

Chapter One

Introduction

1.1 Background to the Study

Postpartum haemorrhage is one of the leading cause of maternal mortality globally, accounting for more than 30% of maternal deaths¹. World Health Organization (WHO) explained that approximately 14 million women experience postpartum haemorrhage annually, and nearly 70,000 dies from its complications, representing about one-quarter of all maternal deaths worldwide². Sub-Saharan Africa and South Asia account for the majority of these fatalities, often due to delayed recognition, poor clinical response, and insufficient resources. Postpartum haemorrhage is typically defined as blood loss of 500 mL or more following vaginal delivery or 1,000 mL or more after caesarean section, and it can rapidly become fatal without timely intervention³. Postpartum haemorrhage is generally categorized into two types: primary and secondary. Primary postpartum haemorrhage occurs within the first 24 hours after delivery, while secondary postpartum haemorrhage refers to bleeding that occurs after the first 24 hours but within six weeks postpartum.

The causes of primary postpartum haemorrhage can be classified into four main categories: uterine atony, trauma, retained placental tissue, and coagulopathy⁴. Uterine atony is the most common cause of postpartum haemorrhage, accounting for approximately 70-80% of cases. It occurs when the uterus fails to contract effectively after delivery, leading to inadequate compression of the blood vessels at the placental site. This failure of uterine contraction is often due to factors such as prolonged labour, over-distension of the uterus (as seen in multiple pregnancies, large babies, or polyhydramnios), use of medications that relax the

uterus (such as magnesium sulfate), or uterine trauma during delivery⁵. Uterine atony is typically characterized by a soft, enlarged uterus that does not contract after the delivery of the baby. Trauma during delivery, including lacerations or ruptures of the cervix, vagina, perineum, or uterus, is another significant cause of postpartum haemorrhage. Obstetric trauma may occur due to the use of forceps or vacuum extraction, a rapid or prolonged labour, or incorrect handling during the delivery process. Uterine rupture, while less common, is a severe form of trauma that can lead to massive bleeding and is often associated with a previous caesarean section or uterine scarring⁶.

The complications of postpartum haemorrhage are severe and can have long-lasting consequences on maternal health. If not promptly treated, PPH can lead to hypovolemic shock, a condition characterized by a significant reduction in the blood volume, resulting in inadequate perfusion of organs. This can lead to organ failure, particularly of the kidneys, liver, and heart⁷. In addition, severe anemia from blood loss may necessitate blood transfusions, and in some cases, the mother may require surgical interventions such as a hysterectomy to stop the bleeding and save her life.

Historically, the management of PPH involved basic measures such as manual compression of the uterus and the administration of uterotonics like oxytocin. However, these measures often proved insufficient in cases of severe bleeding. Over the years, the development of protocols for PPH management has evolved significantly, with an emphasis on a stepwise approach starting with the identification of the cause, followed by the appropriate intervention. In the past, treatment largely revolved around immediate surgical interventions, such as uterine tamponade, the use of a Bakri balloon, or, in extreme cases, hysterectomy.

Blood transfusions and the administration of clotting agents were also common but could be delayed due to limited resources in some settings.

Midwives acquire foundational knowledge during pre-service education in nursing and midwifery schools, however, the integration of recent innovations such as the E-MOTIVE bundle into institutional curricula is not always timely or consistent. As a result, midwives often rely on in-service training, workshops, seminars, and continuing professional development programs to update their skills. Unfortunately, such training opportunities are unevenly distributed and often limited in secondary health institutions. A qualitative study in Nigeria found that many midwives had not attended any recent training on emergency obstetric care and were therefore unfamiliar with updated clinical tools and protocols like calibrated drapes or the use of tranexamic acid⁸.

