Title:

Evaluation of emergency obstetric care implementation by midwives in Botswana

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DECLARATION

I, the undersigned, hereby declare that, **"EVALUATION OF EMERGENCY OBSTETRIC CARE IMPLEMENTATION BY MIDWIVES IN BOTSWANA"** is my original work and all the sources used have been indicated and acknowledged by means of complete references.

Signature: _____ **Date:** _____

Ms Gorataone Montsho

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LIST OF ACRONYMS

AMTSL	Active Management of Third Stage of Labour
ANC	Ante-Natal Care
BAIS IV	Botswana AIDS Impact Survey IV
CPD	Cephalo-Pelvic Disproportion
CTG	Cardiotocograph
DHMTs	District Health Management Teams
DHS	Department of Health Survey
EmOC	Emergency Obstetric Care
BEmONC	Basic Emergency Obstetric and Neonatal Care
G-GDHMT	Greater Gaborone District Health Management Teams
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
HRD	Health Research Division
IV	Intravenous
IM	Intramuscular
LSS	Life-Saving Skills
MDGs	Millennium Development Goals
MoH	Ministry of Health
PIH	Pregnancy Induced Hypertension
PMH	Princess Marina Hospital
PPH	Post-Partum Haemorrhage
PMTCT	Prevention of Mother to Child Transmission

SDG	Sustainable Development Goals
SRH	Sexual and Reproductive Health
STIs	Sexually Transmitted Infections
UN	United Nations
UNICEF	United Nations Children's Fund
WHO	World Health Organisation

ABSTRACT

Background: Maternal mortality is a serious concern worldwide and the death of a woman is really the fall of a country. Evidence shows that most of the high number of deaths in the world occurs in the developing countries. Within the eight (8) MDGs that were formulated, were the fifth (5^{th}) MDG that targeted reducing maternal mortality by three quarters between 1990 and 2015, and the sixth (6^{th}) MDG that aimed at achieving universal access to reproductive health by 2015. The Government of Botswana has made efforts by developing EmOC manual and other interventions to provide skilled attendance during pregnancy, childbirth and postnatal period at all levels of the health care delivery system. Despite several interventions, women are still dying from circumstances that are avoidable such as eclampsia, immediate postpartum haemorrhage and sepsis following abortion.

Purpose: The purpose of this study is to evaluate the implementation of emergency obstetric care services rendered by midwives in Gaborone, Botswana**.**

Design: The study is a quantitative cross sectional approach which is descriptive in nature, conducted on midwives in Gaborone, Botswana. From a population of 223 midwives, 168 of these were sampled to participate in the study. A self-administered questionnaire was used to collect data. Confidentiality, anonymity and informed consent were ensured throughout the study. A descriptive data analysis using the SPSS software version 24 was used to interpret and evaluate the data.

Results: The midwives are knowledgeable as 92.9% were able to define anaemia and prolonged labour while others (79.8%) did not even undergo training in EmOC. Midwives confirmed that they are skilful in managing some emergency conditions, but showed low confidence in performing some activities. Out of thirteen facilities, only nine managed to perform all the functional signals designated for the level of the facility. Drugs, equipment and guidelines were available in the facilities. About 66.1% of the sampled midwives stated lack of technical support, supervision and audits.

Haemorrhages and anaemia (19.0%) are the leading causes of maternal mortality in the area of study.

Conclusion: There is a need for all midwives to be trained on EmOC, and in-service training sessions must be conducted to improve midwives' skills and knowledge. The EmOC implementation in the area of study is currently ineffective.

Key concepts: EmOC, implementation, maternal mortality, midwives.

CHAPTER 1

OVERVIEW OF THE STUDY

1.1 INTRODUCTION

This chapter focuses on the background of maternal mortality globally, regionally and locally, including the interventions that were put in place. In addition, the chapter discusses the problem statement and the aims and objectives set for this study.

1.2 BACKGROUND

Globally, the death of women during childbearing has been at the top of the health agenda since the early 90s, and this called for a global discussion and commitment at the Nairobi Conference in 1987, where safe motherhood initiatives were established (Ministry of Health, 2010a:3). During that time maternal deaths in the world were as high as 543 000 in 1990, and the Nairobi congress targeted to reduce these maternal deaths by at least 50% by the year 2000. Evidence shows that most of the high number of deaths in the world occurred in the developing countries (Bankole, Sedgh, Okonofua, Imarhiagbe, Hussain & Wulf, 2009:3). According to Statistics Botswana (2017:7), maternal death is 'the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of pregnancy, from any cause aggravated by pregnancy or its management, but not from accidental or incidental causes.' The death of women during pregnancy has been a key health concern globally as the situation is alarming and has financial implications on countries in relation to services rendered.

The global statistics show the higher portion of maternal deaths is recorded by the developing countries (99%: 302 000), where sub-Saharan Africa contributed about 66% (201 000) (WHO, 2015:16). This has been attributed to various factors such as accessibility to health facilities, shortage of skilled attendants and affordability of resources (Mbizvo & Say, 2012:S10). The World Health Organisation launched the Millennium Development Goals (MDGs) at the 2000 Millennium summit that aimed to further reduce maternal mortality in the world (Ministry of Health, 2014:1). Within the eight (8) MDGs that were formulated, were the fifth (5^{th}) MDG that targeted reducing maternal mortality by three quarters between 1990 and 2015 and the sixth (6^{th}) MDG that aimed at achieving universal access to reproductive health by 2015 (Ministry of Health, 2014:1).

Since the implementation of safe motherhood initiatives and compliance with the MDGs, an estimated 303 000 maternal deaths occurred globally in 2015, which was a decline of 43% in 1990 (532 000), (WHO, 2015:17). Sub-Saharan Africa accounts for 66% while Southern Asia was at 48.8%. The Botswana maternal mortality ratio dropped from 326 deaths per 100 000 live births in 1990 to 127 deaths per 100 000 live births in 2015 (Statistics Botswana, 2015:4).

Table 1: Botswana Maternal Mortality Ratio 2011-2015 (Statistics Botswana 2015)

	2011	2012	2013	2014	2015
Institutional live births	44,904	49,957	49,771	47,273	57,290
Non-Institutional live-births	104	91	68	205	190
Total live births	45,008	50,048	49,839	47,478	57,480
Maternal deaths	85	74	91	72	73
Maternal mortality ratio (per 100 000 live births)	188.86	147.9	182.6	151.6	127

(Source: Statistics Botswana, 2017)

In 2012, when national maternal deaths in Botswana were 71, Gaborone alone contributed 14 (26.9%) deaths. Though there is a decline, it is not significant as the maternal ratio is far from the country's global target of three quarters (82/100 000 live births) by 2015 (Sinvula & Insua, 2015:1)

1.3 INTERVENTIONS

In 1999, a safe motherhood initiative was established in Botswana by providing antiretroviral drugs (Zidovudine and Niverapine tablets) to pregnant women who are HIV positive and their neonates, with the aim of preventing mother-to-child-transmission of the HIV (PMTCT) (Ministry of Health, 2016:9). Trials on the treatment of HIV revealed that the PMTCT approach had low effectiveness and the use of highly active antiretroviral therapy (HAART) was introduced to further reduce the mother-to-child-transmission (Ministry of Health, 2016:9). These strategies of PMTCT and HAART yielded better results as there was a significant decline in the sub-Saharan Africa country.

The following were some of the strategies that Botswana developed in order to achieve the target of 82 deaths/100 000 live births by 2015:- strengthening utilisation of policy guidelines, protocol and service standards in maternal and new-born health care; providing skilled attendance during pregnancy, childbirth and postnatal period at all levels of the health care delivery system; equipping all health facilities with required equipment and supplies in accordance with national health standards; strengthening information, education and communication community orientation strategies; strengthening monitoring and evaluation activities at district and national levels by 31st March 2013 (Ministry of Health, 2009:13). Currently there is no evaluation report that shows the country's progress on the strategies above that were targeted to have been

fulfilled by 2013. Botswana implemented its strategies of reducing maternal mortality through a robust midwifery curriculum and safe motherhood guidelines that were revised (Ministry of Health, 2009:13).

Botswana has since developed a comprehensive training manual on emergency obstetric care (EmOC) in 2010, as a way of doubling up the efforts towards reducing maternal mortality (Ministry of Health, 2010b: VIII). This manual targets the health workers who are placed at maternity facilities. The main aim was to develop skills and knowledge in critical thinking and effective decision-making in the provision of quality care by the health workers during the critical period of saving the lives of both the mother and the baby. The programme comprises a week of theory and a week for clinical practice on selected high risk maternal conditions. Currently the Ministry of Health, Botswana, has conducted nine (9) training sessions of EmOC training country-wide, where 269 (181 midwives and 88 doctors) practitioners have been trained. The training covered all levels of health care (referral and district hospitals, clinics with and without maternity wings) and health training institutions. Included in the EmOC is the use of misoprostol for induction of labour and active management of the third stage of labour where the client is given 20 IU of oxytocin in 1000ml of Ringers lactate and another 10 IU intramuscularly (Ministry of Health, 2014:10).

This approach that Botswana has taken is perceived as having had an impact on the reduction of maternal mortality, when incorporated with other interventions like effective family planning programme, effective prevention of sexually transmitted infections (STIs) and other infections, comprehensive abortion care and effective ANC (Prata, Passano, Sreenivas & Gerdts, 2010:312). Despite the above interventions,

women are still dying from avoidable and preventative situations during pregnancy, labour and delivery and postnatal.

1.4 PROBLEM STATEMENT

The Government of Botswana is making efforts to provide skilled attendance during pregnancy, childbirth and postnatal period at all levels of the health care delivery system. Interventions such as provision of PMTCT and HAART to all HIV positive women who are pregnant; the EmOC training that the ministry of health provides; enforcement of policy guidelines and protocols utilisation, have been put in place to reduce maternal morbidity and mortality. However, women are still dying from circumstances that are avoidable such as eclampsia, immediate postpartum haemorrhage and sepsis following abortion (Statistics Botswana, 2017:4).

The maternal mortality ratios trends are still high as the country had 163.0/100,000 births in 2010 and this rose to 188.86/100,000 births in 2011, when Botswana has a target to reduce maternal deaths to 82 deaths per 100 000 live births by 2015 (Statistics Botswana, 2017:2). It is against this background that the researcher evaluates the implementation of EmOC services that are provided by midwives in the Greater Gaborone region, so as to recommend strategies to improve the quality of care rendered.

1.5 RESEARCH PURPOSE

The purpose of the study is to evaluate the implementation of EmOC services rendered by midwives in the Greater Gaborone DHMT in Botswana.

1.5.1 Objectives

The objectives of the study are to:

1. Determine the level of EmOC knowledge of the midwives.
2. Describe the EmOC services rendered in the Greater Gaborone DHMT.
3. Determine the availability of resources in the implementation of EmOC services.
4. Determine the level of technical support received by midwives in the implementation of EmOC services.
5. Determine the outcomes of the EmOC implementation.

1.6 SIGNIFICANCE OF THE STUDY

The findings of the research may inform the policy makers and programme coordinators for maternal health to initiate improved approaches that could strengthen the acceleration of the reduction of maternal deaths in the era of Sustainable Development Goals (SDGs). Moreover, this could assist the service providers (midwives) to further improve the standard of care rendered to expectant women.

1.7 DEFINITION OF TERMS

Midwife: is a professional nurse who underwent midwifery training in a recognised institution, and has been licensed with the regulatory body (Marshall, Raynor & Nolte, 2014). In the study a midwife is therefore a nurse who has been trained and licenced as a midwife, practicing in Greater Gaborone DHMT facilities for at least three (3) months

EmOC- an approach of improving the availability, accessibility, quality and use of services for treating of complications arising during pregnancy, labour and delivery and post-partum geared towards reducing maternal and neonatal mortality (Ministry of Health, 2010:2). In the study, EmOC is a series of health care activities that is

expected to be performed in the facility by the midwife on pregnant women during an emergency in order to prevent morbidity and mortality.

Maternal mortality- 'A death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes' (Statistics Botswana, 2017:7). In the study maternal mortality is the number of women who die during pregnancy, labour and delivery and post-partum.

1.8 RESEARCH DESIGN AND METHODS

The research methods and design are important factors of the research process as they set the plan, how it is implemented and analysed (Polit & Beck, 2017:11). This section discusses the research approach used, sampling, data collection and analysis of data.

1.8.1 Study design

The study design is a series of activities that the researcher follows in order to direct and achieve the intended goal of the study (Polit & Beck, 2017:56). A quantitative cross sectional study which is descriptive in nature was used to evaluate the implementation of EmOC services provided by midwives in the Greater Gaborone DHMT.

1.8.2 Setting of the study and target population

The setting of the study explains the place (s) where the researcher collects data for the research study (Brink, van de Walt & van Rensburg, 2015:59). The study was conducted in Gaborone, the capital city of Botswana, with a population estimated at 227,333 (Statistics Botswana, 2012:5). It is situated in the south-east region of the country. There is one referral hospital and five (5) clinics with maternity wings that run

for 24 hours and 13 clinics that offer all health services including sexual and reproductive health (SRH) services. The setting of the study would have an influence on the midwives' responses because of their diverse knowledge, experiences and practices in the reduction of maternal mortality and morbidity.

Population

According to Polit and Beck (2017:249), population is defined as a total group that possess specific characteristics that the researcher intends to study. It refers to individuals in the population who hold specific features. The population of the study were all registered midwives practising in the government health facilities within Greater Gaborone DHMT. There were 223 midwives in Greater Gaborone DHMT including the referral hospital that renders SRH services in the area. This population was of interest to the researcher because they are first hand professionals who offer maternity services to clients arriving at a health facility, and are the most readily available professionals in all health facilities as they have been equipped with high impact interventions aimed towards reducing maternal mortality and morbidity.

