc Nsg, MSc Nsg)

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DECLARATION

I, Fannie Somanje Kachale, declare that this dissertation is my original work and hence any errors made herein are mine alone. The opinions expressed in the study are those of the researcher and do not necessarily represent the views of the supervisors. Where other researchers' work has been used, due acknowledgements have been made accordingly. I further declare that this thesis has never been submitted to any university or any institution of higher learning for similar purposes.

FANNIE SOMANJE KACHALE

Full Legal Name



Signature

13th August 2021

Date

CERTIFICATE OF APPROVAL

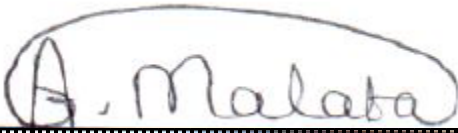
We declare that this thesis is the student's own work and effort and where she has used other sources, acknowledgment has been duly made. Hence the dissertation with our approval on behave of the University of Malawi, Kamuzu College of Nursing, Lilongwe.



Date: 13th August 2021

Ellen Mbweza Chirwa, PhD (Professor)

First supervisor



Date: 13th August 2021

Address Mauakowa Malata, PhD (Professor)

Second supervisor

DEDICATION

This thesis is dedicated to my husband Trueman Hensley Kachale together with Momo my grand-daughter, Takondwa, Evans and Jimmy my children who gave 200% support during my studies, my colleagues Carol and Tuli for their encouragement; my colleagues in the Reproductive Health department for their understanding; my supervisors' Professors Ellen and Address for their undivided supervision; my late father Friday Jim Somanje, my late stepfather Byson Lichenya and my late mother Ellen Kachulu Lichenya who always stressed the importance of hard working, may their souls rest in eternal peace. To God be the glory for seeing me through the long but rewarding journey.

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ABSTRACT

Maternal near-miss cases which are more frequent than maternal deaths can lead to more robust conclusions on problems and obstacles that have to be overcome during the process of maternal health care. In Malawi, there is little information on the circumstances surrounding maternal near-misses. The aim of the study was to describe determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals in Malawi. This study used a mixed methods approach to collect data on determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central hospitals in Malawi. This was a convergent design in which both quantitative and qualitative data were collected simultaneously from February to July 2017. Quantitative and qualitative data were integrated through merging the two data sets with an aim to balance the respective strengths and weaknesses as well as maximizing the yield of the complementary sources of evidence. This study has found that the magnitude of maternal near-miss in the local setting is very high (35.1%, n=161). The demographic characteristics that were significantly linked to maternal near-misses in the local setting are marital status, occupation, admission mode, means of transport and age. The obstetric characteristics that were significantly associated with maternal near-miss were fetal presentation, mode of birth, birth status and child sex. However, age and mode of birth were strong determinants of maternal near-miss. Women aged 31-35 years had significantly 4 chances of experiencing maternal near-miss. Women who had laparotomy for uterine rupture had 83 chances of being a maternal near-miss case while those who had emergency caesarean had 4 times chances compared with those who had a vaginal birth. Using the adapted World Health Organization Quality of Care Assessment tool, the quality of care offered to women was found to be below standard and this was

corroborated by reports from midwives who stated that some patients were not checked blood pressure, emergency care was not performed within 30 minutes of diagnosis, no handovers were made when transferring patients from theatre to postnatal ward. The magnitude of maternal near-miss was very high compared to other parts of Africa and numerous preventable determinant factors were identified. In addition, the quality of care provided to maternal near-miss cases was below standard. It is essential that Malawi should include maternal near-miss ratio as an indicator for evaluating its maternal health services.

Keywords: Maternal near-miss cases, quality of care, determinants.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIM	Alliance for Innovation of Maternal Health
BP	Blood pressure
CBDA	Community Based Distribution Agents
CHAM	Christian Health Association of Malawi
CI	Confidence interval
CINAHL	Cumulative Index of Nursing and Allied Health Literature
CMW	Chatinkha Maternity Wing
COMREC	College of Medicine Research and Ethics Committee
CVI	Content Validity Index
EM	Enrolled Midwife
EMMW	Ethel Mutharika Maternity Wing
ENM	Enrolled Nurse Midwife
Hb	Haemoglobin
HDU	High Dependency Unit
HEELP	Hemolysis Elevated Liver Enzymes, Low Platelets
HINARI	Health Inter-Network Access to Research Initiative

HMIS	Health Management Information Systems
HSSP	Health Sector Strategic Plan
ICPD	International Conference on Population and Development
KCH	Kamuzu Central Hospital
LSHTM	London School of Hygiene & Tropical Medicine
MDR	Maternal Death Reviews
MDSR	Maternal Death Surveillance and Response
MEDLINE	Medical Literature Analysis and Retrieval System Online
MGDS	Malawi Growth and Development Strategy
MMR	Maternal Mortality Ratio
MNM	Maternal Near-miss
NMT	Nurse Midwife Technician
NSO	National Statistical Office
OR	Odds Ratio
PPH	Postpartum haemorrhage
QECH	Queen Elizabeth Central Hospital
QED	Quality Equity Dignity

QIA	Quality Improvement Assessor
SDGs	Sustainable Development Goals
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children’s Education Fund
WHO	World Health Organization

CHAPTER 1

INTRODUCTION AND BACKGROUND

1.1 Introduction

Globally, the Maternal Mortality Ratio (MMR) fell by nearly 44% over the past 25 years to an estimated 216 maternal deaths per 100, 000 live births in 2015, from 385 deaths per 100, 000 live births in 1990. However, low and medium resource setting countries accounted for 99% (302, 000) of the global maternal deaths with Sub-Saharan Africa alone accounting for roughly 66% (201, 000) in 2015. The risk of a woman dying as a result of pregnancy or childbirth during her lifetime is 1 in 180 globally, 1 in 4, 900 in high-income countries, 1 in 150 in the low and medium resource setting countries and 1 in 36 in Sub-Saharan Africa (World Health Organization & UNICEF, 2015). Maternal mortality is categorized as low when it is less than 100; moderate when it is 100-299; high when 300-499; very high 500-999 and extremely high when MMR is greater than or equal to 1000. A low MMR of less than 100 was estimated in Australia and New Zealand, Central Asia, Eastern Asia, Western Asia, Latin America and the Caribbean, Europe and Northern America. North Africa, Oceania, Southern Asia, Southeastern Asia and small island developing countries registered moderate MMR of 100-299 maternal deaths per 100, 000 live births. Sub-Saharan Africa was the only region with a very high MMR for 2017 at 542 per 100, 000 live births (World Health Organization, 2019). These statistics show that it is riskier to deliver in Sub-Saharan Africa than in high and middle-income countries.

Nigeria and India were estimated to account for over one-third of all maternal deaths in 2015 at 58, 000 (19%) and 45, 000 (15%) maternal deaths respectively with Sierra Leone having the highest MMR in Africa of 1360 maternal deaths per 100, 000 live births. Furthermore, eighteen countries in Sub-Saharan Africa were estimated to have very high MMR in the range of 999 down to 500 deaths per 100, 000 live births. The countries included Central Africa Republic (882), Chad (856), Nigeria (814), South Sudan (789), Somalia (732), Liberia (725), Burundi (712), Gambia (706), Democratic Republic of the Congo (693), Guinea (679), Côte d' Ivoire (645), Malawi, Mauritania, Cameroon, Mali, Niger, Guinea Bissau and Kenya (World Health Organization & UNICEF, 2015). Some of the reasons hindering progress in the reduction of maternal mortality were emergent humanitarian settings, situations of conflict, post-conflict and disasters. There is a dramatic rise in maternal deaths due to the breakdown of health systems.

Malawi's MMR has declined slowly from 675 per 100,000 live births in 2010 to 439 per 100,000 live births in 2015 (National Statistical Office (NSO) [Malawi] & ICF, 2017). The current MMR is high compared to 9 per 100,000 live births in the United Kingdom (World Health Organization & UNICEF, 2015). One maternal death is one too many and no woman should die while giving life (UNFPA, 2011). The slow decline in MMR resulted in the country not being able to achieve the Millennium Development Goal number 5 target, "to reduce the MMR by 75% by 2015", which would translate to 155 per 100,000 live births (Government of Malawi, 2015b). Nevertheless, the unfinished agenda of Millennium Development Goals has been carried over to Sustainable Development Goals (SDGs) era. Sustainable Development Goals are a set of objectives within a universal agreement to end poverty and ensure that all people enjoy peace and prosperity (Morton et al., 2017).

Goal 3 of the SDGs states the need to ensure healthy lives and promote well-being for all at all ages. The health goal seeks to ensure universal health coverage, leaving no one behind and committing to accelerate the progress made in reducing newborn, child and maternal mortality. It is envisaged that by 2030 the global maternal mortality will be reduced to less than 70 per 100,000 live births (World Health Organization, 2015). This requires that, low medium-income countries like Malawi, should accelerate efforts to reduce maternal deaths to achieve the target.

Maternal near-miss is a concept in maternal health that has been explored over the past twenty years (Tunçalp et al., 2012). The World Health Organization (WHO) defined maternal near-miss as ‘a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy’ (World Health Organization, 2011, page 7). Similarly, Shrestha, Saha, and Karki (2010) defined maternal near-miss as those cases in which women survived merely by chance or good hospital care after presenting with potentially fatal complications during pregnancy, birth and puerperium. In addition, Sinha et al. (2016) referred to maternal near-miss as severe acute maternal morbidity as “a very ill pregnant or recently delivered woman who would have died had it not been that luck and good care was on their side”. These definitions rotate on the severity of the woman and surviving death. According to Say et al. (2009) the definition of maternal near-miss should take into account all countries (low, middle and high income) and must not be dependent on the resources available in that country. Some studies referred to maternal near-miss as near-miss cases while in others they were referred to as near-miss events. Near-miss events were complications that immediately threaten the woman’s survival but do not lead to her death (Filippi et al., 2005; Oladapo et al., 2005; Shrestha et al., 2010). Near-miss events

considered five main diagnoses of haemorrhage, hypertensive diseases of pregnancy, dystocia, infection and severe anaemia.

The definitions cited are similar and speak towards the severity of obstetric complications that pregnant women go through or the burden of severe maternal morbidity. Maternal near-miss cases (also to be referred to as maternal morbidity) occur more frequently than maternal deaths and identification of cases of severe morbidity has emerged as a promising alternative to studying maternal deaths. Some authors state that maternal mortality is a tip of an iceberg where maternal near-miss is the base (Abdel-Raheem et al., 2016; Sahijwani et al., 2013). Identification of severe morbidity cases would give more robust conclusions on problems and obstacles that had to be overcome during the process of maternal health care (Tunçalp et al., 2012). An operational definition for maternal near-miss in this study was based on the criteria as proposed by Filippi et al. (2005). The criteria focus on the following conditions: severe haemorrhage, severe pre-eclampsia ($BP \geq 140/90$ mmHg and proteinuria), sepsis defined as a temperature $\leq 36^{\circ}\text{C}$ or $\geq 38^{\circ}\text{C}$, dystocia which includes uterine rupture or impending rupture and severe anaemia $\leq 6\text{g/dl}$ or clinical signs of severe anaemia occurring during pregnancy, childbirth or within 42 days of termination of pregnancy.

Several studies have been conducted on maternal near-miss globally and within Africa for various reasons ranging from exploring incidence, prevalence, and nature of maternal near-miss (e.g., Filippi et al., 2005; Kaye et al., 2011; Oladapo et al., 2005; Shrestha et al., 2010). A systematic review of 12 studies from Sub-Saharan Africa was conducted to assess the prevalence/incidence of maternal near-miss, morbidity, maternal mortality and case fatality ratio (Kaye et al., 2011). The study indicated that there are close to a hundred women

with severe maternal morbidity referred to as maternal near-miss, for every maternal death. The incidence/prevalence and case fatality ratio ranged from 1.1%-10.1% and 3.1%-37.4% respectively. The commonest morbidities analysed were ruptured uterus, sepsis, and obstructed labour. The study found large variations in the prevalence and incidence of maternal near-miss due to the different contexts and criteria used. Some studies used different denominators like total births or live births and clinical features, organ dysfunction or clinical management to define maternal near-miss (Kaye et al., 2011). Utilization of clinical features refers to the use of signs and symptoms, or clinical entities such as eclampsia or uterine rupture; criteria of organ dysfunction and criteria utilizing clinical management practices such as admission to the intensive care unit.

Although maternal near-miss has received considerable attention in other countries, there is limited published information on maternal near-miss in Malawi. A study by Kuyeli (2013, unpublished) reported that the prevalence of maternal near-miss is 18% using disease-specific criteria. Contrastingly, a separate study by van den Akker et al. (2013) showed that the prevalence is 88% for disease-specific criteria, 46% using intervention-based criteria and 22% using organ-based criteria. The present study explored determinants of care for maternal near-miss with a focus on the problems encountered during the implementation of care. As suggested by Nelissen et al. (2013) maternal near-miss cases should be considered in the assessment of the quality of obstetric care because the cases have characteristics that are like maternal deaths. It is expected that the results of the study would lead to the formulation of recommendations that would inform policy, education and practice and contribute to the reduction of maternal mortality.

The conceptual framework overarching the study is the near-miss maternal morbidity by Adeoye et al. (2013) Figure 2 and the World Health Organization Quality of Care framework for maternal and newborn health (Tunçalp et al., 2015) as the underpinning framework (Figure 3).

1.2 Background

1.2.1 Overview of Malawi

Malawi is a landlocked country in South-eastern Africa. It has a surface area of 118, 484 kilometres of which 94, 276 kilometres island. The country is divided into three regions of North, Central and South with 28 administrative districts as shown in Figure 1. According to the most recent population and housing census, the country's population was 17.6 million in 2018 (National Statistical Office (NSO) [Malawi] & ICF, 2017, National Statistics Office, 2018). The population increased by 35 percent between 2008 and 2018 representing an intercensal growth rate of 2.9 per annum. The implication of the high population growth rate is a threat to progress in various development sectors like diminishing availability of land per holder (Government of Malawi, 2017d). In addition, the growing population puts pressure on increased demand for health care services amidst limited resources. The population is predominantly rural-based with 14, 780, 385 people living in the rural area representing 84 percent. Malawi has a young population with 64% of the total population under the age of 15, 18% under the age of 5 and only 3% over the age of 65 years. Malawi's Gross Domestic Product (GDP) per capita was estimated at USD 318.40 in 2015 (Government of Malawi, 2016). The economy is predominantly agro-based with mean and median earnings per month of USD114 and USD37 respectively for the economically active population (Government of

Malawi, 2013). The large population of youths under the age of 18, therefore, indicates the dependency on a lesser proportion of economically active adults.

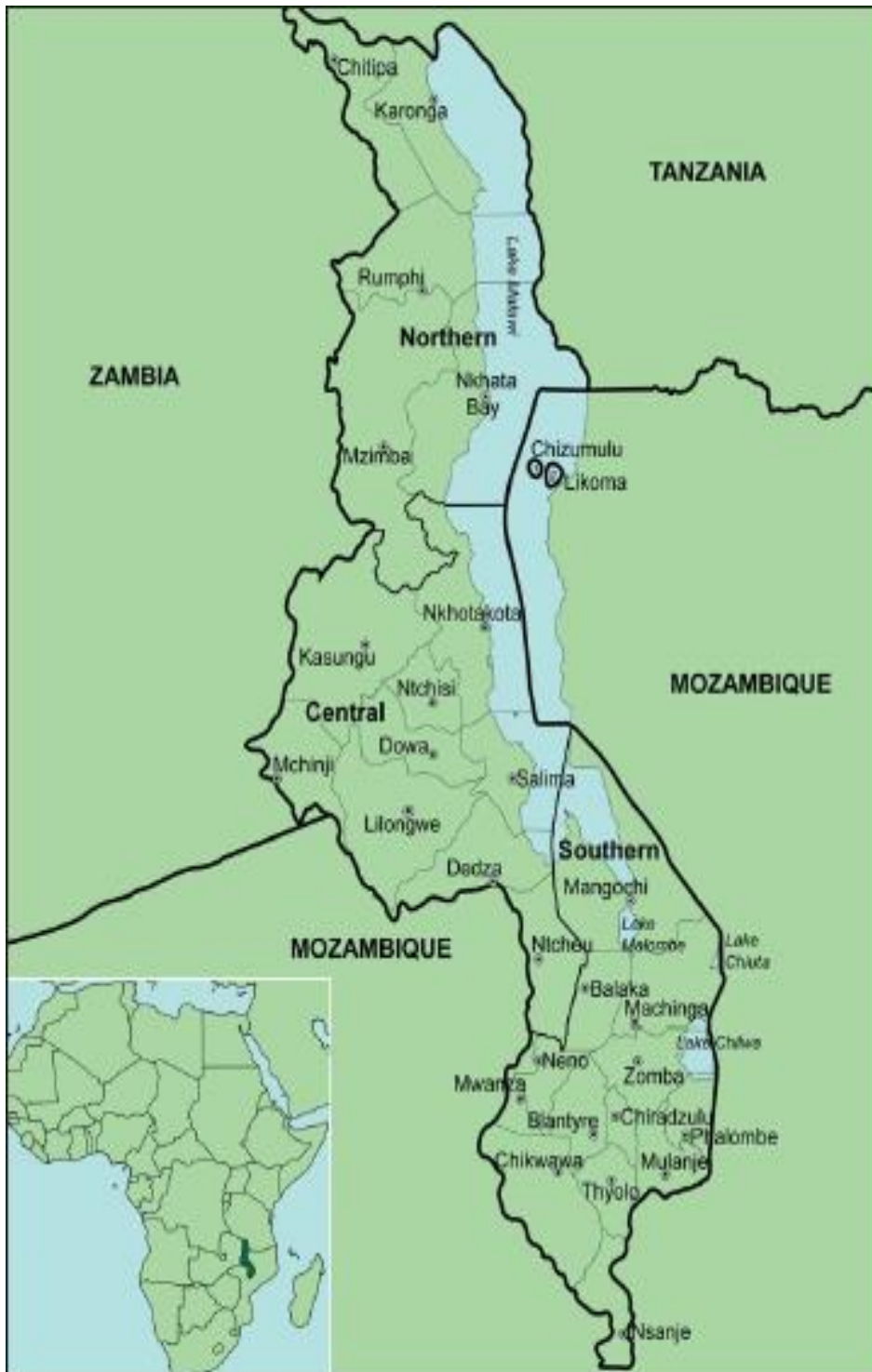


Figure 1: Map of Malawi showing the regions and districts

Source: Reprinted from “The genus *Aloe* L. (Asphodelaceae: Aloioideae) in Malawi” (Klopper, R. R., Stewart S. Lane, S. S., Msekandiana-Mkwapatira, G., & Gideon F. Smith, G. F. (2012). *Bradleya*, 2012 (30), 66). Copyright 2012 by G. Msekandiana-Mkwapatira. Reprinted with permission.

1.2.2 Context of health care system in Malawi

Health services in Malawi are provided by public, private for-profit (PFP) and Private not for profit (PNFP) sectors. The public sector includes all health facilities under the Ministry of Health, district hospitals, town and city councils, Ministry of Defence, Ministry of Internal Affairs and Public Security (Police and Prisons) and the Ministry of Natural Resources, Energy and Mining (Government of Malawi, 2017a). Health services in public facilities are free at the point of care. Private for Profit refers to private hospitals, clinics, laboratories, and pharmacies while private not for Profit consists of religious institutions and non-governmental organizations, statutory corporations, and companies. Christian Health Association of Malawi (CHAM) is the major religious provider.

The country's health delivery system is four-tiered consisting of community, primary, secondary, and tertiary levels which are connected by the patient-referral system. At a community level, cadres are comprising Health Surveillance Assistants (HSAs), Community Based Distributing Agents (CBDAs), Village Health Committees, Community Health Nurse Technicians, and volunteers. The primary level includes community initiatives and services delivered at health posts, community outreach clinics, village health clinics, dispensaries, maternity facilities, health centres and community/rural hospitals (Government of Malawi, 2017a).

The secondary level is delivered at district hospitals while tertiary services are delivered by central hospitals. District hospitals serve as referral facilities for health centres whilst central hospitals serve as a referral for district hospitals and offer specialized care (Government of Malawi, 2017a). Central hospitals also serve as teaching hospitals. Nearly all health care services are provided by three main agencies namely: the Ministry of Health

(70%); the Christian Health Association of Malawi (CHAM) providing 29% and a small contribution from the private-for-profit sector (1%) (Government of Malawi, 2017a). The health care system in Malawi faces many challenges ranging from a shortage of medical products and technologies; high vacancy rates for human resources for health, inadequate medical equipment and infrastructure (Government of Malawi, 2017d).

1.2.3 Health workforce in Malawi

Health services are provided by a team of health professionals comprising midwives, nurses, medical assistants, clinical officers, medical doctors, and allied health professionals. Allied health professionals include laboratory, pharmacy, radiography, physiotherapy, and nutrition personnel. Malawi employed a total of 37,926 staff out of 62,269 positions existing in the Ministry of Health (MoH) and Christian Health Association of Malawi (CHAM). Out of these, the majority, 20,434 (54%) comprise non-physician clinicians (clinical officers), nursing/midwives, allied services and environmental health staff (Government of Malawi, 2018).

Clinical Officers (COs) are a non-physician cadre of health workers trained for three years who are licenced to practice independently. In some low and middle-income countries including Malawi, Clinical Officers perform major emergency and elective surgeries (Chilopora et al., 2007; Wilson et al., 2011). Nurses/midwives are the backbones of the health delivery system through in 2012, there was a vacancy rate of 65 percent for nursing and midwifery positions (Bandazi et al., 2013; Government of Malawi, 2017a).

In addition, Malawi Demographic and Health Survey (National Statistical Office (NSO) [Malawi] & ICF, 2017) revealed that most of the deliveries were carried out by nurses

or midwives (68%) followed by doctors, clinical officers and medical assistants (22%). These findings highlight the important role played by midwives hence the need to have them in adequate numbers to ensure quality midwifery/obstetric care. There are two cadres of nurses: Registered Nurse-Midwives (professional) who undergo four years of training and attains a Bachelor of Science Degree in Nursing and Midwifery. Nurse Midwife Technicians (previously known as Enrolled Nurse-Midwives) undergo three years of training and attain a Diploma certificate. Malawi currently has a nurse/midwife population ratio of 1 to 2300; a nurse-patient ratio of 1:80 against a recommended nurse-patient ratio of 1:6 by the International Council of Nurses (ICN) (Government of Malawi, 2015a).

With decentralization, the delivery of health services at the district and community levels is the responsibility of District Councils which fall under the Ministry of Local Government. The central hospitals which are responsible for tertiary and specialized care fall under the Ministry of Health. A situation analysis conducted by the Human Resource Department of the Ministry of Health (Government of Malawi, 2018) indicated that challenges in the health workforce span across planning, development and management issues one of which is the retention of staff. The analysis revealed that there is an average of 14.86 clinical, nursing/midwifery and allied health professionals per 10,000 populations with variation among districts. Shortages of human resources for health impact negatively on the quality of care as there would be a high workload for few human resources (Bogren et al., 2018).

Compared to Europe and America where the density of health workers is 14.0 and 9.6 per 1,000 population respectively, the density of non-physician clinicians, nurses/midwives and allied health professionals in Malawi are 14.86 per 10,000 population. According to the

World Health Organization (2016), there is a need for 4.45 skilled health workers per 1,000 population to achieve the Sustainable Development Goals. The critical shortage of health workers in Malawi requires significant investment in training and retention of the health workers. In addition, a population density analysis showed that Africa and Southeast Asia had the lowest density of health workers per 1,000 population of 2.2 and 3.3 respectively despite having the greatest burden of preventable diseases (World Health Organization, 2016). Furthermore, the World Health Organization indicates that human resources for health are very crucial for the functioning of health systems and that health systems depend on the availability, accessibility, acceptability and quality of human resources for health. Furthermore, countries at all levels of socioeconomic development face varying degrees of the education, deployment, retention and performance of the workforce. There is evidence showing that health workers are challenged/tasked with providing health services in the face of increasingly complex health issues (WHO, 2010). Countries are thus requested to strengthen the content and implementation of human resources for health plans as part of long-term national health and broader development strategies to strengthen health systems (World Health Organization, 2016). They should ensure consistency between health, education, employment, gender, migration, development, cooperation and fiscal policies.

1.2.4 Maternal health care services in Malawi

Maternal and neonatal health care implementation is through the roadmap for accelerating the reduction of maternal and neonatal morbidity and mortality in Malawi in line with the Health Sector Strategic Plan II (Government of Malawi, 2017). One of the objectives of the Health Sector Strategic Plan II is to increase equitable access to and improve the

quality of health care services. This is in line with the main purpose of the roadmap for accelerating the reduction of maternal and neonatal morbidity and mortality which is to increase availability, accessibility, utilization and quality of obstetric care during pregnancy, childbirth and the postnatal period (Government of Malawi, 2011).

In addition, Malawi's Vision 2063 envisions a healthy population with improved life expectancy working towards the socio-economic transformation of the country (Government of Malawi, 2020). The goal is to attain universal health coverage with quality, equitable and affordable health care for all Malawians. The vision will be accomplished by the provision of a comprehensive health care system through interventions that will address shortfalls in the recruitment, distribution, and retention of health workers. Furthermore, there should be strengthening of reproductive, maternal, neonatal, child and adolescent health; improving the availability and quality of health infrastructure, medical equipment, medicines, and medical supplies; and exploring innovative and sustainable financing for health. This will be done while focussing on efficiency-enhancing measures such as strengthening governance among other interventions.

The Roadmap has ten strategies to guide policymakers, programme managers, development partners, training institutions and service providers in government efforts towards the attainment of goals related to maternal and neonatal health. The strategies are: Improving the availability of, access to, and utilisation of quality comprehensive family planning service; Improving the availability of, access to, and utilisation of quality Maternal and Neonatal Health Care; Strengthening human resources to provide quality skilled MNH care; Strengthening the referral system; Strengthening national and district health planning and management of maternal and neonatal health services; Resource mobilisation for

maternal and neonatal health services including family planning; Fostering partnerships; Scaling up of community-based MNH intervention to ensure the continuum of care between the household and health facility; Strengthening services that address adolescents' sexual and reproductive health services; and Strengthening monitoring and evaluation mechanisms for better decision-making and service delivery of Maternal and Neonatal Health services including Family Planning (Government of Malawi, 2011).

Furthermore, sexual and reproductive health issues are guided by the National Sexual and Reproductive Health and Rights (SRHR) Policy, 2017-2022 (Government of Malawi, 2017b). The goal of the National SRHR policy is to promote through informed choice, safer reproductive health practices by men, women, and young people including the use of quality and accessible reproductive health services. The SRHR services in Malawi focus on: Maternal and neonatal health (including prevention and management of unsafe abortion); Young people sexual and reproductive health; Family planning; Prevention and management of sexually transmitted infections, HIV and AIDS; Early detection and management of cervical, prostate and breast cancers; Elimination of harmful maternal practices, including domestic and sexual violence; Prevention and management of obstetric fistula; Prevention and management of infertility; Male involvement in the development, promotion and delivery of SRHR services and Strengthening of the support systems for delivery of SRHR services. Sexual and reproductive health services have multidimensional aspects hence the reason for multisectoral collaboration realizing that one sector alone cannot achieve the goals of reducing maternal and newborn mortality.

The Malawi Growth and Development Strategy (MGDS III) has an objective of fostering a resilient nation and for health and population to ensure healthy lives and promote

well-being for all ages. In addition, the MGDS III prioritizes health and acknowledges that Malawi's maternal and neonatal mortality ratios remain high within Sub-Saharan Africa hence the need for all Malawians to access quality health care (Government of Malawi, 2017). The MGDS III recognizes that health is a linchpin for socio-economic development as well as having trickle-down socio-economic effects on other key elements of development including population, education, agriculture, and industry.

Furthermore, maternal and neonatal health services are guided by global, continental and regional strategies such as: the Global Strategy for Women's, Children's and Adolescents' health (2016-2030) and the African Union Maputo Plan of Action just to mention a few (African Union, 2015; WHO & Mathers, 2016). The Global Strategy for Women's and Children's Health was launched by the United Nations Secretary-General Ban Ki-moon with three main objectives of survive, thrive, and transform. The Strategy guides countries to achieve nothing less than a transformation in health and sustainable development by 2030 for all women, children and adolescents, everywhere (WHO & Mathers, 2016). In addition, the survival, health and well-being of women, children and adolescents are essential to ending extreme poverty, promoting development and resilience and achieving the Sustainable development Goals (SDGs).

The Maputo Plan of Action's goal is 'for African Governments, civil society, the private sector and all multisector development partners to join forces and redouble efforts for the effective implementation of the continental sexual and reproductive health and rights policy framework' (African Union, 2015, p 6). Key strategies to improve the poor maternal, newborn and adolescent indicators include, improving political commitment, leadership and governance; increasing health financing; instituting health legislation and policies for

improving access to services and optimizing the functioning of the health system and improving human resources for reproductive, maternal, newborn, child and adolescent health services. These documents are in line with the goal of the Sustainable Development Goals of universal health coverage to all and leaving no one behind.

Maternal and neonatal health services are provided through the four-tiered system at the community, primary, secondary, and tertiary facilities with referral accordingly. The Reproductive Health Directorate of the Ministry of Health of Malawi facilitates the implementation of maternal and neonatal health services through the provision of policy direction. The Reproductive Health Directorate was established in 1997 as a Unit under the Clinical department and was elevated to a full directorate in 2012. The vision of the directorate is “to attain the highest level of sustained comprehensive and integrated sexual and reproductive health and rights services to improve quality of life for all” (Government of Malawi, 2017b). The mission of the Reproductive Health Directorate is “equitable delivery of a comprehensive range of quality and integrated sexual and reproductive health and rights services that are accessible, acceptable, effective and safe to individuals, couples and communities”. To achieve the vision, the goal is to improve sexual and reproductive health for all men, women and young people in Malawi especially the vulnerable and underserved. Services offered include family planning, antenatal care, labour and delivery, postnatal care, post-abortion care, prevention and management of obstetric fistula, prevention and management of reproductive health cancers, provision of youth-friendly health services and monitoring and evaluation of services.

Several guidelines and policies have been developed with support from development partners and stakeholders. The maternal and neonatal health indicators have slightly improved

over the years as depicted in Table 1. However, there is a need to strengthen the implementation of high impact interventions for better outcomes. Skilled attendance at birth increased from 71 percent in 2010 to 90 percent in 2016 while maternal mortality reduced from 675 per 100,000 live births to 439 per 100,000 live births over the same period. Similarly, the neonatal mortality rate declined from 31 per 1,000 live births in 2010 to 27 per 1,000 live births in 2016. HIV prevalence among women and men age 15-49 was 8.8% in 2016, down from 10.3% in 2010. In addition, Contraceptive Prevalence Rate for married women was 58.6% with 19.4% unmet need for family planning (National Statistical Office (NSO) [Malawi] & ICF, 2017).

The gains in health outcomes could partially be attributed to increased utilization of some key services such as skilled attendance at birth (Government of Malawi, 2017a). However, the rate at which maternal and neonatal mortality declined does not match with the high skilled birth attendance. One would expect better maternal outcomes from the high skilled birth attendance. This demonstrates that there are challenges of quality of care in the births that need to be addressed.

Table 1: Maternal and Newborn health indicators for Malawi

Indicator	Year	
	2010	2016
Total population (million)	14	17.6
Skilled Attendance at Birth (%)	71	90
Modern Contraceptive Prevalence Rate for married women aged 15-49 (%)	42	58.6
Unmet need for Family Planning for married women aged 15-49 (%)	26	19.4
Total Fertility Rate	5.7	4.4
Adolescent Birth Rate (%)	26	29
Neonatal Mortality Rate per 1 000 live births	31	27

Some policies guide health workers in the event of maternal deaths. Maternal death reviews were introduced in 2003 with review committees existing at national, regional and district levels. In addition, the Government made maternal deaths notifiable within 24 hours of occurrence at the facility level and 48 hours at community including zero reporting where no maternal death has occurred. A facility is required to report to the Ministry of Health, Reproductive Health directorate about a maternal death through filling a notification form within 24 hours of the occurrence of the death. To further strengthen the system and ensure complete accountability, the government moved to a more robust system of Maternal Death Surveillance and Response (MDSR). The system builds on the principles of public surveillance linking health information systems and quality improvement processes from district to national level (Government of Malawi, 2014b). It promotes routine identification and timely notification of maternal deaths and helps in quantification and determination of causes and avoidability of maternal deaths. Furthermore, there is a requirement for the maternal death surveillance and response committee to conduct a maternal death review of the death within seven days in order to identify causes and contributing factors to the death (Government of Malawi, 2014b). The Maternal Death Surveillance and Response (MDSR) guidelines stress the importance of collecting data on all maternal deaths occurring in facilities as well as the community with an aim to act on avoidable causes and contributing factors to prevent a recurrence. This is in line with the guidance that countries, where maternal deaths remain high, should accelerate efforts to save lives, and must also be paired with country-driven efforts to accurately register births and deaths, including the cause of

death certification (World Health Organization & UNICEF, 2015). In addition, strengthening civil registration and vital statistics will support measurement efforts and help track progress towards reaching SDG 3 of good health and well-being. However, it is not yet in the MDSR guidelines for maternal near-miss cases to be audited as well.

Owing to the high maternal mortality ratio, the Malawi Ministry of Health established a National Committee for the Confidential Enquiry into maternal deaths (NCCEMD) in 2009. The NCCEMD is mandated to produce a national analytical report on maternal deaths every two years. The reports are aimed at guiding policy direction, action and instituting relevant interventions aimed at addressing the avoidable causes of maternal deaths (Government of Malawi, 2014c). The quality of data from which the report is generated remains a challenge most likely due to the multiple levels of data collection. It is recommended that the report is widely disseminated to serve its purpose of reaching out to the intended health workers for them to understand the situation on the ground and follow suggested recommendations. Otherwise, it makes no difference if reports are generated and are not widely shared. The Reproductive Health Directorate serves as the secretariat for the NCCEMD.