The level of knowledge among midwives regarding the E-MOTIVE Care Bundle varies widely, particularly in low-resource settings. While many are familiar with standalone interventions like oxytocin administration or uterine massage, evidence suggests that comprehensive knowledge of all six E-MOTIVE components early detection using calibrated drapes, massage of the uterus, oxytocin or other uterotonics, tranexamic acid, intravenous fluids, and escalation is often lacking. A study in Enugu State, Nigeria, revealed that only 23.7% of healthcare professionals demonstrated good knowledge of tranexamic acid, and just 16.4% reported using it routinely for PPH management⁹. This highlights a significant knowledge gap concerning newer, life-saving interventions within the E-MOTIVE protocol.

Knowledge is a critical predictor of the utilization of evidence-based care bundles, addressing these gaps is essential enhancing midwives' knowledge through structured,

routine training and provision of updated clinical tools can significantly improve the detection and management of postpartum haemorrhage, reduce maternal deaths, and promote adherence to WHO-recommended practices such as the E-MOTIVE Care Bundle¹⁰. In Nigeria, maternal mortality remains a public health concern, with an estimated 1,047 deaths per 100,000 live births, as of 2022¹¹. The majority of these deaths are attributed to preventable conditions such as haemorrhage, pre-eclampsia, and sepsis. While the Nigerian health sector has made efforts to adopt WHO-recommended guidelines, gaps in knowledge and inconsistent application of such protocols remain prominent, especially at the level of primary and secondary healthcare delivery.

Globally, in Western countries such as the United Kingdom, Canada, and the United States, the introduction of structured PPH care bundles including E-MOTIVE care bundle or locally adapted equivalents has led to significant improvements in maternal outcomes. E-MOTIVE care bundle for managing postpartum haemorrhage was developed following the WHO's 2012 and 2017 recommendations and a WHO Technical Consultation on PPH Bundle Development. For instance, in a UK-wide initiative led by the National Health Service (NHS), the implementation of standardized PPH bundles resulted in a 38% reduction in cases requiring surgical intervention for haemorrhage over a five-year period.¹² Similarly, a Canadian study showed that hospitals implementing bundled PPH care based on E-MOTIVE guidelines saw a 30–50% decrease in PPH-related blood transfusions¹³. In the southwestern region of Nigeria, including Ibadan, midwives form the backbone of maternal health services. Over the years, the approach to managing postpartum haemorrhage has evolved, despite the existence of individual interventions such as uterine massage, use of oxytocics, and

administration of intravenous fluids, their inconsistent or delayed application has led to suboptimal outcomes.

In response to the need for a standardized and effective strategy, the WHO launched E-MOTIVE care bundle in 2023, yet evidence suggests that many midwives have limited knowledge or incomplete understanding of emerging protocols such as E-MOTIVE care bundle. For example, a recent local survey revealed that although some midwives were aware of oxytocin and uterine massage as first-line interventions, very few could identify the complete set of E-MOTIVE components or had received formal training on the bundle.¹⁴ The word E-MOTIVE is an acronym for Early detection using a calibrated drape, Massage, Oxytocics, Tranexamic acid, IV fluids, and Escalation, was developed after a multi-country, randomized controlled trial demonstrated that implementing the entire bundle promptly reduced severe bleeding by 60% and improved maternal outcomes significantly.¹⁵ Historically, management of postpartum haemorrhage relied heavily on clinical judgment, with no standardized tools for quantifying blood loss. The turning point came with the introduction of calibrated drapes, which enabled objective measurement and early detection of bleeding a cornerstone of E-MOTIVE model.¹⁶

The integration of tranexamic acid (TXA) also followed the ground-breaking WOMAN trial, which showed TXA's effectiveness in reducing bleeding-related deaths when administered within three hours of childbirth¹⁷. As a bundle, E-MOTIVE represents a shift from single interventions to a coordinated, protocol-driven response that can be scaled even in resource-limited settings. Despite national guidelines promoting the use of active management of the third stage of labour (AMTSL), implementation remains inconsistent. Several studies have

shown that healthcare workers, particularly midwives, often have limited knowledge or fail to utilize recommended protocols effectively¹⁸.