1.8.3 Inclusion and exclusion criteria

Inclusion criteria

The following descriptors were met by the participants who were included in the study:

1. Midwives who are registered with the Nursing and Midwifery Council of Botswana (NMCB).
2. Working in Greater Gaborone DHMT facilities.
3. Have been providing maternity services for at least three (3) months.

Exclusion criteria

1. Midwives who are registered with the NMCB and working in G-G DHMT but not rendering maternity services
2. Midwives who have provided maternity service for less than three (3) months.

1.8.4 Sampling and sample selection

A systematic random sampling of the facilities and participants was employed in this study. The method was chosen as all the facilities have an equal chance of being selected for the study (Polit & Beck, 2017:250). The researcher developed a sample frame from the target population and selected the k^{th} number until the sample size was reached (Polit & Beck, 2017:250).

Sample size

Researchers are generally convinced that 'the larger the sample the smaller sampling error' (Polit & Beck, 2017:257). This researcher opted to utilise the Raosoft technique of calculating the sample size. Target population was 223 and sample size = 168. The k^{th} number was found to be 2, this means every 2^{nd} midwife was selected from the sample frame.

1.8.5 Instrumentation

The researcher used a self-administered questionnaire to gather data for the study as the approach is less costly, allowing for possible complete anonymity and less interviewer bias is curtailed in this instrument (Polit & Beck, 2017:225). The questionnaire comprises two (2) sections, where section A entails demographic data and section B reflects questions on general training courses; availability and utilization of policies in the unit; availability of drugs, equipment and supplies; basic emergency obstetric care signal functions performed and obstetric skills performed by the midwife

in the implementation of EmOC services (See Annexure F and detailed discussion in chapter 3).

1.8.6 Data collection

Brink *et al.* (2015:59) define data collection as a series of steps where the information is gathered from the participants using a certain technique in order to answer the why, where, what and how questions. A self-administered questionnaire was distributed to the midwives who consented to participate, and these completed it at their own time.

1.8.7 Data analysis

Data analysis is the step where the researcher organizes the collected data and comes up with answers to the research question (Brink *et al*., 2015:59). Descriptive statistics were used to calculate, summarise and describe the demographic characteristics of the participants and facilities, the implementation of EmOC and level of maternal mortality.

1.9 ETHICAL CONSIDERATIONS

Ethical clearance was sought from the North-West University's Ethics Committee (Annexure A), permission to conduct research was requested from the Ministry of Health, Botswana (Annexure B) and was granted by the Health and Research Division (Annexure C). Following granting of the ethical clearance, permission was requested from the management of the facilities where research was conducted: Princess Marina Hospital ethics committee (Annexure D) and Greater Gaborone DHMT (Annexure E) and prospective participants (Annexure G).

Written consent (Annexure H) was sought and received from the midwives; confidentiality, privacy and anonymity were maintained throughout the study. Principle

of beneficence was ensured and participants' right to participate was upheld throughout the study.

1.10 CHAPTER OUTLINE

Chapter 1: Study overview
Chapter 2: Literature review and conceptual framework
Chapter 3: Research Design and Methods
Chapter 4: Results
Chapter 5: Discussion of findings
Chapter 6: Conclusions and recommendations

1.11 DISSEMINATION OF RESULTS

This is the final step in termination of the relationship in a research; the researcher presented and submitted a copy of the research findings to the North-West University and the Health Research Division. The findings of the study were shared with the facilities that offer maternity services in the Greater Gaborone DHMT. In addition, the findings were presented to the Department of Public Health: Sexual and Reproductive Health (SRH) unit which coordinates the implementation and evaluation of maternal health in Botswana.

1.12 SUMMARY

The chapter offered an overview of maternal mortality worldwide, regionally and locally. It also discussed the interventions employed to reduce the maternal deaths. Discussions of the problem statement, aims and objectives including the significance of the study were made. The chapter concluded by defining specific concepts as they are used in the study.

CHAPTER 2

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

This chapter aims at identifying various relevant studies that have been carried out on the evaluation of the EmOC, so as to establish similar studies and eliminate duplication. The purpose of the study is to evaluate the implementation of emergency obstetric care activities provided by health care providers in Gaborone, Botswana.

The researcher identified different instruments that have been used and tested for validity and reliability. Lastly, this review of antecedent literature guides the researcher to clearly identify the gaps in the studies that are similar and drives the researcher to focus on aspects that generate new knowledge (Mouton, 2014:121).

In discussing the chapter, the researcher's main focus is on the background of maternal mortality and its magnitude in Botswana, availability and implementation of EmOC, including various intervention strategies that were employed to reduce maternal deaths. In-depth review is done on the effectiveness of the interventions and the factors contributing to EmOC implementation. The chapter concludes with a summary of the major theoretical and conceptual issues raised in the discussions.

2.2 HISTORY OF MATERNAL MORTALITY

Maternal death is a global concern that is on the top of the health agenda in all countries. This alarm was raised in 1997 when global countries met in Nairobi, Kenya, to try and map the way forward with regards the high maternal mortality witnessed globally (Ministry of Health, 2014:5). Statistics Botswana (2015:4) defines maternal death as the 'death of a woman while pregnant or within 42 days of termination of

pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.' This is a long period that the women undergo from conception through to labour and delivery and post-delivery which is associated with various challenges that could jeopardise the life of a woman (Pillitteri, 2014:12).

Globally, it is estimated that in developing countries, including Botswana, more than 529 000 women and more than 5.7 million babies die during pregnancy, labour and delivery and post-delivery, due to complications that arise during these periods (WHO, 2015:7; Ministry of Health, 2015:1). The world started being very much concerned about the alarming maternal death around the late 1980s, and the safe motherhood initiative was established in 1987 as an intervention to reduce the maternal mortality (Ministry of Health, 2014:1). At the period before 1990, the global maternal mortality was at 523,000 and was to be reduced to at least 289,000 by 2013 (United Nations, 2014:61). This decline in maternal mortality was estimated as 380 deaths per 100 000 live births in 1990 to 210 deaths per 100 000 live births in 2013, which was a significant 45% decline. Africa had the highest contribution to maternal mortality recording an alarming maternal mortality ratio of 870 deaths per 100 000 live births in 1990. This was reduced to 460 deaths per 100 000 live births in 2013, signifying a 47% reduction in maternal mortality (United Nations, 2014:61).

The safe -motherhood initiative after observations that the maternal mortality in the developing countries are alarming as compared to the one in the developed countries, developed a plan to reduce maternal mortality by half in 2000 (Ministry of Health, 2014:1). Botswana adopted the strategy, at that time in 1990 the country had maternal mortality ratio of 326/ 100 000 live births (Ministry of Health, 2014:1). In 2000 on

evaluating the trend of the maternal mortality, the progress was not impressive and the millennium summit was convened which bore the Millennium Development Goals. This strategy was geared towards reducing maternal mortality from the 1990 baseline to 2015 by 75%, and this meant that Botswana should reduce its maternal mortality from 326 to 135 / 100 000 live births (Ministry of Health, 2014:1).

2.3 BOTSWANA MATERNAL MORTALITY RATIO TRENDS

Since the establishment of safe motherhood and millennium development goals strategies, the Botswana maternal mortality ratio has been fluctuating but not reaching the target of reduction by 75%. There has been a reduction in maternal mortality from 326 per 100 000 in 1990 to 2014 (Ministry of Health, 2014:1). Other maternal health indicators, notably family planning and assisted delivery, have made significant progress and are on track to be achieved by 2015. For example, 94.6% of births in the country are attended to by skilled personnel and contraceptive prevalence is estimated at 52.8% (Statistics Botswana, 2015:3). However, progress in maternal mortality is off-track: for example, between 1990 and early 2000, maternal mortality dropped from a high of 326 deaths per 100,000 live births to 135 deaths per 100,000 live births in 2005, but has since increased to 163 deaths in 2010 and 189 deaths in 2012 (UNDP & MoH, 2013:3).

Statistics Botswana is responsible for capturing and analysing national statistics, and the following has been a trend of maternal mortality ration in Botswana. It clearly shows that the maternal mortality in Botswana has declined but did not achieve the target of reducing maternal deaths by at least 75%; currently the maternal mortality ratio fell from 182.6 to 151.6 in 2013 and 2014 respectively (Statistics Botswana, 2015:4). This status is still a concern for the country as there are good interventions that are

employed to reduce maternal mortality such as good antenatal attendance high deliveries at the facility by highly skilled practitioners, yet women are still dying at unacceptable levels (Statistics Botswana, 2015:2).

As shown in Table 1 (page 2), there is a highly volatile trend in the maternal mortality ratio: in some years there is an improvement, while in others, there is a significant reversal of the gains. Consequently, the target of 82 per 100,000 live births is unlikely to be achieved even if the rate of decline observed in 2008–2011 is maintained. This is precisely why acceleration efforts are required if the 2015 target of reducing maternal morbidity and mortality has to be met.

2.4 CAUSES OF MATERNAL MORTALITY

The millennium development goals targeted reduction of maternal mortality by 75% by the year 2015; only a few countries in the developed regions manage to meet the target (Statistics Botswana, 2017:4). Developed countries have long known about the high maternal mortality since 1997 and that most of the leading causes worldwide are due to obstetric complications and the leading causes attributed to haemorrhages, sepsis, obstruction and HIV/AIDS (Ministry of Health, 2014:13). The trend of the causes of maternal mortality is common globally, regionally and locally. A study conducted in China that tracked the maternal mortality between 2001 and 2012 revealed the major causes of maternal mortality ranked from obstetric haemorrhages, pregnancy complications, and amniotic fluid embolism to gestational hypertension (Yang, Zhang, Zhao, Wang, Flick, Qian, Zhang & Mei, 2014:4).

Botswana is not an exception on the ranking of these causes of maternal mortality. A scientific study that was conducted in 2010 reviewed records of maternal deaths that

occurred in Botswana in 2010, and it identified the causes as: haemorrhage (39%), hypertension (22%), and 13% attributed to pregnancy-related sepsis (Ray, Madzimbamuto, Ramogola-Masire, Phillips, Mogobe, Haverkamp, Mokatedi & Motana, 2013:539). This sequence does not differ much from the global trend. The same trend and pattern was observed in a study that was done in 2014 which compared the quality of the maternal audits conducted between 2007-2011 and the one done in 2014, (Sinvula & Insua, 2015:1). The findings from the two audits revealed that between 2007 and 2011 the causes of mortality were: haemorrhage (28%), HIV related infections (17%), hypertensive disorders (17%) and abortion(15%) respectively, while in 2004 the following sequel was deduced as: abortion (22%), hypertension pre-eclampsia (14%), postpartum haemorrhage (14%), HIV related (13%) and 12% attributed to other obstetric causes (Sinvula & Insua, 2015:5).

2.5 INTERVENTIONS TO REDUCE MATERNAL MORTALITY

Following the conferences that were highly concerned of the high maternal mortality in the world, more especially in the sub Saharan Africa, several initiatives were established, and follow ups and reviews on the progress of maternal mortality were mandatory.

2.5.1 Routine HIV testing and PMTCT

One of the causes of maternal mortality in Sub Saharan Africa in the early 90s was due to the HIV/ AIDS related diseases, routine HIV testing was mandatory for pregnant women and their partners (Ministry of Health, 2016:9). In 1999, Botswana introduced a Prevention of mother to child of HIV transmission; a mono antiretroviral therapy of zidovudine was given at 28 weeks of gestation as a prophylaxis, followed by a single dosage of niverapine at onset of true labour (Ministry of Health, 2016:9). The

introduction of PMTCT was successful in the prevention of the HIV from the mother to the unborn foetus, as in 2011 an uptake of 94% was made which yielded a reduction of vertical transmission from 40% in 2001 to less than 4 % in 2009 (Ministry of Health, 2016:9). Similar results of the high uptake on PMTC were revealed in the Botswana AIDS Impact Survey IV (BAIS IV) conducted in 2013, which was at 93.5% (Statistics Botswana, 2014:13). Evaluation on the use of mono antiretroviral therapy was made and some challenges such as resistance to the single dose of Niverapine were deduced (Ministry of Health, 2016:12). This led to the introduction of triple antiretroviral therapy to all HIV positive pregnant women regardless of the CD 4 cell count, which was believed to further reduce the transmission to below 1% annually with the intention of achieving an AIDS free generation (Ministry of Health, 2016:9).

2.5.2 Emergency Obstetric Care

Emergency obstetric care is a strategy that involves services necessary to save life and is most useful when a complication occurs during pregnancy, childbirth and after birth (Chi, Bulage, Urdal & Sundby, 2015:24). This strategy was established by the World Health Organisation in 1997 as a way of reducing maternal mortality (Ministry of Health, 2014:3). It is projected that the services could avert more than 60% of maternal mortality if it is effectively implemented. Botswana started implementing the EmOC strategy in 2011 as a measure to accelerate the reduction in maternal mortality in a bid to meet the target of reducing maternal mortality by 75% by 2015 (Ministry of Health, 2014:2).

EmOC comprises two components being the basic emergency obstetric care and the comprehensive emergency obstetric care.

2.5.2.1 Basic emergency obstetric care

Basic emergency obstetric care consists of seven activities that are essential in preventing maternal morbidity and mortality:

- Administration of parenteral antibiotics;
- Administration of parenteral anticonvulsants;
- Administration of parenteral uterotonics;
- Removal of retained products (manual vacuum aspiration);
- Assisted vaginal delivery;
- Manual removal of the placenta; and
- Resuscitation of the new-born (Otolorin, Gomez, Currie, Thapa & Dao, 2015:S46).