1.2.5 Context of the problem, maternal near-miss

Maternal near-miss has been classified following the World Health Organization criteria. The WHO near-miss approach is a criterion used for monitoring the implementation of care for severe pregnancy complications (World Health Organization, 2011). The approach is implemented in three steps namely: baseline assessment, situation analysis and interventions for improving health care. In baseline assessment inclusion criteria for quality of care consists of severe maternal complications; critical interventions or intensive care unit

use as well as life-threatening conditions determined by system dysfunction (World Health Organization, 2011).

The near-miss criteria based on severe maternal complications include severe haemorrhage, hypertensive disorders in pregnancy, prolonged obstructed labour, infection and severe anaemia (Adeoye, Onayade, & Fatusi, 2013; Filippi et al., 2005; Oladapo et al., 2005; van den Akker et al., 2013) as per studies done in Nigeria, Tanzania and Malawi. However, in their studies done using the WHO near-miss approach Nelissen et al. (2013) and van den Akker et al. (2013) both indicated that the tool does not apply to low-resource settings as there are some criteria like intensive care unit and blood transfusion which may not be applicable. Nelissen et al. adapted the WHO near-miss approach with some modifications to apply to the context of Tanzania. Nevertheless, the WHO near-miss approach was preferred to be more accurate in determining maternal near-miss cases in a study that was conducted in Brazil, where three

Maternal near-miss defines women who survived by chance or good hospital care after presenting with potentially fatal complications during pregnancy, birth and puerperium (Shrestha et al., 2010; World Health Organization, 2011). Maternal near-miss cases are referred to as near-miss events which are complications that immediately threaten the woman's survival but do not lead to her death. Furthermore, near-miss events applied to five main diagnoses of haemorrhage, hypertensive diseases of pregnancy, dystocia, infection and severe anaemia (Filippi et al., 2005; Oladapo et al., 2005).

In this study, maternal near-miss referred to any woman who had a severe haemorrhage, severe pre-eclampsia ($BP \geq 140/90$ mmHg and proteinuria), sepsis defined as a temperature $\leq 36^{\circ}\text{C}$ or $\geq 38^{\circ}\text{C}$, dystocia which includes shoulder and uterine rupture or impending rupture and

severe anaemia $\leq 6\text{g/dl}$ or clinical signs of severe anaemia based on obstetric protocols (Government of Malawi, 2014a). Literature indicates that maternal near-miss and maternal morbidity are used interchangeably (Say et al., 2009). Likewise, in this study maternal near-miss and maternal morbidity will be used interchangeably.

1.3 Problem statement

Literature indicates that review/audit of near-miss cases which are more frequent than maternal deaths can lead to more robust conclusions on problems and obstacles to be addressed during the process of maternal health care (Adeoye et al., 2013; Nelissen et al., 2013; Say et al., 2009). Malawi's maternal mortality ratio of 439 per 100,000 live births (National Statistical Office [Malawi] and ICF International, 2016) falls in the high category (300-499) according to the World Health Organization categorization (World Health Organization, 2019). A situation analysis of the health sector strategic plan in Malawi identified low quality of care as a major barrier to improving health outcomes (including maternal and neonatal outcomes) and achieving universal health coverage (Government of Malawi, 2017a). In Malawi, studies that have been done were to assess the prevalence of near-miss cases in Thyolo and at Kamuzu Central Hospital (Kuyeli, 2013, unpublished; van den Akker et al., 2013). However, there is a scarcity of information on determinants of maternal near-miss cases and the quality of care provided. Probably this could be attributed to the persistently high incidence of maternal mortality which overshadows other severe obstetric complications. Therefore, a study on determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals would reveal findings that would

serve as a reference point for designing interventions to contribute to the improvement of quality of antenatal, labour and postnatal care.

1.4 Significance of the study

The trend for maternal mortality ratio in Malawi has varied over the years from 620 maternal deaths per 100,000 live births in 1990 to 1120 per 100,000 live births in the year 2000, 675 per 100,000 live births in 2010 and 439 per 100,000 live births in 2016 (National Statistical Office [Malawi] and ICF International, 2016). This has been the case despite high impact interventions in the implementation of maternal health care. Maternal near-miss is taken as an adjunct to maternal deaths as it has similar pathological and circumstantial factors (Chhabra, 2014). Furthermore, studying maternal near-miss is a promising indicator to improve the quality of care (World Health Organization, 2011). There existed a gap in maternal near-miss studies in the country as evidenced by the only two studies that the author identified (van den Akker et al., 2013). Kuyeli (2013 unpublished) recommended a follow-up study to focus on the management of maternal near-miss to conclude whether the near-miss was caused by poor obstetric care, or the women survived because of good obstetric care. The other factor that prompted me to conduct the study was that there was no study conducted on determinants of maternal near-miss in the country, hence the need to add to the body of knowledge.

1.5 Objectives

1.5.1 Broad Objective

The broad objective of the study was to describe determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals in Malawi.

1.5.2 Specific Objectives

The specific objectives were to:

- i) Establish the demographic, socioeconomic and obstetric characteristics of maternal near-miss cases.
- ii) Establish determinants of care associated with maternal near-miss cases.
- iii) Assess the quality of antenatal, labour, and postnatal care provided to maternal near-miss cases.
- iv) Describe the midwives' experiences of quality of care provided to maternal near-miss cases.

1.6 Structure of the thesis

This initial chapter provided the introduction and background information about maternal mortality, maternal near-miss, the context of the health care system in Malawi and maternal health system. The problem statement, the significance of the study and objectives were also defined. Chapter 2 will present the relevant literature that was reviewed on maternal near-miss in line with the objectives of the study. A conceptual framework for near-miss maternal morbidity and the World Health Organization Quality of care framework for maternal and newborn health will also be presented. This will be followed by Chapter 3 which presents the methodology of the study. Chapter 4 will present findings of the

quantitative, qualitative parts of the study including observations made using the World Health Organization Quality of Care Assessment Tool. Finally, Chapter 5 presents the discussion of the findings, study strengths, limitations and conclude with recommendations.

1.7 Conclusion

This chapter has provided an introduction and background on maternal near-miss. Context of health care system in Malawi, maternal health system, problem statement, the significance of the study, objectives, and structure of the thesis have been presented. There is a gap in studies on maternal near-miss conducted in Malawi. The next chapter will present an overview of the literature on maternal near-miss and the conceptual frameworks utilized for the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The previous chapter presented the introduction, background information and overview of the study. Maternal near-miss refers to a woman who nearly died due to maternal related complications during pregnancy and childbirth. As previously indicated, maternal near-miss cases are more common than maternal deaths. Although there has been a decline in maternal deaths globally, maternal deaths in low- and medium-income countries accounted for 99% (302,000) while Sub-Saharan Africa alone accounted for roughly 66% of the global maternal deaths in 2015 respectively (World Health Organization & UNICEF, 2015).

This chapter presents a review of literature on maternal near-miss cases. The literature review followed the mixed methods approach for the study starting with searching articles addressing quantitative objectives and ending with the qualitative study objectives (Creswell, 2014). In this study, the quantitative strand weighted more than the qualitative. The review considered search of multiple sources for detailed information about the studies. Online search was done in the following databases: CINAHL, Ebscohost, Google Scholar, HINARI, MEDLINE and Pub Med. The key search words included determinants; AND maternal near-miss cases OR severe/acute maternal morbidity; AND quality of care AND midwives' experiences of care provided. Consideration was made to include articles from 2008 to 2018. However, some articles and books published more than a decade ago or earlier were also

included because they contained original work or had relevant information that was not available in recent literature.

The search yielded several articles from high-income countries, low- and middle-income countries including Africa. Compared to high-income countries where maternal near-miss has received considerable attention in research, published literature from Malawi were scarce. Most of the studies that were found were descriptive quantitative studies that focused on prevalence, incidence and nature of maternal near-miss cases while others compared maternal near-miss and maternal deaths. The author did not have a specific assessment tool to select articles that would be included in the literature review, rather selection was done based on the relevance of the article to the research topic. Approximately 50 descriptive articles on maternal near-miss with two qualitative studies were found during the search. Articles that were chosen were those that were written in English while those that required a fee to be paid for access were searched through HINARI access.

The studies included: maternal near-miss events at Sisaket Hospital, maternal near-miss from two hospitals in Uganda and near-miss maternal morbidity at Kathmandu Hospital, just to mention a few (Nakimuli et al., 2016; Shrestha et al., 2010; Wianwiset, 2012). The studies sought to determine the incidence of maternal near-miss, near-miss events and obstetric outcomes. In addition, the search yielded qualitative studies on care experiences of women with near-miss maternal morbidities. It also yielded only two studies on midwives' experiences on quality of care provided to maternal near-miss cases in Vietnam and Bangladesh (Bogren et al., 2018; Graner et al., 2010). The review will be presented as follows: magnitude of maternal near-miss; demographic, socioeconomic and obstetric characteristics of maternal near-miss cases; determinants of care associated with maternal

near-miss cases; quality of antenatal, labour and postnatal care provided to maternal near-miss cases; midwives' experiences of care provided to maternal near-miss cases; and research frameworks.

2.2 Magnitude of Maternal near-miss

As indicated earlier, the World Health Organization (WHO) defined maternal near-miss as 'a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy (World Health Organization, 2011, page 7). Maternal near-miss has been referred to as severe acute maternal morbidity, severe maternal outcomes and near-miss events (Asaye, 2020; Filippi et al., 2006; Kaye et al., 2011; Nelissen et al., 2013; Oliveira et al., 2014; Shrestha et al., 2010; Sinha et al., 2016). A woman is recognized as a maternal near-miss case retrospectively after she survives the complications (Say et al., 2009). Three approaches have been used to identify maternal near-miss: disease-specific, organ system-based and management specific criteria (Filippi et al., 2006; Kaye et al., 2011; Nelissen et al., 2013; Sinha et al., 2016; Tunçalp et al., 2012). Disease-specific utilizes signs and symptoms that the woman presents with like preeclampsia, severe postpartum hemorrhage and severe anemia. The organ system relates to the system that has been affected like shock or renal dysfunction. Management based criteria are based on interventions done such as admission into intensive care unit and blood transfusion.

Though disease-specific criteria is a clear cut entity, it has been observed to be difficult to manage when there are multiple organ dysfunction (Sinha et al., 2016). Management specific is the most commonly used, is easy to measure and has lesser

variations. However, management-specific may be a challenge in low resource settings where some facilities may not have intensive care units or laboratories (Nelissen et al., 2013; Tura et al., 2019; van den Akker et al., 2013). Organ system criteria may be the most accurate approach though it requires technologies that may not be available in some settings (Sinha et al., 2016; van den Akker et al., 2013).

Literature indicates that the magnitude of maternal near-miss varies in countries and within countries due to many factors with the highest rates reported in low-and middle-income countries (Kumela et al., 2020). Large variations exist among countries in the prevalence/incidence of a maternal near-miss due to different contexts/settings that were used to define maternal near-miss (Kaye et al., 2011). In a systematic review by Tunçalp et al. (2012) of eighty-two studies conducted on the prevalence of maternal near-miss, the majority (33) used management-based criteria; eighteen used intensive care unit admission; 9 studies used organ system dysfunction; 7 studies used disease-specific criteria while the rest used a combination of disease, organ and management-based criteria. The review reported that the prevalence rate varied between 0.6% and 14.9% for disease-specific criteria; 0.14% and 2.3% for organ dysfunction and 1.04% and 4.54% for management-based criteria. In addition, the systematic review indicated that prevalence rates were higher in low income and middle-income countries of Asia and Africa. Near-miss ranged from 4.93% in Latin America and the Caribbeans; 5.07% in Asia and 14.98% in Africa. Studies from Developed countries reported a low of 0.79% in Europe to a high of 1.38% in North America (Tunçalp et al., 2012).

Studies by Abdel-Raheem et al. (2016) in Egypt, Ali et al. (2011) in Sudan, Nelissen et al. (2013) in Tanzania and Kumela et al. (2020) in Ethiopia reported magnitudes of 20, 22.1, 23.6 and 4.9 per 1000 live births respectively. The highest magnitude of maternal near-

miss has been reported in low and middle-income countries (Abdel-Raheem et al., 2016) concurring with the findings of the systematic review by Tunçalp et al. (2012). The incidence of maternal near-miss was 14.5 in Syria, 12.9 in Palestine, 12 in Morocco and 4.3 per 1000 in Lebanon. The prevalence of maternal near-miss in high-income countries was estimated to be between 3.8 and 12 per 1000 as found in Scotland and Italy recorded 3.8 and 2.1 per 1000 respectively (van Roosmalen & Zwart, 2009).

The studies conducted in Malawi showed different magnitudes of maternal near-miss of 18% and 88% using disease-based criteria (Gwedeza Kuyeli, 2013; van den Akker et al., 2013) confirming variations that can occur within the same country. The study by (Gwedeza Kuyeli, 2013) was conducted at a tertiary (referral) facility to measure the prevalence of near-miss and to describe factors associated with maternal near-miss. The study reported that out of a total of 369 records reviewed, 38% of women had severe haemorrhage; 29% severe anaemia; 17% eclampsia; 11% sepsis and 10% severe eclampsia. Contrastingly, in a study by van den Akker et al. (2013) in the same country but at a district facility, the prevalence for maternal near-miss was higher at 88% using disease-based criteria. The study reviewed records of 386 women who had given birth at the hospital. The leading causes for maternal near-miss in various studies were hypertensive disorders of pregnancy, severe haemorrhage, sepsis and anaemia (Abdel-Raheem et al., 2016; Gwedeza Kuyeli, 2013; Kaye et al., 2011; Kumela et al., 2020). Delays at home, on the way to the hospital and at the health facility were cited as factors contributing to the high magnitude of maternal near-miss (Kumela et al., 2020). This concurs with studies on maternal mortality in Malawi where the three delays were at interplay in contributing to maternal deaths (Mgawadere et al., 2017; Thorsen &

Sundby, 2012). Efforts should be made to implement interventions that should address the factors contributing to the magnitude of maternal near-miss.

2.3 Demographic, socioeconomic, and obstetric characteristics of maternal near-miss cases

A study conducted in Ethiopia to determine the magnitude of maternal near-miss and its determinants reported 73.77% cases and 90.16% controls were aged 20-34 years (Kumela et al., 2020). In addition, most participants in both groups were married, could not read and lived far from the health facility. It was indicated that 77.05% of maternal near-miss cases took more than 60 minutes to reach the hospital. A higher proportion of maternal near-miss cases (77.41%) were referred from another health facility compared to 50.82% in controls. The same study reported that the majority of participants were gravida 2-4. Furthermore, 26.23% of maternal near-miss cases received no antenatal care while 98.36% of controls received antenatal care.

Similarly, in their studies in Sudan and Syria, Ali et al. (2011) and Almerie et al. (2010) reported that demographic characteristics associated with maternal near-miss include patients age, parity and number of previous deliveries. Age at first pregnancy was identified as a predictor of maternal near-miss in some studies (Aduloju et al., 2018; Mekango et al., 2017). However, the studies by Aduloju et al (2018) and Mekango et al (2017) reported that age below 16 years and 19 years respectively were associated with maternal near-miss. Younger women exposed to obstetric complications tend to be more vulnerable as their bodies are not fully physically developed. Apart from that, teenage pregnancies often occur outside the context of marriage thereby exposing them to adverse social consequences like

delayed antenatal care attendance or even non-attendance as they tend to hide the pregnancy. In addition, advancing maternal age was found to be a determinant of maternal near-miss with medical conditions like hypertension and diabetes occurring in older age complicating the pregnancy (Aduloju et al., 2018; Galvão et al., 2014).

The other determinants of maternal near-miss are the history of caesarean section and chronic illness (Adeoye et al., 2013; Galvão et al., 2014; Mekango et al., 2017). According to Mekango et al. (2017), previous caesarean section scar predisposes a woman to uterine rupture if vaginal birth is attempted. In another study, it was indicated that mothers were more likely to develop severe maternal outcomes in the intrapartum and postpartum periods, with factors such as clinical and previous health status, disease severity and adequacy of care provided determining the outcomes. The adequacy of care provided was in relation to timeliness, adequacy and comprehensiveness (Nakimuli et al., 2016). Several studies concurred in major causes of maternal near-miss as hypertensive disorders, hemorrhage, obstructed labour, uterine rupture and ruptured ectopic pregnancy (Abdel-Raheem et al., 2016; Gwedeza Kuyeli, 2013; Kaye et al., 2011; Kumela et al., 2020).

Furthermore, a study conducted in Thailand by Wianwiset, (2012) reported increased near-miss cases among multiparous women with less than 38 weeks gestation. The study explored the incidence of maternal near-miss cases, their near-miss events and obstetric outcomes. Multiparous women had the odds 1.39 times higher for maternal near-miss [OR=1.39, 95% CI: 1.08-1.81] while women with gestational age less than 38 weeks had the odds 2.23 times higher for maternal near-miss [OR=2.23, 95% CI: 1.73-2.88]. Multigravidity, lack of antenatal care and induction of labour were positively associated with maternal near-

miss. In addition, mothers with no antenatal care were six times more likely to have a maternal near-miss compared to those that received antenatal care (Kumela et al., 2020).

2.4 Determinants of care associated with maternal near-miss cases

The World Health Organization defines social determinants of health (SDH) as “the non-medical factors that influence health outcomes. They are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems (WHO, 2012). These factors do not exist in isolation from each other.

Mekango et al. (2017) conducted a study in public hospitals of Tigray Region Northern Ethiopia to identify determinants of a maternal near miss. The study reported lack of formal education, age below 16 years, chronic disorders and travelling more than 60 minutes to a health facility to be determinants of maternal near-miss. This indicates that lack of education limits access to information. Lack of information, in turn, affects the woman’s health-seeking behaviour like delay in accessing care and eventually poor maternal and neonatal outcomes. According to the three delays model, the decision by the woman or her relatives on whether to go and seek care at a health facility was associated with severe maternal outcomes in various studies (Kumela et al., 2020; Mgawadere et al., 2017; Thorsen & Sundby, 2012). This is consistent with the findings of a demographic and health survey in Malawi which indicated that women with secondary education are more likely to make better decisions about their health (National Statistical Office [Malawi] & ICF International, 2016) because they can understand and comprehend information which positively influences access

to health services. It can be inferred that women with no or less education are less likely to make good decisions about their health.

In addition, women who travel more than 60 minutes before reaching the final place of care and those that reside in rural areas are at high risk for maternal near-miss and severe maternal outcomes compared to those from urban areas (Aduloju et al., 2018; Mekango et al., 2017). Hardships of long distances and physical terrain were cited as obstacles to access a health facility in a study in Lilongwe, Malawi where ox-carts had to be used (Thorsen & Sundby, 2012). Similarly, lack of antenatal care, illiteracy and lack of adequate monitoring are associated with adverse perinatal outcomes (Ali et al., 2011; Galvão et al., 2014). Lack of antenatal care and delays in seeking care result in the pregnant woman's inability to access health services provided by a trained health worker who would monitor pregnancy and reduce morbidity and mortality (Gebrehiwot & Tewolde, 2014). Inadequate monitoring implies that risk factors may not be detected early enough for interventions to be implemented hence resulting in adverse outcomes.

Lastly, a study conducted in Western Nigeria by Adeoye et al. (2013) reported phase one or phase two delays as determinants of maternal near-miss where pregnant women underestimated the severity of various pregnancy-related conditions and delayed seeking care or reaching a health facility. Similarly, a study by Aduloju et al. (2018) conducted in South-Western Nigeria to identify profile and determinants of maternal near-miss indicated that low education, late arrival at the referral facility and unemployment were determinants of maternal near-miss. Poor knowledge of risks associated with pregnancy warning signs affects care-seeking decisions. Phase one delay involves a decision by a pregnant woman to seek medical help for an obstetric emergency, while phase two delay applies to reaching an

appropriate obstetric facility (Thorsen & Sundby, 2012; World Health Organization, 2012). It is important to identify where delays occur for the phases in order to determine appropriate interventions to address the delays (Mgawadere et al., 2017).

2.5 Quality of antenatal, labour, and postnatal care provided to maternal near-miss cases

Quality of care is multi-faceted and has been described from different perspectives and dimensions. World Health Organization (2016) defines quality of care as the extent to which health care services translate to desired health outcomes in individuals and patient populations. The definition adapted in Malawi states quality of care is the degree to which health services increase the likelihood of desired health outcomes in individuals and the population (Government of Malawi, 2017c). The definitions denote the linkages existing between services provided and the health outcomes achieved. The quality management policy of Malawi prioritizes efforts to improve infrastructure, infection prevention practices, regular electricity availability in addition to governance, people centered care, client safety and evidence-based decision making.

The definition of quality of care is complex and depends on where one is located in the system of care (Donabedian, 1997). According to Donabedian (1997), quality can be assessed based on the performance of physicians and other health workers in terms of technical and interpersonal skills. Technical included knowledge, judgment and skill used in implementing strategies of health care, with technical performance being good where it is judged in comparison with the best in practice. Best in practice was further explained to be known or believed to produce the greatest improvements in health.

An interpersonal relationship is a component in the practitioner's performance where the patient exchanges information with the physician that the latter uses to arrive at a diagnosis and appropriate strategies of patient care. Literature indicates the importance of amenities of care being desirable attributes in the environment where care is provided such as convenience, comfort, quietness and privacy (Donabedian, 1997). This corresponds with the World Health Organization Quality of Care framework which puts the health system as the structure, with quality of care as the process and the practices leading to the health outcomes (Tunçalp et al., 2015).

Quality could also be described using three different models of perspectives, characteristics and systems model (Raven et al., 2012). The perspectives take into consideration that there are different views to quality of care on the patients, health care provider and health care manager. The patient would view quality based on whether health services meet the patient's perceived needs. On the other hand, the health care provider's perspectives may focus on technical competence while the managers that oversee the health care system may focus on resource allocation, supervision and financial logistics.

The characteristics model indicates that characteristics of health care vary depending on the type of health care being provided. The characteristics are effectiveness, acceptability, efficiency, access, equity and relevance (Maxwell, 1992; Raven et al., 2012). Recent definitions of characteristics of quality of care include safety, effectiveness, patient-centeredness, timeliness, equity and efficiency (Kruk et al., 2016; Raven et al., 2012; Tunçalp et al., 2015; Van den Broek & Graham, 2009; World Health Organization, 2016). Safety refers to health care that minimizes risks and harm to service users including preventable injuries and reducing medical errors. Health services are effective when services are provided

based on scientific knowledge and evidence-based guidelines. Reducing delays to providing and receiving care relates to the timeliness component. Efficiency arises when health care services are delivered in a manner that maximizes resource use and avoids waste. When services do not differ in quality based on personal characteristics such as gender, ethnicity, geographical location and socioeconomic status, there is equity. People centeredness arises when the provision of care takes into account the preferences and aspirations of individual service users (World Health Organization, 2016). According to Raven et al. (2012), stakeholders such as the patients, health care providers or managers of the health care system would differ on the importance they attach to the characteristics. These tally well with the view of the perspectives model where the different stakeholders have varying perspectives of quality of care.

The systems model states that quality of care is related to the different dimensions of the health care system namely structure, process and outcome. As such, measurement of quality of care can be done at these points (Raven et al., 2012). This is consistent with the view that health outcomes are dependent on the structure as well as the processes. The structure includes facilities, equipment, human resources as well as financing of the care; which is the responsibility of the practitioner in private practice or the owners of the institution in public practice (Donabedian, 1997; Raven et al., 2012). Processes refer to the actual care provided. These include both the patient's activities in seeking care and activities done by the practitioner in diagnosis and prescription of treatment. On the other hand, outcomes are the results of the care and are usually expressed in terms of the patient's health, welfare and satisfaction (Donabedian, 1997; Raven et al., 2012).

The World Health Organization (2016) and Tunçalp et al. (2015) stipulate eight domains of quality of care namely: evidence-based practices for routine care and management of complications; actionable information systems; functional referral systems; effective communication; respect and preservation of dignity; emotional support; competent, motivated human resources; and essential physical resources available. The domains focus on quality in terms of provision of care itself and the experience of care by the client. These are the domains that would determine desirable attributes of the settings in which care is provided and the judgment that the client would make of the care received.

Each domain of quality of care is supported by a standard that defines what is required to achieve high-quality care during childbirth. The standards of care are: Every woman and newborn receives routine, evidence-based care and management of complications during labour, childbirth and are given timely, appropriate care; The health information system enables use of data to ensure early, appropriate action to improve the care of every woman and newborn; Every woman and newborn with condition (s) that cannot be dealt with effectively with the available resources is appropriately referred; Communication with women and their families is effective and responds to their needs and preferences; Women and newborns receive care with respect and preservation of their dignity; Every woman and her family are provided with emotional support that is sensitive to their needs and strengthens the woman's capability; For every woman and newborn, competent, motivated staff are consistently available to provide routine care and manage complications and lastly, The health facility has an appropriate physical environment, with adequate water, sanitation and energy supplies, medicines, supplies and equipment for routine maternal and newborn care and management of complications (World Health Organization, 2016). Facilities monitor

implementation of the standards using quality statements that have been provided with the standards.

In line with the standards of care and the goal to reduce maternal and newborn deaths and stillbirths, a quality, equity and dignity network (QED) was established in 2017 in Malawi (World Health Organization, 2018). The network is supported by the World Health Organization, United Nations Children’s Education Fund and United Nations Population Fund. The network consists of 11 countries across World Health Organization regions which have demonstrated leadership in improving the quality of care in health services. The countries include Bangladesh, Côte d’Ivoire, Ethiopia, Ghana, India, Malawi, Nigeria, Sierra Leone, Tanzania, Uganda and Kenya. The QED network’s vision is that “every pregnant woman and newborn infant receives good quality care throughout pregnancy, childbirth and the postnatal period”. The vision is underpinned by the core values of quality, equity and dignity. The network countries use the WHO quality of care framework and standards of care in the implementation of activities to reduce maternal and newborn mortality.

The World Health Organization further identified six building blocks that create a structure from where health systems analysis and interventions can be established. The building blocks are: service delivery; health workforce; information; medical products, vaccines and technologies; financing and leadership/governance (Ö Tunçalp et al., 2015). The building blocks are critical and inform the functionality of a health system.

The six building blocks are further described as: “Good health services are those which deliver effective, safe, quality personal and non-personal health interventions to those that need them, when and where needed, with minimum waste of resources” (WHO, 2007). Facility managers need to provide their health workers with a conducive environment for the

provision of good health services. Furthermore, a well-performing health workforce works in ways that are responsive, fair and efficient to achieve the best health outcomes possible, given available resources and circumstances (i.e., there are sufficient staff, fairly distributed; they are competent, responsive and productive). There is a need for a well-functioning health information system in health facilities. The World Health Organization further defines a well-functioning health information system as one that ensures the production, analysis, dissemination and use of reliable and timely information on health determinants, health system performance and health status.

A well-functioning health system ensures equitable access to essential medical products, vaccines and technologies of assured quality, safety, efficacy and cost-effectiveness, and their scientifically sound and cost-effective use. In addition, a good health financing system raises adequate funds for health, in ways that ensure people can use needed services and are protected from financial catastrophe or impoverishment associated with having to pay for them. It provides incentives for providers and users to be efficient. Finally, leadership and governance involve ensuring strategic policy frameworks exist and are combined with effective oversight, coalition-building, regulation, attention to system-design and accountability” (WHO, 2007).

The World Health Organization technical Working group developed the WHO near-miss approach as a guide for health care workers, program managers and policy makers responsible for the improvement of quality maternal health care in facilities (World Health Organization, 2011). The main purpose of the near-miss approach was to improve clinical practice and reduce preventable morbidity and mortality through the use of the best evidence-

based practice. The WHO near-miss approach is a standard that is implemented in three cyclical steps of baseline assessment, situation analysis and interventions for improving health care. During an assessment, data is extracted from woman's records based on the occurrence of selected severe pregnancy-related outcomes, use of critical key interventions and admission to the intensive care unit. The near-miss approach yields result that inform policy decisions for improving the quality of maternal health care.

The near-miss approach is designed for assessment of maternal health care in the district health system, all facilities that admit women for delivery or facilities that treat women with complications related to pregnancy. Furthermore, the World Health Organization recommends institutions using the near-miss approach to follow the 3 steps in conducting the assessment to continuously improve maternal health care. According to Say et al. (2009) routine assessments of maternal near-miss cases will help answer the need to assess the quality of care within institutions following which quality of obstetric care can be improved. In addition, the near-miss approach is designed to enable comparability of data over time from different settings and across countries. The World Health Organization and other agencies can use the information for systematic reviews which can give a better global picture of maternal health care.

Nelissen et al. (2013) modified the WHO near-miss approach in a study conducted in rural Northern Tanzania to assess the occurrence of severe maternal morbidity. The study also sought to assess implementation levels of key evidence-based interventions in women experiencing severe maternal morbidity and mortality. They modified the tool as not all WHO near-miss criteria were applicable. The study found out that some key evidence-based interventions were not implemented in women with severe maternal morbidity and mortality

like prophylactic antibiotics. Similarly, in their study in a district hospital in Malawi, van den Akker et al. (2013) indicated that the WHO near-miss criteria may not be suited to compare maternal near-miss across all settings as some low resource settings may not have the sophisticated laboratory and clinical monitoring equipment.

The WHO maternal near-miss approach was used in a multicenter cross-sectional study implemented in 27 referral maternity hospitals in Brazil (Souza et al., 2012). The study sought to validate the identification of maternal near-miss cases using the World Health Organization list of pregnancy-related life-threatening conditions or markers. The WHO criteria are a package of 25 severity markers portraying a comprehensive range of life-threatening conditions with each of the severity markers being associated with a specific relationship with mortality. The study reported that the WHO maternal near-miss criteria were accurate and highly associated with maternal deaths. In addition, it was reported that women experiencing pregnancy-related complications can present with more than one of the severity markers and that survivors of the WHO pregnancy-related life-threatening conditions can be accurately classified as maternal near-miss.

Confidential enquiries into maternal deaths have also been a tool available for assessing the quality of care in pregnancy (Pattinson, 2009). Furthermore, confidential enquiries give a good indication of problems in the health system in countries where maternal deaths are more frequent especially where most deaths occur within health institutions. This was affirmed by van den Akker et al. (2009) in audit sessions that were performed at a district hospital in Malawi aimed at improving obstetric care and reducing the incidence of uterine rupture. The study reported that the implementation of recommendations led to a decline in the incidence of uterine rupture. In addition, the study concluded that audits are inexpensive,

appropriate and effective interventions to improve the quality of facility-based maternal care in low-resource settings. However, Pattinson assented the difficulty in collecting information on all deaths in an area where a number of home births are high.

High-quality maternal health care and not only increasing coverage of skilled birth attendance are essential for the reduction of maternal mortality and newborn survival (Nababan et al., 2017). Furthermore, a health system that integrates educated, trained, regulated and licensed midwives were associated with improved quality of care and sustained decrease in maternal and newborn mortality (Filby et al., 2016; Renfrew et al., 2014). Components for high-quality care in a health system were identified as effective practices, the organization of care, the philosophy and values of the care providers working in the health system (Renfrew et al., 2014). Emphasis was put on the role played by interdisciplinary teamwork and collaboration in the implementation of the quality-of-care framework. This underscores the contributions made by each team member to the improvement in quality of care.

According to Donabedian (1997), it is important to understand the relationship between the structure, process and outcome characteristics in order to perform a meaningful assessment of the quality of care since normally, there is a weak relationship between structure and process. However, Renfrew et al. (2014) indicated that the components of high-quality care are interlinked. As such, the inference that can be made is that multiple elements contribute towards the quality of care such that some elements may either be obstructive or conducive to good care. There is a need for a proper selection of elements to be used in the improvement of quality care.

Near-miss cases have been used for the assessment of maternal health and quality of maternal care (Chhabra, 2014; Nelissen et al., 2013; Tunçalp et al., 2012) as they reflect deficiencies in the care of pregnant women. Furthermore, maternal near-miss cases have been used to examine the quality of obstetric care since complications occur in 15% of women worldwide (Ali et al., 2011). However, there is no gold standard to identify maternal near-miss hence eligibility criteria vary from one study to another. Several studies, e.g. studies by Nelissen et al., (2013) and van den Akker et al. (2013) have used the WHO maternal near-miss criteria which proposes the identification of maternal near-miss through severe maternal complications; critical interventions or intensive care unit use, as well as life-threatening conditions determined by system dysfunction (World Health Organization, 2011).

In the same vein, studies by Chhabra (2014) and Symon, McStea, and Murphy-Black (2006) noted that the increase of the load on health workers created by the call for birth by skilled attendants at health facilities can compromise the quality of care due to limited financial resources. The situation is worsened by poor documentation, lack of skills and shortage of human resources. However, availability and access to emergency obstetric care are a key strategy to improve maternal outcome as it reduces maternal mortality (Chhabra, 2014). Similarly, Nakimuli et al. (2016) indicated that the severity of maternal near-miss depends on the disease progression and the quality of care received. This included early recognition of severe life-threatening maternal morbidity and prompt management utilizing critical life-saving skills.

Maternal near-miss and deaths are a result of delays that occur in implementing appropriate obstetric care in women with haemorrhage (Lotufo et al., 2012). Similarly, Thorsen et al. (2014) identified delayed or incorrect treatment delayed referrals and transfers

as some of the shortfalls by skilled birth attendants contributing to maternal deaths in Malawi. Skilled birth attendants' provision of care was found to be sub-optimal. On the other hand, Van den Broek and Graham, (2009) observed that poor quality of care contributed to high levels of maternal and newborn mortality. Considering this evidence, maternal and perinatal death reviews and criterion-based audits are promising approaches to measure and improve quality. It is also imperative for health workers to be equipped with adequate skills to handle obstetric emergencies for better maternal and newborn outcomes.