In Ibadan, the capital of Oyo State, these challenges are also evident, the city is served by major secondary and tertiary hospitals, including the University College Hospital (UCH) and Adeoyo Maternity Teaching Hospital. These facilities manage high volumes of deliveries, yet maternal deaths from postpartum haemorrhage remain a concern. Informal reports and preliminary audits suggest gaps in the timely recognition and comprehensive management of postpartum haemorrhage cases. There is limited data on the extent to which midwives in Ibadan are knowledgeable about and actually utilize E-MOTIVE care bundle in their daily practice¹⁹.

In healthcare research, utilization refers to the practical application of knowledge, protocols, and clinical tools in real-time patient care it reflects how well healthcare providers translate training and theoretical understanding into consistent, evidence-based practice. In relation to postpartum haemorrhage management, the utilization of the E-MOTIVE Care Bundle would involve the timely and coordinated implementation of its six components early detection using a calibrated drape, uterine massage, administration of oxytocin or other uterotonics, tranexamic acid, intravenous fluids, and escalation of care while knowledge is a prerequisite, its application for example., utilization can vary significantly across settings and among healthcare workers.

Nigerian secondary health institutions, including those in Ibadan, studies and field observations suggest that midwives frequently implement some components of the E-MOTIVE bundle, particularly oxytocin administration and uterine massage. However, the complete and integrated application of all six components is rare, often due to systemic

constraints. For example, in an implementation study carried out across Nigeria, Kenya, and South Africa, many midwives reported administering uterotonics but lacked access to calibrated drapes and tranexamic acid, which resulted in inconsistent bundle use²⁰. Several factors influence the utilization of the E-MOTIVE Care Bundle among midwives in secondary health institutions, especially in low-resource settings such as those in Nigeria. While knowledge is foundational, the effective application of this knowledge particularly in emergencies like postpartum haemorrhage depends on a combination of personal, institutional, and systemic enablers or barriers²¹.

Healthcare facilities in Nigeria lack formal in-service training programs, leading to gaps in midwives' practical readiness. In cases where trainings are offered, they are often irregular or limited to tertiary hospitals, leaving secondary-level providers underprepared.²² The absence of E-MOTIVE Care Bundle tools forces midwives to rely on estimations or incomplete measures, which undermines the precision and effectiveness of the care bundle. Institutional support also plays a significant role. Facilities with proactive leadership, effective supervision, clear clinical guidelines, and supportive monitoring systems tend to foster better protocol adherence. Conversely, a lack of institutional commitment can result in poor enforcement of standards, irregular supply of critical drugs and tools, and low prioritization of emergency maternal care²³.

These factors create notable gaps in implementation. For instance, a study carried out in northern Nigeria reported that although 78% of midwives administered oxytocin during PPH cases, fewer than 20% used tranexamic acid or calibrated drapes²⁴. This suggests that knowledge alone is insufficient; utilization depends heavily on institutional readiness, resource availability, and supportive clinical environments. In order to improve maternal

outcomes, especially in PPH cases, it is essential not only to train midwives on the E-MOTIVE bundle but also to ensure that all components are readily available, protocols are reinforced institutionally, and staffing levels support full implementation. The current study sought to ascertain the actual level of utilization of the E-MOTIVE Care Bundle among midwives in selected secondary health facilities in Ibadan, Oyo State.

1.2 Statement of the Problem

Postpartum haemorrhage (PPH) remains one of the leading cause of maternal mortality globally, accounting for about 30% of deaths²⁵, especially in low- and middle-income countries like Nigeria to address this burden, the WHO introduced the E-MOTIVE Care Bundle in 2023 an evidence-based package including calibrated drapes for early detection, uterine massage, uterotonics, tranexamic acid, IV fluids, and timely escalation although proven effective, its impact depends on midwives' knowledge and use. In Nigeria many midwives still lack adequate understanding of its components and preliminary observations showed that while midwives commonly use traditional PPH measures, such as oxytocin, they rarely apply the full E-MOTIVE protocol. Limited knowledge of calibrated drapes, minimal escalation practices, inadequate training, and inconsistent availability of essential materials highlight a major gap between policy and practice. Despite the crucial role of midwives in maternal care, no study has examined their knowledge and use of the E-MOTIVE bundle in Ibadan. This gap justifies the present study, which aimed to ascertain midwives' knowledge and utilization of the bundle in selected state hospitals.