These activities are expected to be carried out in all levels of the health care (clinics, District Hospitals and referral hospitals) but mostly in the clinics with and without maternity, where there are skilled trained midwives. Botswana customised the BEmOC to include the repair of the episiotomy and perineal tears and extended the signal function of administration of parenteral anticonvulsants to include anti-hypertensive (Ministry of Health, 2010b:X).

2.5.2.2 Comprehensive emergency obstetric care

This level, as the name states, is higher than the basic emergency obstetric care, as it comprises of all basic emergency obstetric care signal functions and the following:

- surgical capacity; and
- blood transfusion (Otolorin *et al*., 2015:S46)

To implement the emergency obstetric care, the following general requirements should be in place at the health facility:

- provision of services should be available 24 hours

- availability of skilled providers in sufficient numbers
- ability for referral services to higher-level care
- functional communication tools
- access to reliable electricity and water supply
- availability of heating in cold climates, clean toilets (Otolorin *et al*., 2015: S46)

2.6 Factors contributing to EmOC implementation

A study in Botswana on assessment of the availability, quality and utilisation of EmOC in selected facilities was conducted and it revealed availability of EmOC in some facilities, inadequate training of health care providers, inadequate drugs, supplies and equipment (Bowelo, Maribe, Rabantheng & Thipe, 2008:19). In addition, the study on the perceptions of the health care providers on the quality of emergency obstetric care in Malawi also revealed the poor quality of care attributed to inadequate resources, inadequate staffing, poor teamwork, and inadequate knowledge and supervision. There was also a client factor that was identified, as the clients delay seeking medical assistance and rely on traditional birth attendants (Chodzaza & Bultemeier, 2010:107)

2.7 Conceptual framework: The Donabedian Structure Process and Outcome (SPO)

The Donabedian framework of quality of care is a theoretical basis of outcome research that emerged from evaluation research, which aimed at developing the theory of quality of health care and the process of evaluating the quality of health care (Polit & Beck, 2017:241). The framework conceptualised three dimensions of quality of care being: structure, process and outcome. The researcher chose this model in order to evaluate the structure and processes that are in place for the implementation of EmOC in reducing maternal morbidity and mortality in Botswana.

Structure: This describes the setting in which the care is provided focusing on material resources, human resources and the physical structure. Material resources encompass equipment, supplies and money available, while human resources entail the number and qualifications of the providers of care available. The structure mainly describes having the right things through which to provide quality care (Donabedian, 1988:1745, Polit & Beck, 2017:241; Grossbart & Agrawal, 2013:13). These include material resources (availability of functional essential equipment, availability of supplies and drugs, availability of manuals), Human resources (number of midwives, qualifications of the midwives, number of midwives trained on EmOC) and organisational structure (role clarity, lines of supervision, peer review approach, staff development plan such as-in-service).

Process: These are the actual activities that the care providers should carry out in order to achieve the goals of the institution. Process involves the technical aspect of doing the right things through the assessment, implementation and evaluation standards put in place in order to improve the quality of care (Donabedian, 1988:1745; Polit & Beck, 2017:241; Grossbart & Agrawal, 2013:13). Included in this aspect are the practitioner's activities in making decisions and implementation of plans. In this study the practitioners' activities include: availability and utilisation of policies or standards (admission, management of high risk patients), standards in case of emergency in the unit, policy or standards on referral procedures, implementation of EmOC in the unit, monitoring and evaluation of facility or unit plans.

Outcome: This aspect defines the effectiveness of the process and available structure in the provision of care. In other words, it means having the right things happen. It denotes the performance of the process in relation to the expected outcomes (Donabedian, 1988:1745, Polit & Beck, 2017:241; Grossbart & Agrawal, 2013:13).

This part of the model points to the effects of the care on the health status of the patient. In the study the researcher looked at the end results of the EmOC implementation.

This approach of quality assessment is possible because 'good structure increases likelihood of good process, and a good process increases the likelihood of good outcomes' (Donabedian, 1988:1745).

Figure 1: The Donabedian Quality-of-Care Framework

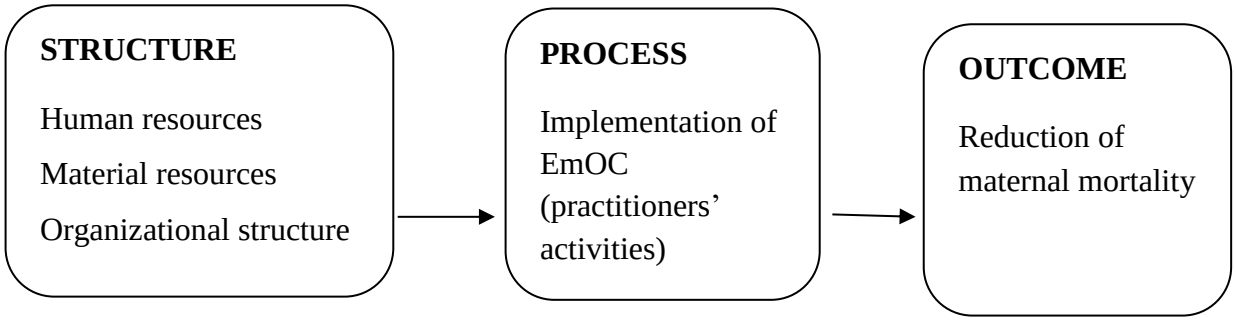


Figure 1A: Application of Donabedian Quality-of-Care Framework in the study

2.8 SUMMARY

The researcher looked for studies that were relevant to the topic of this study guided and was significantly by the objectives. The focus was on maternal mortality history, interventions implemented to reduce maternal mortality and the factors that contributed to the implementation of EmOC and the causes of maternal mortality. Discussion on the conceptual framework was made to help guide the researcher by looking at the concepts and components of the Donabedian quality of care and were applied to the study.

CHAPTER 3

RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

This chapter discusses the methodology that the research used in the evaluation of the EmOC services rendered by midwives in the Greater Gaborone DHMT. It explains the research design, setting of the study, the target population including the sampling and sample size. In addition it describes in detail the method of data collection, data analysis, dissemination of findings and ethical principles that were instituted.

3.2 STUDY DESIGN

A research design is a series of activities that the researcher intends to follow in order to direct and achieve the intended goal of the research project, that start with the population selection, steps in sampling, method of measurement to final plans for data collection and analysis (Mouton, 2014:107).

According to Polit and Beck (2017:11), quantitative research is a problem-solving method used to answer a research question through a statistical procedure, whereby phenomena are explored, explained and described. Quantitative research is important in generating knowledge in a situation where it is difficult to use an experimental approach. The purpose of a quantitative research approach is mostly to identify the cause and effect in a phenomenon, to test the intervention or theory that is practiced and it is therefore one of the methods utilised in order to answer a research question that informs evidence-based practice (Polit & Beck, 2017:13).

On the other hand, the quantitative research is objective and does not gather deep investigation into a phenomenon as compared to a qualitative method that explores the meaning of a phenomenon (Polit & Beck, 2017:13). The method is essential because analysis becomes less time consuming due to various software that are available for use in data collection and analysis (Polit & Beck, 2017:12). A quantitative cross sectional study which is descriptive in nature was used to evaluate the implementation of EmOC services provided by midwives in the Greater Gaborone DHMT.

3.3 SETTING OF THE STUDY AND TARGET POPULATION

The study was conducted in the capital city of Botswana, Gaborone, with population estimated at 213,592 (Statistics Botswana, 2012:4). It is situated in the south-east region of the country. There is a referral hospital and five (5) clinics with maternity wings that are run 24 hours and 13 clinics that offer all health services including sexual and reproductive health (SRH) services. The setting of the study would have an influence on the midwives' responses because of their diverse knowledge, experiences and practices in the reduction of maternal mortality and morbidity.

The population of the study was registered midwives practising in the government health facilities within Greater Gaborone DHMT. There are 223 midwives in Greater Gaborone DHMT, including the referral hospital that renders SRH services in the area. This population has been of interest to the researcher because they are the first hand professional who offer maternity services to clients arriving at the health facility, and are the most readily available professional in all the health facilities as they have been equipped with high impact interventions aimed at reducing maternal mortality and morbidity.

3.4 SAMPLING AND SAMPLE SELECTION

A sample is ‘a subset of a population comprising those selected to participate in a study’ (Polit & Beck, 2017:249). As the researcher chose the quantitative approach, a systematic sampling of the facilities was employed. All the facilities rendering labour and delivery services were purposefully selected because these units are critical as they do close monitoring of maternity clients for a longer time until delivery and puerperium periods. The remaining facilities were randomly chosen. The researcher came up with the criteria of using the first main road in the city that passes the city from south to north to divide the facilities.

Those facilities that are on the eastern side were grouped together and a list made alphabetically; the same procedure was applied to the facilities on the western side. Following arrangement to avoid bias, these facilities we given numbers from 01, and then all the facilities (on the eastern and western side) that had an even number were selected. The method was chosen as the facilities have an equal chance of being selected for the study (Polit & Beck, 2017:251). During data collection, those participants who met the criteria, and were willing to participate were selected, and a convenience sampling was used (Polit & Beck, 2017:252). The researcher encountered participants who did not meet the criteria as the participants are not known to the researcher; on the other hand the researchers identified the participants by their distinguishing professional devices (Polit & Beck, 2017:252). In selecting the participants, the researcher requested a list of the midwives in the Greater Gaborone DHMT, and then selected those working in the units that offer SRH services and came up with the exact number of the target and accessible population.

To draw the number of midwives for interviews, a table of random numbers was developed after getting the list of the midwives who provided maternity services in the Greater Gaborone DHMT. These names were given numbers and arranged numerically in a table, and were drawn using a simple random sampling until the calculated sample size was reached (Polit & Beck, 2017:258). A systematic random sampling of the facilities and participants was employed. The method was chosen as all the facilities had an equal chance of being selected for the study (Polit & Beck, 2017:257)

3.5 SAMPLE SIZE

A sample size is a small portion derived from the target population that the researcher selects to participate in a study (Polit & Beck, 2017:258). Quantitative researchers always seek to generalise the findings of the study and this is often determined by the sample size since there is 'no simple formula' stipulated on how the size of the sample is calculated (Polit & Beck, 2017:257). On the other hand, it is stated that when estimating the size of the sample, the researcher mostly works on the basis of a certain percentage that is deemed representative enough of the target population. The sample size, whether small or large is predicted by the type of the study conducted. Generally, 'the larger the sample, the smaller the sampling error' (Polit & Beck, 2017:258). The researcher opted to utilise the Raosoft technique of calculating the sample size.

Target population is 223 and sample size = 168

$$\mathrm{k} = \frac{Population\ size}{Sample\ size}$$

$$\mathrm{k} = \frac{223}{168}$$

$$k = 1.33$$

$k = 1.3$; Therefore, every 2nd person was selected from the sample frame.

3.6 INCLUSION AND EXCLUSION CRITERIA

The following criteria were used to include or exclude participants in the study:

3.6.1 Inclusion criteria

1. Midwives who are registered with the Nursing and Midwifery Council of Botswana (NMCB).

2. Should be working in Greater Gaborone DHMT facilities.

3. Have been providing maternity services for at least three (3) months.

3.6.2 Exclusion criteria

1. Midwives who are registered with the NMCB and working in G-G DHMT but not rendering maternity services

2. Midwives who have not provided maternity service in less than three (3) months.

3.7 INSTRUMENTATION

The researcher utilised a self-administered questionnaire to gather data for the study as the approach is less costly and displays less interviewer bias (Polit & Beck, 2017:225). The questionnaire comprised two (2) sections, where Section A entailed demographic data and section B reflected questions on general training courses; availability and utilization of policies in the unit; availability of drugs, equipment and supplies; basic emergency obstetric care signal functions performed and obstetric

skills performed by the midwives in the implementation of EmOC services (Annexure F). The questions in the tool have been adopted from the World Health Organisation (2012) and Demographic Health Survey (DHS) questionnaire (2012). The questions addressed the seminal components in the conceptual framework (structure, process and outcome) well.

VALIDITY

Instrument validity assesses if the tool that the researcher intends to use for collection of data for the study is relevant and yields correctly what the researcher seeks to measure (Brink *et al*., 2015:126). The questions in the tool have been adopted from the World Health Organisation (2012) and Demographic Health Survey (DHS) questionnaire (2012) which had been used by countries like Swaziland and Botswana (Bowelo *et al*., 2008:6).

RELIABILITY

The reliability of the instrument explains the extent to which the tool can be depended upon and give the same results repeatedly when used by the same researcher or other researchers on the same person (Brink *et al*., 2015:126). The tool was found to be reliable for the study as the Cronbach alpha was 0.73.

The researcher conducted a pre-test of the tool on 8 participants in order to assess if the tool gathered what the researcher sought to collect. Those who participated in the pilot study were not included in the entire data collection.

3.8 DATA COLLECTION

Brink *et al.* (2015:59) defines data collection as a series of steps where the information is gathered from the participants using a certain technique in order to answer the why, where, what and how questions. This step in research is very crucial as is the time when the researcher now has to ensure implementation of the research plan. In a

quantitative study, the researcher may utilise questionnaires or interviews. This study utilised a self-administered questionnaire to gather data for the study as the approach is less costly, and this also offers possible complete anonymity and less interviewer bias (Polit & Beck, 2017:243).

The questionnaire was offered to the participants who consented to participate, and were allowed to complete it at their own time. The researcher collected those questionnaires from the participants after completion (Polit & Beck, 2017:247). Data collection was done between May and August 2016 (4 months).