2.6 Midwives' experiences of care provided to maternal near-miss cases

There are several studies on the prevalence, incidence and nature of maternal near-misses. However, there is a paucity of information on midwives' experiences on maternal near-miss cases although this is crucial to inform areas that need improvement. Suffice to say that midwives' experiences would shed light on the human experiences in caring for maternal near-miss (Taylor, 2014). Though not all midwives are comfortable in discussing near-miss incidents, there is a need for practitioners to discuss clinical and operational matters openly to improve obstetric care (Symon et al., 2006). Unless the care is scrutinized, it would be difficult to identify whether the challenges occurred in the structure, process or outcome.

According to evidence from other developing countries like Vietnam and Bangladesh, midwives cited lack of clinical knowledge, inadequate human resources, heavy workload and lack of equipment as affecting the quality of care they provided (Bogren et al., 2018; Graner et al., 2010). Bogren et al (2018) conducted a study to describe midwifery students' perceptions in Bangladesh on midwives' realities based on their own experiences. The study in Vietnam indicated that the shortage of appropriate gloves and sterilizers restricted health

care professionals' performance within antenatal and birthing rooms. This was exacerbated by long working hours and lack of collegial support during obstetric emergencies. The World Health Organization (2007) indicates the interplay among factors in the six building blocks critical in informing quality and outcomes of care. The linkages in service delivery; health workforce; information; medical products, vaccines and technologies; financing and leadership/governance are crucial for an effective and functional health system.

Furthermore, the contextual conditions influenced both the pregnant women's use of maternal health care and health care professionals' performance. This further illustrates the linkages in structure, process and outcomes of care in that unavailability of some element would affect the other. Lack of or inadequate human resources in Malawian health facilities as observed by the researcher affected the quality of care. For example, pregnant women had to wait for long hours for services before being attended to.

A systematic review by Filby et al. (2016) on what prevents quality midwifery care in low- and medium-income countries reported that social, cultural, economic and professional barriers can prevent the provision of quality midwifery care. Social inequality, inadequate pay to meet the basic cost of living as well as inadequate staffing and material resources compromised the quality of care as midwives would end up with burnout and moral distress. Similarly, Homer et al. (2018) conducted a study to explore barriers, challenges and solutions to the availability, accessibility, acceptability and quality of sexual reproductive maternal newborn and adolescent health services and workforce. The study indicated the need to address barriers to the availability, accessibility, acceptability and quality of sexual, reproductive, maternal, newborn and adolescent health workforce in order to contribute to the achievement of Universal Health Coverage by 2030. Barriers stated by Midwives included

the insufficient size of the workforce and inequities in its distribution, lack of transportation, lack of supplies and equipment. In addition, the midwives mentioned that women mistrusted the workforce due to cultural differences and disrespectful behaviours. Although this is not specifically related to maternal near-miss cases, it can be implied that social, cultural, economic and professional barriers experienced by midwives can negatively affect the quality of care.

2.7 Research frameworks

Conceptual framework refers to a set of highly abstract, related constructs which broadly explain phenomena of interest, expresses assumptions and reflects a philosophical stance (Grove et al., 2013). At times the terms conceptual framework, conceptual models and theoretical frameworks are used interchangeably (Polit & Beck, 2012). This study used the adapted conceptual framework for near-miss maternal morbidity (Adeoye et al., 2013) as the overarching framework (Figure 2) and the World Health Organization Quality of care framework (Tunçalp et al., 2015) as its underpinning (Figure 3) to investigate the quality of obstetric care in the two hospitals.

2.7.1 A conceptual framework for near-miss maternal morbidity

The conceptual framework for near-miss maternal morbidity was originally developed by McCarthy and Maine (1992) and was later adapted by Adeoye et al. (2013). According to McCarthy and Maine (1992) the conceptual framework for near-miss maternal morbidity proposes factors that reduce maternal mortality by: (a) reducing the likelihood that a woman will become pregnant; (b) reducing the chances that a pregnant woman will develop a serious

complication, and (c) improve the outcome for women who develop complications. The major concepts in the conceptual framework include background determinants, proximate determinants, known clinical factors and near-miss morbidity which identify critical factors in relation to maternal near-miss (Figure 2). These four major concepts have been further described below.

2.7.1.1 Background determinants

The conceptual framework for near-miss maternal morbidity proposes that the background determinants such as age, marital status and occupation operate through the proximate factors to influence morbidity outcome (Adeoye et al., 2013). For instance, these background determinants would influence women's education, occupation, polygamy, distance to health facility and socio-economic status which in turn impact maternal mortality.

2.7.1.2 Proximate determinants

Proximate determinants include modifiable factors, reproductive health characteristics and obstetric history which are located closer to the outcome of interest maternal near-miss mortality (Adeoye et al., 2013). Modifiable factors are those that can be changed by measures taken like education on birth preparedness (Goffman et al., 2007). The reproductive health characteristics of parity, inter-pregnancy interval, age, access to reproductive health services and delays of referral status would impact maternal mortality as proximate determinants (Adeoye et al., 2013).

The framework further proposes that obstetric history and known clinical factors are other proximate determinants for maternal near-miss mortality amongst women (Adeoye et

al., 2013). Obstetric history includes any previous related complications such as previous caesarean section, previous eclampsia, previous antepartum/postpartum haemorrhage, previous fetal death and antenatal history. The aforementioned proximate factors are linked to known clinical factors that may cause complications.

2.7.1.3 Known clinical factors

Known clinical factors include gestational age, blood pressure, malpresentation and bleeding per vagina and may cause complications that are related to maternal near-miss mortality (Adeoye et al., 2013). The framework also includes unknown factors taking into consideration that some women develop pregnancy complications for no apparent reason (Reynolds et al., 2006).

2.7.1.4 Near-miss morbidity

Near-miss maternal morbidity refers to the outcome of the woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy (Adeoye et al., 2013). The framework proposes that background determinants are linked to proximate determinants and known clinical factors which together influence near-miss maternal mortality as an outcome of pregnancy among women. This implies that near-miss maternal mortality is a product of an interplay of various factors that are crucial and worthy to be taken into consideration by midwives when caring for women receiving maternity care. Furthermore, maternal near-miss mortality may reflect the quality of maternity care received by women.

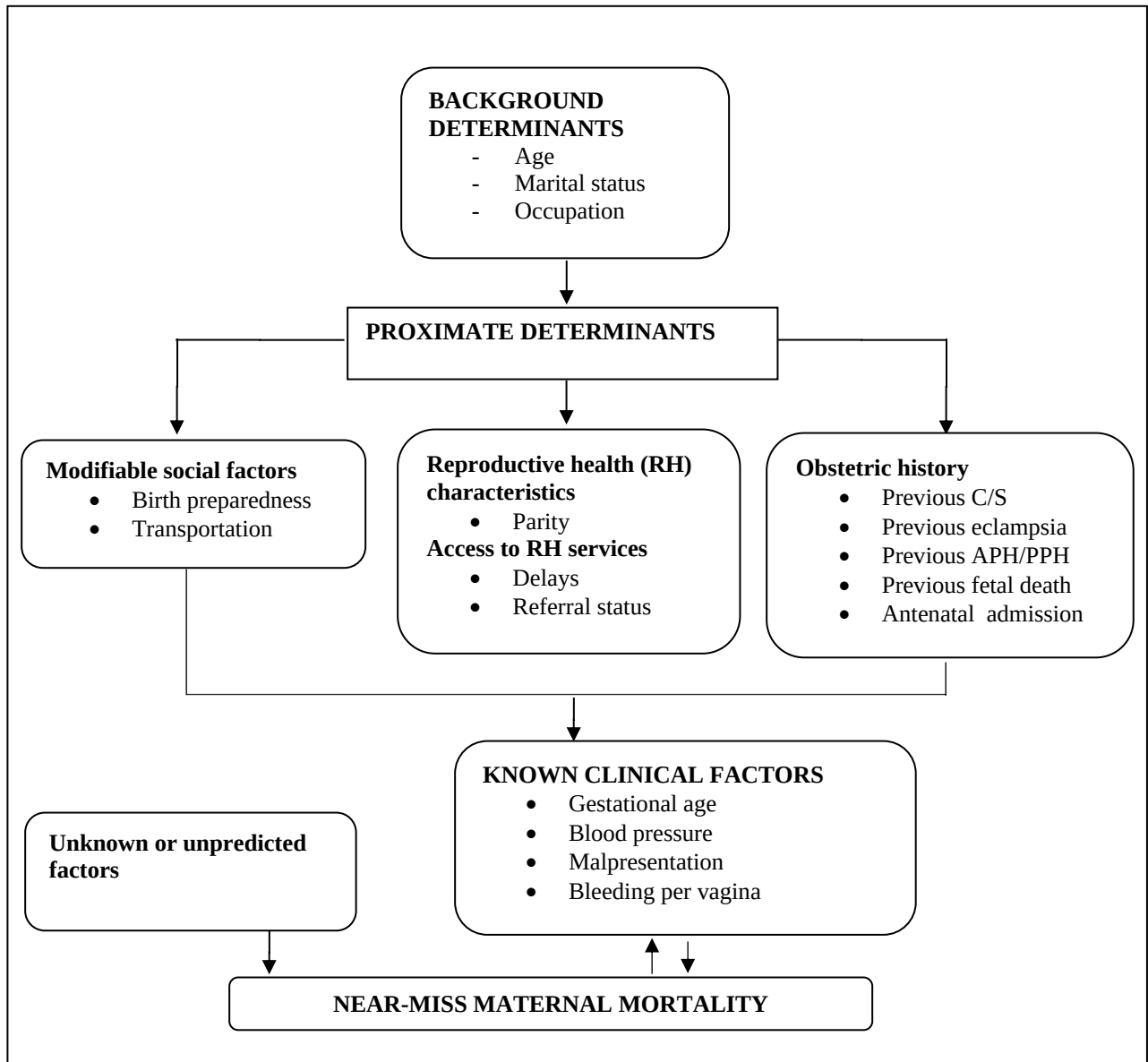


Figure 2: Conceptual framework for near-miss maternal morbidity

Source: Adopted from Adeoye et al. (2013)

2.7.2 The WHO Quality of Care framework for maternal and newborn health

The World Health Organization Quality of care framework for maternal and newborn health was designed to target domains important to assess, improve and monitor care in health facilities. The framework identifies eight domains under-provision and experience of care (Tunçalp et al., 2015; World Health Organization, 2016). Under the provision of care, the framework depicts that pregnant women and new-born in facilities require evidence-based practices which include practices for emergency care, actionable information systems and functional referral systems. The client needs effective communication, respect, and preservation of dignity as well as emotional support under the experience of care. Cross-cutting domains are competent and motivated human resources and the availability of essential physical resources. The framework further describes the health system as the structure; quality of care is the process for providing care to women and the experience of care while the outcomes are at individual and facility-level as presented in Figure 3. The outcomes include coverage of key practices and people-centred outcomes. Operational definitions for characteristics of quality of care are provided as:

Safe—delivering health care that minimizes risks and harm to service users, including avoiding preventable injuries and reducing medical errors

Effective—providing services based on scientific knowledge and evidence-based guidelines

Timely—reducing delays in providing/receiving health care

Efficient—delivering health care in a manner that maximizes resource use and avoids wastage

Equitable—delivering health care that does not vary in quality because of personal characteristics such as gender, race, ethnicity, geographical location or socioeconomic status

People-centred—providing care that takes into account the preferences and aspirations of individual service users and the cultures of their communities (Tunçalp et al., 2015).

2.5.2.1 Structure

Structure relates to characteristics of the providers of care, the tools and resources they have at their disposal as well as the physical organizational settings (Donabedian, 1969). The skills of the provider and adequate resources to conduct a procedure would impact the outcome of the care. The assumption is that when specified conditions are satisfied, good care is likely to follow. According to Salzer et al. (1997) factors such as access, institutional characteristics, provider characteristics, community characteristics and client satisfaction are critical when assessing the quality of service structure.

2.7.2.2 Process

Process refers to the treatment process, interpersonal process factors and technical skills utilized in the delivery of care (Salzer et al., 1997). The interpersonal process indicates a therapeutic relationship that exists between the care provider and the one who experiences the care. Furthermore, quality of care is divided into the provision of care and experience of care with elements or standards under each of them (Tunçalp et al., 2015). The process also encompasses barriers to treatment, timeliness to treatment, accountability to consumers, consumer advocacy and protection of human rights.

2.7.2.3 Outcome

Outcome was defined as a change in the patient's current and future status that could be attributed to previous care (Donabedian, 1969). The WHO Quality of Care framework for

maternal and newborn health indicated that outcomes are achieved by individuals through coverage of key practices and at the facility level through people-centred outcomes (Tunçalp et al., 2015). The key practices relate to the procedures which are centred on the needs of the woman provided by the health worker, in this case, the midwife.

A review of literature on women's views and perspectives on quality of care showed that information and education help women learn for themselves and understand the organization of services to access them promptly (Renfrew et al., 2014). Overall, the studies highlight the need for services that are provided respectfully by staff that are not abusive or cruel.

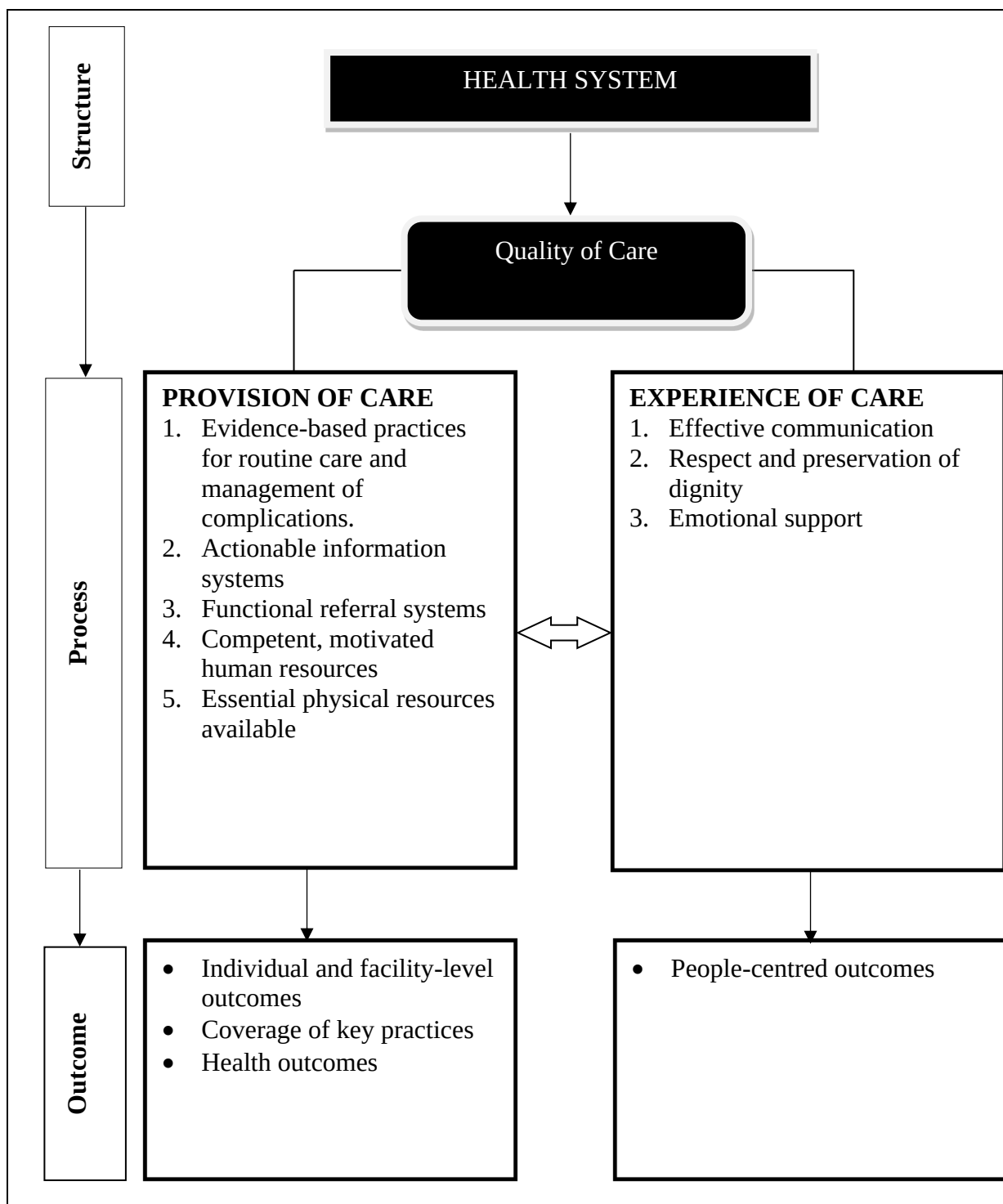


Figure 3: WHO Quality of Care Framework for Maternal and Newborn Health

Source: Adopted from Ö Tunçalp et al. (2015)

2.7.3 Application of the research frameworks to this study

The World Health Organization Quality of care framework for maternal and newborn health provided a relevant framework to establish the demographic, socioeconomic and obstetric characteristics of maternal near-miss cases; establish determinants of care associated with maternal near-miss cases; assess the quality of antenatal, labour and postnatal care provided to maternal near-miss cases; and describe the midwives experiences of the quality of care provided to maternal near-miss cases (Figure 4).

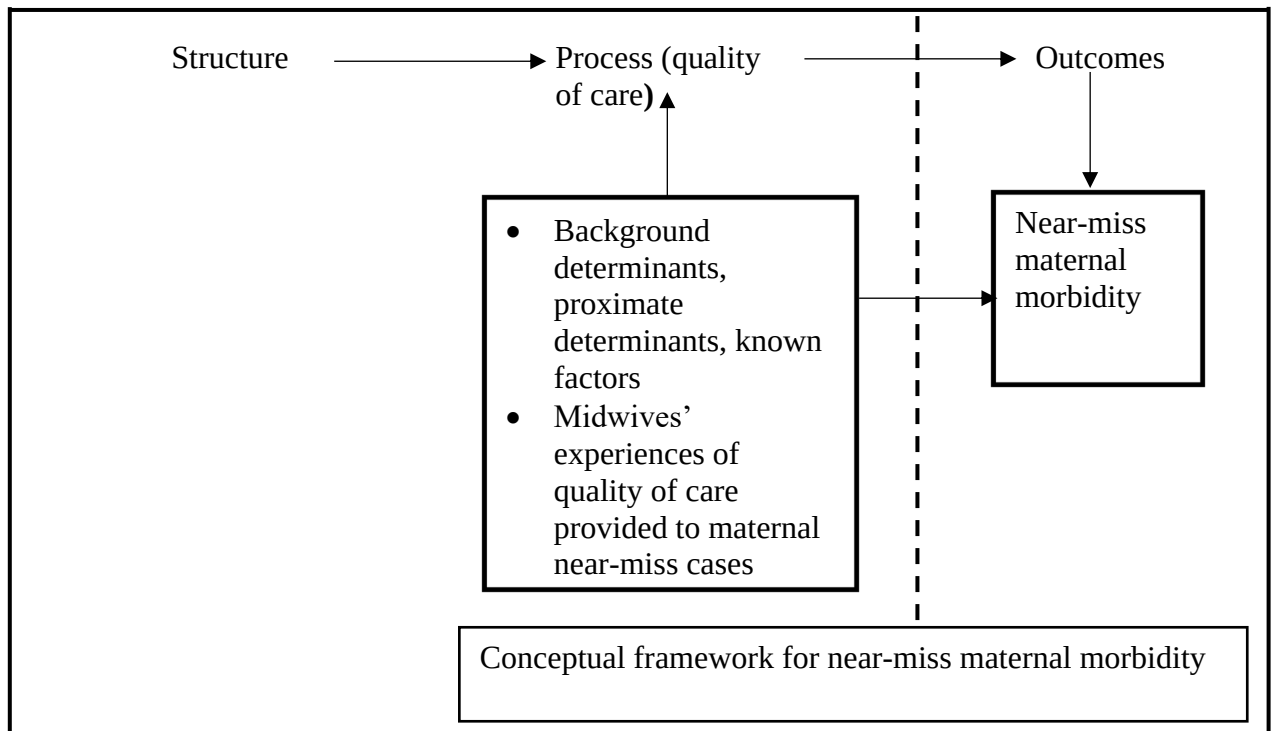


Figure 4: Application of the research frameworks to this study

Source: Author's own construction

The World Health Organization Quality of care framework for maternal and newborn health major concepts of structure, process and outcomes were applied to this study. The structure was the health facility, human resources and infrastructure where care was provided.

The adapted Module A of the World Health Organization Quality of care assessment tool was used to collect data in this study (Appendix 2B). The tool was used to assess the facility infrastructure and organization in terms of availability of actual space; resources and supplies for use by health providers; amenities like running water, electricity and backup power as well as records. Guidelines and policies were also checked.

In terms of process, Module B of the tool was used to observe the emergency obstetric care procedures provided by midwives, infection control practices and availability of staffing according to cadres in comparison with recommended numbers. In relation to the process, the conceptual framework for near-miss maternal morbidity was used to identify determinants of maternal near-miss at the three levels i.e., patient, socio-environmental and health system. This conceptual framework informed the development of a data collection tool that was used to extract data on background factors, proximate determinants as well as clinical factors from the files of women who participated in this study (Appendix 2A).

For outcome, the adapted WHO quality of care assessment tool checked for areas to do with monitoring of women with complications of labour including pre-eclampsia, postpartum haemorrhage including post caesarean section observations. This is in line with the WHO quality of care framework for maternal and newborn health which indicates health outcomes in relation to coverage of key practices and people-centred outcomes. According to Donabedian (1969), an outcome is the woman's current and future health status. Therefore, in this study, the outcome of interest was near-miss maternal morbidity as proposed by the conceptual framework for near-miss maternal morbidity. However, it was not possible to measure some possible outcomes such as women's satisfaction and behavioral change because data were collected from the women's records in this study. Nonetheless, the fact that

a woman survived and did not die (maternal near-miss morbidity) was considered as a health outcome.

2.8 Conclusion

This chapter presented a literature review on maternal near-miss in relation to the objectives of the study. Most of the literature found was from other low-income, middle-income and high-income countries as the researcher found one study that was conducted in Malawi with another unpublished, hence the reason for conducting this study. There is an information gap on determinants of care as well as the quality of care rendered to maternal near-miss cases. The conceptual framework on maternal morbidity and the WHO Quality of care framework for maternal and newborn health were used to contextualize maternal near-miss. The next chapter will present the methodology of the study.

CHAPTER 3

METHODOLOGY

3.1 Introduction

The previous chapter discussed the demographic, socioeconomic and obstetric characteristics of maternal near-miss cases, a conceptual framework for near-miss maternal morbidity and application of the research frameworks to the study. There was a scarcity of information and a gap on maternal near-miss studies in Malawi which prompted the author to conduct the current study. This study aimed to describe the determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth central hospitals in Malawi. In this chapter, methods and procedures used to conduct the study will be presented. The discussion will cover the following areas: study design, study setting, study period, study population, sample size and selection, sampling and sample size; data collection instruments, data management and ethical considerations.

3.2 Study design

According to Polit and Beck (2012, 58) “Research design is the overall plan for obtaining answers to the research questions.” The main aim of the research design is to maximize control over factors that could interfere with the study findings (Grove et al., 2014). In addition, three components considered when choosing a research approach are: philosophical worldviews, designs and research methods (Creswell, 2013). The philosophical worldview proposed in the study is pragmatism since it is not committed to any one system of

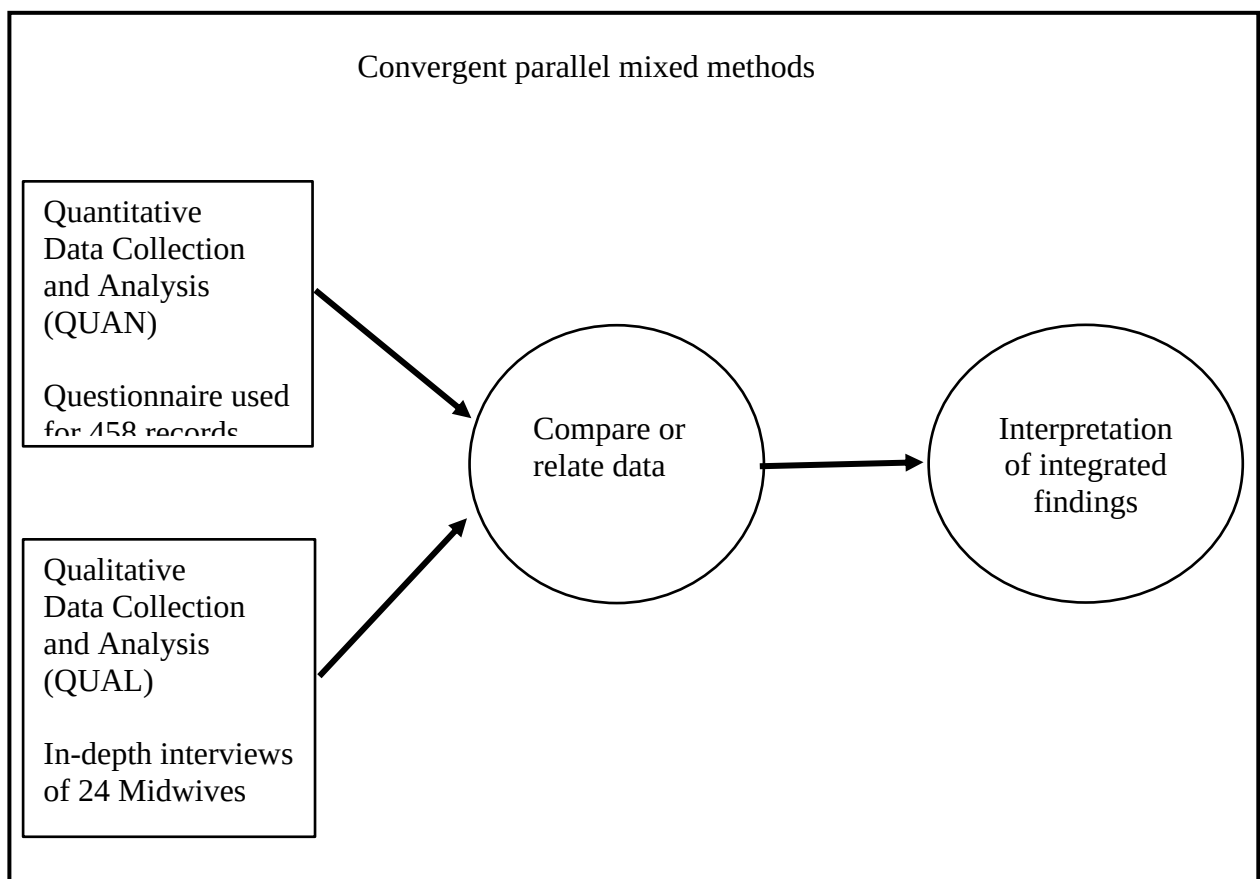
philosophy and reality. In pragmatism, truth is what works at the time. Furthermore, mixed methods draw from both quantitative and qualitative assumptions hence renders itself well to pragmatism as it opens the door to multiple methods, different worldviews, assumptions, different forms of data collection and analysis.

The pragmatic philosophic worldview was chosen to address the problem of maternal near-miss in that different approaches were important to understand the problem. There was a need to understand the maternal near-miss concept and the mixed methods was appropriate because both quantitative and qualitative data were obtained (Clark & Creswell, 2011). The researcher believed that the pragmatic philosophic worldview would yield vast information on maternal near-miss cases which were not extensively explored previously in Malawi. The quantitative strand provided the numbers on various issues that the study sought to investigate while the qualitative provided the meanings to the numbers. The overall thrust of this study was deductive because it was predominantly quantitative. The two strands were designed to answer different study objectives.

The study design was case-control that utilized a mixed methods approach for data collection and analysis to study the determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central hospitals in Malawi. Mixed methods refers to “research in which both qualitative and quantitative data are collected and analyzed to address different but related questions”(Polit & Beck, 2012, 734). A convergent design in which both quantitative and qualitative data were collected simultaneously was used. Both quantitative and qualitative data were collected, analyzed separately and then compared the results to see if the findings confirm or disconfirm each other (Creswell, 2013). Furthermore, mixed methods is appropriate to use when the concepts being studied are new and poorly

understood. In this case, the findings from one approach can be greatly enhanced with the second source of data (Creswell, 2013; Polit & Beck, 2012).

Convergent parallel mixed methods is a form of mixed methods in which the researcher merges quantitative and qualitative data in order to provide a comprehensive analysis of the problem. In convergent design, both forms of data are collected at the same time with information integrated in the interpretation of the overall results. The convergent design was chosen as appropriate for this research because there was a paucity of data on the concept of maternal near-miss in Malawi. Hence, data collected quantitatively and qualitatively would complement each other. Figure 5 illustrates the convergent parallel mixed methods design that was employed.



Source: Adopted from Creswell (2013)

Figure 5: Illustration of the convergent parallel mixed methods design employed in the study

Advantages of the mixed methods approach include complementarity, practicality, incrementality, enhanced validity and collaboration (Polit & Beck, 2012). Complementarity arises in the use of both quantitative and qualitative strands. It is practical to use methodological tools given the complexity of phenomena like maternal near-miss. Tools best suited to explain the phenomena would be used as opposed to being tied to one approach. Incrementality exists where a study can be designed to simultaneously address exploratory and confirmatory quests. Researchers can be more confident about the validity of their results with mixed methods. In addition, mixed methods provide opportunities and encouragement for collaboration between qualitative and quantitative researchers working on similar problems. Combining elements of qualitative and quantitative research strands provides breadth and depth of understanding as well as corroboration (Curry & Smith, 2015). Quantitative and qualitative data were integrated through merging the two data sets with an aim to balance the respective strengths and weaknesses as well as maximizing the yield of the complementary sources of evidence.

Decisions that are important to make about mixed methods involve sequencing, prioritization and integration. Sequential refers to a situation when the collection of qualitative and quantitative data are not collected at the same time. The analysis and interpretation in one phase of the study inform the collection and analysis of data in the second phase. Concurrent, simultaneous and parallel is when data are collected at the same time (Creswell, 2014; Polit & Beck, 2012). Prioritization is when the researcher decides which strand to emphasize between quantitative and qualitative. The two components may be given equal weights (status), or one approach may be given priority referred to as dominant. Integration refers to the merging of the two data sets to provide enhanced insights. Data can

be merged either during analysis or during interpretation. In this study, data were merged during interpretation and presented in the discussion. The combination of quantitative and qualitative strands maximized data interpretation in this study (Creswell, 2014) and this boosted the understanding of the maternal near-miss concept. Mixing data combined the strengths and weaknesses of each method thus facilitating rigor in the study.

Quantitative data were collected through a review of pregnant women's records at the two hospitals using the adapted maternal near-miss tool (Appendix 2A). Qualitative data were collected through in-depth interviews with a sample of Registered Nurse Midwives and Nurse Midwife Technicians using an open-ended interview guide (Appendix 2C). The adapted World Health Organization (WHO) quality of care assessment tool was also used to assess the quality of antenatal, labour and postnatal care provided to pregnant women.

In the quantitative strand, the researcher conducted a case-control study from records of women who were admitted to antenatal, labour, postnatal wards and high dependency units. A case-control design was chosen to enable the comparison of maternal near-miss cases and non-cases. Cases refer to participants that have the outcome or condition under scrutiny while participants that do not have the condition under scrutiny are the controls (Polit & Beck, 2012). Maternal near-miss cases were the women who had the condition under scrutiny while the non-cases (controls) were women who did not have the condition. Maternal near-misses included any woman who had a severe haemorrhage, severe pre-eclampsia (BP $\geq$ 140/90mmHg and proteinuria), sepsis defined as a temperature $\leq$ 36 °C or $\geq$ 38 °C, dystocia which includes uterine rupture or impending rupture and severe anaemia $\leq$ 6g/dl or clinical signs of severe anaemia was categorized as maternal near-miss based on obstetric protocols (Government of Malawi, 2014a).

All women who gave normal birth and did not have a severe haemorrhage, severe pre-eclampsia, sepsis, dystocia and severe anaemia were under the non-cases group (controls). The World Health Organization Technical Working Group (1997) defined normal birth as ‘spontaneous in onset, low-risk at the start of labour and remaining so throughout labour and birth. The infant is born spontaneously in the vertex position between 37 and 42 completed weeks of pregnancy’.

The study was done to: establish the demographic, socioeconomic and obstetric characteristics of maternal near-miss cases; establish determinants of care associated with maternal near-miss cases and assess the quality of antenatal, labour and postnatal care provided to maternal near-miss cases. The objective for the qualitative strand of the study was to describe the midwives experiences of quality of care provided to maternal near-miss cases. Each of the two approaches provided distinctive evidence (Ritchie et al., 2013). Furthermore, quantitative and qualitative strands have different strengths and weaknesses therefore the combination of the two strands complemented each other. In this study, the quantitative strand provided the numbers while the qualitative told the stories about maternal near-miss.

3.3 Study setting

Setting refers to “the physical location and conditions in which data collection takes place in a research study” (Polit & Beck, 2012). Study settings depend on the nature of the research question and the type of information required. Study settings are naturalistic such as in homes, others in laboratory settings, field like the entire community and multisite where several sites are used. The study was conducted at Kamuzu and Queen Elizabeth Central Hospitals. Both hospitals are tertiary level and offer specialized services, have separate wings

for maternity services and serve as teaching hospitals for different cadres of medical professionals. Kamuzu Central Hospital (KCH) is a public tertiary facility in the central region of the country which serves as a referral hospital for the 9 districts of the central region of Malawi. The hospital serves a population of 7,936,927 from the following districts: Dedza, Dowa, Kasungu, Lilongwe, Mchinji, Nkhosvota, Ntcheu, Ntchisi and Salima. The hospital has a maternity wing that offers antenatal, labour and birth and postnatal care. Other services include neonatal care and operating theatre. The hospital also provides other specialties like pediatrics, surgery, medical, ophthalmology, gynecology, dental and physiotherapy services. In addition, Kamuzu Central Hospital manages approximately 10,000 deliveries per year, as well as multiple obstetric complications such as obstructed labour, postpartum haemorrhage, pre-eclampsia/eclampsia, anaemia and sepsis (Government of Malawi, 2015c).

Queen Elizabeth Central Hospital (QECH) is the oldest and largest public tertiary facility in Malawi located in the southern region. It equally offers specialized services and is a teaching and referral hospital for the 13 districts of the southern region. The hospital serves a population of 6,140,289 from Balaka, Blantyre, Chikwawa, Chiradzulu, Machinga, Mangochi, Mulanje, Mwanza, Neno, Nsanje, Phalombe, Thyolo and Zomba districts. There is a maternity wing that offers obstetric services and has its own operating theatre. In addition, the facility manages over 10,000 deliveries per year as well as multiple obstetric complications (Government of Malawi, 2015c). The districts that refer women to both KCH and QECH are shown in Figure 1 on page 5.

The hospitals were chosen based on the services they offer and that they are referral hospitals for twenty-two out of the twenty-eight district hospitals of the country. These hospitals handle diverse obstetric complications of which some end up as maternal near-miss

cases and others as maternal deaths. The facilities were purposely selected to get sufficient near-miss cases to be included in the study. This was to allow for rich data to be included in the study as complicated cases from the mentioned districts are referred to these facilities. A preliminary audit by the researcher showed that the two hospitals had an average of 760 obstetric complications that were maternal near-miss cases over four months in 2014 (HMIS, 2015). The complications included antepartum haemorrhage, post-partum haemorrhage pre-eclampsia/eclampsia, obstructed labour and sepsis. There were 47 and 97 maternal deaths at Queen Elizabeth and Kamuzu Central hospitals respectively in 2015 (Government of Malawi, 2015c).

3.4 Study period

The study was conducted over twenty-three months, but data collection took six months (February 2017 to July 2017).

3.5 Study population, sample size and selection

3.5.1 Population

According to Polit & Beck (2012), study population refers to the whole aggregation of cases in which the research is interested. In addition, a population is not restricted to human subjects only and it may include records in a hospital. The study population comprised all pregnant women who gave birth during the data collection period which was between February and July 2017 and were admitted to antenatal, labour, postnatal ward and high dependency unit (HDU) of Ethel Mutharika Maternity Wing (EMMW) at Kamuzu Central Hospital (KCH) and Chatinkha Maternity Wing (CMW) at Queen Elizabeth Central Hospital (QECH). The qualitative study targeted Registered Midwives (RM) and Nurse Midwife

Technicians (NMTs) working in antenatal, labour, postnatal wards and high dependency units of EMMW at Kamuzu Central Hospital and CMW of Queen Elizabeth Central Hospital. The wards were selected because these are the wards where maternal near-miss cases were cared for including the HDU where women who were maternal near-miss cases and in critical condition were cared for.

3.5.2 Inclusion criteria

Inclusion/eligibility criteria are defined as the population who had characteristics stipulated for inclusion in the research (Polit & Beck, 2012). Case files/records of all women who gave birth from February 2017 to July 2017 when data collection was conducted were included. These included case files of women with severe haemorrhage, severe pre-eclampsia, sepsis, shoulder and uterine dystocia and clinical signs of severe anaemia. Additional criteria of admission to a high dependency unit were considered since this is the ward where women with obstetric complications were managed. Any woman who had a severe haemorrhage, severe pre-eclampsia ($BP \geq 140/90$ mmHg and proteinuria), sepsis defined as a temperature $\leq 36^{\circ}\text{C}$ or $\geq 38^{\circ}\text{C}$, dystocia which includes uterine rupture or impending rupture and severe anaemia $\leq 6\text{g/dl}$ or clinical signs of severe anaemia was categorized as maternal near-miss based on obstetric protocols (Government of Malawi, 2014a). Table 2 describes criteria for the definition of maternal near-miss in the current study.

Table 2: Definition of maternal near-miss

Complication	Description
Severe haemorrhage	Vaginal bleeding of 500 milliliters or more and/or causing worsening of pulse rate and blood pressure within the first 24 hours after childbirth; or increased vaginal bleeding after the first 24 hours to 6 weeks after childbirth (Government of Malawi, 2017; Marshall & Raynor, 2014)
Sepsis	Infection of the genital tract following childbirth up to 6 weeks or any time after abortion up to 6 weeks. The clinical manifestations include fever 38 °C or more, foul-smelling discharge, tender uterus and sub-involuted increased pulse rate and respiratory rate (Government of Malawi, 2017).
Severe pre-eclampsia	Diastolic blood pressure of 110 millimeters mercury (mmHg) and a systolic greater than 160 mmHg at a gestation of 20 weeks or more proteinuria of 3 pluses (+++). Eclampsia was also included which was typical convulsions in a pregnant woman or woman who had given birth, with a diastolic blood pressure of 90 mmHg or more and proteinuria of 2 pluses (++) or more (Government of Malawi, 2017)
Dystocia	Results from ineffective uterine contractions, malposition of the fetus, malpresentation or any combination of these. Shoulder dystocia is the failure of the shoulders to traverse the pelvis spontaneously requiring additional maneuvers after the birth of the head. Uterine rupture or impending rupture was included in dystocia (Marshall & Raynor, 2014).
Severe anaemia	Haemoglobin concentration of less than 11 grams per deciliter (James et al., 2017). For purposes of this study, severe anaemia was a woman whose haemoglobin concentration was 6 grams per deciliter or less (Government of Malawi, 2017).

For the qualitative part of the study, all consenting midwives (NMTs and RMs) who had worked in antenatal, labour and postnatal wards of the hospitals for a minimum of six months period or more were included. Working for six months or more in these wards was considered as adequate time for a midwife to have experience in caring for maternal near-miss cases. In addition, midwives worked in the wards on a 24 hour and daily basis and were the cadre that was most highly represented while the other cadres were available for a shorter period.

3.5.3 Exclusion criteria

Exclusion criteria refer to the population that does not possess the required criteria to be part of the study (Polit & Beck, 2012). Case files of women who did not give birth within the months of February 2017 to July 2017 and women who did not have a severe haemorrhage, severe pre-eclampsia, sepsis, dystocia and severe anaemia were not included in the study. For the qualitative part of the study, exclusion criteria were those midwives who had worked less than six months periods in the antenatal, labour and postnatal wards, midwives on locum as well as clinical officers and doctors. Locum is a situation where a midwife, doctor or cleric does the job of another person who is ill or on holiday (Concise Oxford English Dictionary, 2011). Locum midwives were excluded as they were from other wards and did not meet the inclusion criteria.

3.5.4 Selection

Case files of all women who gave birth from February 2017 to July 2017 were randomly selected by the researcher and 2 trained research assistants (one at each hospital)

from the maternity register in the labour ward. Also, visits to the postnatal ward and high dependency unit were made on daily basis to identify cases of women who met the inclusion criteria.

Quality of care was assessed by a Quality Improvement Assessor from the same hospital but different ward through observation of midwives managing mothers or conducting procedures in maternity using an adapted World Health Organization Quality of care assessment tool (Appendix 2B). The maternity ward was assessed for cleanliness, equipment and supplies, as well as infection prevention practices. Case files were reviewed on how midwives managed caesarean section cases, sepsis and post-partum haemorrhage cases. A summary of how the facility had performed under each case was made.

3.6 Sampling and sample size

Sampling is “the process of selecting cases to represent an entire population so that inferences about the population can be made” while a sample is “a subset of population elements which are the most basic units about which data are collected” (Polit & Beck, 2012). Polit and Beck (2012) indicated that considerations of a sample are its representativeness and size. A representative sample’s key characteristics closely approximate those of the population. “Probability sampling involves random selection of elements while random sampling involves a selection process in which each element in the population has an equal, independent chance of being selected” (Polit & Beck, 2012: 280).

According to Clark & Creswell (2011) subpopulations of populations are referred to as strata with a segment of the population referred to as a stratum. This study used a stratified random sampling of case files of all deliveries from February to July 2017 to enhance

representativeness (Polit & Beck, 2012). The case files of all deliveries in the high-risk ward were grouped according to the six months from February to July 2017. These case files were put in two groups of maternal near-miss and non-cases to constitute two sampling frames from which the sample was drawn. Systematic sampling was used to select every 60th case file for maternal near-miss while every 20th case file for non-cases was chosen for inclusion in this study. There was one case of maternal near-miss to two non-cases. All women who had a normal birth and did not have a severe haemorrhage, severe pre-eclampsia, sepsis, dystocia and severe anaemia were under the non-cases group. The selection of case files continued until the desired sample of 458 was achieved. The desired sample was calculated by using a formula proposed by Lemeshow et al. (1990);

$$n = \frac{Z^2 P(1-P)}{e^2} \quad \text{where;}$$

n is the sample size; Z is a value of a standard normally distributed variate which for a 95% confidence interval takes the value of 1.96; P is the prevalence rate of near-miss, which is 0.18 in this study (18%); and e is the allowable error or the desired level of precision, which in this study was set at 0.05 or (5%).

Therefore, for each facility, $n = (1.96^2 \times 0.18 \times 0.82) / 0.05^2 = 227$. Hence, the sample size was 229 for EMMW and 229 for CMW, adding to 458 for both facilities. With a 1:2 ratio, 161 were maternal near-miss and 297 were non-cases.

3.7 Data collection instrument

3.7.1 Quantitative instrument

An instrument is described as a device used to collect data such as a questionnaire, test or observation schedule (Polit & Beck, 2012). The maternal near-miss tool was adapted

and used to collect the quantitative data (Appendix 2A). The tool developed by the London School of Hygiene and Tropical Medicine (LSHTM) to measure the quality of maternal and perinatal care in referral facilities and was used in a study in Benin was adapted (Fem Health, n.d.). The tool collects information on health outcomes (maternal near-miss, neonatal near-miss, unmet need for obstetric complication, maternal deaths, stillbirths) and the process of care (health care near-miss indicators) (Fem Health, n.d.). In addition, information on demographic and reproductive risk factors is collected. For the present study, the following sections were isolated to suit the context: identification; demographic characteristics; reproductive health history, serious complications; newborn; caesareans and laparotomies; quality of care indicators; and maternal near-miss. The tool comprised a total of ninety-eight (98) items.

Information under-identification included health facility name, woman's identity number and time of arrival at the facility. Demographic information included age, marital status, woman's occupation and partner's occupation. Reproductive health history in terms of the number of pregnancies, previous history, antenatal care attendance history and present pregnancy history were sought. There was a section on serious complications identified in the present pregnancy. A section on newborns sought to identify the total number of babies born during the present delivery, sex of baby, weight, status at birth and specify any complications noted. The section on caesarean and laparotomies sought to identify the date and time a decision of intervention was made, time intervention was done, indication for caesarean or laparotomy and any malpresentation noted. Quality of care indicators for caesarean and laparotomies of uterine rupture as well as state of maternal near-miss were included in the questionnaire.

The variables were grouped into background determinants (age, marital status, occupation); modifiable social factors (birth preparedness, transportation); reproductive health characteristics (parity, delays, referral status); obstetric history (previous caesarean section, previous eclampsia, previous antepartum/postpartum haemorrhage, previous fetal death, antenatal admission). The grouping of variables in the maternal near-miss tool was in line with the conceptual framework for near-miss maternal morbidity used for the study. The adapted maternal near-miss tool was pre-tested on three participants at Zomba Central Hospital (a different hospital from the study sites but with similar characteristics) to evaluate and refine the tool (Polit & Beck, 2012). There were no major changes that were made to the tool after the pretest.

The adapted WHO Quality of Care Assessment tool (Appendix 2B) was also used to assess the quality of antenatal, labour and postnatal care provided to maternal near-miss cases. The WHO Quality of Care Assessment tool was introduced to countries as a means to assess the quality of care. Malawi as one of the countries included in the Quality of Care Network, adapted the WHO Quality of Care Assessment tool to use for assessing the quality of care (World Health Organization, 2018). The network is a country-led initiative jointly led by the World Health Organization (WHO), United Nations Children's Education Fund (UNICEF) and United Nations Population Fund (UNFPA). The quality equity dignity (QED) network was launched in Lilongwe Malawi in February 2017 with a vision "every pregnant woman and newborn infant receives good quality care throughout pregnancy, childbirth and the postnatal period".

The vision is underpinned by the core values of quality, equity and dignity. The quality of care network consists of 11 countries across two World Health Organization

regions. The countries have demonstrated leadership in improving the quality of care in health services. The countries include Bangladesh, Côte d' Ivoire, Ethiopia, Ghana, India, Malawi, Nigeria, Sierra Leone, Tanzania, Uganda and Kenya. The quality equity dignity network goal is to reduce maternal and newborn deaths and stillbirths in participating health facilities by 50% over five years (2017-2022).

Selected sections of the tool pertaining to the areas that were assessed were used. The adapted WHO Quality of care assessment tool was not pretested as the tool was already used to assess five health facilities in the country in 2016. The tool checks for the availability of services, equipment, drugs and supplies. The tool has four modules but for the assessment only two modules, A and B were used as they were of interest to the construct of maternal near-miss. The modules not used were the ones on the neonate and the child (modules C & D). Once the assessment is done, feedback is given to the hospital management team for their action.

Module A was on general hospital information in terms of the layout of the facility, infrastructure of the wards, staffing and training as well as hospital statistics. Main strengths and weaknesses in the areas assessed were noted. Under infrastructure availability of amenities like electricity, backup power supply, running water, oxygen availability and waste disposal were assessed. Essential drugs availability, health information records, laboratory investigations carried out and availability of policies and guidelines were also assessed. Specifically, on guidelines, the facilities were assessed as to whether they performed maternal death audits, implemented maternal death surveillance and response which was inclusive in terms of membership and followed up on recommendations made.

Module B on maternal care assessed the quality of maternal care relating to emergency obstetric care, staffing, hygiene and accident prevention, use of gloves, infection control practices, supportive care, essential drugs, equipment and supplies, and case management. In terms of staffing, the assessment considered the availability of staff according to cadres in comparison with the required numbers. Case management included assessment of care for severe pre-eclampsia and eclampsia patients, antibiotic use to women with preterm labour and prophylaxis to women with prolonged rupture of membranes and in caesarean section cases based on accepted standards.

A Quality Improvement Assessor (QIA), who was either a Registered Nurse Midwife/ Clinical Officer or a Doctor specially trained for assessing the quality of care conducted the quality of care assessment. There was one Quality Improvement Assessor for each hospital. The Quality Improvement Assessor is a person who has undergone a Trainer of Trainers course in the assessment of quality at a health facility. The assessors used for this study were selected from the pool of assessors that were used when Malawi was adapting the WHO Quality of Care Assessment. The Quality Improvement Assessor observed any midwife on duty managing a woman after getting consent. For example, the midwife would be assessed on how she managed a woman with severe pre-eclampsia and eclampsia according to standards and criteria. In such a scenario, the QIA would refer to the standards and observe whether the midwife is giving care according to the standards. Scores would be given according to observed performance, indicating strengths and omissions.

Across both modules, each aspect of care was scored on a Likert scale of 1-5 where: 5 represented good practice complying with standards of care; 4 indicated little need for improvement to reach a standard of care; 3 meant there was some need for improvement to

reach standards of care; 2 indicated a considerable need for improvement to reach standards of care; and 1 was awarded where services were not provided, there was inadequate care or potentially life-threatening practices. Each section ended with a summary table, in which the findings were condensed, space provided to include comments on the main strengths and weaknesses, to facilitate a quick overview of each area.

A summary of the data collection approach based on the four study objectives is presented in Table 3.

Table 3: Summary of data collection instruments for the study

Objective	Instrument	Section
Establish the demographic, socioeconomic and obstetric characteristics of maternal near-miss cases	Adapted maternal near-miss tool (questionnaire)	Sections A1, A2, A3 and A4 on identification, demographic characteristics, reproductive health history, and serious complications
Establish determinants of care factors associated with maternal near-miss cases	Adapted maternal near-miss tool (questionnaire)	Sections A7 and A8
Assess the quality of antenatal, labour and postnatal care provided to maternal near-miss cases.	Adapted WHO quality of care assessment tool	Module A and B
Describe the midwives' experiences of quality of care provided to maternal near-miss cases	Interview guide	2 open-ended questions and a probe

3.7.1.1 Validity

Validity is “the degree to which an instrument measures what it is intended to measure”(Polit & Beck, 2012; Schmidt & Brown, 2012). To ensure that the data collection instruments were valid and measured what they were supposed to measure, the content validity of the adapted maternal near-miss tool was assessed by three midwifery experts and a statistician. Content validity is assessed on the extent to which the instrument contains items it should have. The midwifery experts each checked the relevance of individual items in the tool regarding the construct being measured i.e., maternal near-miss. A score of 1 to 4 was given for each item on a scale of relevance to determine the Content Validity Index (CVI). A score of 1 meant not relevant, 2= somewhat relevant, 3= quite relevant, 4= highly relevant (Polit & Beck, 2012). The experts rated each item in the questionnaire in terms of relevancy.

An average of the score for each question for the experts was calculated to find the CVI. The final CVI was 0.80, which was an acceptable value. Face validity is based on how the items in the instrument appear (Polit & Beck, 2012). In this study, face validity was addressed through the same midwifery experts by having them check and confirm that the tool appeared to measure the construct of maternal near-miss.

3.7.1.2 Reliability

Reliability is the consistency of the instrument in measuring the attributes (Polit & Beck, 2012). In this study, reliability was ensured through accurate and careful phrasing of the questions to avoid ambiguity and leading respondents to a particular answer. Furthermore, reliability was tested for stability by test-retest of the instrument. This was through conducting a pre-test of 3 patient files at Zomba Central Hospital (a hospital different from the study sites). The pre-testing was repeated 2 weeks later (test-retest) for consistency and accuracy to ensure stability. The Maternal near-miss tool had a good internal consistency with Cronbach's alpha of ≥ 0.7 and 15% interrater reliability of the coded files.

3.7.1.3 Data collection procedure

Permission was sought from the Hospital directors to access the case files for women who delivered at the two facilities. Data collection was conducted by two research assistants (RA) who are qualified medical personnel. There was one research assistant at each facility. The RAs received one-day training on the data collection instruments and data collection procedure to ensure that the collected data would be reliable. This was classroom training on the research topic, objectives and the 94 items of the research instrument (Appendix 2A). The

researcher was available to the research assistants for consultation during the data collection period. Using the maternity register in the labour ward, the research assistant grouped the case files of all women who gave birth from February to July 2017 in each of the two facilities in piles according to months. The piles of case files served as a sampling frame for maternal near-miss from which the research assistant picked every 60th case file after randomly choosing the first one.

Similarly, the selection of case files of non-cases was done in the postnatal ward. The selection considered case files of women who did not have a severe haemorrhage, severe pre-eclampsia, sepsis, dystocia and severe anaemia during the same period as maternal near-miss cases. The research assistant picked every 20th case file after randomly choosing the first one.

The research assistant also visited the high dependency unit to identify case files of women who met the inclusion criteria. The selection of case files continued until the desired sample of (458) was achieved. Using the maternal near-miss tool, the research assistants abstracted data from the case files. Maternal near-misses were those women who had a severe haemorrhage, severe pre-eclampsia ($BP \geq 140/90$ mmHg and proteinuria), sepsis defined as a temperature $\leq 36^{\circ}\text{C}$ or $\geq 38^{\circ}\text{C}$, dystocia which includes shoulder dystocia and uterine rupture or impending rupture and severe anaemia ≤ 6 g/dl or clinical signs of severe anaemia.

The Quality Improvement Assessors also used the adapted World Health Organization Quality of care assessment tool as a checklist to assess the quality of care provided by midwives in maternity through observations. According to (Guba & Lincoln, 1985) observations enable the researcher to gain a partially independent view of the phenomenon under research. It maximizes the inquirer's ability to grasp motives, beliefs, concerns, interests, unconscious behaviours and customs. Furthermore, observations allow the inquirer

to see the world as his subjects see it, to live in their time frames, to capture the phenomenon on its own terms, and to grasp the culture in its own nature.

Direct observation of a midwife managing a woman was done by the Quality Improvement Assessor after getting verbal consent. In addition, case files were reviewed on how midwives managed caesarean section cases, sepsis and post-partum haemorrhage cases. A summary of how the facility had performed in managing each case was made. The maternity ward was assessed for cleanliness, availability of equipment and supplies, as well as infection prevention practices like sharps disposal facilities. The toilets were assessed for cleanliness, presence of running water, hand washing facilities for patients and health workers.

3.7.1.4 Data analysis

Data analysis refers to the systematic organization and synthesis of research data (Polit & Beck, 2012). Data were reviewed for completeness and legibility before analysis. Data were analyzed using Stata 14 (StataCorp, 2015). The data were explored and cleaned to correct mistakes (e.g., outliers and wild codes) and missing data using frequencies. Descriptive statistics such as means, frequencies and percentages were computed to determine the magnitude and trend of maternal near-miss cases. Chi-Square test was used to investigate significant associations among the variables measured such as background determinants, modifiable social factors, reproductive health characteristics and obstetric history with maternal near-miss. The Chi-Square test was used because the study sought to test whether maternal near-miss was independent of the various categorical variables used (e.g., marital status, occupation of woman, admission mode and means of transport).

Statistical analysis was performed using STATA version 14 (StataCorp, 2015). A binary logistic regression model was used to generate Odds Ratios for determinants of maternal near-miss cases. We used stepwise regression analysis to investigate the effect of each variable in the regression model to come up with the best subset of the most significant explanatory variables for predicting maternal near-miss in the data set. All variables that were significantly associated with maternal near-miss were taken into a logistic regression model to calculate the Odds Ratio. The model adjusted for a woman's occupation, marital status, age, antenatal care attendance, mode of birth, gender of baby and status of a baby at birth. This analysis was carried out to characterize the maternal near-miss cases and risk factors. The differences in the proportion of the characteristics of maternal near-miss cases and non-cases were compared using a t-test at the 5% level of significance. Firstly, a correlation analysis of all the variables was done using a correlation matrix and the variables that were significantly associated with maternal near-miss were used to build the bivariate regression model.

For the bivariate logistic regression, the dependent variable was near-miss and the independent factors were derived from the conceptual framework for near-miss maternal morbidity. The dependent variable is the outcome variable of interest. The independent variable is defined as "the variable that is believed to cause or influence the dependent variable" (Polit & Beck, 2012). The number of predictors of maternal near-miss was determined and fitted into the final model using step-wise regression analysis in the Stata software. The Pearson Product Moment correlation coefficient was calculated for each of the significant variables to determine the direction and strength of the linear association between the variables and maternal near-miss cases.

3.7.2 Qualitative strand

The qualitative part of the study aimed at describing midwives' experiences about the quality of care provided to maternal near-miss cases. Data collection was done concurrently with the cross-sectional study that has already been described.

3.7.2.1 Data collection instrument for Qualitative part of the study

An in-depth interview guide (Appendix 2C) was developed by the researcher based on the objectives of the study to get information from the midwives in the study setting. An interview is a data collection method in which an interviewer asks questions of a respondent, either face to face or by telephone (Polit & Beck, 2012:731). In addition, a qualitative research interview is a powerful data collection tool that affords researchers opportunities to explore unknown areas of education and practice within a subject (McGrath et al., 2019). This technique allowed for the collection of all information as participants had the freedom to give illustrations and explanations as they wished (Creswell, 2013; Polit & Beck, 2012). Probes were used where there was a need to find out more information on a particular issue from the participant. Content validity of the interview guide was assessed by midwifery experts in the faculties of nursing and midwifery at Kamuzu College of Nursing. Midwifery experts reviewed questions in the interview guide to verify the accuracy and comprehensiveness of the content. They reviewed the questions put in the interview guide as to the extent they were requesting information regards the views of midwives on the quality of care given to maternal near-miss cases.

3.7.2.2 Data collection process

Permission was sought from the Hospital directors and individual consent was obtained from interviewees. The researcher requested a quiet place from the labour ward in charge and the postnatal ward to avoid disturbances. An office at the administration block was reserved for the interviews as it was quiet and there were no interruptions. It may be easier to conduct interviews in a place where participants do not feel restricted or uncomfortable sharing information (Turner III, 2010). Interviewees were selected from the duty roster in consultation with the ward in-charges based on the duration of placement in the ward (6 months and above). An appointment was made with individual interviewees and six interviews were conducted in a day but spaced to allow for adequate time for interviews. The interviewee was given an informed consent form which had two parts. Part A was participant information that explained the study goal, type of data, confidentiality pledge, voluntary consent, right to withdraw and contact information of the researcher and supervisor in case of questions. Part B was the same information as A and was meant for the interviewee to sign upon consenting to be interviewed (Appendix 1). The researcher also signed the consent form, and the interviewee retained a copy of the signed consent form.

Confidentiality pledge included information that participant's privacy would be protected and maintained at all times. Informed consent is important as it ensures that participants have adequate information about the research, comprehend that information and have the freedom to consent to or decline to be interviewed (Polit & Beck, 2012). Interviews were conducted from around 9:00 am to enable the researcher access to midwives that were ending the night shift. Individual interviews were conducted by the researcher to collect in-depth and diverse information from participants on the phenomenon under study (Grove et

al., 2014). This method was chosen considering that health workers provide some of the patient care individually much as they consult each other for other areas. The researcher talked less and did more active listening as a catalyst for driving the conversation (McGrath et al., 2019). An interview guide was prepared to guide the interviews.

An interview guide allowed the researcher to ask participants identical questions and giving them room to give as much information as they desired (Turner III, 2010). A voice recorder was used to record the interviews. The recorder was checked in advance before use to ensure that it was functional. Probes were used where there was a need to find out more information on a particular issue from the participant. Creswell (2013) encourages researchers to be prepared with follow up questions or prompts to ensure that they obtain optimal responses from participants. The transition was given between the first and second questions in the interview guide to allow the participant to know that the topic was changing to another (Turner III, 2010). The researcher took extra notes while interviewing to capture all information. Particular attention was taken not to distract the participant when note-taking.

3.7.2.3 Qualitative data analysis

Data collection and analysis occurred simultaneously just like other studies that used similar methodology (Polit & Beck, 2012). The raw data were transcribed word for word. Content analysis followed using the four stages of decontextualization, recontextualization, categorization and compilation (Bengtsson, 2016). Decontextualization involved reading the transcribed texts to get a sense of the meaning of the data. Condensation of data followed with a grouping of similar words together to form meaning units. In addition, Seers (2012) indicates that the researcher reads the transcripts, sorts and organizes data into codes,

categories and themes. In recontextualization, the researcher re-read the original transcripts to check if there were some words left that could be added to the meaning units. The word files were then uploaded into the NVIVO program for management of the data.

Then a query was run which asked for word frequency. Using appropriate commands in NVIVO, the “finding matches” were adjusted from “exact to similar”, and the analysis program was run on the data. The words were clouded together using the “word cloud” command. Words such as near-miss and or causes and effects of near-miss were searched using a text search command. Then a search was made to find matches from exact to similar.

A word tree was created followed by nodes. The final step was the selection of codes from existing nodes, which were further analyzed into categories. The categories were further analyzed into themes. The research produced two themes from the categories based on content areas as outlined by the objectives and conceptual framework, namely perceptions on quality of care and factors promoting quality of care for maternal near-miss. Conditional, good and sub-optimal (below standard) care emerged as the sub-themes for perceptions on quality of care. Furthermore, sub-themes for factors promoting quality of care for maternal near-miss were resource availability, teamwork/collaboration and on the job preparation as positive factors. Shortage of resources delayed care, negative attitude and lack of knowledge were the negative factors. Themes and sub-themes showed the experiences of the midwives on determinants (causes and drivers) of maternal near-miss.

3.8 Trustworthiness

Trustworthiness is a concept often used to portray quality in qualitative research and it encompasses both rigour in the research process and relevance of the research (Baillie, 2015).

Lincoln and Guba introduced trustworthiness as a way of presenting the validity and reliability of qualitative research studies through four criteria of credibility, transferability, dependability and confirmability (Guba & Lincoln, 1985; Shenton, 2004). Credibility was used in preference to internal validity; transferability in preference to external validity/generalizability; dependability in preference to reliability and confirmability in preference to objectivity. Other books include a fifth criteria of authenticity (Bryman, 2012).

3.8.1 Credibility

This was attained through carrying out the qualitative research according to practice. Triangulation of data, audit trails and member checks were the strategies used to enhance credibility in this study. Triangulation might involve trying to reveal the complexity of a phenomenon (in this case maternal near-miss) by using multiple means of data collection (Polit & Beck, 2012). The use of multiple methods of data collection: interview of midwives and observation of midwives conducting procedures improved credibility. The skills used in presenting the study influences the reader on what to expect and the qualifications of the author as they read on (Ryan et al., 2007). Transcription of data from interviews was done word for word without filling in words or editing the views of the participants. A field journal was kept for reflexivity where the researcher's feelings and biases were documented. A member check was done by returning to some participants to check whether they recognized the findings as a true reflection of their experiences (Taylor, 2014).

3.8.2 Transferability

Transferability refers to the extent to which qualitative findings can be transferred to other settings (Guba & Lincoln, 1985). This was done by ensuring a thick description of data

(Bryman, 2012) from which the reader could make judgements as to whether the results can be applied to another setting. The thick description refers to rich accounts of details of an experience, which provides a database for others to make judgements about the possible transferability of the findings to another setting. Verbatim quotes from midwives that were interviewed were included to serve the purpose of transferability.

3.8.3 Dependability

According to Polit and Beck (2012) dependability refers to the stability of data over time and conditions and credibility cannot be achieved without dependability. The interviews were conducted by the researcher to ensure the stability of the data. A dense description of research methods, code re-codes procedure and stepwise replication were done. In other words, complete records of the research process were kept including the selection of research participants, field notes, and interview transcripts and data analysis. An audit trail was kept, and it was given to an experienced qualitative data analyst to follow the trail used to analyse data. Peer audit was also done to ensure dependability (Holloway & Wheeler, 2013).

3.8.4 Confirmability

Confirmability is “the degree to which study results are derived from characteristics of participants and the study context, not from researcher’s bias” (Polit & Beck, 2012). In this study, confirmability was attained through keeping an audit trail, i.e., a recording of activities over time that can be followed by another individual. The audit trail helps to keep evidence of the thought processes that led to the conclusions made by the researcher (Taylor, 2014). The researcher recorded activities in a separate book daily to keep track of events.

3.8.5 Authenticity

Polit and Beck (2012) defined authenticity as “the extent to which researchers fairly and faithfully show a range of realities of the participants’ lived lives. In this study, authenticity was achieved by including quotes from participants’ expressions of their experience of a situation. In this case, the researcher quoted how a participant managed to serve a maternal near-miss from death. In addition, field notes and audit trail were kept for reference (Polit & Beck, 2012).

3.9 Data management

Data management is a critical process in qualitative research that deserves researchers’ attention (Lin, 2009). It encompasses topics such as human subjects’ protection, confidentiality, data storage and record-keeping, data ownership and data sharing. Data were kept under lock and key for security and confidentiality purposes. Information was accessible to the researcher only. Filled data collection tools were also scanned and stored in sky drive to avoid loss. Data was only available to the researcher, research assistants and researcher’s supervisors. The researcher ensured that the voice recorder had functional batteries at all times so as not to lose valuable interviews due to a faulty recorder (Marshall & Rossman, 2011). Transcribed data were given colour or number codes for easy reference during analysis.

3.10 Integration of quantitative and qualitative data

Interpretive integration is common in concurrent mixed methods design and occurs at a narrative level in discussion (Polit & Beck, 2012). In this study, the two databases of quantitative and qualitative strands were analyzed and presented separately but integrated into the discussion section of the study (Creswell, 2013). Integration was achieved through merging the two data sets after both the quantitative and qualitative data collection and analysis were completed. The findings were compared to identify complementarity, concordance and discordance (Curry & Smith, 2015). Divergence and dissonance are important as they represent important nodes for further analytic work (Polit & Beck, 2012).

3.11 Ethical considerations

Ethical approval was sought from the College of Medicine Research and Ethics Committee (COMREC) and permission to access sites from the Directors for Kamuzu and Queen Elizabeth Central Hospitals as well as heads of the Obstetrics departments. Participants for the qualitative part of the study were asked to give informed consent before they were interviewed (Appendix 1). Respect for persons was ensured through getting individual consent and ensuring privacy and confidentiality. The principle of beneficence was observed by avoiding harm of participants to the study (Marshall & Rossman, 2011). The qualitative study was non-invasive as it focused on an interview of midwives.

The quantitative part involved record review and there was no interaction with clients. In addition, the questionnaires did not contain the names of the patients thereby ensuring nonidentification of patients in the data collection tools. Women's file numbers were

recorded on the questionnaires as a way of identifying specific records for the study purposes. The records were accessible to the research team only, hence ensuring confidentiality.

3.12 Conclusion

The chapter presented the research methodology in terms of the design, setting, study period, population, sampling, data collection instruments, validity and reliability, data collection procedure, analysis, trustworthiness, data management and ethical considerations. The next chapter will present the findings of the study.

CHAPTER 4

PRESENTATION OF FINDINGS

4.1 Introduction

This chapter will present the research findings that answered the aim of the study to describe the determinants of maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals in Malawi. Determinants of maternal near-miss cases were explored using a mixed methods approach. The findings are presented in accordance with the following specific objectives of the study: (1) to establish the demographic, socioeconomic and obstetric characteristics of maternal near-miss cases; (2) to establish determinants of care associated with maternal near-miss cases; (3) to assess the quality of antenatal, labour and postnatal care provided to maternal near-miss cases; and (4) to describe the midwives experiences of the quality of care provided to maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals in Malawi.