3.9 DATA ANALYSIS

Data analysis is the step where the researcher organizes the collected data and comes up with the answers to the research question (Polit & Beck, 2017:357). A descriptive statistical analysis was used to calculate, summarise and describe the demographic characteristics of the participants and facilities, the implementation of EmOC and level of maternal mortality.

3.10 ETHICAL CONSIDERATIONS

The ethical clearance was sought from the North-West University's Ethics Committee (Annexure A), permission to conduct research was requested from the Ministry of Health, Botswana (Annexure B) and was granted by the Health and Research Division, Botswana (Annexure C). Following granting of the ethical clearance, permission was requested from the management of the facilities where research was conducted; Princess Marina Hospital Ethics Committee (Annexure D) and Greater Gaborone DHMT (Annexure E) and prospective participants (Annexure G).

3.10.1 Participants' consent

The participants were informed that their participation in the study was voluntary and the right to withdraw at any time if they felt uncomfortable, without any prejudice. Participants were allowed to ask any pertinent questions prior signing of the consent form (Annexure H).

3.10.2 Confidentiality

To maintain confidentiality, data gathered was kept under lock and key and only the researcher and the research supervisors involved in the study had access to the information for the purposes of peer review.

3.10.3 Anonymity

There were no names used but a number was attached to each questionnaire that identified the facility or the participants. The questionnaires were allocated numbers that only the researcher was able to trace. The completed informed consent and reference number of the participants were stored separately from the questionnaires. In addition, on writing the report the researcher ensured that there were no ways that could link the information with the participants of the study.

3.10.4 Benefits and risks of harm

The researcher ensured the principle of beneficence to the participants by avoiding any discomfort and harm throughout the study. There was no physical harm inflicted as there was no manipulation of participants.

3.10.5 The right to participate

The participants were assured that the participation in the study was voluntary, and if on the process the participants intends to withdraw from the study. No punishment was instituted.

3.11 SUMMARY

The section described the method that the research took when conducting the study. A descriptive cross sectional study design was used in this study. The study was conducted in Gaborone, Botswana. The target population was midwives who renders maternity services and had been working in the area for at least three (3) months. A systematic random sampling of the facilities and participants and a self-administered questionnaire were employed in this study. Only those midwives who agreed to participate in the study were asked to sign the consent form, and then given a questionnaire to complete and return. Statistical Package for the Social Sciences (SPSS) version 24 was used for data analysis. This study ensured and maintained the midwives' rights and dignity throughout as consent was sought, confidentiality and anonymity were observed.

CHAPTER 4

RESULTS

4.1 INTRODUCTION

The purpose of the study was to evaluate the implementation of EmOC services rendered by the midwives in Botswana. It also examined if demographic variables such as age, gender, level of education have any significant effect on the EmOC implementation. Furthermore, the level of EmOC knowledge and skills of the midwives and the availability of resources in the implementation of EmOC were assessed to establish whether or not they contributed to maternal mortality. A descriptive statistical analysis was used to describe the demographic data. This chapter discusses the results of the study guided by the conceptual framework and objectives stated below which were set to:

1. Determine the level of EmOC knowledge of the midwives
2. Describe the EmOC services rendered in the Greater Gaborone DHMT.
3. Determine the availability of resources in the implementation of EmOC services.
4. Determine the level of technical support received by the midwives in the implementation of EmOC services.
5. Determine the outcomes of the EmOC implementation.

4.2 DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS

The numbers of midwives in the area were 223 and a sample of 168 was obtained to participate in the study. The sampled population managed to answer and return all the questionnaires.

4.2.1 Age and gender

The midwives who participated in the study were aged between 25 and above 50 years, with a majority of midwives within the ages of 35-39 years (n=45; 26.8%) followed by ages 40-44 years (n=44; 26.2%) and 45-49 years (n= 34; 20.2%) respectively. These findings show that most of the midwives were middle-aged and they are still active enough to render quality care. The females (n=151; 89.9%) dominated in the study when compared to their male counterparts (n=17; 10.1%), clearly showing that the nursing and midwifery as professions are still dominated by female gender.

4.2.2 Nationality

Most of the midwives were citizens of Botswana (n=161:95.8%) and only n=7(4.2%) were non-citizens from Zimbabwe and other countries. This shows that midwives working in Botswana are predominantly national citizens with a few expatriates.

4.2.3 Level of education

The majority of the midwives hold a diploma in midwifery training (n=159; 94.6%) and only n=9 (5.4%) have a degree in nursing. This essentially means that all hold a diploma in midwifery and from the total sampled only n=9 (5.4%) hold both a diploma and a degree.

Table 2: Demographic characteristics of the midwives

Variables		Freq (n)	Percentage (%)
Age	25 -29 years	8	4.8
	30-34 years	17	10.1
	35 -39 years	45	26.8
	40-44 years	44	26.2
	45-49 years	34	20.2
	50 years and above	20	11.9
Gender	Female	151	89.9
	Male	17	10.1
Nationality	Motswana	161	95.8
	Zimbabwean	6	3.6
	Others	1	0.6
Level of education	Diploma in midwifery	159	94.6
	Both degree in nursing and diploma in midwifery	9	5.4

4.2.4 Experience in midwifery

Majority of the midwives (n=93:55.4%) had been practising midwifery between 6 and 10 years, followed by (n=30; 17.9%) with more than 15 years of experience. It is evident that the majority of the midwives (n= 109:64.9%) had worked in maternity services for more than 48 months.

Table 3: Experience in midwifery

		Frequency	Percentage
Year of qualification for midwifery	1-5 years	26	15.5
	6-10 years	**93**	**55.4**
	11 -15 years	19	11.3
	> 15 years	30	17.9
Duration working in maternity services	3-11 months	25	14.9
	12-23 months	9	5.4
	24 -35 months	18	10.7
	36 -47 months	7	4.2
	48 months and above	**109**	**64.9**

4.3 Level of knowledge of Midwives

The research intended to determine the level of knowledge of the midwives providing maternity services in the area of study.

4.3.1 Knowledge of the midwives

The midwives showed that they were highly knowledgeable as they were able to define anaemia and prolonged labour (n= 156, 92.9%), obstetric haemorrhages (n=151, 89.9%), puerperal infections (n=149, 88.9%) and abortion (n=142, 84.5%). An assumption in this study is that ability of the midwives to define terms stated, necessarily implies that they would be able to identify the client on time. In a dim revelation, some midwives were not able to define abortion (n=20, 11.9%) and obstetric haemorrhages (n=15, 8.9%), and this

poses a threat to wrongly facilitating procedures for clients who need emergency attention.

Regarding triaging of clients with obstetric emergencies the study showed that the majority of the midwives were able to triage the clients with obstructed labour (n=121, 72.0%) and those with new-born complications (n=159, 94.6%). However, some midwives showed that sometimes they were not able to triage clients with obstructed labour (n=32, 19.0%).

Table 4: Knowledge of the midwives

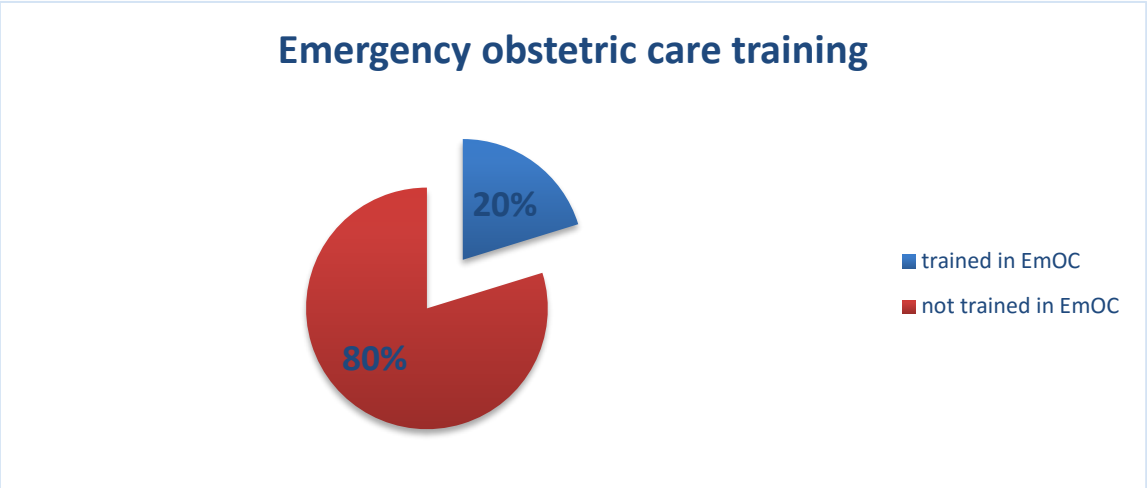
Ability to define the following terms:	**Yes**	**No**	**Partial**	**Total**
Obstetric haemorrhage	**151 (89.9%)**	2 (1.2%)	15 (8.9%)	168 (100%)
Abortion	**142 (84.5%)**	6 (3.6%)	20 (11.9%)	168 (100%)
Anaemia	**156 (92.9%)**	6 (3.6%)	6 (3.6%)	168 (100%)
Prolonged labour	**156 (92.9%)**	6 (3.6%)	6 (3.6%)	168 (100%)
Puerperal infections	**149 (88.7%)**	7 (4.2%)	12 (7.1%)	168 (100%)
Ability to identify or triage clients with the following conditions:				
	Yes	**No**	**Sometimes**	**Total**
Early bleeding in pregnancy	**148 (88.1%)**	14(8.3%)	6(3.6%)	168(100%)
Late bleeding in pregnancy	**146 (86.9%)**	16 (9.5%)	6 (3.6%)	168(100%)
Intrapartum bleeding	**143 (85.1%)**	14(8.3%)	11(6.5%)	168(100%)
Post-Partum bleeding	**154 (91.7%)**	14(8.3%)	0(0%)	168(100%)
Prolonged labour	**148 (88.1%)**	14(8.3%)	6 (3.6%)	168(100%)
Obstructed labour	**121(72.0%)**	15(8.9%)	32(19.0%)	168(100%)
Puerperal infections	**135(80.4%)**	15(8.9%)	18(10.7%)	168(100%)
New-born complications (e.g. asphyxia)	**159(94.6%)**	9(5.4%)	0(0%)	168(100%)

4.3.2 Trainings received by the midwives

Midwives need to receive updates on current interventions that are geared towards reducing maternal mortality and morbidity.

4.3.2.1 EmOC training

The majority of midwives (n=134; 79.8%), who participated in the study were not trained in Emergency Obstetric Care, only n=34 (20.2%) had undergone the EmOC training, which is perceived to have a positive impact on the reduction of maternal mortality.



4.3.2.2 In-service trainings

The results of this study show that in-service training has not been carried out effectively as n=119; (70.8%) did not receive in-service training on post abortion care, n=102 (60.7%) in life-saving skills (LSS) - in general, n=86 (51.2%). Basic Emergency Obstetric Care (BEmOC), n=70 (41.7%) complications of pregnancy and their management and n=68 (40.5%) indicated they had participated in routine care for labour and normal vaginal delivery. Lack of in-service training on the key aspects that are principal contributory factors to maternal mortality and morbidity implies insufficient knowledge amongst the midwives and this could be a source of great susceptibility of patients to wrong classification and serious complication in the labour process.

The following midwives received in-service training within the 24 months in the following categories: n=83 (49.4%) in PMTCT, n=94 (56.0%) in antiretroviral prophylactic treatment for PMTCT, and n=79 (47.0%) were trained in active management of third stage of labour (AMTSL). About n=99 (58.9%) received in-service training over 24 months on diagnosing and treating sexually transmitted infections (STIs).

Table 5: In-service training received by midwives

In-service training on:	Yes, within 24/12	Yes,> 24/12	No	Total
Diagnosing and treating sexually transmitted infections (STIs)	43 (25.6%)	**99 (58.9%)**	26 (15.5%)	168 (100%)
Complications of pregnancy and their management	54 (32.1%)	44 (26.2%)	**70(41.7%)**	168 (100%)
Prevention of mother-to-child transmission (PMTCT) of HIV/AIDS	**83 (49.4%)**	69(41.1%)	16(9.5%)	168(100%)
Antiretroviral prophylactic treatment for prevention of mother to child transmission of HIV	**94(56.0%)**	41(24.4%)	33(19.6%)	168 (100%)
Basic Emergency Obstetric Care (BEmOC)	38(22.6%)	44(26.2%)	**86(51.2%)**	168 (100%)
Routine care for labour and normal vaginal delivery	64(38.1%)	36(21.4%)	**68(40.5%)**	168 (100%)
Active Management of Third Stage of Labour (AMTSL)	**79(47.0%)**	31(18.5%)	58(34.5%)	168 (100%)
Life-saving skills (LSS) - in general	19(11.3%)	47(28.0%)	**102(60.7%)**	168 (100%)
Post abortion care	11(6.5%)	38(22.6%)	**119(70.8%)**	168 (100%)

4.4 EmOC SERVICES RENDERED IN THE GREATER GABORONE DHMT

The emergency obstetric care services are essential and mandatory to midwives at all times. The researcher discusses the basic signal functions performed by the midwives in the subsequent segment.