4.2 Demographic, socioeconomic, and obstetric characteristics of maternal near-miss cases

4.2.1 Demographic characteristics of participants

This study found that more than one-third of participants (35.2%, n=161) were maternal near-miss cases (Table 4). There were significant differences between demographic characteristics (marital status, occupation, admission mode, means of transport and age) of maternal near-misses and the non-cases ($p \leq .03$) (Table 4). There

were significantly more maternal near-misses among unmarried women (12.4%, n=20) compared to those unmarried non-cases (4.4%, n=13) ($\chi^2=11.8$, $p<0.001$). Furthermore, this study showed that women who were in the 20-25 years old age group accounted for the highest number of maternal near-misses (31.7 %, n=51) and this result was significant ($\chi^2=12.19$, $p<0.03$) (Table 4).

Table 4: Demographic characteristics in relation to maternal near-miss (N=458)

Characteristics	Maternal near-miss n=161(35.2%)	Non-case n=297(64.8%)	Chi-square	p-value
Marital status				
Married	127(78.9)	243(81.8)	11.8	0.001*
Not married	20(12.4)	13(4.4)		
Occupation of woman				
Farming	7(4.4)	4(1.4)	102.8	0.001*
Business	11(6.8)	31(10.4)		
Casual labour	3(1.9)	0(0)		
Formal employment	5(3.1)	7(2.4)		
Housewife	43(26.7)	89(30)		
Admission mode				
Referred	141(87.6)	237(79.8)	6.8	0.03*
Self-referral	19(11.8)	47(15.8)		
Means of transport				
Ambulance	128(79.5)	205(69)	28.6	0.001*
Other	8(5)	39(13.1)		
Age				
<20	28(17.4)	53(17.8)	12.2	0.03*
20-25	51(31.7)	116(38.9)		
26-30	30(18.6)	70(23.9)		
31-35	36(22.4)	40(13.7)		
>35	16(9.9)	17(5.8)		

*Significance level set ≤ 0.05 Data=n (%)

The maternal near-miss group was significantly different from the non-cases group in terms of numbers being referred from other hospitals (87.58%, n=141) for maternal near-miss

cases versus (79.80%, n=237) for non-cases, ($\chi^2=6.76$, $p<0.034$). However, it was noted that information pertaining to referral (e.g., time of departure from referring facility and time of arrival at referral facility) was missing in patients' files.

Descriptive statistics showed that slightly more women (79.5%, n=128) who were maternal near-miss cases were brought to the hospital by ambulance compared to the non-cases group (69%, n=205) as presented in Table 4). On the other hand, more women in the non-cases group (13%, n=39) used other means of transport compared to the maternal near-miss cases (4.97%, n=8).

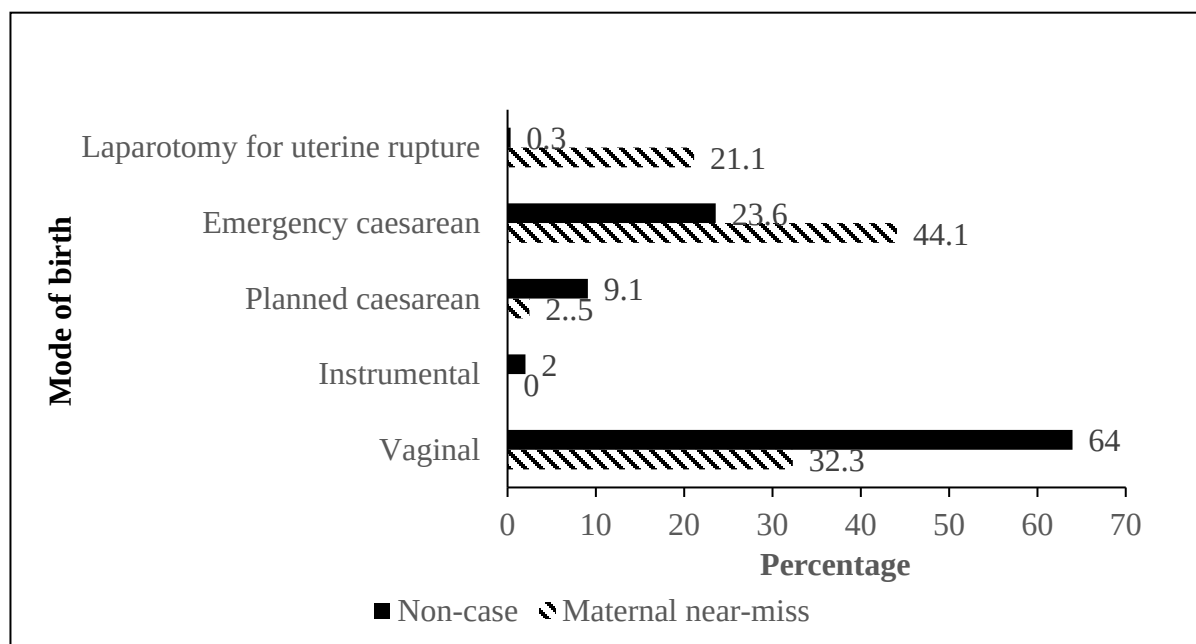
4.2.2 Reproductive Health History of Participants in relation to maternal near-miss

The findings of this study revealed that the reproductive health history of participants in relation to maternal near-miss varied (Table 5). Nearly one-third of the women in the maternal near-miss cases group (29.1%, n=47), were found to have no history of attending antenatal care compared to non-cases (9.5%, n=28). This result was significant ($\chi^2=29.3$, $p=0.001$). Complicated labour was also found to be the most common reason for admission in both women with maternal near-miss (37.9%, n=61) and the non-cases (53.9%, n=160) (Table 5). However, the Pearson Chi-Square test revealed that there were significant differences in the reasons for admission between women with maternal near-misses and those who were non-cases ($\chi^2=150.6$, $p=0.001$). This study further found that primigravids accounted for slightly more than one-third of both the maternal near-miss group (38.5%, n=62) and non-cases group (36%, n=107) and this result was not significant ($\chi^2=4.8$, $p<0.19$). In addition, there was no difference between maternal near-miss cases and non-cases based on the history of caesarean or abdominal scar and ($\chi^2=4.71$, $p<0.09$) (Table 5).

Table 5: Reproductive health history in relation to maternal near-miss cases (N=458)

Characteristics	Maternal near-miss n=161(35.2%)	Non-case n=297(64.8%)	Chi-square	p-value		
Number of pregnancies						
1	62(38.5)	107(36)	4.8	0.19		
2-4	73(45.3)	152(51.2)				
>4	26(16.2)	38(12.8)				
History of caesarean or abdominal scar						
Yes	22(13.7)	46(15.6)	4.7	0.09		
No	139(86.3)	251(84.4)				
History of abortion						
Yes	23(14.3)	30(10.2)	3.8	0.28		
No	138(85.7)	267(89.8)				
Antenatal care						
Yes	114(70.9)	269(90.6)	29.3	0.001*		
No	47(29.1)	28(9.5)				
Reason for admission						
Normal birth	3(1.9)	82(27.6)	150.6	0.001*		
Complicated labour	61(37.9)	160(53.9)				
Extra-uterine Pregnancy	25(15.5)	1(0.3)				
Other complication during birth	25(15.5)	34(11.5)				
Prophylactic caesarean	0	5(1.9)				
Abortion/miscarriage	45(28)	7(2.4)				
Postpartum Complications	1(0.6)	3(1)				
*Significance level set ≤0.05 Data =n(%)						

This study found that there were significant differences among the mode of birth in relation to maternal near-miss ($\chi^2=104.7$, $p<0.001$) (Figure 6). Vaginal mode of birth was found to be the commonest among the non-cases group (64%, n=190) while the emergency caesarean section was the most common among maternal near-misses than non-cases (44.1%, n=71).



Chi-square: 104.7 **p-value:** 0.001

Figure 6: Mode of birth among participants

The findings of this study revealed that there were significant differences in fetal presentations in relation to maternal near-miss with the cephalic presentation being the commonest in both maternal near-miss (89.5%, n=144) and non-cases (88.4%, n=263) groups ($\chi^2=61.3$, $p<0.001$) (Table 6). There were two cases of transverse presentation of the unborn baby in the non-cases group (0.7%) while there was none in the maternal near-miss cases group.

Table 6: Foetal presentation and maternal near-miss (N=458)

Fetal presentation	Maternal near-miss n=161(35.2%)	Non-case n=297(64.8%)	Chi-square	p-value
Cephalic	144(89.5)	263(88.4)	61.3	0.001*
Breech	4(2.6)	16(5.3)		
Transverse	0(0)	2(0.7)		
Other	13(7.9)	17(5.6)		

*Significance level set ≤ 0.05 , Data=n(%)

This study revealed that birth status and sex of the child in relation to maternal near-miss varied (Table 7). The number of children who were born alive was higher in the non-cases (94.4%, n=280) compared to the maternal near-miss cases (70.3%, n=113). This result was significant ($\chi^2=90.7$, $p<0.001$). Furthermore, sex of the child was associated with maternal near-miss cases ($\chi^2=85.36$, $p<0.001$).

Table 7: Birth Status and Sex of Child in relation to maternal near-miss (N=458)

Characteristics	Maternal near-miss n=161(35.2%)	Non-case n=297(64.8%)	Chi-square	p-value
Birth status				
Alive	113(70.3)	280(94.4)	90.7	0.001*
Fresh stillbirth	27(17)	6(2.1)		
Macerate stillbirth	15(9.3)	11(3.53)		
Stillbirth not specified	6(3.4)	0		
Sex of child				
Male	85(52.6)	146(49.1)	85.4	0.001*
Female	76(47.4)	151(50.9)		

*Significance level set ≤ 0.05 Data=n(%)

4.3 Determinants of care associated with maternal near-miss cases

The determinants of maternal near-miss results were assessed using binary logistic regression in this study. The findings showed that there were only two determinants of care

that were significantly associated with maternal near-miss (Table 8). This study found that women aged 31-35 years had significantly 3.14 chances of experiencing maternal near-miss [OR=3.14, 95% CI: 1.09, 9.02, $p<0.03$] compared to the less than 20 age group, p -value >0.05 (Table 8). Furthermore, this study revealed that emergency caesarean [OR=4.08, 95% CI: 2.34, 7.09, $p<0.001$] and laparotomy for uterine rupture [OR=83.49, 95% CI: 10.49, 664.55, $p<0.001$] were the two modes of birth that were significantly associated with maternal near-miss. The results suggest that the chances of falling into the maternal near-miss category were 83 times higher among mothers who had laparotomy for uterine rupture and 4 times higher among those who had an emergency caesarean than among mothers who had a vaginal birth.

Table 8: Association between determinants of care and maternal near-miss

Characteristic	Outcome	Odds ratio	p-value	95% CI
Antenatal care	Yes	0.53	0.095	0.25,1.12
Previous caesarean	Yes	0.88	0.736	0.42,1.84
Previous abortion	Yes	1.39	0.424	0.62,3.15
Marital status	Married	0.49	0.146	0.19,1.28
Pregnancies	Between 2 and 4 pregnancies	0.60	0.180	0.29,1.27
	More than 4 pregnancies	0.47	0.206	0.15,1.51
Age	20-25	1.21	0.627	0.56,2.64
	26-30	0.99	0.985	0.36,2.73
	31-35	3.14	0.034*	1.09,9.02
	>36	2.56	0.179	0.65,10.09
Mode of birth	Planned caesarean	0.79	0.694	0.24,2.59
	Emergency caesarean	4.08	0.001*	2.34,7.09
	Laparotomy for uterine rupture	83.49	0.001*	10.49,664.55

*Significance level set ≤ 0.05

4.4 Midwifery interventions and complications of maternal near-miss cases

Findings indicated that blood transfusion was significantly associated with maternal near-miss ($\chi^2=174.91$, $p<0.001$) with slightly above half of the maternal near-miss cases (55.35%, $n=89$) having a blood transfusion compared to women in the non-cases group (3.10%, $n=9$). More women in the maternal near-miss cases group (85.91%, $n=138$) had complications identified during hospitalization compared to the non-cases group (29.49%, $n=88$) as depicted in Table 9. The complications identified during hospitalization included: haemorrhage, pre-eclampsia/eclampsia, puerperal sepsis, severe anaemia and ruptured uterus among others. Using the Chi-Square test to analyze data, this study found that the following complications were significantly associated with maternal near-miss: blood transfusion ($\chi^2=174.91$, $p<0.001$), complication identified during hospitalization ($\chi^2=183.69$, $p<0.001$), haemoglobin level ($\chi^2=156.27$, $p<0.001$) and neonatal complications ($\chi^2=94.3$, $p<0.001$). Neonatal complications included birth asphyxia, sepsis, low birth weight and hypothermia (Government of Malawi, 2014a).

Table 9: Maternal near-miss complications (N=458)

Characteristics	Maternal near-miss n=161(%)	Non-case n=297(%)	Chi- square	p-value
Blood transfusion				
Yes	89(55.4)	9(3.1)	174.9	0.001*
No	72(44.7)	288(96.9)		
Complication identified during hospitalization				
Yes	138(85.9)	88(29.5)	183.68	0.001*
No	23(14.1)	209(70.5)		
Haemoglobin level				
Hb<11g/dl	93(57.7)	26(8.6)	156.3	0.001*
Hb>12g/dl	68(42.3)	271(91.4)		
Neonatal complications				
Yes	45(28.1)	48(16)	94.3	0.001*
No	116(71.9)	249(84)		

* Significance level set ≤ 0.05 , Data=n(%)

This study revealed that pre-eclampsia was the leading indication for caesarian section and laparotomies (22.98%, n=37) (Figure 7).

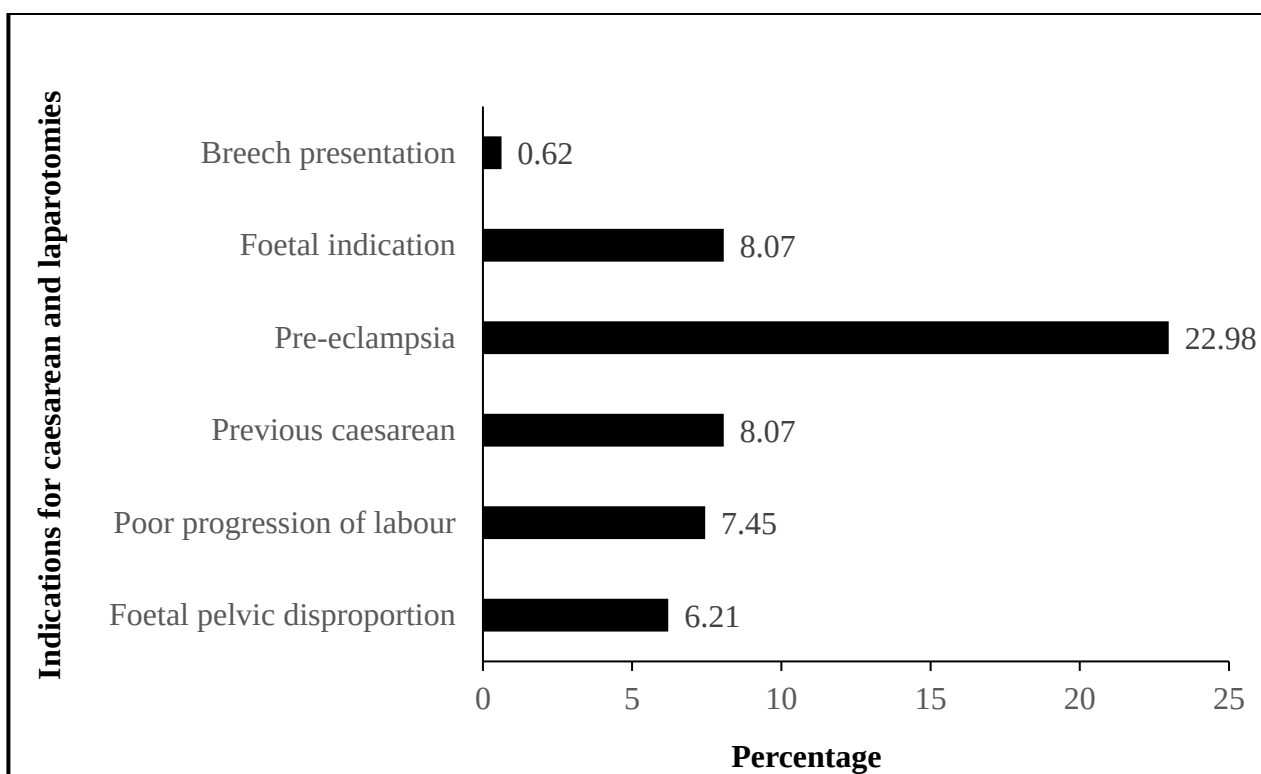


Figure 7: Indications for caesarean and laparotomies among maternal near-miss

4.5 The quality of antenatal, labour, and postnatal care provided to maternal near-miss cases

4.5.1 Availability of resources based on WHO quality of care assessment tool

Using the adapted WHO quality of care assessment tool, this study explored the quality of antenatal, labour and postnatal care that was provided to maternal near-miss cases at both Kamuzu and Queen Elizabeth Central Hospitals. The scores for quality in terms of availability of resources in the two facilities based on the tool ranged from 3 (Some need for improvement to reach standards of care) to 5 (Good practice, complying with standards of care) (Table 10). The findings showed that both hospitals were complying with standards of care with regard to infrastructure (score =5) while both facilities were found to require some

improvement to reach standards of care in relation to the laboratory (score=3) and hospital policies (score=3) (Table 10).

Table 10: Availability of resources based on WHO quality of care assessment tool

Standard	Facility score	
	KCH	QECH
Infrastructure	5	5
Health information and records	4	4
Essential drugs and blood products	4	4
Laboratory	3	3
Health facility policies	3	3
Guidelines and audits	4	5

KCH=Kamuzu Central Hospital, QECH=Queen Elizabeth Central Hospital, 5= Good practice, complying with standards of care, 4= little need for improvement to reach a standard of care and 3= some need for improvement to reach standards of care

4.5.2 Quality maternal care

This study further found that the quality of maternal care that was offered at the two facilities generally needed little (score=4) or some (score=3) form of improvement to reach a standard of care except for maternity wards (score=5) and management of pre-eclampsia, mild and severe pre-eclampsia and eclampsia (score=5); confirming that facilities were not complying with many areas of care (scores=<5) (Table 11).

Table 11: Quality maternal care based on WHO quality of care assessment tool

Standard	Facility score	
	KCH	QECH
Emergency obstetric care	4	4
Maternity wards	5	5
Infection control	3	4
Maternal essential drugs equipment and supplies	4	4
Antepartum care		
Management of pre-eclampsia, mild & severe pre-eclampsia & eclampsia	5	5
Prevention & management of infections in pregnancy	5	4
Normal labour & vaginal birth	4	5
Prevention and management of preterm labour	4	3
Caesarean section	4	4
Management of postpartum haemorrhage	4	4
Management of unsatisfactory progress of labour	4	4
Monitoring and follow up	4	4

KCH=Kamuzu Central Hospital, QECH=Queen Elizabeth Central Hospital, 5= Good practice, complying with standards of care, 4= little need for improvement to reach a standard of care and 3= some need for improvement to reach standards of care.

4.5.3 Staffing levels

This study found that staffing levels at both KCH and QECH were generally $\leq 50\%$ of the hospital recommended staffing levels (Table 12). The staffing levels were consistently below the recommended numbers in all departments during all shifts in both hospitals (Table 12). However, QECH was found to have the recommended number of Chief Medical Officers (1) during all shifts (recommended by the institution).

Table 12: Comparison of recommended and available staffing levels at the two hospitals

Staff type	KCH					QECH				
	Day Shift		Night Shift		Weekend / public holiday	Day Shift		Night Shift		Weekend / public holiday
	Recommended	Available	Recommended	Available	Available	Recommended	Available	Recommended	Available	Available
Midwives										
Theatre	5	2	5	2	3	4	2	4	2	2
Postnatal Ward	4	2	2	2	3	3	2	2	2	2
Labor Ward	5	2-3	5	2-3	3	4	2	4	2	2
HDU	2	1-2	2	1-2	1	2	1-2	2	1-2	1
Antenatal ward	2	1	2	1	1	4	2	4	2	2
Other cadres covering all wards										
Clinical officer	3	1	2	0	1	2	1	1	0-1	1
Consultants	4	2	3	1	1	2	1	1	0-1	1
Registrars	6	3	3	1	1	3	1	2	1	1
CMOs	2	1	1	0	0	1	1	1	1	1

KCH=Kamuzu Central Hospital, QECH=Queen Elizabeth Central Hospital, HDU=High Dependency Unit, CMOs=Chief Medical Officers

4.6 Midwives experience of maternal near-miss cases care

Using in-depth interviews, this study explored the views of midwives regarding the quality of care provided to maternal near-miss cases at KCH and QECH. There were 24 participants: Nurse Midwife Technicians (NMT) (11), Registered Nurse-Midwives (RNM) (10), Enrolled Nurse-Midwives (2) and Enrolled Midwife (1) (Table 13). Further characteristics of the participants are presented in the same Table 13.

Table 13: Characteristics of midwives interviewed

Characteristic	n
Facility	
QECH —Chatinkha Maternity Wing	12
KCH —Ethel Mutharika Maternity Wing	12
Sex	
Female	24
Male	0
Cadre	
Nurse Midwife Technician	11
Registered Nurse Midwife	10
Enrolled Nurse Midwife	2
Enrolled Midwife	1
Years in department	
<1 year	6
2-5 years	12
>6 years	6

The qualitative findings reported in this section added depth to the quantitative findings. Two themes that emerged from the data using content analysis were “perceptions on quality of care for maternal near-miss” and “factors promoting quality of care”. Factors promoting quality of care were further divided into positive and negative with the latter referring to those hindering quality of care. The sub-themes that emerged are also presented in Table 14.

Table 14: Themes identified from in-depth interviews of midwives

Theme	Sub-theme
Perception on quality of care	Conditional care Good care Sub-optimal (below standard) care
Factors promoting quality of care	
Positive	Resource availability Teamwork/collaboration On the job preparation
Negative (hindering quality of care)	Shortage of resources Delayed care Negative attitude Lack of knowledge

4.6.1 Perceptions on quality of care

The theme *perception of care* refers to the midwives' views of the quality of care given to maternal near-miss cases. This was expressed as good, conditional and sub-optimal (below standard) care.

4.6.1.1 Good care

Good care was associated with offering individualized care, following standards, protocols/ guidelines and monitoring of patients. An individual woman was managed according to the problems that she presented with on admission. However, quality of care was also dependent on human and material resources availability.

In addition, regards the quality of care, CMW Midwife 10 indicated: “*The way I see it, it all depends on that particular time. Sometimes I would say the care is good depending on what the situation is or how many nurses there are to provide care, and what materials are available. Sometimes we fail to provide proper care because of the situation at hand; may need blood for a patient with postpartum haemorrhage but blood is not available.*”

When there were adequate numbers of midwives during a shift and material resources, it was possible to give good quality of care according to standards and guidelines. It was indicated that the lower number of beds in HDU allowed for better access to good quality of care as the medical personnel were adequate to take care of the few women. It was further indicated that the unit was well stocked with medicines and supplies as illustrated by a midwife in HDU.

“In HDU there is good care due to the number of beds, four. At times there are 2 or 3 nurses on duty which allow them to give individualized care since one nurse may have 2 patients to take care of. By individualized care I mean the nurse is able to monitor the patient well and according to scheduled time since she has one or two patients to manage” CMW Midwife 08

Good care depends on how well the professionals relate. Likewise, another participant said:

“The care that is given generally is good. Yes, because I have seen women who were about to die to survive because there is teamwork. When we have critically ill patients, there is teamwork, and everybody comes in to help. We do everything possible to save the woman. When I talk of teamwork, I mean most of the times people that are supposed to be involved in the care of the patient come in; we talk of the lab, the doctors and the support staff to carry specimens to the lab. So, it’s like everyone is taking part in the care of the patient.” CMW Midwife 05

One Nurse Midwife Technician said: *“Quality of care is good, but workload is too much. We tend to have more women and fewer midwives on duty, like two midwives on day*

duty against 80 patients, and four midwives on night duty against 80 women. Like such, you tend to prioritize as you can't attend to all of them at once" EMMW Midwife 10.

"I can say the care is good in the sense that there is teamwork. Most of the times we encounter some women who are at risk but because we are organized, put everything in place as early as possible before danger arises, we are able to save the woman's life. For instance, when we have a woman with previous scar or one who has had more than four deliveries, we know they are at risk of PPH, so we make sure everything is in place. Things like cannulas and oxytocin are placed by the bedside for use in the event of PPH. For the cannula we already insert it....we don't wait up until the woman starts bleeding". EMMW Midwife 06

4.6.1.2 Conditional care

Care was said to be conditional depending on the situation at that particular time where it was good if resources were available and poor where there was a shortage of material or human resources. This was because close monitoring of very sick women was a challenge when they were few midwives on duty against many women in labour. The few midwives would spend more time managing the rest of the women such that at times they would miss administering a particular drug on schedule.

"The care depends on the availability of resources in terms of human and material...on human resource, it also depends on the experience, knowledge, attitude and skills of the midwife. If the midwife is compromised in doing certain procedures, she may not be able to manage a patient properly. I have also seen that when material resources are available, we are able to provide care according to what the guidelines say. However, when

certain resources needed to help us prolong the care are not there, we end up improvising and may compromise care.” CMW Midwife 06

Another participant felt that the quality of care depended on number of health personnel *“Actually, I think I can say it’s two-fold. It depends on the number of midwives who are on duty because if you have a very sick patient and then it is just the two of you on duty, with other patients in labour, it is difficult to monitor the critically ill patient closely....So there are times when the woman is on Magnesium Sulphate or some hypertensives, then sometimes we miss some doses because you are also busy with other women. You are running up and down and then time goes up you don’t give the drug at the required time. So, it becomes challenging, it really depends on the number of midwives who are on duty”*. EMMW Midwife 05

In addition, regards the quality of care, CMW Midwife 10 indicated: *“The way I see it, it all depends on that particular time. Sometimes I would say the care is good depending on what the situation is or how many nurses there are to provide care, and what materials are available. Sometimes we fail to provide proper care because of the situation at hand; may need blood for a patient with postpartum haemorrhage but blood is not available. I remember this other patient; she came in very weak and was on IV fluids for resuscitation...but I think she had already lost a lot of blood....we managed to assist her. We called for help. The blood samples were sent urgently and then the lab provided us with blood. It was really an urgent case where we saw that the lab was really was really helpful at that particular time. We managed to save the patient upon the proper interventions that we provided”*.

Another participant, EMMW Midwife 11 lamented:

The quality of care is okay but with maternal near-miss cases, it really depends on the number of midwives on duty compared to the patients. Maternal near-miss patients need close monitoring of their condition, but you cannot spend a lot of time monitoring one patient when there are many patients in the ward. So, it is like you have 60 to 70 patients in the postnatal ward against 2 midwives, it becomes a challenge to monitor all patients. There are times when your colleague has to go to a theatre to collect a patient after caesarean section, so you are left alone in the ward with the many patients to monitor”.

Conditional and sub-optimal care generally were the consequences of the challenge of material and human resources with lack of resources impacting negatively on the quality of care.

4.6.1.3 Sub-optimal care

In some cases, care was sub-optimal or below standard due to lack of resources, work overload as well as delayed care at the district before referral.

“Just a comment, mostly here we receive patients from other districts, and they are very sick when they come. Maybe the patient has stayed for a long time there without receiving enough care or proper medication like antibiotics, so when they come here, we lose them. I think the care should be starting from the district where the patient is coming from and when she is referred here, it should be just for the continuation of care.” CMW Midwife

03

Another participant EMMW Midwife 01 said: *Care is not done as it is supposed to be because of shortage of materials and supplies. Like sometimes we have a patient with anemia, and you go to the laboratory to get blood you are told there is no blood. You are stranded on*

how to manage such a patient. Some patients do survive because you give plasma expanders like haemacel while waiting to get blood. At times the patients survive. But I know of patients who are delayed care because the theatre is busy. Like in preeclampsia patients, if you delay taking them to theatre for caesarean section sometimes you lose both the mother and baby. But when taken to theatre immediately decision has been made, we end up helping them survive”.

Poor skills in the midwives were cited as a reason for suboptimal care. According to EMMW Midwife 04,

‘Quality of care is not satisfactory for reasons like poor skills, shortage of staff. I feel most people who are working these days they don’t apply the skills that they were taught at school. They are full of shortcuts instead of following a procedure as they were taught. Most of the time you find that they are just chatting on the phone and yet they have not distributed drugs or monitored the patient. When you check the patient’s file, you will see that maybe they have not checked the vital signs; they haven’t been given the drugs or even they haven’t followed the doctor’s orders made during a ward round. That’s what I have observed most times.’ This relates to the preparation of the midwives at pre-service as well as commitment.

Another participant had this to say concerning the challenge of human resources, *‘I think the care we provide is not enough care because of work overload. We have a shortage of nurses, two nurses in a busy labour ward with 30-40 deliveries per night. The ideal is to have five nurses on duty. You can imagine we have the interest to give total comprehensive care to mothers but due to workload, it is not possible. We only provide the care possible’*

CMW Midwife 09

It is clear from the views expressed by the midwives on the sub-optimal care theme that, preparation of the midwives, inadequate numbers of human resources in relation to the number of women in labour, impacted negatively on the quality of care. This would result in poor maternal and newborn outcomes.

4.6.2 Factors promoting quality of care

The theme *factors promoting quality of care* refers to, midwives' views of the conditions in the workplace that contributed either positively or negatively to the quality of care. Sub-themes for factors promoting quality of care were teamwork, resource availability and on the job preparation as positive factors and shortage of resources, delayed care, poor attitude, and lack of knowledge as negative factors.

4.6.2.1 Teamwork

To describe their experience in the provision of care to a recent maternal near-miss case that they cared for, participants mentioned teamwork as a positive factor indicating that there is a collaboration among the health workers, midwives, doctors, and support staff despite the shortage of staff. Nurses from one ward were reported to even go to another ward to assist their colleagues whose ward is very busy.

“Basically, I would say about ninety percent of patients survive the complications that occur during pregnancy or childbirth because of joint teamwork that we have. When we have emergencies, we work as a team, nurses, doctors, support staff, X-ray and laboratory technicians all play their part. However, I would have loved that we have more advanced technology to use to manage our patients” EMMW Midwife 02

Teams were able to perform better with good leadership as indicated by CMW Midwife 01:

As the ward in-charge, I always take the lead by instructing the nurses, student nurses/student medical doctors and qualified doctors to provide the care according to guidelines. Like when we have eclampsia patients, we assist each other to maintain a clear airway while others bring and administer the anti-hypertensives. The other person will be monitoring and recording vital signs, as such, we manage to save the mothers as we do things timely. We work as a team. There is good collaboration and teamwork between the midwives in the labour ward and medical team”.

Another participant, CMW Midwife 05 added that:

“One thing I like most about HDU is that there is teamwork most of the time. Whenever you need help and you are looking for a doctor, they come in. And when there is an emergency there is really teamwork with different people contributing to manage the patient by playing their part. We have seen teamwork also from anaesthetists, you know sometimes because of shortage of staff like the anaesthetist is alone and theatre is busy with procedures, he will tell you that wait I will come. Usually, we need the anaesthetist when we have a patient in shock, with difficult veins and we want to commence an intravenous line but haven’t succeeded. Immediately the anaesthetist is free he comes to attend to the patient in the spirit of saving a life”.

Similarly, to support the teamwork sub-theme another participant said:

“Yaa, we work as a team, nurses and doctors....because alone I don’t think you can really prove your work to be efficient. So, you need to involve other nurses as well as doctors.

Every member contributes to the care, and I have seen that if we have a strong team, a good/hard working team, we manage to save our mothers". CMW Midwife 07

Teamwork continued emerging in the narratives as indicated by CMW Midwife 09

"We try our best to give quality care. We work as a team, that is why more mothers survive and fewer mothers die. Despite the shortages in staff, when it comes to emergencies like these near-miss cases, every profession in the ward are involved in managing the patient. You talk of doctors, nurses including the domestic staff, they all get involved".

Teamwork was interchangeably used with collaboration that was seen in the management of maternal near-miss cases as elaborated by EMMW Midwife 03.

But in terms of how we manage maternal near-miss cases among us, there is that collaboration. Say there is a patient who urgently needs attention, when you call the doctor, he comes immediately. Actually, most doctors stay close to the ward such that when they are needed, they come to review the patient, unless otherwise, they are somewhere busy or in theatre".

In agreement with other participants on the issue of teamwork, participant CMW Midwife 12 reiterated;

"I should mention that there is teamwork in the care given to the patients. We work as a team. There was this woman who was referred from a district hospital because she had PPH after delivery which was difficult to control. When she arrived, doctors were around. We worked together to resuscitate the woman and she survived because of the teamwork".

Teamwork was mentioned by several participants and in most cases, it was during the management of postpartum hemorrhage cases. Another participant mentioned that; *“We had an incident of PPH last month. The woman bled a lot almost about 2000mls, she could have died but she survived because we worked as a team. One person expelled clots, another put up an IV line while another rushed to collect Oxytocin and put in the liter. So, the woman survived”*. CMW Midwife 09

4.6.2.2 Resource availability

Some participants attributed positive patient outcomes to the availability of resources, in particular the Non-Pneumatic Antishock Garment (NASG).