4.4.1 Basic EmOC functional signals performed by midwives

All the health facilities in this study render the type of EmOC services according to the level of the facility determined by the functional signal expected to be performed by the midwives at that level. The midwives who participated in the study responded that they are able to perform the stated functional signals, n=138 (82.1%) were able to administer parenteral oxytocic drug, however n=28(16.7%) could not to perform administration of parenteral oxytocic, which the researcher assumed are midwives based at the clinics without maternity units. Majority of the participants, n=136 (81.0%) stated that they had not performed manual removal of placenta. This could be interpreted as suggesting that midwives are managing third stage of labour effectively because retained placenta may contribute to postpartum haemorrhage which is one of the leading causes of maternal mortality. On the other hand, midwives would lose this skill on manual removal of retained placenta should they not have

such cases to deal with. The participants showed n=115 (68.5%) and n=57 (51.8%) had administered parenteral antibiotics and anticonvulsant for hypertensive disorders of pregnancy respectively. About n=91 (54.2%) performed assisted deliveries. In conclusion, this study demonstrates that the midwives who participated in the study are effectively assessing and managing the obstetric clients as evidenced by almost the majority of the EmOC signals having been performed by the respondents in this study.

Table 6: Basic EmOC functional signals performed by midwives

Have you carried out any of the following interventions as part of your work?	Yes	No	NA	Total
Parenteral administration of antibiotics (IV or IM)	**115(68.5%)**	53(31.5%)	0	168 (100.0%)
Parenteral administration of oxytocic (IV or IM)	**138(82.1%)**	28(16.7%)	2(1.2%)	168 (100.0%)
Anticonvulsant for hypertensive disorders of pregnancy (IV or IM)	**87(51.8%)**	74(44.0%)	7(4.2%)	168 (100.0%)
Assisted vaginal delivery	**91(54.2%)**	63(37.5%)	14(8.3%)	168 (100.0%)
Conducted manual removal of placenta	21(12.5%)	**136(81.0%)**	11(6.5%)	168 (100.0%)
Removal of retained products after delivery	59(35.1%)	**93(55.4%)**	16(9.5%)	168 (100.0%)

4.4.2 Provision of obstetric skills by midwives and their level of confidence in managing high risk conditions

Skill competency is important in the reduction of maternal mortality and morbidity. Participants' responses showed that they are able to perform skills in managing most of the maternity situations. About 88.7% (n=149) stated they were skilled in managing pre-eclampsia, where 85.1% (n=143) have skills in assessing progress of labour. The least skill that has been marked and identified in this study is the management of fever before delivery (n=90; 53.6%) and referring of eclampsia (n=103; 61.3%).

Observations made in this study highlighted that the midwives showed less confidence in most of the skills as the highest confidence was marked in the management of pre-eclampsia (149; 88.7%) followed by improved confidence in assessing progress of labour (n=121; 72.0%). There were contrasting responses between the midwives' level of skill in

relation to the confidence level, as in the majority of the respondents their confidence level fell below 50%.

The midwives who participated in the study showed that they are skilful and have confidence in managing women with high risk complications during pregnancy as evidenced by n=149 (88.7%) skilled in managing pre-eclampsia, n=143 (85.1) skilled in assessing progress of labour, n=127 (75.6%) for bleeding in late pregnancy, n=125 (74.4%) bleeding in early pregnancy, and n=119 (70.8%) able to manage fever in pregnancy. The midwives showed lower confidence levels in the management of these high risk pregnancies, as only two (2) attributes scored above 50%. Majority of the midwives revealed low confidence in bleeding in early pregnancy (n=79; 47.0%), bleeding in late pregnancy and labour (n=81; 48.2%), referral for eclampsia (n=74; 44.0%), fever before delivery (amnionitis) (n=69; 41.1%), fever after delivery (n=79; 47.0%) and assessing progress of labour (n= 121; 72.0%). Managing pre-eclampsia had the highest confidence (n=149; 88.7%), followed by assessing progress of labour (n= 121; 72.0%) There are conflicting results between the skill and confidence levels of the midwives in managing the high risk pregnancy.

Regarding skill and confidence in managing women during labour, a majority of the midwives showed that they were highly skilful in the correct use of and completing the partograph, including the fourth stage of labour (n=137; 81.5%), managing abnormal early labour (n=130; 77.4%), management of abnormal active first stage of labour (n=117; 69.6%), managing abnormal active second stage labour (n=105; 62.5%), management of abnormal active third stage of labour (n=107; 63.7%). The confidence level responses were identified as lower than the skill in all the attributes, where correct use and completing the partograph, including the fourth stage of labour (n=123; 73.2%), managing abnormal early labour (n=103; 61.3%), management of abnormal active first stage of labour (n=98; 58.3%),

management of abnormal active second stage of labour (n=87; 51.8%), management of abnormal active third stage of labour (n=81; 48.2%).

The midwives were to respond on whether or not they are skilled and the level of confidence exhibited in managing complicated deliveries. The study established that a majority of the midwives were not skilled in most of the services expected from them: 74.4% (n=125) responded that they did not have skills in managing third degree episiotomy tear, 73.2% (n=123) were not skilled in performing manual removal of placenta, 70.8% (n=119) were not skilled in performing bimanual compression, 68.5% (n=115) did not have skills in performing manoeuvres for shoulder dystocia, 70.8% (n= 119), doing postpartum care visits at home, 61.3% (n= 103) not skilled in assisting vacuum delivery and 53.0% (n= 89) not skilled in monitored client on induction of labour. Few midwives responded as being skilled in breech delivery (n=99; 58.9%), managing prolapsed umbilical cord (n=86; 51.2%), repairing first degree tear (n=126; 75.0%), repairing second degree tear (n=106; 63.1%) and managing twin delivery (n=97; 57.7%). Looking at the level of confidence, there are contrasting responses as the majority of the midwives stated that the activity was not applicable, except 71.4% (n= 120) in repairing of first degree tear and 42.9% (n= 72) who indicated that they were confident in repairing second degree episiotomy tear.

Table 7: Provision of obstetric skills by midwives and their level of confidence in managing high risk conditions

	Skill			**Confidence**			
Do you personally provide the services: If yes, how confident?	**Yes** [N (%)]	No [N (%)]	N/A [N (%)]	Not at all [N (%)]	Need assistance N (%)	Confident N (%)	N/A [N (%)]
Bleeding in early pregnancy	**125(74.4)**	35(20.8)	8(4.8)	2(1.2)	51(30.4)	**79(47.0)**	36(21.4)
Bleeding in late pregnancy and labour	**127(75.6)**	33(19.6)	8(4.8)	1(0.6)	51(30.4)	**81(48.2)**	35(20.8)
Pre-eclampsia	**149(88.7)**	11(6.5)	8(4.8)	0	11(6.5)	**149(88.7)**	8(4.8)
Referral for eclampsia	**103(61.3)**	57(33.9)	8(4.8)	0	29(17.3)	**74(44.0)**	65(38.7)
Fever before delivery (amnionitis)	**90(53.6)**	70(41.7)	8(4.8)	7(4.2)	21(12.5)	**69(41.1)**	71(42.3)
Fever after delivery	**119(70.8)**	40(23.8)	9(5.4)	7(4.2)	40(23.8)	**79(47.0)**	42(25.0)
Assessed progress of labour	**143(85.1)**	19(11.3)	6(3.6)	1(0.6)	20(11.9)	**121(72.0)**	26(15.5)
Use a partograph correctly & completely up to stage 4	**137(81.5)**	23(13.7)	8(4.8)	3(1.8)	11(6.5)	**123(73.2)**	31(18.5)
Managed abnormal early labour	**130(77.4)**	30(17.9)	8(4.8)	1(0.6)	33(19.6)	**103(61.3)**	31(18.5)
Managed abnormal active labour (first stage)	**117(69.6)**	35(20.8)	16(9.5)	1(0.6)	19(11.3)	**98(58.3)**	50(29.8)
Managed abnormal active labour (second stage)	**105(62.5)**	47(28.0)	16(9.5)	1(0.6)	18(10.7)	**87(51.8)**	62(36.9)
Managed abnormal active labour (third stage)	**107(63.7)**	45(26.8)	16(9.5)	1(0.6)	26(15.5)	**81(48.2)**	60(35.7)
Monitored client on induction of labour	63(37.5)	**89(53.0)**	16(9.5)	2(1.2)	5(3.0)	57(33.9)	**104(61.9)**
Assisted vacuum delivery	49(29.2)	**103(61.3)**	16(9.5)	6(3.6)	17(10.1)	27(16.1)	**118(70.2)**
Conducted breech delivery	**99(58.9)**	53(31.5)	16(9.5)	13(7.7)	46(27.4)	40(23.8)	**69(41.1)**
Managed prolapsed umbilical cord	**86(51.2)**	65(38.7)	17(10.1)	11(6.5)	20(11.9)	55(32.7)	**82(48.8)**
Repaired first degree tear	**126(75.0)**	26(15.5)	16(9.5)	1(0.6)	5(3.0)	**120(71.4)**	42(25.0)
Repaired second degree tear	**106(63.1)**	46(27.4)	16(9.5)	2(1.2)	31(18.5)	**72(42.9)**	63(37.5)
Repaired third degree tear	27(16.1)	**125(74.4)**	16(9.5)	6(3.6)	14(8.3)	7(4.2)	**141(83.9)**
Performed manoeuvres for shoulder dystocia	36(21.4)	**115(68.5)**	17(10.1)	6(3.6)	16(9.5)	12(7.1)	**134(79.8)**
Managed a twin delivery	**97(57.7)**	55(32.7)	16(9.5)	12(7.1)	11(6.5)	67(39.9)	**78(46.4)**
Performed manual removal of placenta	29 (17.3)	**123(73.2)**	16(9.5)	0	17(10.1)	13(7.7)	**138(82.1)**
Perform bimanual compression	32(19.0)	**119(70.8)**	17(10.1)	6(3.6)	10(6.0)	22(13.1)	**130(77.4)**
Do postpartum care visits at home	47(28.0)	**105(62.5)**	16(9.5)		10(6.0)	37(22.0)	**121(72.0)**

The participants were requested to state the number of deliveries that they had conducted in the past six (6) months. The findings revealed that a majority (n=48; 30%) of the midwives had conducted more than 30 deliveries in the past six months, followed by n=40 (25%) who had conducted between 0 and 10 deliveries, about n=27 (16.9%) had delivered between 11 and 20 women, n=19 (11.9%) did between 21 and 30 deliveries and n=26 (16.25%) did not conduct any deliveries leading to the surmise that they were in facilities without a maternity wing.

Table 8: Number of deliveries conducted in past six months

Number of deliveries conducted in past six months	Frequency	Percentage
0	2	1.25
Less than or = 10	40	**25.0**
Less than or = 20	27	16.86
Less than or = 30	19	11.9
More than 30	48	**30.0**
Not applicable	24	15.0
Total	160	100.0

4.5 AVAILABILITY OF RESOURCES IN THE IMPLEMENTATION OF EmOC SERVICES

The availability of material resources was categorised as guidelines, equipment and drugs which are mandatory in the provision of emergency obstetric care in order to reduce maternal mortality.

4.5.1 Availability of guidelines

Majority of the midwives who participated in this study showed that most of the important guidelines were available in the facilities as follows: clinical management of HIV/AIDS (n=152; 90.5%); Safe Motherhood Initiative (n=143; 85.1%); National ANC guidelines (n=142; 84.5%); Standard precautions for infection prevention (n=135; 80.4%); and Emergency Obstetric Care (EmOC) had the lowest percentage (n=123;

73.2%). The availability of guidelines ensures that the midwives could make reference to them when they encounter any challenging condition in the execution of their duties.

Table 9: Availability of guidelines

Availability of the following guidelines:	Yes	No	Total
Standard precautions for infection prevention	**135 (80.4%)**	33 (19.6%)	168 (100.0%)
National ANC guidelines	**142 (84.5%)**	26 (15.5%)	168 (100%)
Safe motherhood Initiative	**143 (85.1%)**	25 (14.9%)	168 (100%)
Emergency Obstetric Care (EmOC)	**123 (73.2%)**	45 (26.8%)	168 (100%)
Clinical management of HIV/AIDS	**152 (90.5%)**	16 (9.5%)	168 (100%)

4.5.2 Availability of equipment

From the thirteen types of equipment that were checked for availability and functionality from the midwives, nine (9) out of thirteen of the equipment items were available. This is a reflection of good status in the facility. Majority of the basic equipment that are used on a daily basis were indicated as being available in the facilities and functional such as thermometer (n=168; 100%) availability and (n=161; 95.8%) functionality; the blood pressure apparatus (n=162; 96.4%) availability and (n=55; 92.3%) functionality while the adult weighing scale (n=152; 90.5%) availability and (n=135; 80.4%) functionality.

Also included in the availability of equipment were packs used during emergency obstetric care and it was revealed that majority of the equipment are available and functional at the following levels: per vaginal pack (n=161; 95.8%) availability and functionality, delivery pack (n=159; 94.6%) both availability and functionality, suturing pack (n=109; 64.9%) both availability and functionality; pre-eclamptic pack (n=124; 73.8%) both availability and functionality and post-partum haemorrhage (n=104; 61.9%) availability with (n=98; 58.3%) functionality. This was impressive as almost all the necessary equipment was available and functional. However, availability of

Cardiotopograph which is one of the important equipment had the lowest percentage (n=72; 42.9%) and where it was available mostly it was not functional (n=83; 49.4%).

Table 10: Availability of equipment

	Availability			Functionality		
	Yes	**Not seen**	**No**	**Yes**	**No**	**Don't know**
Adult weighing scale	**152(90.5%)**	8(4.8%)	8(4.8%)	**135(80.4%)**	15(8.9%)	18(10.7%)
Thermometer	**168(100%)**	0	0	**161(95.8%)**	7(4.2%)	0
Blood pressure apparatus	**162(96.4%)**	0	6(3.6%)	**155(92.3%)**	13(7.7%)	0
Cardiotopograph	72(42.9%)	25(14.9%)	71(42.3%)	69(41.1%)	**83(49.4%)**	16(9.5%)
Pulse oximeter	47(28.0%)	33(19.6%)	**88(52.4%)**	45(26.8%)	**106(63.1%)**	17(10.1%)
Oxygen cylinders	**150(89.3%)**	9(5.4%)	9(5.4%)	**150(89.3%)**	9(5.4%)	9(5.4%)
Mounted Oxygen	54(32.1%)	20(11.9%)	**94(56.0%)**	52(31.0%)	**111(66.1%)**	5(3.0%)
Eye protection	57(33.9%)	47(28.0%)	**64(38.1%)**	63(37.5%)	**78(46.4%)**	27(16.1%)
Per Vaginum pack	**161(95.8)**	1(0.6%)	6(3.6%)	**161(95.8)**	6(3.6%)	1(0.6%)
Delivery pack	**159(94.6%)**	1(0.6%)	8(4.8%)	**159(94.6%)**	8(4.8%)	1(0.6%)
Suturing pack	**109(64.9%)**	3(1.8%)	56(33.3%)	**109(64.9%)**	46(27.4%)	13(7.7%)
Pre-eclamptic pack	**124(73.8%)**	24(14.3%)	20(11.9%)	**124(73.8%)**	28(16.7%)	16(9.5%)
Post-partum haemorrhage	**104(61.9%)**	26(15.5%)	38(22.6%)	**98(58.3%)**	49(29.2%)	21(12.5%)

4.5.3 AVAILABILITY OF DRUGS

Most of the drugs were stated as available by the midwives who participated in the study. Availability of drugs was high as it ranged from 81.0% being the lowest percentage and 95.8% being the highest as shown in the table below. Only two (2) drugs, misoprostol tablets (n= 92; 54.8%) and pethidine injection (n=90; 53.6%), were not available. This is a drug that is not availed to all facilities; it is only kept by clinics with maternity that is supervised by a qualified medical practitioner.

Table 11: Availability of drugs

	Yes	Not seen	No	I don't know
Oxytocic drugs	**45(86.3%)**	7(4.2%)	11(6.5%)	5(3.0%)
Hydralazine tablets / injections	**160(95.2%)**	7(4.2%)	1(0.6%)	0(0.0%)
Nifedipine tablets	**161(95.8%)**	7(4.2%)	0(0.0%)	0(0.0%)
Magnesium sulphate injection	**161(95.8%)**	7(4.2%)	0(0.0%)	0(0.0%)
Misoprostol tablets	42(25.0%)	28(16.7%)	**92(54.8%)**	6(3.6%)
Pethidine injection	56(33.3%)	21(12.5%)	**90(53.6%)**	1(0.6%)
Iron supplementation	**160(95.2%)**	7(4.2%)	1(0.6%)	0(0.0%)
Folic acid supplementation	**159(94.6%)**	7(4.2%)	2(1.2%)	0(0.0%)
Metronidazole cap/tab	**159(94.6%)**	8(4.8%)	1(0.6%)	0(0.0%)
Ceftriaxone injection	**158(94.0%)**	8(4.8%)	2(1.2%)	0(0.0%)
Benzathine penicillin injection	**136(81.0%)**	13(7.7%)	19(11.3%)	0(0.0%)
Erythromycin tablets	**160(95.2%)**	7(4.2%)	1(0.6%)	0(0.0%)

4.6 LEVEL OF TECHNICAL SUPPORT AND SUPERVISION RECEIVED BY THE MIDWIVES IN THE IMPLEMENTATION OF EmOC SERVICES.

Majority of participants (n=111; 66.1%) responded that there was no technical support or supervision received, however 15.5% (n=26), 10.1% (n=17) and 1.2% (n=2) received some support and supervision in the past three (3), four to six (4-6) and more than 12 months respectively.

Table 12: Technical support or supervision received by midwives

Did you receive the technical support or supervision	Frequency	Percentage
Yes, in the past 3 months	26	15.5
Yes, in the past 4-6 months	17	10.1
Yes, more than 12 months	2	1.2
No	**111**	**66.1**
Not applicable	12	7.1
Total	168	100.0

4.7 EXPOSURE OF MIDWIVES TO EmOC IMPLEMENTATION

Majority of the participants (n=96; 57.1%) revealed that they did not know the number of women whom they assisted who had complications during delivery through to 42 days postnatal period. Most of responses showed that few midwives encountered women with complications that ranged between n=7 (4.2%) and n=16 (9.5%).

Table 13: Number of women assisted who had complications during pregnancy until 42 days after delivery

	Frequency	Percentage
0	9	5.4
1-2	24	14.3
3-4	18	10.7
5 and above	8	4.8
I don't know	**96**	**57.1**
Not applicable	13	7.7
Total	**168**	**100.0**

4.8 MORBIDITY AND MORTALITY RATE DURING EmOC IMPLEMENTATION

In assessing the implementation of EmOC, the researcher was interested in identifying the number of women who had complications and some who did not survive.

4.8.1 Morbidity

On determining the common complications that were experienced by women during labour and delivery through to 42 days after delivery, the responses showed that both post-partum haemorrhage and anaemia (n=32; 19.0%) were the major complicating conditions. Some participants responded to have observed pregnancy induced hypertension (n=22; 13.1%) alone, both pregnancy induced hypertension and anaemia (n=17; 10.1%) and pre-eclampsia (n=8; 4.8%) being some of the common conditions.

Table 14: Common conditions women had during pregnancy until 42 days after delivery

What were the common conditions?	Frequency	Percentage
PIH	22	13.1
PPH	**32**	**19.0**
Pre-eclampsia	8	4.8
Anaemia	**32**	**19.0**
CPD	1	0.6
Others	26	15.5
PIH and Anaemia	17	10.1
All conditions	30	17.9
Total	168	100.0

4.8.2 Maternal Mortality

Majority of the participants (n=80; 47.6%) did not have maternal deaths that occurred in the facility, and n=65 (38.7%) did not know the women who died in the facility. Few participants n= 14 (8.3%) and n=9 (5.4%) reported to have had one (1) and two (2) maternal deaths in their facility respectively.

Table 15: Number of maternal deaths in facilities

Women died during pregnancy until 42 days after delivery in the facility	Frequency	Percentage
1	14	8.3
2	9	5.4
0	**80**	**47.6**
I don't know	65	38.7
Total	168	100.0

The midwives who stated having had some maternal deaths revealed the leading cause of deaths were PPH (n=8; 34.8%), followed by PIH, PPH and anaemia (n=6; 26.1%), then PIH and PPH (n=5; 21.8%), PPH and pre-eclampsia PPH and pre-eclampsia (n=2; 8.7%) and PIH alone and PIH, PPH and Pre-eclampsia (n=1; 4.3%) each.

Table 16: Common causes of death

What were the common causes of death?	Frequency	Percentage
PIH	1	4.3
PIH and PPH	5	21.8
PIH, PPH and Pre-eclampsia	1	4.3
PIH, PPH and anaemia	6	26.1
PPH	8	34.8
PPH and pre-eclampsia	2	8.7
Total	23	100.0

4.9 FACILITY AUDITS

Majority of the midwives (n=115, 68.5%) indicated that they do not conduct audits in their facility, while n=53 (31.5%) do conduct facility audits.

Table 17: Conduct audits in the facility

Do you ever conduct audits in the facility	Frequency	Percentage
YES	53	31.5
NO	115	68.5
Total	168	100.0

4.10 SUMMARY

The fourth chapter focused on the results, discussed the demographic characteristics of the midwives who participated in the study including gender, age, experience and qualifications. As one of the objectives, level of EmOC knowledge of the midwives was discussed in the results looking at the qualification, training on EmOC and in-service training. The chapter further discussed the midwives' skills and confidence in rendering the EmOC activities by assessing the basic functional signals performed. One of the important aspects that were discussed entailed the level of supervision offered to the midwives and the outcomes resultant from the EmOC implementation, which focused on morbidities and mortalities encountered by the midwives. The following chapter identifies the relevant literature that supports or contradicts the findings of the study regarding the morbidity and mortality of pregnant mothers.

CHAPTER 5

DISCUSSION OF THE RESULTS

5.1 INTRODUCTION

This chapter discusses the study results in relation to the purpose, objectives and revisits relevant literature reported from various researches. The purpose of this study was to evaluate emergency obstetric care implementation by midwives in Botswana. In this chapter, discussion categorises the results according to the specific objectives which are the level of knowledge of the midwives regarding emergency obstetric care, the EmOC services rendered in Gaborone facilities, the availability of resources in the implementation of EmOC services, the level of technical support and supervision received by the midwives in the implementation of EmOC services and the outcomes of EmOC implementation. The evaluation focussed on the human and material resources of the maternity facilities.

5.2 THE LEVEL OF EmOC KNOWLEDGE OF THE MIDWIVES

The results of the study revealed that all the midwives had undergone midwifery training at the diploma level. This suggests that the midwives are generally knowledgeable about the appropriate basic care that has to be provided to pregnant women. It is essential for the midwives to be skilled in emergency obstetric care (EmOC), especially in countries with high maternal mortality (Otolorin *et al*., 2015:S52; Ameh & Broek, 2015:1079). Despite the good knowledge of the midwives, the results clearly reveal that a majority of the midwives were not trained on emergency obstetric care (Islam, Rahman, Halim, Eriksson, Rahman & Dalal, 2015:6). According to a study conducted in Kenya that assessed training and evaluation of emergency obstetric and

neonatal care competencies for midwives, it was established that there was some marked improvement in midwives' knowledge and skills in the management of clients during pregnancy, labour and delivery, postnatal care and new-born care after participating in the training on emergency obstetric care (Gitonga, 2016:160). The study showed that there is insufficient knowledge amongst the midwives on triaging clients with obstructed labour that resulted in the midwife delaying to incept appropriate timely emergency interventions and rendering poor quality care. This situation is similar to the findings of a study conducted in Malawi (Chodzaza & Bultemeier, 2010:107) that indicated inadequate resources, inadequate teamwork, inadequate staff, and inadequate information as contributing factors to poor quality of work. Lack of in-service training that surfaced in this specific study could have contributed to the increasing maternal mortality as midwives do not keep abreast with the rest of current evidence-based practice, and this was also confirmed in a study conducted in Bangladesh (Islam *et al*., 2015:6).

5.3 EmOC SERVICES RENDERED BY THE MIDWIVES

The EmOC signals are indicators for assessing the performance in the reduction of maternal mortality and morbidity and are mandatory. In this study, the findings revealed that the midwives had not performed, among others, the manual removal of the placenta; some had not administered parenteral oxytocin. This indicates that the midwives were not compliant on performing EmOC signals. This was also found in a study conducted in Tanzania that revealed non-performance of any of the EmOC signals, thus making the facility non-compliant to international recommendations set by the World Health Organisation (Miltenburg, Kiritta, Bishanga, Roosmalen & Stekelenburg, 2017:3). In the study, some midwives had not performed the EmOC

signals as the facility is not conducting deliveries, or it is providing delivery services but the midwives had not been trained on the manual removal of the placenta. This is confirmed by a study that was conducted in Botswana (Bowelo *et al*., 2008:19) whose findings show that the signal function may not have been performed as there is no indication, no midwife trained or the facility is not authorised to perform the signal.

5.3.1 Midwives' skills and confidence in managing high risk conditions

Midwifery skills competency is very important in the reduction of maternal mortality and morbidity. Findings from this current study revealed that midwives possess skills in managing women throughout pregnancy, labour and delivery and postnatal care; this also was deduced in a study conducted in Botswana in 2008 (Bowelo *et al*., 2008:15). A study carried out in Sub-Saharan African countries revealed poor skills by midwives as a contributing factor to maternal mortality (Kyei-Nimakoh, Carolan-Olah & McCann, 2017:7).

The study, with regard to the confidence levels, found that midwives are not as confident in most of the midwifery activities such as managing per vaginal bleeding during early pregnancy and assessing progress of labour. It has also been highlighted that there is no correlation between the midwives' levels of skill and the confidence levels, thus suggesting that midwives could be skilled but lack confidence towards the application of the skills. These findings are similar to the results of a study carried out in Malawi, (Bayley, Colbourn, Nambiar, Costello, Kachale, Meguid & Mwansambo, 2013:107). The same sentiment is supported by the findings of a study done in Bangladesh which emphasized that lack of confidence, coupled with lack of skill from the midwife, renders the midwife not competent and this contributes to substandard care which results in high maternal mortality (Islam *et al*., 2015:4).

5.4 AVAILABILITY OF RESOURCES IN THE IMPLEMENTATION OF EmOC SERVICES

Resources are important in the planning and implementation of the EmOC programme. The availability of material resources was inclusive of and incorporated guidelines, obstetric equipment and drugs which are mandatory in the provision of EmOC in order to reduce maternal mortality.

5.4.1 Availability of guidelines

The guidelines and protocols were available in the facilities according to the study findings. However, the appropriate use of and adherence to the guidelines was not investigated in this study. The availability of guidelines is anticipated to promote midwives making reference to them when they encounter challenges or deal with a maternity client presenting a challenging condition that requires EmOC intervention. These results were in line with one study done in Bangladesh (Islam *et al*., 2015:5) which revealed that facilities do have available protocols but due to shortage of staff, the health providers are unable to use these, believing that use of protocols certainly improves quality of care.