“We have managed to save women with postpartum haemorrhage with the NASG which is a Non-Pneumatic anti-shock garment. I remember this mother who was referred from a particular health center. She was referred because of PPH and when she was arriving here, she was nearly getting into shock because she had lost a lot of blood. Of cause on referral, she had a catheter in and in the labour ward, there was a nurse trained in NASG, non-pneumatic anti-shock garment. This nurse trained in NASG mobilized us. There was a doctor around, but it was this nurse who mobilized us. Because she was the one who knew how to apply the NASG, she mobilized us to help that mother put on the NASG. When the doctor was examining the patient, at least the condition had stabilized because of the NASG. The NASG really works wonders. I am thinking had it been that there was no equipment and the trained nurse, the patient would have gone into shock which should have given us a bad result”.

Upon probing on what a NASG was and how it works, the participant said;

“It’s a garment which is worn from the abdomen below the legs, and it has compartments. It applies pressure to the surrounding areas so that blood is not lost. The blood is pushed up to the vital organs to control damage to vital organs like the heart and brain. So instead of the blood getting down to lower extremities, it’s like over that pressure on the arteries and veins, they are pressed, and they push the blood to the vital organs and prevent shock....so it’s a garment which we apply on a woman who is bleeding and is nearly getting into shock. It’s plastic and it does not get to the chest that’s why it is called non-pneumatic”. Smiling, she continued

“I am a living testimony because I have seen three or four women who survived PPH by the use of NASG.” CMW Midwife 06

In the management of postpartum haemorrhage, EMMW Midwife 05 stated: *“I had a woman who had pre-eclampsia, severe pre-eclampsia and then after she delivered it seemed everything was normal but then she started bleeding heavily. So lucky enough we have the non-pneumatic anti-shock garments for the management of PPH and shock. So, we rushed, actually, she started gasping after she lost a lot of blood. So, we applied the NASG and one of our support staff rushed to the lab, brought some blood which we transfused”.*

“Then the wonders of the antishock garment how it works, it really works miraculously...because the woman’s vitals, her vitals were actually dropping: BP 70 over sixty something. But we applied the NASG on her and her BP picked up. Also, my colleague and I failed to insert a second IV line, so we called the anesthetist from the theatre who came and inserted a jugular one. There was teamwork and the woman survived, she escaped death”.

Good practice of giving initial treatment before referring a patient from a health centre to the hospital was cited as contributing positively to patient outcomes. CMW Midwife 10 indicated;

“Patients with pre-eclampsia would come whilst they have been given a loading dose of Magnesium Sulphate so when they arrive here, we just continue with maintenance doses. In such cases, we are able to save the woman’s life”.

4.6.2.3 On the job preparation

It was reported that ward in-charges were responsible for organizing simulation drills to enhance skills of the health workers in handling emergencies and performing procedures. In particular, there was the Alliance for Innovation of Maternal Health (AIM) project at EMMW where health workers including midwives were equipped with skills to improve their confidence and efficiency in interventions/procedures. Materials such as non-pneumatic anti-shock garment (NASG) used in the management of postpartum haemorrhage were also indicated as preventing maternal near-miss cases from deteriorating and thereby preventing shock and eventual maternal death.

“I have been training my colleagues in use of the Non-Pneumatic Antishock Garment (NASG) such that even the interns, all doctors, nurses the whole Ethel Mutharika Maternity Wing they know about the Antishock Garment. Actually, under skills lab, we could pretend there is an emergency of postpartum haemorrhage, we would apply the NASG and then we would rush the patient to theatre... we have been having drills.” EMMW Midwife 05

“We use simulations to improve management of complications like postpartum haemorrhage and the simulations contribute to positive outcomes. We have the AIM project

which is Alliance for Innovation of maternal health. Through this project teams of midwives, doctors and anesthetists have been trained using simulations on how to manage complications. There was this particular woman who had secondary PPH. She lost approximately 1, 000mls of blood. We were able to use the skills we learnt through the AIM project to control the bleeding. The three of us shared responsibilities and because we knew what to do and how to do it, we saved the woman's life. AIM has taught us to work as a team and appreciate each other's skills and input". EMMW Midwife 02

4.6.3 Factors hindering quality of care

4.6.3.1 Shortage of resources

Shortage of supplies and equipment was cited as one of the factors impacting negatively on the quality of care for maternal near-miss. One participant had this to say:

"Like in our set up mostly we have to improvise when we are working. Sometimes we work with few resources, and some are not there, like in terms of medications sometimes we have stock-outs of antibiotics. Or we have to request the guardians to source those kinds of things.... a few weeks ago, we had stock-outs of blood transfusion sets and intravenous fluid giving sets which was a setback. But the basics like the gloves, cotton wool and cannulas are mostly available." EMMW Midwife 02

In addition, CMW Midwife 11 indicated: *"Lack of material resources affects quality of care, for example when there are no thermometers for checking temperature or when there is no oxygen concentrator in the labour ward, you have to rush to HDU but may find the concentrator being used on another patient."*

Shortage of human resources proved a challenge in ensuring patients receive a good quality of care as indicated by another participant EMMW Midwife 03

“There is a problem in this ward in that there are few of us, midwives, in number. Like today there are only two of us. Lucky enough today is quiet but there are times when the ward is so busy, and you find that there is only one midwife on duty. I mean you can’t monitor a number of patients at once when you are just alone, it’s impossible. \that’s another challenge, a very big one because lately, we have noticed four of our staff have gone to school for further training. So, it’s like four staff down”.

She continued to give her experience in relation to staff shortages.

“There was a time when there were two of us on duty. My colleague had gone to receive a baby from a patient who had gone for a caesarean section in theatre. We had four if not five women in labour, those stages like six, or seven, eight centimeters cervical dilatation. There was another woman who was fully dilated (cervical dilatation of 10cm). Soon after I had assisted the woman to give birth, a companion of another woman came to inform me that her patient was about to give birth and I should go and attend to her. Fortunately, the baby had a good Apgar Score and was crying and not in imminent danger. I put the baby on the mother’s abdomen, covered it and asked the mother to hold the baby to prevent it from falling off. I proceeded to go and assist the next woman to give birth.... After completing delivery of the placenta for both women, I had to sit down and fill in the Partograph for both women. Pause.... We really experience such scenarios due to staff shortages, it is challenging”.

4.6.3.2 Delayed care

Shortage of human resources was mentioned to contribute to the delayed provision of care as indicated by CMW Midwife 04: *“We have issues of shortage of resources, mostly we*

do have problems with theatre. When we have a postnatal woman who needs to go for a procedure in theatre after delivery, say for examination under anesthesia in case of secondary PPH, the patient takes time to be taken into theatre because the theatre may be busy with caesarean sections from the labour ward. The theatre equally faces staff shortages that is why they take time to take in patients from the postnatal ward for procedures, rather priority is given to the labour ward. We have locum nurses who are being used to address the problem of staff shortages.”

In response to a probe on how many nurses there are in the postnatal ward, the participant responded;

“In postnatal, we are six nurses for two wards with a bed capacity of 120 for the two wards but only six nurses working in postnatal. Mostly we are backed by locum nurses who come to work when they are off duty in their respective wards”.

Similarly, in relation to locum CMW Midwife 09 stated that;

“Sometimes there are two nurses on duty in labour ward against 30-40 deliveries. There are supposed to be 12 nurses on day shift and 10 nurses on night shift but due to recent attrition there were two of us on duty”.

Upon questioning how the shortage of human resources is being handled, the participant commented *“Locum nurses come to work in the labour ward but because the ward is always very busy, they complain that the money they get for working locum is little. They tried to request for a raise in locum fee but to no avail. Imagine K3, 200 per day for all that work I told you about, 30-40 deliveries per day”!*

Confirming the concern on the amount of money paid to nurses on locum, EMMW Participant 05 stated;

“Previously we had an advantage of locum nurses to cover the shortage because they were paid in good time. But these days they are demotivated as it takes three to four months before they are paid their locum money. Others also complain that the money is little compared to the long hours that they work. Night shift is sixteen hours, and they get 3, 600 Malawi Kwacha (K3, 600) while for the day shift it is K3, 200. Others go to private clinics where they are paid about K5, 000 or K6, 000”.

Another participant explained about patients that are transferred from the district hospital in a very serious condition which can be challenging to manage;

“Sometimes we get patients late and in critical condition. There was this woman who had multiple gestations. She gave birth through the caesarean section to live twins. The woman had anemia and started gasping after delivery. There was no blood to transfuse her at the district hospital and so she was referred to our hospital. Her Hb (hemoglobin) was 1.8 gram, so we rushed to the laboratory to get blood. Fortunately, we got 2 pints of blood which we transfused the woman. We were lucky that there was blood in the lab otherwise there are days when you find there is no blood. The woman survived”. EMMW Midwife 01

In addition, reasons for delay included referring patients in an already complicated state. EMMW Midwife 05 said;

“On maternal near-miss, some of the cases which we have been having like the referred cases from districts and community hospitals, they are brought in a very complicated state. Others do survive others die and sometimes we feel they are brought in late after all complications have already arisen and there’s very little that we can do.

Delay was also expressed in terms of the client’s religious beliefs in relation to blood transfusion as expressed by EMMW Midwife 08

“Usually, the main problem we have is the blood issue plus that’s the main issue for Jehovah Witnesses you know they don’t accept blood. So that’s some of the challenges we face. We try to talk to them explain to them the advantages, respecting their beliefs, some refuse completely but others accept to be transfused. So, we go according to what they feel like, and we do not force them to get the blood”.

Similarly, delays on the patient’s side were noted as lamented by EMMW Midwife 07

“I think we should encourage our pregnant women to go to the hospital rather than going to the traditional birth attendant for delivery. There they lose the baby and they (Traditional Birth Attendant) refer them late to the hospital when they see many complications. We have this woman who attended a Traditional Birth Attended and was only referred after her uterus ruptured and she was bleeding. She delivered a fresh stillbirth”.

4.6.3.3 Negative attitude

Poor attitude was mentioned as a factor contributing negatively to the quality of care with some senior midwives stating that the conduct of some midwives shows a lack of dedication.

“Umh, I think most people who are working these days don’t apply the skills that they were taught at school. They are full of shortcuts. Most of the midwives these days are on the phone and yet they have not distributed the drugs or monitoring the women. They spend their time chatting. The patient most of the time is left alone, we don’t have time to chat with the patient. Sometimes just talking to the patient helps to improve their condition because maybe they have just seen that our relationship with the nurse is just very good. Over and above getting drugs, if the relationship with the nurse is good, the patient improves quickly. But most of the nurses...we are harsh”, said EMMW 04.

4.6.3.4 Lack of knowledge

Some participants attributed lack of knowledge and skills to poor quality of care.

When asked to elaborate on lack of knowledge and skills, EMMW Midwife 04 lamented,

“I think most people who are working these days they don’t apply maybe the skills that they were taught at school. They are full of shortcuts most of them.”

The concern on lack of knowledge was echoed by EMMW Midwife 05

“I don’t know whether all midwives know what a partogram means because we have been having cases where actually the partogram is almost finished; cases which are usually referred from XX community hospital. The challenge is most of the health centres apart from Health center YY do not bring the labour chart when bringing patients with prolonged labour. So, I don’t know if midwives can be oriented further on how to interpret the labour chart because we once had a case which was referred to as prolonged labour only to discover that it was a ruptured uterus from XX community hospital. XX community hospital has a lot of complicated cases umh”.

Another participant stated: *“Sometimes it would be the challenge of lack of knowledge on how to manage such a condition, or at times may be the attitude of that particular staff.... One is supposed to provide the care but maybe sometimes they are not interested in doing that.”* CMW Midwife 10

4.7 Conclusion

The chapter presented the findings of the study according to objectives. Age, marital status, occupation of woman, mode of admission, antenatal care received, the reason for admission, history of caesarean section, mode of birth and fetal presentation were highly associated with a state of maternal near-miss while there was no association between state of

maternal near-miss with a number of pregnancies and history of abortion. Furthermore, perceptions of midwives on quality of care, factors promoting quality of care and factors hindering quality of care were presented. The narratives from the interviews with midwives were also presented. The next chapter discusses the key study findings and their implications. Integration of the quantitative and qualitative strands of the study is done in the discussion.

CHAPTER 5

DISCUSSION

5.1 Introduction

The previous chapter presented the findings of the study. The discussion section presents the meaning of the results of the study on determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals. The study sought to address the objectives to 1) establish the demographic, socioeconomic and obstetric characteristics of maternal near-miss cases; 2) establish the determinants of care associated with maternal near-miss cases, 3) assess the quality of antenatal, labour and postnatal care provided to maternal near-miss cases; and 4) describe the midwives experiences of the quality of care provided to maternal near-miss cases. The discussion is presented according to objectives and also includes study strengths, limitations, policy implications, recommendations and conclusion. Integration of findings of both quantitative and qualitative strands of the study is done in the discussion in line with the convergent design method.

5.2 Magnitude of maternal near-miss

It is important to have a clear understanding of the magnitude and associated factors of maternal near-miss in a particular setting to improve maternal outcomes. Evidence shows that the incidence of maternal near-miss varies across different settings due to criteria used to identify cases (Kaye et al., 2011; Tunçalp et al., 2012). In the systematic review by Tunçalp et al. (2012) prevalence ranged between 0.6-14.9 percent for disease-specific criteria. The

magnitude was higher in low and middle resource countries of Asia and Africa. Incidence of maternal near-miss for Scotland and Italy were 3.8 and 2.1% respectively (van Roosmalen & Zwart, 2009). This study revealed that the magnitude of maternal near-miss in the local setting is very high (35.1%, n=161). This is not comparable with the magnitude of maternal near-miss that were found in Ethiopia (5% to 29.7%) (Kumela et al., 2020). This could be explained by qualitative data from midwives who reported that lack of resources, delayed care, lack of knowledge and skills compromise the care they provide to women. Consistent with this, Kumela et al. (2020) asserted that an increase in the magnitude of maternal near-miss can be attributed to delays at home, on the way to health facilities and at the health facility itself. Necessary interventions must be put in place to reduce the number of maternal near-miss in the local setting.

5.3 Demographic, socioeconomic, and obstetric characteristics of maternal near-miss cases

This study suggests that demographic characteristics (marital status, occupation, admission mode, means of transport and age) of maternal near-misses and the non-cases significantly differ. This is consistent with Adeoye et al. (2013) who found that an unmarried woman had three times the chances of having a maternal near-miss compared to married. This may be partly attributed to a lack of financial support which potentially disadvantages unmarried women by impeding their ability to access health and social services. Many women in Malawi lack formal employment which makes them dependent on their partners and other relations (National Statistical Office [Malawi] & ICF International, 2016). In addition to marital status and occupation, there is also evidence that indicates that age, parity and number of previous deliveries are linked to maternal near-miss (Ali et al., 2011; Almerie

et al., 2010). This is consistent with the findings of this study which showed that there were significant differences in the ages of women in maternal near-miss and non-cases groups.

Some previous studies found that age is significant to maternal near-miss (Adeoye et al., 2013; Aduloju et al., 2018; Akrawi et al., 2017; Gwedeza Kuyeli, 2013; Mekango et al., 2017). There is evidence that showed that being below the age of 16 years at first pregnancy was a predictor of maternal near-miss (Mekango et al., 2017). Younger women may be more vulnerable to obstetric complications including maternal near-miss because their bodies are not fully physically developed or may be victims of adverse social consequences of teenage pregnancies. There is evidence which indicates that advancing maternal age is a determinant of maternal near-miss with medical conditions like hypertension and diabetes occurring in older age complicating the pregnancy (Aduloju et al., 2018; Galvão et al., 2014). However, some studies found that age was not significantly associated with maternal near-miss in Iraq (Akrawi et al., 2017) and Uganda (Nakimuli et al., 2016). This may be possible due to intervening factors including having a supportive partner which may mitigate the effects of age in relation to maternal near-miss.

The obstetric characteristics that were found to be significantly associated with maternal near-miss in this study were fetal presentation, mode of birth, birth status and child sex. Furthermore, the reproductive health history of participants in relation to maternal near-miss varied. A study by Kumela et al. (2020) found that lack of antenatal care was linked to maternal near-miss. This is consistent with the findings of this study which showed that a significant number of women in the maternal near-miss cases (29.1%, n=47), did not attend antenatal care. Conversely, antenatal care helps in preventing adverse maternal outcomes through early detection and treatment of conditions that may threaten the health of the

fetus/newborn and/or the mother (Cumber et al., 2016). Therefore, one may argue that it is very important that all pregnant women access antenatal care if maternal near-miss cases are going to be reduced.

5.4 Determinants of care associated with maternal near-miss cases

This study suggests that age and mode of birth were the two determinants that were strongly associated with maternal near-miss. Literature indicated that age of >30 years is associated with maternal near-miss (Aduloju et al., 2018; Galvão et al., 2014; Oliveira et al., 2014; Rocha Filho et al., 2015). This agrees with the findings of this study which revealed that women aged 31-35 years had 4 times higher chances of experiencing maternal near-miss compared to those less than 20 years of age. The explanation could be that older women tend to acquire chronic diseases throughout their lifetime which predispose them to complications in pregnancy (Galvão et al., 2014; Rocha Filho et al., 2015). Rocha Filho et al. (2015) purported that women aged over 30 years had adverse maternal outcomes due to postpartum haemorrhage. This may imply that targeted perinatal care for these women is essential to reduce the occurrences of maternal near-miss cases.

In this study, women who had laparotomy for uterine rupture had 83 times higher chances of being a maternal near-miss case while those who had emergency caesarean had 4 times higher chances compared with those who had a vaginal birth. These findings are in agreement with other studies from Brazil and Ethiopia which reported that caesarean section was associated with maternal near-miss (Galvão et al., 2014; Kasahun & Wako, 2018; Mekango et al., 2017). This may be explained by qualitative findings of this study which indicated that patients are not taken to the theatre on time because of a shortage of staff and

consequently are lost due to delay. Health workers should be equipped with skills to strengthen obstetric maternal and newborn care management.

There is evidence that showed that delays at home, on the way to health facilities and at the health facility itself play substantial roles in increasing the magnitude of maternal near-miss (Kumela et al., 2020) associated with caesarean section. However, previous caesarean section was not associated with maternal near-miss in this study. Consistent with this finding, Litorp et al. (2016) established that previous caesarean section was not a risk factor for severe maternal outcomes in Tanzania. On the contrary, findings from other studies (Adeoye et al., 2013; Galvão et al., 2014; Mekango et al., 2017) indicate that history of caesarean section and chronic illness are determinants of maternal near-miss. Previous caesarean section scar predisposes a woman to uterine rupture if vaginal birth is attempted (Mekango et al., 2017). Therefore, it remains logical for clinicians to be alert of women with a history of the caesarean section because they may develop severe maternal outcomes including maternal near-miss in the intrapartum and postpartum periods.

5.5 Midwifery interventions and complications of maternal near-miss cases

The findings of this study showed that blood transfusion was significantly associated with maternal near-miss with 55.4% (n=89) of maternal near-miss cases having a blood transfusion. The majority of the maternal near-miss cases (85.9%, n=138) had complications identified during hospitalization including haemorrhage, pre-eclampsia/eclampsia, puerperal sepsis, severe anaemia and ruptured uterus among others. In addition, 57.7% of women in the maternal near-miss group had haemoglobin levels below 11grams per deciliter. This result concurs with findings from a survey that revealed that almost a third (33%) among women

aged 15-49 years in Malawi were anemic (National Statistical Office [Malawi] & ICF International, 2016). This is higher than anaemia levels from studies in other developing countries which ranged from 9.1% to 21.2% (Adeoye et al., 2013; Kasahun & Wako, 2018; Mustafa & Hashmi, 2009). This indicates that the availability of blood for transfusion is essential for clinicians to prevent maternal near-miss. However, the non-availability of blood products accounted for 12.3% of delays in the management of women in the perinatal period in Nigeria (Mbachu et al., 2017). This is supported by qualitative findings from this study which revealed that sometimes midwives fail to provide proper care because blood may not be available for a patient with a postpartum haemorrhage. Furthermore, these midwives reported that they were able to save the lives of women who had a postpartum hemorrhage in incidences where blood and blood products were readily available.

5.6 Quality of antenatal, labour, and postnatal care provided to maternal near-miss cases

This study identified that the two facilities complied with standards of care with regard to infrastructure according to the adapted World Health Organization Quality of Care Assessment tool. However, it was observed that there was an erratic supply of reagents, test kits, blood products and drug supplies in the settings. This was corroborated by qualitative data from midwives who reported that basic medical supplies including gloves, cotton wool and cannulas were mostly available in the wards. However, midwives also reported that sometimes they improvise in situations where medical supplies are not available to the extent of requesting guardians of the pregnant women to source resources elsewhere. Similarly, in their study, Bogren et al. (2018) midwives cited the challenge that is there when emergency

drugs are not available especially at night where relatives seek the drugs in private pharmacies.

It is documented that lack of essential supplies, equipment, human resources and inadequate infrastructure hinder the provision of quality midwifery care in low resource settings. (Bogren et al., 2018; Geller et al., 2018; Homer et al., 2018). This shows that the quality of midwifery care provided to women is dependent on both structure and processes in the health system (Raven et al., 2012). This is corroborated by numerous contributors to the body of knowledge who indicated that several components key to promoting quality of care including: effective practices, the organization of care, availability, accessibility, acceptability and the quality of care are inter-linked (Homer et al., 2018; Renfrew et al., 2014; ten Hoope-Bender et al., 2014).

In this study it was also observed that the quality of care offered to women was below standard because some patients were not checked blood pressure, emergency care were not performed within 30 minutes of diagnosis, no handovers were made when transferring patients from theatre to postnatal ward. This may explain the high rate of maternal near-miss (35.1%, n=161) that was found in this study. Furthermore, qualitative data from midwives attributed the occurrence of maternal near-miss to shortage of staff, inadequate knowledge and skills of staff, and equipment. Issues of poorly equipped facilities coupled with inadequate skills of health workers to handle emergency obstetric care situations were mentioned as associated with maternal near-miss. This result is supported by Tunçalp et al. (2015) who recommended that health workers should be equipped with adequate skills to handle obstetric emergencies for better maternal and newborn outcomes.

There is evidence which indicates that having adequate and well-trained midwives may improve the quality of care and may sustain a decrease in maternal and newborn mortality (Filby et al., 2016). Nevertheless, this study found that staffing levels at both study settings were consistently inadequate ($\leq 50\%$ of the hospital recommended staffing levels) in all departments during all shifts. Qualitative data from midwives reported that shortage of human resources was a hindrance to the provision of quality care during the interview of participants in the study. Midwives reported situations where only two midwives instead of four or five in an ideal situation would cover a shift resulting in work overload and negatively impacting patient outcomes. However, the midwives cited the collaboration and teamwork that existed with other health workers like doctors, anesthetists and laboratory technicians which enabled them to provide better care. This concurs with the statement in support of interprofessional collaboration (WHO, 2010) which states “health workers who are able to identify key strengths of each member of the health care team and use these strengths to manage complex health issues of maternal health would assist reduce the alarming maternal and newborn mortality statistics”. It was also reported in the narratives by midwives that nurse/midwives on locum who come to work during their spare time (or when off duty) at a fee, assist to cover the shortage of human resources. However, it was indicated that midwives were disgruntled due to the money that was paid for locum as it was on the lower side compared to what was offered at other private health facilities. According to (Bogren et al., 2020; WHO, 2010) health workers are challenged with providing health services in the face of increasingly complex issues.

The availability of human resources with competent skills and material resources would enable health workers to provide routine, evidence-based care and management of

complications during labour, childbirth and the antenatal period to every woman and newborn care (Homer et al., 2018; Renfrew et al., 2014). The World Health Organization emphasizes the importance of human resources for health as being very crucial for the functioning of health systems and that health systems depend on the availability, accessibility, acceptability and quality of human resources for health (WHO, 2010). Countries are thus requested to strengthen the content and implementation of human resources for health plans as part of long-term national health and broader development strategies to strengthen health systems (World Health Organization, 2016). They should ensure consistency between health, education, employment, gender, migration, development, cooperation and fiscal policies. Malawi's vision 2063 envisions the provision of a comprehensive health care system through interventions that will address shortfalls in the recruitment, distribution and retention of health workers to strengthen reproductive, maternal, neonatal, child and adolescent health (Government of Malawi, 2020). In addition, the vision seeks to improve the availability and quality of health infrastructure, medical equipment, medicines, and medical supplies; and explore innovative and sustainable financing for health.

However, the staff shortages in the local setting pose a challenge to ensuring the provision of quality care. According to a study by Bogren et al. (2018) shortage of midwives resulted in increased workload and insufficient care with poor patient outcomes in Bangladesh. In this study, midwives reported that poor attitude of health workers impede the provision of quality care and contributes to maternal near-miss. There is evidence that showed that negative attitudes of health workers undermined health care seeking and affected patient well-being (Mannava et al., 2015). Similarly, in our study midwives lamented over the negative attitude portrayed by some midwives in terms of their conduct of staying on the

phone and ignoring patient care. It can be implied that negative attitude of midwives may discourage women from seeking health services and end up shying away from institutional deliveries. A study conducted in Tanzania and Zambia to explore the intrapartum experiences of women, partners and different health providers reported that women viewed poor behavior of health workers as a lack of professionalism (Lavender et al., 2021). The WHO quality of care framework for maternal and newborn health which was used for this study has domains of provision and experience of care. The provision is by the provider, in this case, the midwife who is expected to communicate with the client but spends time on the phone instead of monitoring the woman. In such a way the woman's condition may deteriorate without the midwife's attention and affect the outcome. In the domain of experience of care, there is respect and preservation of dignity for the woman who is giving birth (Tunçalp et al., 2015). Furthermore, Lavender et al. (2021) concur with the WHO quality of care framework for maternal and newborn health that quality of maternal and newborn care is integral to positive health outcomes. This finding suggests that interventions for reducing maternal near-miss occurrences should also address attitude issues of health workers involved in the provision of obstetric care. In a study by (Homer et al., 2018) it was reported that some countries called for punitive measures to address malpractices and misbehaviors. Furthermore, respectful care is a fundamental human right for women and babies as stipulated in the WHO's intrapartum guidelines as it contributes to a positive childbirth experience (Lavender et al., 2021). Poor attitude towards women impinges on the right to access care.

The WHO quality of care framework for maternal and newborn health identifies three domains of structure, process and outcomes (Tunçalp et al., 2015). In this study, the structure

for the two facilities as observed using the WHO Quality of care assessment tool scored well showing compliance with standards of care. However, equipment and supplies were not adequate as indicated by midwives where one had to move between wards looking for an oxygen concentrator for a woman who had a postpartum hemorrhage and needed oxygen. This concurs with the statement that increasing complex challenges in health systems affect care provision (WHO, 2010). With regards to the process of care domain, one of the two facilities in the study had a score of 3 on prevention and management of preterm labour indicating some need for improvement. This requires efforts for improvement to fulfil the quality statement that women with preterm labour receive appropriate care according to guidelines (World Health Organization, 2016). In agreement with the requirement by World Health Organization that health systems can only function when there is availability, accessibility, acceptability and quality health workforce and materials including that health workers are adequately supported by the system (World Health Organization, 2016).

5.7 Midwives' experiences of quality of care provided to maternal near-miss cases

In this study, quality of care was determined by several things including number of staff, skills of staff, and equipment. Issues of poorly equipped facilities coupled with adequate skills of health workers to handle emergency obstetric care situations were mentioned as associated with maternal near-miss. The High Dependency Unit (HDU) at both Kamuzu Central and Queen Elizabeth Central Hospitals was cited as a ward where it was possible to give good care due to the few beds that enable strict monitoring of patients as opposed to a general ward with many women.

Midwives indicated that the lower number of beds in HDU allowed for better access to good quality of care as the medical personnel were adequate to take care of the few women. It was further indicated that the unit was well stocked with medicines and supplies. This result is supported by Tunçalp et al. (2015) who recommended having health workers that are well equipped with adequate skills to handle obstetric emergencies for better maternal and newborn outcomes. The narratives from the midwives in the study support the findings from the observations made by the quality improvement assessors at both hospitals who indicated scores of 4 and 3 for essential drugs and blood products as well as laboratory respectively. A score of 4 meant little need for improvement to reach a standard of care, while a score of 3 meant there is some need for improvement to reach standards of care. Furthermore, care was said to be conditional depending on the situation at that particular time where it was good if resources were available and poor where there was a shortage of material or human resources. This was because close monitoring of very sick women was a challenge when there were few midwives on duty against many women in labour. The few midwives would spend more time managing the rest of the women such that at times they would miss administering a particular drug on schedule. It was cited, as an example, that there are usually two midwives on duty in a 20-bed labour ward, with 30 to 40 deliveries conducted per night, instead of the recommended 5 midwives. In some cases, care was sub-optimal or below standard due to lack of resources, work overload as well as delayed care at the district before referral.

The implication of not commencing emergency obstetric care interventions before a referral is that the client's condition deteriorates such that even though interventions may be made on arrival at the next facility, the prognosis would be poor. This concurs with reports

from other studies (Aduloju et al., 2017; Gebrehiwot & Tewolde, 2014) which attributed poor maternal outcomes in maternal near-miss cases to delays in referral as well as initiating care after arriving at the referral facility. Similarly, in a study by (Mgawadere et al., 2017) delays before receiving treatment, shortage of drugs and non-availability and incompetence of skilled staff were some of the major causes of type 3 delay. Some of the midwives interviewed in this study expressed delayed care as the time it took to transfer a woman from when a decision was made, to when the woman arrived at the referral facility. Furthermore, it was indicated that life-saving interventions like taking blood samples, commencing intravenous infusions and administering prophylactic antibiotics was not done prior to sending the woman to the referral facility impacting negatively on the maternal outcomes.

Midwives interviewed in this study purported that skills in emergency obstetric and newborn care improved maternal and newborn outcomes. It was explained that the application of the non-pneumatic anti-shock garment on women with postpartum hemorrhage improved the pumping of blood from lower extremities to vital organs like the heart and lungs thereby preventing women from going into shock. In addition, it was mentioned that the ward-in-charge ensured the capacity building of all health workers in the ward on the use of the non-pneumatic anti-shock garment for maximum impact. Furthermore, skills drills and simulations that were conducted among teams of different professions, enhanced their skills, teamwork and collaboration. This concurs with literature that cites “interprofessional collaboration in education and practice is likely to ensure a fit for purpose workforce is developed” (Homer et al., 2018; WHO, 2010).

This study interviewed midwives on the quality of care provided to maternal near-miss cases, addressing the ‘provision of care’ component in the WHO quality of care

framework for maternal and newborn health that was used in this study. The component on ‘experience of care was not addressed since it was the records of the women who were maternal near-miss that were reviewed. This is contrary to the study by Adeoye et al. (2013) that interviewed the women who were maternal near-miss, thereby able to get first-hand information on the women’s experiences. There is evidence that getting the experience of the women that survived complications of pregnancy may assist policy makers on areas that need improvement as they would tell the stories of the care they received (Kaye et al., 2011; Mbachu et al., 2017).

5.8 Study Strengths and Limitations

These study findings might have been affected by selection bias because they included patient records that were available at the time of data collection. The exclusion of Clinical Officers and Doctors from qualitative interviews in the study creates a gap in perspectives of valuable players in the management of maternal near-miss cases. The disease-based criteria that were used to identify maternal near-miss cases was another limitation in that definition of conditions may not always be straightforward (e.g., not all women with pre-eclampsia nearly die). The findings of this study must be applied in other settings with caution because they may not be representative beyond the two central hospitals. This study might have missed some seasonal variations in maternal near-miss that occurred during January and August to December 2017 which were not included in the study.

5.9 Recommendations for Policy, education, practice, and research

The following recommendations with regards to policy, practice, education, and future research are made based on the findings of this research study:

5.9.1 Policy

1. To achieve the required standards of care for reducing and managing maternal near-miss cases there is a need to review laboratory and hospital policies
2. Maternal near-miss cases occur more than maternal deaths. Midwives indicated that it was possible to observe problems and obstacles during the provision of care to maternal near-miss cases that contributed to preventing maternal deaths. To reduce preventable deaths and reduce maternal mortality, there is a need to include auditing of maternal near-miss cases as part of Maternal Death Surveillance and Response.
3. Midwives cited the Non-pneumatic anti-shock garment to have prevented women who developed postpartum haemorrhage from going into shock. The Non-pneumatic anti-shock garment should be promoted in the management of postpartum haemorrhage.

5.9.2 Practice

1. Among pregnant women, health workers need to pay close attention to factors such as age and mode of birth for them to implement targeted maternal health services to reduce incidences of maternal near-miss cases.
2. There were some missing data during the collection of information from records of maternal near-miss cases. There is a need for midwives to strengthen the documentation of all interventions performed in women's record files.

3. Information from in-depth interviews with midwives indicated that some maternal near-miss cases were referred from the district hospitals without commencing some critical initial management such that patients arrived at the referral facility in critical condition. Health workers need to be equipped with adequate skills to handle obstetric emergencies for better maternal and newborn outcomes. Staff in the obstetric unit should undergo regular training in emergency obstetric services, managing complications and emergency drills for improvement of skills.
4. High Dependency Units were cited to promote the provision of quality care as there were fewer beds that allowed for strict monitoring of patients. There should be the provision of evidence-based protocols within the obstetric unit and HDU for improved management of critical conditions.
5. Midwives indicated that there was teamwork and collaboration among health professionals in the management of maternal near-miss cases which contributed to positive patient outcomes and saved some pregnant women from dying. Interprofessional collaboration and teamwork should be strengthened.
6. Shortage of material and human resources was observed in the study facilities and midwives also cited shortages of both human and material resources as hindering the provision of quality care. Observations of the study facilities indicated staffing were below recommended establishment hence there is a need for management to increase staffing levels for improved provision of quality maternal and newborn care. There is evidence showing that health workers are challenged/tasked with providing health services in the face of increasingly complex health issues (WHO, 2010). Countries are thus requested to strengthen the content and implementation of human resources for

health plans as part of long term national health and broader development strategies to strengthen health systems (World Health Organization, 2016). There is a need for hospital management to avail adequate material resources and supplies for quality maternal care.