5.4.2 Availability of equipment

From the thirteen varieties of equipment that ought to be in place for EmOC implementation the study sought to establish availability and functionality from the facilities that midwives are working and subsequently identified that only nine (9) out of the thirteen were available. Majority of the basic equipment that are used on a daily basis were reported available within the facilities and this study established also that these were in a functional state. However, Cardiotopograph, which is also very important, was reported to be available in the facility but it was not functional. This may also mean that there is a high usage or reliance on the fetoscope as manual

equipment for foetal heart monitoring. This was also found to be in line with a study conducted in Bangladesh (Islam *et al*., 2015:6), indicating that some equipment items are available but not operated such as incubator, X–ray machine and the lack of blood banks which hampers the implementation of health care services.

5.4.3 Availability of drugs

Drugs are very crucial for a facility that professes to provide maternal care. Most of the drugs were reported to be available for use by the midwives which promotes and enhances provision of quality maternal health care that is also timely. Only pethidine and misoprostol were not available in some of the facilities. According to Bowelo *et al*. (2008:18) the unavailability of emergency drugs was because they were out of stock, such as anticonvulsants and magnesium sulphate.

5.5 THE LEVEL OF TECHNICAL SUPPORT AND SUPERVISION

It was evident for this study that there was lack of support and supervision for the midwives at their facilities. It should also be highlighted that lack of support and supervision would have a negative impact in the proper and timely provision of quality maternal health care which in turn have the potential to contribute to high rates of maternal mortality in Botswana. According to Chi, Bulage, Urdal and Sundby (2015:11), midwives revealed lack of recognition, support and motivation within the health system to be barriers to effective EmOC delivery.

5.6 THE OUTCOME OF EmOC IMPLEMENTATION

The findings of the study established that the implementation of EmOC in Gaborone is largely ineffective, as there are still some evident morbidities and mortalities, wherein given the available resources and interventions this could have been avoided.

The results revealed that PPH is one of the leading causes of maternal mortality in the area of study. This is in agreement with a study conducted in Botswana in 2010 that investigated each maternal death record and found 39% of the maternal deaths were due to haemorrhages (Ray *et al*., 2013:538). The contributing factors identified from the study were lack of knowledge and less confidence that emanates from lack of training on EmOC and in-service lectures. These findings correspond with the results of a study conducted in Nigeria that revealed lack of skills of the health workers to be a barrier to quality care (Hussein, Hirose, Owolabi, Imamura, Kanguru & Okonofua, 2016:4). The country has not achieved the reduction of maternal mortality by 75% in 2015 as anticipated in the millennium development goals (MDGs) (Sinvula & Insua, 2015:1).

5.7 SUMMARY

The chapter discussed the results of the study aligning them to the objectives and available literature related to the topic of study. The chapter discussed the level of knowledge of the midwives which was found to be good, despite lack of training in EmOC and other related in-service training. The other key element identified was that the facilities were not performing all the functional signals anticipated to reduce the maternal mortality and morbidity. In addition, lack of confidence and skill in performing some critical activities were identified as contingent factors. Availability of the most needful resources was convincing, even though some equipment items that are essential were not functional. One of the barriers was lack of supervision and audits in the facilities. A conclusion was made that EmOC implementation was not effective in the area of study. The following chapter proffers the researcher's impressions, constraints and recommendations of the study.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

The previous chapter discussed the findings of the study and interrogated them against other studies that had similar or contradicting results. This chapter focuses on deducing conclusions based on the study and challenges that the researcher encountered during the study. Finally the researcher submits recommendations to the health system, profession, training and future researchers.

6.2 CONCLUSIONS

The research reviewed literature prior to conducting research as detailed in Chapter 2, and after data analysis also reviewed relevant studies that have similar results or contradicting results with this study. The study identified that a majority of the midwives were females who are citizens of Botswana. One of the important factors that needs to be highlighted is that all the midwives underwent training in midwifery at diploma level. This further suggests that the midwives are knowledgeable about the appropriate basic care to be provided to pregnant women, even though the majority were not trained on emergency obstetric care, in spite of the fact that they are expected to implement the strategy.

The midwives revealed that they had not performed, among others, the manual removal of the placenta, some had not administered parenteral oxytocin. Furthermore, they are skilled but lack confidence towards the application of the skill. The guidelines, basic equipment and drugs were found to be largely available in the facilities. Majority

of the midwives noted lack of support and supervision for midwives at their facilities. EmOC implementation was found to be not effective in the area of study. Generally the objectives of the research have been achieved.

6.3 LIMITATIONS OF THE STUDY

The study took long (before data) to be completed as the researcher had limited time allocated to the study due to work constraints. Distribution and collection of questionnaire was another challenge. The results of the study cannot be generalised to the entire health environment in Botswana as it targeted small population of the midwives and was conducted only in urban area.

6.4 RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made based on policy, practice and future research.

6.4.1 Recommendations for policy makers and education

The following recommendations were developed in lieu of the findings of the study. The researcher recommends that all the midwives be trained and updated on essential activities that are mandatory in reducing maternal mortality and morbidity such as EmOC and safe motherhood. This could improve the quality of care and skills in the provision and implementation of the EmOC activities hence reduce maternal mortality.

Improvement of the conditions and terms regarding professional development of the midwives could be enhanced by support in the form of block release to attend classes, collecting data for research and re-imbursement of fees paid by employees who are studying on a distance or part time basis. This is likely to motivate professionals in

midwifery to develop and acquire more knowledge and skills hence improve quality of care and critical thinking.

6.4.2 Recommendations for practice

Conducting of in-service training on implementation of EmOC strategies is recommended to reduce maternal mortality by acquainting midwives with current evidenced based practice.

There is a dire need for a skills audit for midwives on performing key activities that help to reduce maternal mortality such as manual removal of retained placenta. There can be periodic peer assessment and appraisal on certain skills that are necessary for the midwife's competency. It is additionally important to establish periodic auditing on management of women during pregnancy, labour and delivery, including post-delivery.

Another obvious recommendation is the supervision of the services provided in the facilities. Procurement of essential drugs and equipment should be a priority in the reduction of maternal mortality, so that midwives could manage clients timeously during emergency and avoid the deaths occurring in the facility.

6.4.3 Recommendations for further research

A qualitative study that is exploratory could be conducted to gather in-depth information from midwives and other health professional on factors that negatively affect and therefore impede the implementation of EmOC in Botswana. A study that audits thoroughly the obstetric record of maternal deaths and near-miss should be conducted to identify what contributes to such occurrences.

Finally, this study advocates an evaluation if midwives' skills and knowledge gained after training EmOC.

6.5 SUMMARY

In this chapter the conclusions drawn on the findings of the study were discussed. The study found that midwives have knowledge and skills even though they are not trained in EmOC. The study also found that midwives are not as confident in most of the midwifery activities such as managing vaginal bleeding during early pregnancy and assessing progress of labour. Constraints that were encountered during the study were stated. Recommendations were made which hopefully address the factors that continue to contribute to ineffective implementation of EmOC services in Botswana.

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Annexure A: Approval from North-West University

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X6001, Potchefstroom
South Africa 2520

Tel: (018) 299-4900
Faks: (018) 299-4910
Web: http://www.nwu.ac.za

Ethics Committee
Tel +27 18 299 4849
Email Ethics@nwu.ac.za

ETHICS APPROVAL OF PROJECT

The North-West University Research Ethics Regulatory Committee (NWU-RERC) hereby approves your project as indicated below. This implies that the NWU-RERC grants its permission that provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

Project title: EVALUATION OF EMERGENCY OBSTETRIC CARE IMPLEMENTATION BY HEALTH CARE PROVIDERS IN GABORONE, BOTSWANA.

Project Leaders: L Makhado, M Matsipane & Gorataone Montsho (Student)

Ethics number: N W U - 0 0 0 0 2 - 1 5 - A 9
(Institution - Project Number - Year - Status)
Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Approval date: 2015-05-22 **Expiry date**: 2020-05-21

Special conditions of the approval (if any): None.

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- *The project leader (principle investigator) must report in the prescribed format to the NWU-RERC:*
  - *annually (or as otherwise requested) on the progress of the project,*
  - *without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.*
- *The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the NWU-RERC. Would there be deviated from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.*
- *The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-RERC and new approval received before or on the expiry date.*
- *In the interest of ethical responsibility the NWU-RERC retains the right to:*
  - *request access to any information or data at any time during the course or after completion of the project;*
  - *withdraw or postpone approval if:*
    - *any unethical principles or practices of the project are revealed or suspected,*
    - *it becomes apparent that any relevant information was withheld from the NWU-RERC or that information has been false or misrepresented,*
    - *the required annual report and reporting of adverse events was not done timely and accurately,*
    - *new institutional rules, national legislation or international conventions deem it necessary.*

The Ethics Committee would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the Ethics Committee for any further enquiries or requests for assistance.

Yours sincerely

Linda du Plessis

Digitally signed by Linda du Plessis
DN: cn=Linda du Plessis, o=North-West University, ou=Vice-Rector: VTC, email=Linda.duPlessis@nwu.ac.za, c=ZA
Date: 2015.05.28 13:21:10 +02'00'

Prof Linda du Plessis
Chair NWU Research Ethics Regulatory Committee (RERC)

Annexure B: Request for permission from Health Research Division

P.O. Box M1980
Kanye
Botswana

The Permanent Secretary
Ministry of Health
Private Bag 0038
Gaborone
Attention: Health Research and Development Division

Dear Sir

REQUEST FOR PERMISSION TO CONDUCT A RESEARCH

I am a student at the North West University presently studying for Master's degree in Nursing Science (MCur), and requesting for permission to carry out the study in Greater Gaborone District Health Team (G-GDHMT) health facilities and Princess Marina Hospital (PMH). The title of my research: **evaluation of emergency obstetric care (EmOC) implementation by health care providers in Botswana, Gaborone.**

The purpose of the study is to evaluate the implementation of EmOC services provided by the health care providers in the Greater Gaborone DHMT.

The researcher is requesting permission to interview health care providers who meet the following criteria:

1. Trained at any level (diploma, degree)
2. Midwives who have registered with the Nursing and Midwifery Council of Botswana (NMCB).
3. Employed by government and working in Greater Gaborone DHMT
4. Have been providing maternity services for at least three (3) months.

The researcher will adhere to the following ethical guidelines:

1. Participation is voluntary and participants may withdraw from the study at any given time, without any penalty.
2. Confidentiality of participants in this study will be protected and the information they share with the researchers will be used only for research purposes.

3. Findings of the research will be made available to the institution once the study has been completed.

Yours faithfully,

……

Gorataone Montsho

Annexure C: Approval from Ministry of Health Botswana

TELEPHONE: 363 2766
FAX: 391 0647
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD

Republic of Botswana

MINISTRY OF HEALTH
PRIVATE BAG 0038
GABORONE

REFERENCE NO: HPDME 13/18/1 X (37) **16 September 2015**

Health Research and Development Division

Notification of IRB Review: New application

Gorataone Montsho
P O Box M1980
Kanye
Botswana

Protocol Title: **EVALUATION OF EMERGENCY OBSTETRIC CARE IMPLEMENTATION BY HEALTH CARE PROVIDERS IN BOTSWANA**

HRU Approval Date:	16 September 2015
HRU Expiration Date:	15 September 2016
HRU Review Type:	HRU reviewed
HRU Review Determination:	Approved
Risk Determination:	Minimal risk

Dear Sir/Madam

Thank you for submitting new application for the above referenced protocol. The permission is granted to conduct the study.

This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

1

Continuing Review
In order to continue work on this study (including data analysis) beyond the expiry date, submit a Continuing Review Form for Approval at least three (3) months prior to the protocol's expiration date. The Continuing Review Form can be obtained from the Health Research Division Office (HRDD), Office No. 7A.7 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from Mr. Kgomotso Motlhanka, e-mail address: kgmmotlhanka@gov.bw As a courtesy, the HRDD will send you a reminder email about eight (8) weeks before the lapse date, but failure to receive it does not affect your responsibility to submit a timely Continuing Report form.

Amendments
During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek HRDC approval before implementing it. Please summarize the proposed change and the rationale for it in the amendment form available from the Health Research Division Office (HRDD), Office No. 7A 7 or Ministry of Health website: www.moh.gov.bw or can be requested via e- mail from Mr. Kgomotso Motlhanka, e-mail address: kgmotlhanka@gov.bw . In addition submit three copies of an updated version of your original protocol application showing all proposed changes in bold or "track changes".

Reporting
Other events which must be reported promptly in writing to the HRDC include:
- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to subjects or others
- Adverse events, including unanticipated or anticipated but severe physical harm to subjects.

If you have any questions please do not hesitate to contact Mr. P. Khulumani at pkhulumani@gov.bw, Tel +267-3914467 or Lemphi Moremi at lamoremi@gov.bw or Tel: +267-3632754. Thank you for your cooperation and your commitment to the protection of human subjects in research.

Yours faithfully

P. Khulumani
For /Permanent Secretary

MINISTRY OF HEALTH RESEARCH DIVISION
2015 -09- 16
P/BAG 0038
GABORONE
REPUBLIC OF BOTSWANA

Annexure D: Approval from Princess Marina Hospital

TELEPHONE: 3621400
FAX: 3973776
PLOT NO. 1836
HOSPITAL WAY

REPUBLIC OF BOTSWANA

PRINCESS MARINA HOSPITAL
P. O. BOX 258
GABORONE
BOTSWANA

REF: PMH: 5/79 I (208)

26th November 2015

Ms. Gorataone Montsho
I.H.S Gaborone

Dear Madam

EVALUATION OF EMERGENCY OBSTERTRIC CARE: IMPLEMENTATION BY HEALTH CARE PROVIDERS IN BOTSWANA

Your application for a research for a research permit for the above research protocol has been approved on the 8th October 2015 by the Research and Ethics Committee (R.E.C) of Princess Marina Hospital.

You are granted a full approval, but you need to note the following:

1. You will not change any aspect of your research without permission from the Research and Ethics Committee (R.E.C).
2. You need to report any unforeseen circumstances including the termination of the study of the R.E.C.
3. You must allow REC access to the study at any time or purposes of auditing.
4. This permit is valid for one year from 26th November 2015 to 26th November 2016.
5. The end of the study you should give the Research and Ethics Committee a hard copy and soft copy of your report.

Wishing you a great success in your studies.

Thank you.

Yours faithfully

P. Mazonde
for/Secretary Research and Ethics Committee

Annexure E: Approval from Greater Gaborone DHMT

TELEPHONE: (267) 3133658
FAX : (267) 3907950
REFERENCE : DHMT

REPUBLIC OF BOTSWANA

Gaborone District Health Management
PRIVATE BAG 00258
GABORONE
BOTSWANA

Ref: DHMT/15/10 II

8th October, 2015

Gorataone Montso
Box M1980
Kanye

Dear Montso,

RE: PERMISSION TO CONDUCT STUDY IN GABORONE PUBLIC CLINICS

Reference is made to your letter of request dated 5th October, 2015.

This serves to let you know that permission is granted to conduct **"to conduct and evaluation of emergency obstetric care (EmOC) implementation by health care providers in Botswana Gaborone".**

This permits you to go into the health facility but you need to ask respondents for their participation. It should also not disturb patient care in any manner during the course of the visit.

The facilities allocated are all public clinics in Greater Gaborone DHMT.

By copy of this letter the In-charges of all Health facilities are informed of your intentions and asked to provide you access and support during your study.

Yours faithfully,

Dr. G. M. Simoonga
Coordinator DHMT

Annexure F: Questionnaire for assessing EmOC implementation

Instructions to participants:

- Make a tick (√) in the box next to the statement.
- Please respond to all statements and return the questionnaire.
- The questionnaire consists of 5 pages.
- Carefully read the following statements
- Give your honest view

Facility Name: _____

SECTION A

PART A: BIOGRAPHICAL DATA

A1. How old are you? (years)	1. 25-29	2. 30-34	3. 35-39	4. 40-44	5. 45-49	50 and above
A2. Sex.	1. Female	2.Male				
A3. What is your nationality?	1.Motswana	2.Zambian	3.Zimbabwean	4.Lesotho	5.Others(specify)	

I would like to ask you some questions about your educational background

A4. What are your professional qualifications?	Diploma		Degree		Masters (specify)	PhD (specify)		
	1.Nursing		1.Nursing					
	2.Midwifery		2.Midwifery					
	3.Others		3.Others					
A5. What year did you graduate (or complete) with this qualification?	Diploma		Degree		Masters	PhD		
A6. How long have you been working in the maternity services?	1. 3-11 months		2. 12- 23 months		3. 24-35 months	4. 36 -47 months	5. 48+ months	

SECTION B
PROFESSIONAL EDUCATION
B. **Questions on general training courses.**

B1. Have you been trained in Emergency Obstetric Care?	1. Yes	2. No	
Have you received any in-service training (i.e., since you started working) or any training updates in any of the following topics: If yes: was the training or in-service update within the past 24 months or more than 24 months ago?	1. Yes, within 24 months	2. Yes, over 24 months ago	3. No, in-service training or update
B2. Diagnosing and treating sexually transmitted infections (STIs)			
B3. Complications of pregnancy and their management?			
B4. Prevention of mother-to-child transmission (PMTCT) of HIV/AIDS?			
B5. Antiretroviral prophylactic treatment for prevention of mother to child transmission of HIV?			
B6. Basic Emergency Obstetric Care (BEmOC)?			
B7. Routine care for labour and normal vaginal delivery?			
B8. Active Management of Third Stage of Labour (AMTSL)?			

	1. Yes, within 24 months	2. Yes, over 24 months ago	3. No, in-service training or update
B9. Life-saving skills (LSS) - in general?			
B10. Post-abortion care?			
Are you able to define the following terms:	**1. Yes**	**2. No**	**3. Partially**
B11. Obstetric haemorrhage			
B 12. Abortion			
B13. Anaemia			
B14. Prolonged labour			
B15. Puerperal infections			
Are you able to identify clients with the following conditions:	**1. Yes**	**2. No**	**3. Sometimes**
B16. Early bleeding in pregnancy			
B17. Late bleeding in pregnancy			
B18. Intrapartum bleeding			
B19. Post-Partum bleeding			
B20. Prolonged labour			
B21. Obstructed labour			
B22. Puerperal infections			
B23. New-born complications (e.g. asphyxia)			

C. Availability and utilization of policies in the unit/facility

Does the facility have the following guidelines? Tick either **'Yes'** or **'No'** to the following questions	1. Yes	2. No
C1. Standard precautions for infection prevention available in this facility today?		
C2. National ANC guidelines available in this facility today?		
C3. National guidelines on Safe motherhood Initiative available in this facility today?		
C4. National guidelines for Emergency Obstetric Care (EmOC) available in this facility today?		
C5. National guidelines for the clinical management of HIV/AIDS available in this facility today?		

D. Availability of equipment and supplies

I am interested in knowing if the following basic equipment and supplies used in the provision of client services are available in this facility. For each equipment or item, please tell me if it is available today and functioning.	Available			Functional		
	1. Yes	2. Not seen	3. No	1. Yes	2. No	3. I don't know
D1. Adult weighing scale						
D2. Thermometer						
D3. Blood pressure apparatus (may be digital or manual sphygmomanometer with stethoscope)						
D4. Cardiotopograph (CTG) machine						
D6. Pulse oximeter						
D7. Oxygen cylinders						
D8. Mounted Oxygen						
D9. Eye protection (goggles, face shields)						
D10. Per Vaginum pack						
D11. Delivery pack						
D12. Suturing pack						
D13. Pre-eclamptic pack						
D14. Post-partum haemorrhage pack						

Are any of the following reproductive health medicines and commodities available in this service site today?	1. Yes	2. Not seen	3. No	4. I don't know	
E1. Oxytocic drugs					
E2. Hydralazine tablets / injections					
E3. Nifedipine tablets					
E4. Magnesium sulphate injection					
E5. Misoprostol tablets					
E6. Pethidine injection					
E7. Iron supplementation					
E8. Folic acid supplementation					
E9. Metronidazole cap/tab					
E10. Ceftriaxone injection					
E11. Benzathine penicillin injection					
E12. Erythromycin tablets					

F. Basic Emergency Obstetric Care signal functions performed in the last three months

Please tell me if you have carried out any of the following interventions as part of your work in this facility.	1.Yes	2.No	3.Not applicable	If no, give reason
F1. Parenteral administration of antibiotics (IV or IM)				
F2. Parenteral administration of oxytocic (IV or IM)				
F3. Parenteral administration of anticonvulsant for hypertensive disorders of pregnancy (IV or IM)				
F4. Assisted vaginal delivery				
F5. Conducted manual removal of placenta				
F6. Removal of retained products after delivery				

G. Obstetric Skills Performed by the midwife in the last six months and confidence Levels

In your current position, and as a part of your work for this facility, do you personally provide the services: **If yes, how confident were you?**	1.Yes	2.No	3.If no, reason	Confidence 1=not confident at all 2=was assisted 3=confident		
				1	2	3
G1. Managed bleeding in early pregnancy						
G2. Manage bleeding in late pregnancy and labour						
G3. Manage pre-eclampsia						
G4. Made a referral for eclampsia						
G5. Manage fever before delivery (amnionitis)						
G6. Managed a fever after delivery						
G7. Assessed progress of labour						
In your current position, and as a part of your work for this facility, do you personally provide the services: **If yes, how confident were you?**	1.Yes	2.No	3. If no, give reason	Confidence 1=not confident at all 2=was assisted 3=confident		
				1	2	3
G8. Use a partograph correctly & completely up to stage 4						
G9. Managed abnormal early labour						
G10. Managed abnormal active labour (first stage)						
G11. Managed abnormal active labour (second stage)						
G12. Managed abnormal active labour (third stage)						

In your current position, and as a part of your work for this facility, do you personally provide the services: **If yes, how confident were you?**	1.Yes	2.No	3. If no, give reason	Confidence 1=not confident at all 2=was assisted 3=confident		
				1	2	3
G13. Monitored client on induction of labour						
G14. Assisted vacuum delivery						
G15. Conducted breech delivery						
G16. Managed prolapsed umbilical cord						
G17. Repaired first degree episiotomy tear						
G18. Repaired second degree episiotomy tear						
G19. Repaired third degree episiotomy tear						
G20. Performed manoeuvres for shoulder dystocia						
G21. Managed a twin delivery						
G22. Performed manual removal of placenta						
G23. Perform bimanual compression						
G24. Do postpartum care visits at home						

H. Questions about your work in this facility

H1. During the past 6 months, approximately how many deliveries have you conducted as the main provider?	State the number	1.≤10	2.≤20	3.≤30	4. >30
H2. Do you receive technical support or supervision in your work? If yes, when was the most recent time		1.Yes, in the past 3 months			
		2.Yes, in the past 4-6 months			
		3.Yes, in the past 7-12 months			
		4.Yes, more than 12 months ago			
		5.No			
H3. How many women had complications during pregnancy until 42 days after delivery that you assisted in the facility in the past six (6) months?		1. State number …… 2. I don't know ……			
H4. What were the common conditions?	1. PIH …….. 2. PPH …… 3.Pre-eclampsia …….. 4. Anaemia …..... 5. CPD ……. 6. Others……				
H5. How many women died during pregnancy until 42 days after delivery in the facility that you assisted in the past six months?		1. State number …… 2. I don't know ……			
H6. What were the common causes identified?	1. PIH …….. 2. PPH …… 3.Pre-eclampsia …….. 4. Anaemia …..... 5. CPD ….. 6. Others……				
H7. Do you ever conduct audits in the facility /unit?	1.Yes		2.No		

Thank you for participating

Annexure G: Request from participants

Dear Participants

Request to participate in research

I am a student at the North West University presently studying for Master's degree in Nursing Science (MCur), carrying-out a study in Greater Gaborone District Health Team (G-GDHMT) health facilities and Princess Marina Hospital (PMH). The title of my research: **Evaluation of emergency obstetric care (EmOC) services implementation by midwives in Gaborone, Botswana)**.

The purpose of the study is to evaluate the implementation of EmOC services provided by the midwives in Gaborone.

The following are the characteristics of the participants, they should be:

1. Trained at any level (diploma, degree)
2. Midwives who have registered with the Nursing and Midwifery Council of Botswana (NMCB).
3. Employed by government and working in Greater Gaborone DHMT
4. Have been providing maternity services for at least three (3) months.

The researcher will adhere to the following ethical guidelines:

1. Participation is voluntary and participants may withdraw from the study at any given time, without any penalty.
2. Confidentiality of participants in this study will be protected and the information they share with the researchers will be used only for research purposes.

The findings of the research will be made available to the institution once the study has been completed.

Yours faithfully,

……

Gorataone Montsho

Annexure H: Informed consent

TITLE: The evaluation of emergency obstetric care (EmOC) implementation by midwives in Botswana

ETHICS REFERENCE NUMBER: **NWU 00002-15-A9**

PRINCIPAL INVESTIGATOR: **Gorataone Montsho**

ADDRESS: **P.O Box M1980 Kanye**

CONTACT TELEPHONE NO.: **72222647 or 73741258**

DECLARATION BY PARTICIPANT: I, THE UNDERSIGNED.....(name) [I.D. No:.....] the participant in my capacity at .....(address) **A. HEREBY CONFIRM AS FOLLOWS:** 1. I participant was invited to participate in the abovementioned research project which is being undertaken by Gorataone Montsho of the School of nursing sciences in the Faculty of Health Sciences North West University	Initial
2. The following aspects have been explained to me (participant): 2.1 Aim of study: The information will be used to/for ……. ..……	Initial
2.2 Risks: …… ……..	Initial
Possible benefits: As a result of my participation in this study …… ……..	Initial
Confidentiality: My identity will not be revealed in any discussion, description or scientific publications by the investigators.	Initial
Access to findings: Any new information or benefit that develops during the course of the study will be shared with me.	Initial

Voluntary participation / refusal / discontinuation: My participation is voluntary. My decision whether or not to participate will in no way affect my present or future medical care/ employment / lifestyle.	Initial
3. The information above was explained to me (the participant) by..... (Name of researcher) in English. I was given the opportunity to ask questions and all these questions were answered satisfactorily.	Initial
4. No pressure was exerted on me to consent to participation and I understand that I may withdraw at any stage without penalization.	Initial
5. Participation in this study will not result in any additional cost to me.	Initial
B. I HEREBY CONSENT VOLUNTARILY TO PARTICIPATE IN THE ABOVEMENTIONED PROJECT. Signed / confirmed at ..... on ..... 20..... (place) (date) …… …….. Signature Signature of witness	Initial

Declarations:

STATEMENT BY OR ON BEHALF OF INVESTIGATOR: I…… declare that • I have explained the information given in this document to …….. (Name of the participant). • he/she was encouraged and given ample time to ask me any questions; • This conversation was conducted in English. Signed at..... on ..... 20..... (place) (date) ……. …… Signature of investigator Signature of witness	

<u>IMPORTANT MESSAGE TO A PARTICIPANT:</u> Dear participant, Thank you for your participation in this study. Should, at any time during the study, • you require any further information with regard to the study, Kindly contact..... (Name) at telephone number..... (It must be a number where help will be available on a 24 -hour basis).	