7. It was indicated from interviews with midwives that some midwives had poor attitudes which contributed negatively to maternal outcomes. Lavender et al. (2021) indicated the importance to include respectful care as an integral part of quality maternal and newborn care for positive clinical, social, and psychological outcomes. Facility managers need to put measures to address poor attitudes by strengthening respectful maternity care among all midwives.

5.9.3 Research

1. Quality of care comprises of two aspects of provision and experience of care. There is a need to conduct further research on the component on ‘experience of care’ which was not addressed in this study since it used the records for women.
2. The study focused on maternal near-miss cases and did not collect data on maternal deaths. There is a need to conduct a study comparing the prevalence of maternal near-miss cases and maternal deaths.

5.9.4 Education

1. Training institutions should review the competence-based curriculum to address the gap in maternal near-miss.

2. Training institutions should have a skills laboratory for students to improve the management of obstetric emergencies. As such midwifery students should be equipped with adequate skills to handle obstetric emergencies for better maternal and newborn outcomes.

5.10 Unique contributions to the field

In conclusion, this study has documented unique contributions it has made to the field. It has been found that the magnitude of maternal near-miss in the local setting is very high (35.1%, n=161). The demographic characteristics that were significantly linked to maternal near-misses in the local setting are marital status, occupation, admission mode, means of transport and age. The obstetric characteristics that were significantly associated with maternal near-miss were fetal presentation, mode of birth, birth status and child sex. However, age and mode of birth were strong determinants of maternal near-miss. Women aged 31-35 years had significantly 4 chances of experiencing maternal near-miss. Women who had laparotomy for uterine rupture had 83 chances of being a maternal near-miss case while those who had emergency caesarean had 4 times chances compared with those who had a vaginal birth. Using the adapted World Health Organization Quality of Care Assessment tool, the quality of care offered to women was found to be below standard and this was corroborated by reports from midwives who stated that some patients were not checked blood pressure, emergency care were not performed within 30 minutes of diagnosis, no handovers were made when transferring patients from theatre to postnatal ward based on information from interviews with midwives.

5.11 Conclusions

The magnitude of maternal near-miss was very high compared to other parts of Africa and numerous preventable determinant factors were identified. In addition, the quality of care provided to maternal near-miss cases was below standard. It is essential that Malawi should include maternal near-miss ratio as an indicator for evaluating its maternal health services.

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APPENDICES

Appendix 1: Consent form

Study title: Determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals, Malawi

A. Participant Information

The Principal Investigator seeks to study the determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals, Malawi. The World Health Organization defines a maternal near-miss as a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy (WHO, 2011). The study is being conducted in fulfilment of the requirements for the PhD in Interprofessional Health Care Leadership.

Study goal- The broad objective of the study is to describe the determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals, Malawi. Findings of the study would lead to the formulation of recommendations that would inform policy, education and practice to improve quality of care and contribute to the reduction of maternal mortality.

Type of data- Individual in-depth interviews lasting for about 30 to 45 minutes will be conducted in a private room identified within the ward to describe the midwives' experiences of quality of care provided to maternal near-miss cases. The interview will be recorded. The interview will be conducted to midwives that have worked for six months or more in the antenatal ward, labour ward, postnatal ward or high dependency unit because these are the health workers that spend twenty-four hours every day with women who develop complications in labour and survive (maternal near-miss).

Confidentiality pledge- Information collected from the participants will be kept confidential but could be used for publications or presentations. Anonymity will be maintained.

Voluntary consent- Participation is strictly on a voluntary basis and one is not obliged to participate in the study if she/he does not feel like it.

Right to withdraw- Participants can withdraw from the study at any time that they feel like and would not have any negative consequences for withdrawing from the study.

Any payment for participation in the study- There will not be any payment for participating in the study.

Any study benefits- The study findings would inform policy, education and practice in terms of interventions to improve quality of care and contribute to the reduction of maternal mortality.

Any risks for participating in the study- There are no foreseeable potential risks associated with participating in the study.

Sponsorship for the study- The PhD for Interprofessional Health Care Leadership is sponsored by the Bill and Melinda Gates Foundation.

If you agree to participate in the study, you will sign on two forms one of which will be left with you.

Contact information- In case of questions, comments or complaints about the study, contact Fannie Kachale on 0888586 485 or Professor Ellen Chirwa on 0888940513 or Chairperson COMREC, P/Bag 360 Blantyre 3, phone 0187911

B. Informed consent form

I understand that I have been requested to participate in a study at Chatinkha Maternity Wing at Queen Elizabeth Central Hospital/ Ethel Mutharika Maternity Wing at Kamuzu Central Hospital. The study will find out factors/elements determining care for women who almost died from complications of pregnancy but survived. Upon my agreement to participate, I will be interviewed in a private room identified within the ward for a period of 30 to 45 minutes on my experiences of the quality of care provided to women who almost died from complications of pregnancy but survived. The interview will be tape-recorded and there will be no information linking it to my name/identity when transcription will be done.

I understand that study data will be kept confidential but could be used for publications or presentations.

I realize that I can only participate in the study if I have worked for six months or more in any of the following departments: antenatal ward, labour ward, postnatal ward or high dependency unit. Participation is voluntary and I can withdraw from the study at any time that I feel like not participating. I will not be reprimanded for withdrawing from the study.

I understand that knowledge gained from the study would benefit me or other pregnant women in the future.

I understand that there is no payment for my participation in the study. There are no potential risks associated with my participation in the study.

If I need information for further clarification, comments or complaints I can contact Fannie Kachale on 0888586 485 or Professor Ellen Chirwa on 0888940513 or Chairperson COMREC, P/Bag 360 Blantyre 3, phone 0187911

The study has been explained to me and all questions that I had have been responded to. I agree to participate and understand that a copy of the signed consent form will be shared with me.

Signature of participant

Date

Signature of Investigator

Date

Appendix 2: Data collection tools

Appendix 2A: Maternal near-miss data collection tool

Adapted from LSTHM

Questionnaire Serial Number

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STUDY ON DETERMINANTS OF CARE FOR MATERNAL NEAR-MISS CASES AT KAMUZU AND QUEEN ELIZABETH CENTRAL HOSPITALS, MALAWI

Instructions	The target population is specified in the title of each section. Certain sections can be skipped according to the patient. If the information is not known, record a "9" in the field.
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Instructions	The target population is specified in the title of each section. Certain sections can be skipped according to the patient. If the information is not known, record a "9" in the field.		
PQ1. Caesarean		PQ5. Neonatal death	
PQ2. Maternal near-miss		PQ6. Stillbirth	
PQ3. Maternal death		PQ7. Twins	
PQ4. Caesarean		PQ8. Breech presentation	
		PQ9. Vacuum	

A.1.	IDENTIFICATION		
	<i>All women included in the study sample</i>		
A1.1.	Health facility name	A1.10.b.	Admission mode
			Self-referred

			Referred from another facility	
A1.2.	Health facility code 	A1.11.	If referred, Name of referring facility 	
A1.3.	Woman's ID Number 	A1.12.	Date of arrival at referring facility d d m m y y	
A1.4.	Date form filled d d m m y y	A1.13.	Time of arrival at referring facility : h h m m	
A1.5.	Researcher's name 	A1.14.	Date of decision to refer d d m m y y	
A1.6.	Woman's name 	A1.15.	Time of decision to refer : h h m m	
A1.7.	Village's name 	A1.16.	Date of departure from the facility d d m m y y	
A1.8.	District	A1.17.	Time of departure from the facility	

			h h m m
A1.9.	Admission date d d m m y y	A1.18.	Means of transport used Ambulance Private car Minibus Bicycle Hired car Other (specify)
A1.10.a.	Admission time h h m m	A1.19.	Time of arrival at the referral facility h h m m

A.2.	DEMOGRAPHICS CHARACTERISTICS		
A2.1	Age	A2.3.	Woman's occupation A B
A2.2	Marital status Married Single Widowed Other (specify)	A2.4.	Partner's occupation A B

A3.	REPRODUCTIVE HEALTH HISTORY <i>All women included in the study sample</i>		
A3.1.	Number of pregnancies 	A3.11.	Was the fetal heartbeat audible upon admission? Yes No Not Not perceived measured
A3.2.	Number of live births 	A3.12.	Date of birth or end of pregnancy d d m m y y
A3.3.	Number of stillbirths 	A3.13.	Time of birth or end of pregnancy : h h m m
A3.4.	Number of children alive (today) 	A3.14.	Gestational age Estimated at term Estimated pre-term
A3.5.	Number of children died 		
A3.6.	Number of children alive (today) 		

		☐	☐		Estimated post-term	☐	
A3.7.	Does the woman have a history of caesarean or abdominal scar?	☐ ☐ Yes No			Unknown	☐	>> A3.17.
				<i>If known A3.8</i>			
A3.8.	Does the woman have a history of abortion?	☐ ☐ Yes No		A3.15.	Weeks of amenorrhea?	☐ ☐	
A3.9.	Did the women receive antenatal care?	☐ ☐ Yes No		A3.16.	Month of pregnancy	☐ ☐	
A3.10.	Reason for admission						
	Normal birth	☐					
	Complicated birth	☐					
	Extra-uterine pregnancy	☐					
	Other complication during birth	☐					
	Prophylactic caesarean	☐					
	Abortion, miscarriage, or post-abortion complication	☐					

	Postpartum complication			
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If abortion, miscarriage or extra-uterine pregnancy: go to A3.21

A3.17.	Mode of birth	
	Vaginal - perineum intact	
	Vaginal – episiotomy	
	Vaginal - with tears	
	Vaginal - not specified	
	Instrumental - vacuum/forceps	
	Planned caesarean	
	Emergency intrapartum caesarean	
	Emergency antepartum caesarean	
	Laparotomy for uterine rupture	
	Destructive - symphysiotomy	
	Destructive - craniotomy/embryotomy	
Unknown		

<i>Were the following interventions done?</i>		
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A3.18.	Hysterectomy	A3.21	Specify (summarize main events)			
	<table border="1"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>Yes</td> <td>No</td> <td>Don't know</td> </tr> </table>					
Yes	No	Don't know				

A3.19.	Blood transfusion Yes No Don't know		
<i>If yes</i>			
A3.20.	Number of units required 		
A3.21.	Number of units transfused 		
A3.22.	Date of laboratory test d d m m y y		
A3.23.	Time of laboratory test : h h M m		
A3.24.	Date of beginning of transfusion d d m m y y	A3.28	Vital status of woman at discharge Alive Dead

A3.25.	Time of beginning of transfusion h h : M m	A3.29	Date of discharge d d : m m : y y or Date of death of woman d d : m m : y y
A3.26.	Was a complication identified during hospitalization? Yes No Don't know	A3.30	Time of discharge h h : m m or Time of death of woman h h : m m
<i>If Alive</i>		<i>If Dead</i>	
A3.31	Mode of exit Normal discharge Left against medical advice Referred to other hospitals	A3.36	Time of death Dead on arrival Dead between arrival and admission Dead in the first 24hrs Dead after 24hr
<i>If referred</i>			

A3.32	Referral facility name		
A3.33	Reason for referral		
A3.34	Date of decision to refer		
	D d m m y y		
A3.35	Time of decision to refer		
	h h : m m		

A.4 SERIOUS COMPLICATIONS			
<i>All women with complications or dead</i>			
A4.	Haemorrhage		
		Yes	No
	Placenta praevia	☐	☐
	Placenta accreta/increta/percreta	☐	☐
	Retro-placental haematoma	☐	☐
	Other first trimester haemorrhages	☐	☐
	Haemorrhage during birth (no other specification)	☐	☐
	Uterine rupture	☐	☐
	Postpartum haemorrhage (no other specification)	☐	☐
	Other obstetric haemorrhages	☐	☐
A5.1	Infection		
		Yes	No
	Unspecified infection	☐	☐
	Puerperal endometritis	☐	☐
	Pyelonephritis	☐	☐
	Septicaemia	☐	☐
	Peritonitis	☐	☐
	Parietal suppuration	☐	☐
	Malaria	☐	☐
	Other systemic infection	☐	☐
A5.2	Dystocia		
		Yes	No
	Uterine pre-rupture	☐	☐
	Prolonged labour	☐	☐
A5.3	Feto-pelvic disproportion	☐	☐
	Other pathologies		
A4.	Hypertension		
		Yes	No
A5.3	Other pathologies		
		Yes	No

	Pre-eclampsia	☐	☐		HIV/AIDS	☐	☐
	Eclampsia	☐	☐		Embolic diseases	☐	☐
	HELLP	☐	☐		(thrombosis/amniotic fluid or gaseous embolism		
	Chronic hypertension	☐	☐		Heart disease	☐	☐
A4.	a. Anaemia (Hb < 11g/dl)	☐	☐		Sickle-cell disease	☐	☐
		Yes	No		Other (specify:		
b. Haemoglobin level (g/dl)							
	c. Unknown						

A5.	NEWBORN					
	<i>All new born (included stillborn fetuses)</i>					
A5.1.	Total number of new born			A5.9.	Specify neonatal complications	
A5.2.	New born 1 Cephalic Breech Transverse/face/ brow Other	New born 2 Cephalic Breech Transverse/face/ brow Other			New born 1	New born 2
A5.3.	Sex					

	New born 1 Female ☐ Male ☐ Unknown ☐	New born 2 Female ☐ Male ☐ Unknown ☐			
A5.4.	Birth weight		A5.10.	Birth Trauma	
	New born 1 .g	New born 2 .g		New born 1 ☐ ☐ Yes No	New born 2 ☐ ☐ Yes No
A5.5.	Alive or Still born		A5.11.	Specify trauma	
	New born 1 Alive ☐ Fresh stillbirth ☐ Macerated stillbirth ☐ Stillbirth (not specified) ☐ Unknown ☐	New born 2 Alive ☐ Fresh stillbirth ☐ Macerated stillbirth ☐ Stillbirth (not specified) ☐ Unknown ☐			
A5.6.	If stillborn, cause of stillbirth				
	New born 1	New born 2	A5.12.	Baby referred to another facility	

				New born 1	New born 2
				Yes No	Yes No
A5.7.	Apgar at 5min		A5.13.	Admitted to special care or intensive care unit?	
	New born 1	New born 2		New born 1	New born 2
				Yes No	Yes No
A5.8.	Neonatal Complications		A5.14.	If yes, number of days	
	New born 1	New born 2		New born 1	New born 2
	Yes No	Yes No			
			A5.15.	Vital status at discharge	
				New born 1	New born 2
				Alive	Alive
				Dead in the first 24hrs	Dead in the first 24hrs
				Dead after 24hrs	Dead after 24hrs

			Dead (timing not specified)		Dead (timing not specified)	
			Unknown		Unknown	

A5.16.	If dead, cause of death	
	New born 1	New born 2
A5.17.	New born 1	New born 2
	Date of discharge, referral	Date of discharge, referral
	d d m m y y or d d m m y y	d d m m y y or d d m m y y
	Date of death of baby	Date of death of baby
	d d m m y y	d d m m y y

A.6.	CAESAREANS AND LAPAROTOMIES	
	All caesareans and laparotomies for uterine rupture	
A6.1.	Date of decision of intervention d d m m y y	A6.6.c. Uterine rupture or pre-rupture Yes No If yes; Uterine rupture Uterine pre-rupture
A6.2.	Time of decision of intervention	A6.6.d. Malpresentation

	H h : m m		Yes No
A6.3.	Date of intervention d d m m y y		Transverse Oblique Brow Face with posterior chin/"enclaved" face Arm or shoulder
A6.4.	Time of beginning of the intervention h h : m m		
A6.5.	Time of end of the intervention h h : m m	A6.6.e.	Poor progression of labour Yes No If yes; Prolonged labour Failed induction Other
A6.6.	Indication for caesarean or laparotomy		
A6.6.a.	Fetal-pelvic disproportion Yes No If yes; Small or deformed pelvis Fetal macrosomia Unspecified disproportion	A6.6.f.	Previous caesarean Yes No
A6.6.b.		A6.6.g.	Pre-eclampsia

A.7.	Quality of care indicators for caesareans and laparotomies of uterine rupture		
A.7.1.	Before the surgery	A.7.4.	Morbidity during or after caesarean
A.7.1.a.	Was the haemoglobin level checked?		
	☐ ☐ Yes No		Blood transfusion Wound infection Puerperal fever Evacuation of a haematoma Secondary postpartum haemorrhage Severe postpartum anaemia Septicaemia Hysterectomy
A.7.1.b.	Was the fetal heartbeat checked just before the Anaesthesia?		
	☐ ☐ Yes No		
A.7.1.c.	Were prophylactic antibiotics prescribed?		
	☐ ☐ Yes No		
A.7.1.d.	If yes, when were they administered?	A.7.5.	Severe incidents linked to caesareans
	Before the surgery During the surgery After the surgery		Admission for over 1 week due to post-surgical infection Anaesthetic accident Accident of blood transfusion Uterine artery pierced
A.7.2.	During the surgery, was prophylactic oxytocin administered?		

	☐ ☐ Yes No		Accident of other organs Return to the operating room Other (specify)	☐ ☐ Yes No
A.7.3.	During the first 2hrs post-surgery, did someone monitor every 30 minutes:	A.7.6.	Caesarean after failed instrumental birth	☐ ☐ Yes No
A.7.3.a.	Arterial blood pressure ☐ ☐ ☐ Yes Done less No frequently			
A.7.3.b.	Respiratory rate? ☐ ☐ ☐ Yes Done less No frequently			
A.7.3.c.	Pulse? ☐ ☐ ☐ Yes Done less No frequently			

A.8.	MATERNAL NEAR-MISS
	All women in a state of near-miss

A.8.1.	Is the woman considered to be in a state of near-miss? Yes - according to clinical criteria Yes - according to organ dysfunction criteria (WHO) Yes – anaemia No	<i>Organ dysfunction criteria</i>	
		A.8.9	Cardiovascular dysfunction Shock Cardiac arrest Severe hypo perfusion (lactate >5mmol/l or >45mg/dl) Severe acidosis (pH<7.1) Use of continuous vasoactive drugs Cardio-pulmonary resuscitation
A.8.2.	When did the state of near-miss occur? Before arrival at the facility During hospitalization	A.8.1	Respiratory dysfunction Acute cyanosis Gaspings Severe tachypnea (respiratory rate/min>40) Severe bradypnea (respiratory rate/min<6) Severe hypoxaemia (O2 saturation <90% for ≥60min or PaO2/FiO2<200) Intubation and ventilation not related to anaesthesia
A.8.3.	Did the woman require intensive care? Yes No Unknown		
<i>Clinical Criteria</i>			
A.8.4.	Uterine rupture and pre-rupture	A.8.1	Uterine dysfunction

	Dystocia with rapid maternal pulse or fetal distress and sub-pubic tenderness or band's ring Diagnosis of rupture/pre-rupture in the medical record Dystocia with shock or cardiac arrest		Haemorrhage or infection leading to hysterectomy		
			A.8.1 Renal dysfunction		
			Oliguria non responsive to fluids or diuretics		
			Severe acute azotaemia (creatinine >300umol/ml)		
			Dialysis for acute renal failure		
A.8.5.	Haemorrhage		A.8.1 Coagulation dysfunction		
	Haemorrhage with state of shock		Failure to form clots		
	Haemorrhage with cardiac arrest		Severe acute thrombocytopenia (<50,000 platelets/ml)		
	Haemorrhage with laparotomy		Massive transfusion of blood or red cells (≥5 units)		
	Haemorrhage with blood transfusion				
A.8.6.	Infections		A.8.1 Hepatic dysfunction		
	Temp >38.0° or <36.5° or obstetric infectious seat and jaundice		Jaundice in the presence of pre-eclampsia		
	Diagnosis of septicaemia in the medical record		Severe hyperbilirubinemia		

A.8.7.	Severe pre-eclampsia Diastolic BP ≥ 110 mmHg or Proteinuria/albuminuria +++ AND hyper reflectivity or headache or blurred vision or oliguria or high abdominal pain or pulmonary oedema or jaundice	A.8.1	106. Neurological dysfunction Prolonged unconsciousness or coma lasting >12hrs Stroke Status epilepticus / uncontrollable fits Total paralysis
A.8.8.	Eclampsia Diastolic BP ≥ 90 mm Hg or proteinuria/albuminuria ++ AND convulsions or coma		

Anaemia Criteria	
A.8.1	Severe anaemia Haemoglobin level 4-7g/dl; or haematocrit level <20% OR Cutaneo-mucosal pallor Haemoglobin level <6g/dl OR haematocrit level <12% AND/ OR

	State of shock (cold sweat + thready pulse + cold extremities + tachycardia)		
	Difficulty breathing		

Appendix 2B: Adapted WHO Quality of Care Assessment Tool for maternal and neonatal health

A1. Hospital statistics

Source: This information should ideally be collected before the visit and be available for reference during the visit. If it has not been collected before, collect the information early during the visit from the Chief Nursing Officer / DNO, HMIS officer or hospital administration. Make use of routine statistics; adjust the categories accordingly (e.g., Gestational age) where necessary.

Maternal and neonatal statistics

Please use the figures for the last available quarter or year. If data are available for a different period, please specify.

Period _____

MATERNAL/ NEONATAL

Number of deliveries ¹	
A1. Number of live births ²	
A2. Number of low birth weight new-born babies (<2500 g)	
A3. Number of very low birth weight new-born babies (<1500 g)	
A4. *Proportion of extremely low birth weight babies (<1000g)	
A5. *Proportion of deliveries: <37 completed weeks	
A6. *Proportion of deliveries: < 32 weeks	
A7. *Proportion of deliveries: < 28 weeks	
A8. *Proportion of babies delivered in the facility who had all 4 components of essential new-born care ³ (HBB Register)	
A9. *Proportion of babies diagnosed with birth asphyxia ⁴ (HBB register)	

A10. *Proportion of babies with Apgar score <3 at 5 minutes (maternity register)	
A11. *Proportion of neonatal deaths	
A12. *Proportion of stillbirths (FSB/ MSB)	
A13. Number of perinatal deaths (number of stillbirths plus early neonatal deaths in hospital)	
A14. Number of Maternal deaths in hospital	
A15. Number of women with sepsis	
A16. Number of women with obstructed labour	
A17. Number of women with eclampsia	
A18. Number of women with severe pre-eclampsia and eclampsia treated with magnesium sulphate injection	
A19. Number of women receiving oxytocin immediately after the birth of the baby	
A20. Number of women with PPH	
A21. **Proportion of women with prolonged labour Monthly summaries	
A22. **Proportion of women with Caesarean section deliveries as % of all births	
A23. **Proportion of women with Episiotomies	
A24. **Proportion of women with Vacuum deliveries	
A25. **Proportion of women with Inductions of labour	

A26. **Proportion of women with Augmentations (stimulations)	
A27. Average length of stay for vaginal birth (number of hours)	
A28. Average length of stay for caesarean section (number of days)	
A29. Number of women transferred to a higher level of care	

*For proportions (Babies) use the total number of live births as a denominator

** For proportion (Mothers) use Total Number of Deliveries as a denominator

B MATERNAL CARE

Source: This information should be collected by visiting the labour, birth ward and Operating Theatre and observing the treatment and other clinical practices of women, review of records and logbooks and interviews with staff and women.

Refer to IMNH manual 2015 edition, Management of Maternal and Obstetric Complications (Dresen)

B.1. Emergency Obstetric Care

B.1.1. Patient flow

Source: Visit to the emergency department/labour ward and interviews with staff dealing with emergencies.

Instructions: Interview staff where emergencies would present, observe who would see them, how senior staff are contacted to respond to the condition, and where and how severe conditions are handled.

B1. Where are patients with an emergency obstetric condition received?

B2. Is there a system in place how women with an emergency condition get from the point of first reception to the point where she receives care? Y N

B3. Describe the patient flow of a typical obstetric emergency (woman presenting as an emergency to hospital, if there is a triage system in place and how the woman with an emergency moves from the point of first reception at the hospital to the point where she received care).

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B4. Is there an area equipped to take care of emergency obstetric conditions? ☒ Y ☐ N

B5. Is this separate from the general outpatient facility? Y N

B6. Comments and Descriptions:

B7. Do patients come with referral notes when they have been referred from first-level units?

Never ☐ Sometimes ☐ Always ☐

B.1.2. Layout and Structure of Emergency Care

Refer to IMNH Manual

Standards and Criteria	Score 1-5	Comments
B8. A system is in place to prioritize severely ill patients (triage).		
B9. Triage is done as soon as the patient presents to the hospital not hindered by registration procedures, payment etc. before lifesaving action takes place.		
B10. *Staff in charge of triage are adequately trained and able to apply triage criteria.		
B11. A Skilled birth attendant (doctor/ midwife/ clinical officer) is always available to manage patients with emergency conditions.		
B12. **Essential drugs for emergency conditions are always available.		
B13. Essential lab tests (glucose, Packed Cell Volume (PCV) and equipment (including Ambu bags and face masks for adults and new born) for emergency conditions are always available and functional.		
B14. There are job aids (wall charts, chart booklets) displayed for the management of obstetric cases		

* Information is mainly obtained by direct case observation and through interviews with staff about the routine practice. If no cases with emergency conditions are observable, the staff is interviewed about how they would manage such conditions.

** Please refer to the tables in the section “Essential Maternal drugs, equipment and supplies”. Please note when judging the adequacy of supplies that some drugs (e.g., oxygen, anticonvulsants) need to be immediately available; whereas for others (e.g., antibiotics), it is sufficient that availability is assured.

B.1.3. Summary - Emergency obstetric care

Summary	Score 1-5	Comments
B15. Patient Flow		
B16. Layout and structure		

Summary score						
B17. - Emergency obstetric care						
(to be circled)	5	4	3	2	1	

B.1.3.1. Score

Type of staff	During working hours(7.30-16.30) (number available)	After working hours and on the weekend and public holiday Present/ not present If present number	Comments
B21. Obstetrician-Gynaecologist			
B22. Non- specialist doctor			
B23. Specialist midwife			
B24. Midwife			
B25. Clinical Officer			
B26. Anaesthetist/ Anaesthesiologist			

B27. Radiology Technician /Technologist/ Sonographer			
B28. Medical Assistant			
B29. Auxiliary Nurse, Hospital Attendant, Patient Attendant			
B30. Ward Clerk			

B.2.2 Hygiene and Accident Prevention

Refer to IMNH Manual

Standards and criteria	Score 1- 5	Comments
B31. Toilets for patients are functional, accessible and separate from public or staff toilets.		
B32. Toilets are clean		
B33. There is running water and patients can wash their hands after using the toilet		

B34. Patients have access to clean running water, soap and an appropriate space by the ward, to bathe themselves.		
B35. Hand washing stations are provided for mothers to wash their hands in postnatal wards		
B36. Staff have access to hand washing facilities		
B37. Mosquito nets are available for use by patients		
B38. Ward is kept clean		
B39. Sharps are disposed of in a sharps container to prevent accidents		

B.2.3 Attention to the Most Seriously Ill Patients

B40. Is there an emergency management area in or near each ward? Y N

B41. Are the most seriously ill patients cared for in a section close to the midwives' station where they receive closer attention? Y N

B42. Is there a heat source on the ward, and room temperatures kept above 25°C, (if applicable)? Y N

B43. Is there a cooling source (AC) in the ward, (if applicable) Y N

B44. Comments:

B.2.4 Summary - Maternity Wards

Summary	Score 1-5	Comments
B45. Maternity ward staffing		
B46. Hygiene and accident prevention		
B47. Attention to the most seriously ill patients		

Summary score						
Maternity wards						
(to be circled)	5	4	3	2	1	

B. 2.4.1. Score

Please indicate the quality of support by marking one of the 5 numbers; 5 indicates adequately staffed, clean and well-equipped Maternal wards; 4 to 1 indicating levels of

necessary improvement (4=small need for improvement, 1=indicates significant deficiencies in one or more of the wards)

B48. Main strengths

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B49. Main weaknesses

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B.3. Infection Control and Supportive Care

B.3.1. Infection Control in the Maternity Ward

B.3.1.1. Hand Hygiene

Standards and Criteria	Score 1- 5	Comments
B50. Hand washing stations are well organized and equipped.		
B51. Water and Soap or alcohol-based hand rub is available at the point of care.		

Standards and Criteria	Score 1- 5	Comments
B51. Protocols on hand washing and disinfection for various procedures are available.		
B52. Hands are washed with soap and water when visibly dirty or visibly soiled with blood or other body fluid or after using the toilet		
B53. Hand hygiene is performed: B53A. Before and after touching the patient B53B. Before handling an invasive device for patient care, regardless of whether or not gloves are used B53C. After contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings B53D. If moving from a contaminated body site to another body site during care of the same patient B53E. After contact with inanimate surfaces and objects (including medical equipment) near the patient B53F. After removing sterile or non-sterile gloves		

Standards and Criteria	Score 1- 5	Comments
B54. Surgical scrub or surgical hand and forearm disinfection are performed for: Surgery or high-risk invasive procedures e.g., Manual removal of placenta		
B55. Surgical hand preparation is carried out following standard procedure (Refer IPC guideline 2012)		
B56. If hands touch a contaminated surface surgical scrub is repeated		

B.3.1.2. Use of Gloves

Standards and Criteria	Score 1-5	Comments
B57. Sterile gloves are used for surgical operations, vaginal examination, birth, cord-cutting, manual removal of placenta, repair of episiotomy or tear		
B58. Examination gloves are used for nonsterile procedures e.g., blood draws		
B59. The use of gloves does not replace hand hygiene by either hand-rubbing or hand washing		
B60. Gloves are used when it is likely that hands will be contaminated with blood, body fluids and potentially infectious materials.		
B61. Gloves are removed after contact with each patient and after each procedure.		
B62. Gloves are changed or removed during patient care if moving from a contaminated body site to another body site (including non-intact skin, mucous membrane or medical device) within the same patient or the environment		
B63. The reuse of gloves is not practiced.		

Standards and Criteria	Score	Comments
	1-5	
B64. Utility gloves are used when handling soiled instruments and when disposing of contaminated waste items		

B.3.1.3. Practices for Infection Control

Standards and Criteria-	Score 1-5	Comments
B65. Routine disinfection of premises performed facilities are closed regularly for disinfection.		
B66. Ultra-violet lamp is routinely used for disinfection.		
B67. Routine policy of changing dress and footwear by all staff is observed.		
B68. Bandages on aseptic wound/IV catheter are changed daily.		
B69. Hair is not routinely removed preoperatively.		
B70. There is an infection control policy for visitors in the hospital, that requires the restriction of access to some patients		

B.3.1.4. Summary- Infection Control

Summary	Score 1-5	Comments
B71. Hand hygiene		
B72. Use of Gloves		
B73. Practices for Infection Control		

B.3.1.4.1. Score

Summary score					
B74. Infection control					
(to be circled)	5	4	3	2	1

Please indicate the quality of support by marking one of the 5 numbers; 5 indicates excellent infections control practices are being used at all times in all wards; 4 to 1 indicating levels of necessary improvement (4=small need for improvement, 1=urgent need for improvement/life-threatening practices)

B75. Main strengths

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B76. Main weaknesses

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B.3.2. Supportive Care

B.3.2.1. Nutritional needs for in patients

Standards and Criteria	Score 1-5	Comments
B77. Nutritional needs of hospitalized pregnant women and mothers are met.		
B78. IV-glucose should not be used as a calorie source for more than 24 hours.		

B.3.2.2. Use of Intravenous fluids

Standards and Criteria	Score 1-5	Comments
B79. Intravenous fluids are given only when indicated according to guidelines.		
B80. Appropriate fluids are chosen.		
B81. The flow rate is calibrated and monitored closely.		

B.3.2.3. Drug treatment

Standards and criteria	Score 1-5	Comments
B82. Routine use of drugs/ supplements of unproven effectiveness are NOT used.		
B83. Drugs are only given for an established or highly suspected diagnosis, or under clear indication for usage.		
B84. Sedative drugs or anti-histamines are NOT used		

B.3.2.4. Blood Transfusion (Refer IPC guidelines 2012)

Standards and criteria	Score 1-5	Comments
B85. Blood is only given when indicated.		
B86. Only screened blood is used.		
B87. The flow rate is calibrated and monitored.		
B88. Vital signs are monitored.		

B.3.2.5. Summary- Supportive Care

Summary	Score 1-5	Comments
B89. Nutritional needs		
B90. Intravenous fluids use		
B91. Drug treatment		
B92. Blood transfusion		

B.3.2.5.

Summary score					
Supportive care					
(to be circled)	5	4	3	2	1

1. Score. Please indicate the quality of support by marking one of the 5 numbers; 5 indicates good quality of care, 4 to 1 indicating levels of necessary improvement (4=small need for improvement, 1=urgent need for improvement/life-threatening practices)

B93. Main strengths

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B94. Main challenges

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B.4. Maternal Essential Drugs, Equipment and Supplies

B.4.1. Drugs

Source: This information should ideally be collected before the visit and be available for reference during the visit. If it has not been collected before, collect the information early during the visit from the emergency and ward areas.

Check for the availability of drugs and enquire with staff whether drugs are regularly available. Check expiry dates.

Drugs / Supplies	Lying-in	Labour ward	Comments
B95. Water for Injection			
B96. Normal saline			
B97. Ringer's lactate			
B98. Hydralazine/Nifedipine			
B99. Methyldopa			
B100. Oxytocin			
B101. Misoprostol			
B102. Ergometrine			
B103. Calcium gluconate			
B104. Magnesium Sulphate			
B105. Diazepam			
B106. Ampicillin / Amoxycillin			
B107. Benzyl penicillin			
B108. Gentamycin			
B109. Metronidazole			
B110. Lignocaine 2% or 1%			
B111. Halothane/Isoflurine			
B112. Ketamine			

B.4.2. Summary - Essential Drugs

B.4.2.1. Score

Summary score
Essential drugs

Please indicate the quality by marking one of the 5 numbers; 5 indicates all drugs of the list present are present (not expired/expiring), 4 to 1 indicating levels of necessary improvement (4: Between 80%- <100% adequate amount and quality of all essential drugs and also that drugs are not expired/expiring, 3: 60%- 79%, 2: >50%-59%, 1: <50% available or chronic shortages of essential drugs, equipment and supplies or recurrent lapses in the quality)

B113. Main strengths

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B114. Main weaknesses

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B.4.3. Equipment and Supplies in the Maternity Ward

Is the following equipment available in the birth room for normal labour, caesarean section (if birth room for normal labour and caesarean section are in common, please specify in the note)? If a postal questionnaire was sent, cross-check the information obtained in advance. Check the information during the visit. Ask the person in charge of the birth room/ward for the items to be shown to you, and check that they are safe, hygienic and in good working order. (Indicate Yes or No)

Equipment and Supplies	Birth room (normal labour)	Birth room (caesarean section)	Comments
B115. Adequate light source			
B116. Examination light (flashlight ok)			
B117. Wall clock			
B118. Birth pack*			
B119. Blank partographs			
B120. Heating lamp for neonates			
B121. Caesarean section set			
B122. Oxygen source: oxygen cylinder			
B123. Oxygen source: oxygen concentrator			

Equipment and Supplies	Birth room (normal labour)	Birth room (caesarean section)	Comments
B124. Oxygen source: central supply			
B125. Flowmeters for oxygen			
B126. Equipment for the administration of oxygen: B126A. via nasal prongs B126B. via catheters B126C. via masks			
B127. Self-inflating bags for respiratory support			
B128. Bags and Masks (adult and neonatal size)			
B129. Anaesthetic equipment			
B130. Clinical thermometer			
B131. Sterile gloves			
B132. Sterile gauze/swabs			
B133. Fetal stethoscope			
B134. Stethoscope			
B135. Sphygmomanometer			

Equipment and Supplies	Birth room (normal labour)	Birth room (caesarean section)	Comments
B136. Infusion sets			
B137. Infusion pumps/dosimeters			
B138. IV catheters			
B139. Urinary catheter and bags			
B140. Syringes			
B141. Needles, cannulas			
B142. Suturing set**			
B143. Sharps container			
B144. Vacuum extractor			
B145. Vacuum aspirator			
B146. Beds – birth beds with linen			
B147. Beds – regular beds			
B148. Beds – operating theatre beds			
B149. Neonatal equipment:			

Equipment and Supplies	Birth room (normal labour)	Birth room (caesarean section)	Comments
B149A -resuscitation table (with a heat source) (for newborn resuscitation)			
B149B - incubator			
B149C- tracheal tubes			
B149D - newborn bag and mask size 1 for term babies (for newborn resuscitation)			
B149E - newborn bag and mask size 0 for pre-term babies (for newborn resuscitation)			
B149F - laryngoscope blades			
B149G - oropharyngeal airways			
B149H - breathing valves			
B149I- electric suction pump (for suction apparatus)			
B149J - suction catheter (for suction apparatus)			
B149K- suction bulb, single- use (for suction apparatus)			

Equipment and Supplies	Birth room (normal labour)	Birth room (caesarean section)	Comments
B149L-suction bulb, single or reusable(for suction apparatus) B149M - baby scales			

* Birth pack should contain two towels/drapes, gauze, cotton wool, two cord clamps, two scissors and a receiver

**Suturing set should contain needle holder, toothed dissecting forceps, gauze, towel and sutures

B.4.4. Summary - Equipment and Supplies

B.4.1.1. Score

Summary score						
- Equipment and supplies						
(to be circled)	5	4	3	2	1	

Please indicate the quality by marking one of the 5 numbers; 5 indicates all equipment and supplies of the list are present and in working order (safe, clean and well maintained), 4 to 1 indicating levels of necessary improvement (4: Between 80%- <100% equipment and supplies of the list are present and in working order (safe, clean and well maintained), 3: 60%- 79%, 2: >50%-59%, 1: <50% available or chronic shortages of equipment and supplies or recurrent lapses in the quality)

B150. Main strengths

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B.5. Maternal Case Management

Source: Visit the labour and birth ward, observation of practices, review of records and logbooks and interviews with staff and women.

Instructions: Give priority to direct observation, use interviews with staff and mothers to provide additional information.

B.5.1. Antepartum Care

B.5.1.1. Management of Pre-eclampsia and Eclampsia (Refer IMNH 2015)

B.5.1.1.1. Diagnosis

Standards and Criteria	Score 1-5	Comments
B152. Severe pre-eclampsia is defined according to standards: B152A. Diastolic blood pressure 110 mmHg or more after 20 weeks gestation and/or B152B. Proteinuria 3+ or more B152C. Check records or observe		
B153. Eclampsia is defined according to standards: B153A. Convulsions B153B. Diastolic blood pressure 90 mm Hg or more after 20 weeks gestation B153C. Proteinuria 2+ or more Check records and/or observe		
B154. Urine dipstick is immediately performed in women coming to the hospital with hypertension		

B.5.1.1.2. Management of Mild Pre-eclampsia

Standards and Criteria	Score 1-5	Comments
B155. If women are admitted at gestation less than 37 weeks: B155A. A normal diet is provided (salt restriction is discouraged). B155B. Blood pressure is monitored twice daily. B155C. Urine for proteinuria is monitored daily. B155D. No anti-convulsants, anti-hypertensives, sedatives or tranquillizers are given (unless blood pressure or urinary protein level increases). B155E. No diuretics are given (only indicated for use in pre-eclampsia with pulmonary oedema or congestive heart failure).		
B156. If gestation is more than 37 weeks In women with mild pre-eclampsia or mild gestational hypertension at term, induction of labour is recommended.		
B157. Anti-hypertensive treatment is started when diastolic BP ≥ 90 and ≤ 110 mmHg OR if proteinuria is $\geq +$		
B158. Anti-hypertensive treatment NOT routinely started if BP < 160/100 mmHg		

B.5.1.1.3. Management of Severe Pre-eclampsia and Eclampsia

Standards and Criteria	Score 1-5	Comments
B159. Guidelines and a well-defined written protocol for the management of severe pre-eclampsia and eclampsia are available, known and routinely used by staff.		
B160. A kit is ready for the management of severe pre-eclampsia and eclampsia.		
B161. Skilled staff to manage severe pre-eclampsia and eclampsia are available 24 hours.		
B162. IV infusion of Normal Saline/ Ringer's Lactate is commenced using a large-bore cannula or needle (16-gauge or largest available).		
B163. Magnesium sulphate is provided according to the protocol.		
B164. Vital signs and fetal heart rate are monitored ¼ hourly and while reflexes are checked ½ hourly. a woman is never left alone.		
B165A. A fluid balance chart is maintained to prevent fluid overload. B165B. The urinary bladder is catheterized to monitor urine output and proteinuria.		
B166. If diastolic blood pressure remains above 110 mm Hg, anti-hypertensive drugs are given according to protocol.		

Standards and Criteria	Score 1-5	Comments
B167. 1g Calcium gluconate (10 ml of 10% solution) is kept ready in case of signs of toxicity of magnesium sulphate		
B168. In women with severe pre-eclampsia at term, early birth is pursued		
B169. Labour is induced in women with severe pre-eclampsia at a gestational age when the fetus is not viable or unlikely to achieve viability within one or two weeks		
B170. In women with severe pre-eclampsia, a viable fetus and before 34 weeks of gestation, a policy of expectant management is adopted provided that uncontrolled Maternal hypertension, increasing Maternal organ dysfunction or fetal distress are absent and are monitored.		
B171. In women with severe pre-eclampsia, a viable fetus and between 34 and 36 (plus 6 days) weeks of gestation, a policy of expectant management is adopted, provided that uncontrolled Maternal hypertension, increasing Maternal organ dysfunction or fetal distress are absent and are monitored.		
B172. Corticosteroids are not used for the specific purpose of treating women with HELLP syndrome,		
B173. Women are carefully monitored after birth.		

Standards and Criteria	Score 1-5	Comments
B174. Clinicians are aware of the risk of developing eclampsia post-partum		
B175. Women with severe pre-eclampsia/eclampsia are kept in the hospital for at least 4 days postpartum		
B176. Follow-up is scheduled for 1 week. For women with pre-eclampsia/ eclampsia, further investigations are implemented (IMNH 2015).		

B.5.1.1.4. Summary – Management of Pre-eclampsia and Eclampsia

Summary	Score 1-5	Comments
Diagnosis		
B177. Management of mild-pre-eclampsia		
B178. Management of severe pre-eclampsia and eclampsia		

Summary score - Management of pre-eclampsia and eclampsia					
(to be circled)	5	4	3	2	1

B.5.1.1.4.1. Score

Please indicate the quality of support by marking one of the 5 numbers; 5 indicates good quality of care, 4 to 1 indicating levels of necessary improvement (4=small need for improvement, 1=urgent need for improvement/life-threatening practices).

B179. Main strengths

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B180. Main weaknesses

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B.5.1.2. Prevention and Management of Infections in Pregnancy

B.5.1.2.1. Antibiotic use in pregnancy

Standards and Criteria	Score 1-5	Comments
B181. Adequate antibiotics are given in case of preterm pre-labour rupture of membranes (PPROM)		

Standards and Criteria	Score 1-5	Comments
B182. Adequate antibiotic prophylaxis is given to prevent infection in case of prolonged (more than 18 hours) rupture of membranes at or near term.		
B183. Adequate antibiotics are given to women with established preterm labour.		
B184. Adequate antibiotics according to aetiology are given in labour to women with fever >38°C		
B185. Adequate antibiotics are given for prophylaxis in C-section		
B186A. Pyelonephritis is correctly treated according to standard treatment guidelines: B186B. Urine culture and sensitivity is checked, if possible. B186C. Infection is treated with an antibiotic appropriate for the organism.		

B.5.1.2.4. Summary – Prevention and Management of Infections in Pregnant Women

Standards and Criteria	Score 1-5	Comments
B187. Antibiotic use in pregnancy		

B.5.1.2.4.1. Score

Summary score					
Prevention and management of infections in pregnant women					
(to be circled)	5	4	3	2	1

Please indicate the quality of support by marking one of the 5 numbers; 5 indicates good quality of care, 4 to 1 indicating levels of necessary improvement (4=small need for improvement, 1=urgent need for improvement/life-threatening practices

B188. Main strengths

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B189. Main weaknesses

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B.5.2. Intrapartum & Postpartum Care

B.5.2.1. Normal labour and vaginal birth

Source: Visit the labour and birth ward, observation of practices, review of records (patients file & Registers) and interviews with staff and women.

Instructions: Give priority to direct observation, use interviews with staff and mothers to provide additional information.

B.5.2.1.1. Birth Conditions

Standards and Criteria	Score 1-5	Comments
B190. Labour ward teams use RH standard/ guidelines/ Safe childbirth checklists		
B191. Guidelines and a written protocol for birth are available, known and used by staff		
B192. Appropriate admission history is taken		
B193. Cleanliness of the woman and her environment is ensured		
B194. Warm towels/cloth available to dry baby		
B195. Staff washes their hands before birth and use sterile gloves while assisting with the birth.		
B196. Staff uses sterile instruments for birth.		

Standards and Criteria	Score 1-5	Comments
B197. Privacy and confidentiality are ensured: B197A. Single room or curtains/screens available if there is more than one woman per room B197B. The bed is positioned far from the door or window (not in front of them) B197C. The woman's consent is obtained for attendance of people other than staff (i.e., students)		
B198. The room is kept at an adequate temperature (25 C)		

B.5.2.1.2. Supportive Care throughout Labour

Standards and Criteria	Score 1-5	Comments
B199. There is at least one skilled service provider present throughout labour and birth.		
B200. Chosen birth companion is allowed to remain with a woman throughout labour and birth		
B201. A supportive, encouraging atmosphere for the birth that is respectful of the woman's wishes is provided and her complaints listened to and taken seriously : B201A. All procedures are explained, permissions are sought, and findings are discussed with the woman.		

Standards and Criteria	Score 1-5	Comments
B201B. She is kept informed about the progress of labour. B201C. She is praised, encouraged and reassured that things are going well		
B202. Breathing techniques for labour and birth are explained and taught to the woman		
B203. Mobility: B203A. The woman is encouraged to walk around freely during the first stage of labour. B203B. The woman's choice of position is supported (for each stage of labour and birth).		
B204. Women are encouraged to eat and drink as they wish during labour.		
B205. Women are encouraged to empty their bladder frequently (and reminded every 2 hours)		
B206. The following are NOT done enemas, pubic shaving,		

B.5.2.1.3. Care during the first stage of labour

Standard and Criteria	Score 1-5	Comments
B207. Guidelines for safe birth are available, known and used by skilled birth attendants		
B208. Guidelines for anticipating and managing shoulder dystocia are available, known and used by skilled birth attendants		
B209. Guidelines for managing cord prolapse are available, known and used by skilled birth attendants		
B210. Women are monitored hourly for contractions, descent, B/P, and Pulse rate, fetal heart every 30 minutes		
B210A. Cervical dilatation 4 hourly B210B. Temperature 2 hourly.		
B211. Findings are recorded on Partograph/Partogram		
B212. Supportive care is given (see the section on supportive care throughout labour)		
B213. Progress of labour is assessed correctly, and appropriate actions taken		
B214. A woman is never left alone during active labour		
B215. Partograph is used properly and consistently at the bedside		
B216. Partograph's information is collected, recorded and interpreted by a skilled birth attendant and is used to support labour management interventions		

B.5.2.1.4. Care during the Second Stage of Labour

Standards and Criteria	Score 1-5	Comments
B217. When the cervix is dilated 10 cm or bulging thin perineum and head visible, the woman is never left alone and is monitored for : B217A. Emergency signs B217B. Fetal heart rate after every contraction B217C. Frequency, intensity and duration of contractions. B217D. Mood and behaviour (distressed, anxious)		
B218. Monitoring findings are recorded		
B219. Controlled birth of the head is ensured		
B220. Episiotomy is NOT routinely performed (only if fetal distress/operative birth)		
B221. Local anaesthesia is given if an episiotomy is performed		
B222. The mother's abdomen is assessed for a second baby and vaginal bleeding is assessed		
B223. 10 IU oxytocin IM is given to the mother immediately after the birth of the baby		
B224. Essential newborn care is provided (refer to Chapter Neonatal Care)		

B.5.2.1.5. Care during the Third Stage of Labour (Refer IP, RH and PMTCT Performance Standard Guideline 2012)

Standards and Criteria	Score 1-5	Comments
B225. Active management of the third stage is appropriately performed		
B226. Mother is monitored for: B226A. General condition B226B. Vital signs B226C. Uterine contraction B226D. Bladder distension B226E. Vaginal bleeding		
B227. Baby is monitored (refer to Chapter Neonatal Care)		
B228A. Placenta is delivered By controlled cord traction B228B. Placenta and membranes are checked for completeness		

B.5.2.1.6. Care of Mother after Birth

Standards and Criteria	Score 1-5	Comments
B229. Monitor: B229A. Blood loss B229B. fundal height B229C. blood pressure B229D. Every 1/4hourly for the first hr. and ½ hourly for the next hour post-partum		
B230. Minor tears are not stitched if not bleeding		
B231. Episiotomy and tears are repaired according to protocol		
B232. Vagina and perineum are NOT swabbed with antiseptics after birth		
B233. Bladder catheterization is NOT routinely performed in post-partum		
B234. Cervix is NOT routinely checked after birth		

B.5.2.1.7. Summary- Normal Labour and Vaginal Birth

Standard and Criteria	Score 1-5	Comments
B235. Conditions of birth		
B236. Supportive care throughout labour		
B237. Care during the first stage of labour		
B238. Care during the second stage of labour		
B239. Care during the third stage of labour		
B240. Care of mother after birth		

B.5.2.1.7.1. Score

Summary Score					
Normal labour and vaginal birth					
(to be circled)	5	4	3	2	1

Please indicate the quality of support by marking one of the 5 numbers; 5 indicates good quality of care, 4 to 1 indicating levels of necessary improvement (4=small need for improvement, 1=urgent need for improvement/life-threatening practices)

B241. Main strengths

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B242. Main weaknesses

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B.5.2.3. Caesarean Section (CS)

Source: This information should be collected by observing the treatment and care of women undergoing surgery, interviewing staff and caregivers and reviewing guidelines, where available.

Instructions: Give priority to direct observation, use interviews with staff and mothers to provide additional information

B.5.2.3.1. Emergency Caesarean Section

Standards and Criteria	Score 1-5	Comments
B243. Guidelines and written protocols for emergency caesarean section is available, known and used routinely by staff		
B244. Operating theatre staff and a paediatrician (or other health workers responsible for the newborn) are always available for emergency caesarean section		
B245. The emergency caesarean section starts in less than 30 minutes after a decision is made		

B246. An operating theatre is 24 hours/7 days fully ready for emergency caesarean sections (surgery kit, electricity etc.)		
B247. Stored blood is readily available in case blood transfusion is needed		

B.5.2.3.2. Timing of Caesarean Section and Informed Consent

Standards and Criteria	Score 1-5	Comments
B248. Elective caesarean sections are performed after 37 weeks of gestation.		
B249. Informed consent is obtained from women undergoing caesarean section		

B.5.2.3.3. Indications for Caesarean Section and Policies to Reduce Inappropriate Caesarean Section Incidence

Standard and Criteria	Score 1-5	Comments
B250. Indication for caesarean section is reviewed before carrying out the procedure		
B251. A qualified doctor/ Clinical Officer is always involved in the decision to perform a caesarean section		
B252. Caesarean section on maternal request is not allowed unless in very specific circumstances (e.g., previous stillbirth)		
B253. The decision about mode of birth after a previous caesarean section is taken after considering the risk of uterine rupture during labour		

Standard and Criteria	Score 1-5	Comments
B254. Elective caesarean section is performed in uncomplicated twin pregnancies only if the first twin is not vertex lie.		
B255. Caesarean section is NOT routinely offered in preterm pregnancies or term small for gestational age babies.		
B256. Caesarean section is NOT routinely offered for Maternal viral infections other than primary HSV infection in the 3rd trimester (e.g., HCV+, HBV+).		
B257. Caesarean section is NOT routinely carried out for mothers with HIV infection		

B.5.2.3.4. Procedures Related to Caesarean Section

Standards and Criteria	Score 1-5	Comments
B258. Guidelines and written protocols (or checklist) for caesarean section procedures are available, known and used by staff		
B259A. Pre-operative care principles are followed prior to caesarean section		
B259B. The operating theatre is prepared according to guidelines		
B259C. The woman is prepared according to guidelines		
B260. Oxygen, suction and resuscitation equipment are readily available and functioning.		
B261. A blood sample for haemoglobin, haematocrit, grouping and cross-matching is collected and sent to a laboratory		
B262. The urinary bladder is catheterized and urine output monitored		

Standards and Criteria	Score 1-5	Comments
B263. Regional anaesthesia is offered as a first choice to all women undergoing caesarean section		
B264. Intra-operatives care principles are followed: B264A. Surgical hand scrub is carried out B264B. The incision site is prepared		
B265. Proper c/s technique is used		
B266. Prophylactic antibiotics are given		
B267. The woman's condition is monitored throughout the procedure: B267A. Vital signs B267B. level of consciousness B267C. blood loss B267D. Pain is managed		

B.5.2.3.5. Immediate Post-Caesarean Care

Standards and Criteria	Score 1-5	Comments
B268A. There are specific notes from the surgeon on the procedure performed, required monitoring and necessary treatment. B268B. There is a handover of a patient from theatre staff to postnatal nurse/midwives.		
B269A. After recovery from anaesthesia, observations (respiratory rate, heart rate, blood pressure, pain and sedation) are continued according to IMNH and IP, RH, PMTCT guideline 2012)		

Standards and Criteria	Score 1-5	Comments
B269B. If a patient is not stable, more frequent observations and medical reviews are done B269C. There is constant observation until the woman is conscious and stable.		
B270. Guidelines on postoperative pain relief are available, known and used by staff		
B271. If there is no contraindication, non-steroidal anti-inflammatory drugs are offered post-C/S as an adjunct to other analgesics.		
B272. Removal of the urinary bladder catheter is carried out once a patient is mobile after regional anaesthesia		
B273. Women who are recovering well and mobilizing after caesarean section and do not have complications can eat and drink when they feel hungry or thirsty		

B.5.2.3.6. Care after the First 24 Hours and Discharge after Caesarean Section

Standards and Criteria	Score 1-5	Comments
B274. Women are prescribed regular analgesia for postoperative pain		
B275. Temperature is monitored to exclude fever		
B276. Dressing is removed 24 hours after the caesarean section		
B277. The wound is assessed for signs of infection, separation or dehiscence		
B278A. Wound care is carried out appropriately B278B. The wound is gently cleaned and dried daily		

Standards and Criteria	Score 1-5	Comments
B279. Women who are recovering well do not have fever or complications following caesarean section are offered early discharge (after 48 hrs.) from hospital and follow-up at home		
B280. Removal of sutures/clips is planned at discharge if needed		
B281. At the time of discharge from the hospital, women are informed to seek care for abnormal symptoms such as fever; abnormal uterine bleeding, urinary symptoms, chest and leg symptoms of deep vein thrombosis.		
B282. Women discuss with health care providers the reasons for the caesarean section and implications for the Child or future pregnancies and birth methods for subsequent children.		
B283. Women are informed that they can resume activities, such as formal exercise, once they have fully recovered from the caesarean section		

B.5.2.3.7. Summary - Caesarean Section

Standard and Criteria	Score 1-5	Comments
B284. Emergency caesarean section		
B285. Timing of caesarean section and informed consent		
B286. Indications for caesarean section and policies to reduce the inappropriate caesarean section incidence		
B287. Procedures related to caesarean section		
B288. Immediate post-caesarean care		
B289. Care after the first 24 hours and discharge after caesarean section		

B.5.2.3.7.1. Score

Please indicate the quality of support by marking one of the 5 numbers; 5 indicates good quality of care, 4 to 1 indicating levels of necessary improvement (4=small need for improvement, 1=urgent need for improvement/life-threatening practices).

B290. Main strengths

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B291. Main weaknesses

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B.5.2.4. Postpartum Haemorrhage (PPH)

Standards and Criteria	Score 1-5	Comments
B292. Guidelines and written protocols for preventing and managing PPH is available, known and used by skilled birth attendants		
B293. Adequate equipment, drugs and personnel are readily available in case of PPH.		
B294. The uterine tone is checked after birth (every 15 min in the first hour; at the end of the 2nd, 3rd, 4th hour, then every 4 hours) and the uterus is massaged if necessary		
B295. The facility has reliable means of measuring blood loss in the birth room and during early puerperium		
B296. Blood can be obtained without delay 24 hours a day		

B297. A written protocol is readily available, known and used routinely by staff for immediate notification of on-call-staff, initial assessment, treatment and resuscitation		
B298. A written protocol is readily available, known and used routinely by staff for treatment of uterine atony		
B299. A written protocol is readily available, known and used routinely by staff for refractory haemorrhages after medical treatment		

B.5.2.4.1. Summary - Postpartum haemorrhage

B.5.2.4.1.1. Score

Summary score					
Postpartum haemorrhage					
(to be circled)	5	4	3	2	1

Please indicate the quality of support by marking one of the 5 numbers; 5 indicates good quality of care, 4 to 1 indicating levels of necessary improvement (4=small need for improvement, 1=urgent need for improvement/life-threatening practices)

B300. Main strengths

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B301. Main weaknesses

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Appendix 2C: Interview Guide

Determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals, Malawi

The researcher will conduct in-depth interviews of midwives working in antenatal, labour, postnatal wards and High dependency unit on maternal near-miss.

Interview guide

Code number -----

Date of interview -----

Name of interviewer -----

Name of facility -----

Department -----

Section A: Demographic data

What is your cadre? NMT/ RNM

How long have you worked in this department? -----

Sex: Male/ Female

Section B: In-depth interview

- What is your view regarding the quality of care provided to maternal near-miss cases?
- Describe your experience in a recent maternal near-miss case that you provided care to.

Probe: What type of complication did the maternal near-miss case present with?

Appendix 3: Request letters

Appendix 3A: Request letters to facilities

Ministry of Health
Reproductive Health Directorate
P.O. Box 30377
Lilongwe 3
26th September 2016

The Hospital Director
Queen Elizabeth Central Hospital
P.O.Box 95
Blantyre
Dear Sir

Request for Letter of Support

My name is Fannie Kachale currently working with the Ministry of Health as a director for reproductive health services. I am pursuing a PhD in Interprofessional Health Care Leadership with the University of Malawi, Kamuzu College of Nursing. In fulfillment of the PhD, I plan to conduct a research study on 'Determinants of care for maternal near miss cases at Kamuzu and Queen Elizabeth Central Hospitals, Malawi' between October 2016 and February 2017.

This communication is sent to request permission to conduct the study at your facility, the results of which shall be shared with you. Please contact me for any further information on 0888586485/0999231380.



Fannie Kachale (RNM, MSC Nsg)
fankachale@yahoo.co.uk

Supervisor: Professor Ellen Chirwa, Acting Principal, KCN, Lilongwe.

embweza@kcn.unima.mw

2nd Supervisor: Professor Address Malata, Vice Chancellor, MUST, Thyolo.
amalata@must.ac.mw

Ministry of Health
Reproductive Health Directorate
P.O. Box 30377
Lilongwe 3
26th September 2016

The Hospital Director
Kamuzu Central Hospital
P.O.Box 149
Lilongwe

Dear Sir

Request for Letter of Support

My name is Fannie Kachale currently working with the Ministry of Health as a director for reproductive health services. I am pursuing a PhD in Interprofessional Health Care Leadership with the University of Malawi, Kamuzu College of Nursing. In fulfillment of the PhD, I plan to conduct a research study on 'Determinants of care for maternal near miss cases at Kamuzu and Queen Elizabeth Central Hospitals, Malawi' between October 2016 and February 2017.

This communication is sent to request permission to conduct the study at your facility, the results of which shall be shared with you.

Please contact me for any further information on 0888586485/0999231380.



Fannie Kachale (RNM, MSC Nsg)

fankachale@yahoo.co.uk

Supervisor: Professor Ellen Chirwa, Acting Principal, KCN, Lilongwe.
embweza@kcn.unima.mw

2nd Supervisor: Professor Address Malata, Vice Chancellor, MUST, Thyolo.
amalata@must.ac.mw

Appendix 3B: Response letters from facilities

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

28th September 2016

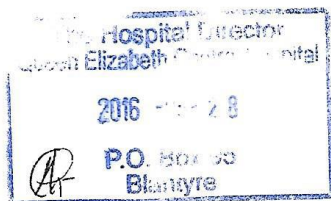
The Chairperson
COMREC
P/Bag 360
Chichiri
Blantyre 3

Dear Sir,

RE: DETERMINANTS OF CARE FOR MATERNAL NEAR MISS CASES AT QUEEN ELIZABETH CENTRAL HOSPITAL BY MRS FANNIE KACHALE

We are writing in support of the above named study that it can take place at this hospital as envisaged. It will be a prospective cross-sectional study that will utilize mixed methods to describe the determinants of care for maternal near miss cases.

We hope that the results will further inform the epidemiology and determinants of care for maternal near miss cases which will in turn inform the effective management to prevent them.



Dr Andrew Gonani
HOSPITAL DIRECTOR

TELEPHONE No.: (265) 753 555
TELE FAX No.: (265) 756 380

PLEASE ADDRESS ALL
COMMUNICATIONS TO: THE
HOSPITAL DIRECTOR
E-MAIL: Kch@sdnp.org.mw

Ref : **COMREC 2016**



MINISTRY OF HEALTH
KAMUZU CENTRAL HOSPITAL
P. O. Box 149
LILONGWE
MALAWI
30TH SEPTEMBER 2016

The Chairman,
College of Medicine Research Committee,
Private Bag 360,
Chichiri,
Blantyre 3.

Dear Sir,

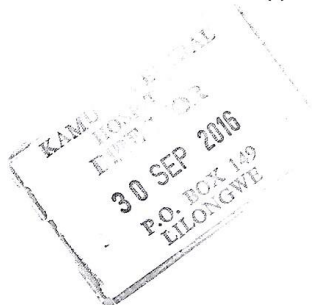
Re: LETTER OF SUPPORT FOR A RESEARCH TITLED – DETERMINANTS OF CARE FOR MATERNAL NEAR MISS CASES AT KAMUZU AND QUEEN ELIZABETH CENTRAL HOSPITALS, MALAWI.

I am writing to express my support in the willingness by the researcher to conduct the above named research at Kamuzu Central Hospital.

The research will help in identifying the determinants for maternal near miss cases at Kamuzu Central Hospital.

We are excited to host this research and we would like to see the results so that we will be able to manage our patients better.

Thanks in advance for the support you are going to give the researcher.



Yours Sincerely,


Dr. Jonathan Ngoma
Hospital Director



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



In reply please quote No. QEC/GEN/2

All communications should be addressed to:
The Hospital Director

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

28th September 2016

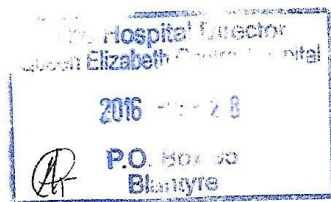
The Chairperson
COMREC
P/Bag 360
Chichiri
Blantyre 3

Dear Sir,

RE: DETERMINANTS OF CARE FOR MATERNAL NEAR MISS CASES AT QUEEN ELIZABETH CENTRAL HOSPITAL BY MRS FANNIE KACHALE

We are writing in support of the above named study that it can take place at this hospital as envisaged. It will be a prospective cross-sectional study that will utilize mixed methods to describe the determinants of care for maternal near miss cases.

We hope that the results will further inform the epidemiology and determinants of care for maternal near miss cases which will in turn inform the effective management to prevent them.



Dr Andrew Gonani
HOSPITAL DIRECTOR

Appendix 4: Registration certificate

		NURSES AND MIDWIVES COUNCIL OF MALAWI P.O. Box 30361 Lilongwe – Malawi Tel: (265) 01 772 044 / 730 Fax: (265) 01 773 932 E-mail: nmcm@nmcm.org.mw www.nmcm.org.mw	
Account No.: 2012-03458		General Receipt	
Receipt No. Received from: Address: The Sum of (In Words)	886711 FANNIE SOMANJE KACHALE MIN OF HEALTH REPRODUCTIVE HEALTH UNIT BOX 30377 LILONGWE		Date Reg. No. 09-May-2019 G/1988/1430
Paid by:		CASH	Amount:
RECEIVED BY:		AMBUKWA	Amount:
COMMENT:		Signature	Official Stamp

Twenty Thousand Kwacha Only
 ANNUAL REGISTRATION FEES FOR 2018/19 FINAL PAYMENT
 Your account balance is MWK 0.00

09 MAY 2019
 P.O. Box 30361, Lilongwe 3

Kris Offset Compu-Feed

Appendix 5: Certificate of Ethics Approval


**CERTIFICATE OF ETHICS
APPROVAL**

This is to certify that the College of Medicine Research and Ethics Committee (COMREC) has reviewed and approved a study entitled:

: P.10/16/2049 – Determinants of care for maternal near miss cases at Kamuzu and Queen Elizabeth Central Hospitals by Ms Fannie Kachale

On 9th February 2017

As you proceed with the implementation of your study, we would like you to adhere to international ethical guidelines, national guidelines and all requirements by COMREC as indicated on the next page

Dr. Y. Mlombwe - Chairperson (COMREC) 

Approved by
College of Medicine
09 FEB 2017
(COMREC)
Research and Ethics Committee

Date *09 Feb 2017*

**Appendix 6: Request for permission to use the conceptual framework for near-misses
maternal morbidity**

Ministry of Health & Population
Reproductive Health Directorate
P.O. Box 30377
Lilongwe 3
Malawi
2nd June 2019

Dr. Adeoye Ikeola
Department of Epidemiology & Medical Statistics
College of Medicine
University of Ibadan
Nigeria

Dear Sir/Madam

**Request for permission to use the Conceptual framework for near misses maternal
morbidity**

I am a PhD candidate on Interprofessional Health Care Leadership with the University of Malawi, Kamuzu College of Nursing. My study is on ‘Determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals in Malawi’.

The purpose of my communication is to request permission to use the Conceptual framework for near misses maternal morbidity that you used for the ‘Incidence, determinants and perinatal care outcomes of near miss maternal morbidity in Ile-Ife Nigeria: a prospective case control study’.

Looking forward to your favourable consideration.

Sincerely,



Fannie Kachale
RNM, MSc Nsg, Min of Health, Box 30377 Lilongwe 3 Malawi

Mobile phone +265888586485/+265999231380
Email: fankachale@yahoo.co.uk

Appendix 7: Request for permission to use the near-miss and quality of care tool

Ministry of Health & Population
Reproductive Health Directorate
P.O. Box 30377
Lilongwe 3
Malawi
2nd June 2019

Dr. Veronique Filippi
London School of Hygiene and Tropical Medicine

Dear Sir/Madam

Request for permission to use the Near miss and quality of care tool

I am a PhD candidate on Interprofessional Health Care Leadership with the University of Malawi, Kamuzu College of Nursing. My study is on ‘Determinants of care for maternal near-miss cases at Kamuzu and Queen Elizabeth Central Hospitals in Malawi’.

The purpose of my communication is to request permission to use the near-miss and quality of care tool that you used for the study on near misses and maternal and perinatal deaths in Benin.

Looking forward to your favourable consideration.

Sincerely,



Fannie Kachale
RNM, MSc Nsg, Min of Health, Box 30377 Lilongwe 3 Malawi

Mobile phone +265888586485/+265999231380
Email: fankachale@yahoo.co.uk