1.3 Aim and Objectives of the Study

The aim of this study examined midwives' knowledge and utilization of E-MOTIVE care bundle in management of postpartum haemorrhage in selected state health institutions in Ibadan, Oyo-state. The objectives are to:

- i. assess the level of midwives' knowledge of E-MOTIVE Care bundle management of postpartum haemorrhage in selected secondary health institutions in Ibadan, Oyo state.
- ii. ascertain the level of midwives' utilization of E-MOTIVE care bundle management of Postpartum haemorrhage in selected secondary health institutions in Ibadan, Oyo state.
- iii. ascertain steps in the management of postpartum haemorrhage with E-MOTIVE care bundle by midwives in selected secondary health institutions in Ibadan, Oyo state.
- iv. determine the association between midwives' knowledge and utilisation of E-MOTIVE care bundle management of Postpartum haemorrhage in selected secondary health institutions in Ibadan, Oyo state.
- v. determine the association between midwives' years of experience and utilisation of E-MOTIVE care bundle management of Postpartum haemorrhage in selected secondary health institutions in Ibadan, Oyo state.

1.4 Research Questions

- i. what is the midwives' knowledge about E-MOTIVE Care Bundle management of postpartum haemorrhage in selected secondary health institutions in Ibadan, Oyo State?
- ii. what is the level of utilization of E-MOTIVE Care Bundle management of postpartum haemorrhage among midwives in selected secondary health institutions in Ibadan, Oyo State?
- iii. what are the steps in the management of postpartum haemorrhage using E-MOTIVE care bundle by the midwives in selected secondary health institutions in Ibadan, Oyo State?

1.5 Research Hypotheses

The following hypotheses were tested in this study:

Ho1: There is no significant association between midwives' knowledge and utilization of E-MOTIVE care bundle management of postpartum haemorrhage in secondary health institutions in Ibadan, Oyo State?

Ho2: There is no significant association between midwives' years of experience and utilization of E-MOTIVE care bundle management of postpartum haemorrhage in secondary health institutions in Ibadan, Oyo State?

1.6 Significance of the Study

The findings of this study may provide critical insights into the current level of knowledge and utilization of E-MOTIVE care bundle among midwives for management of postpartum haemorrhage in Ibadan. The findings could inform targeted training programs, policy formulation, and resource allocation aimed at enhancing the implementation of evidence-based practices for postpartum haemorrhage management. In the long run, improved knowledge and utilization of E-MOTIVE care bundle could lead to a significant reduction in maternal mortality and morbidity related to postpartum haemorrhage. This study could contribute to better neonatal outcomes, which include reduced perinatal mortality and enhanced maternal-infant bonding in postnatal period. Importantly, this research would support the attainment of Sustainable Development Goal (SDG) 3, which targets reducing the global maternal mortality ratio to fewer than 70 deaths per 100,000 live births by 2030.²⁶ By focusing on postpartum haemorrhage a leading cause of maternal deaths the study aligns directly with SDG Target 3.1.

1.7 Scope of the Study

This study focuses on assessing midwives' knowledge and utilization of E-MOTIVE Care Bundle management of postpartum haemorrhage among in three selected secondary health institutions in Ibadan, Oyo State: Adeoyo Maternity Teaching Hospital, Jericho Specialist Hospital, and Ring Road State Hospital. It is limited registered practicing midwives directly involved in maternal care and does not include other healthcare professionals or institutions outside the selected hospitals.

1.8 Operational Definition of Terms

Knowledge of E-MOTIVE: This refers to the awareness, understanding, and ability of midwives to correctly identify and describe the six components of the E-MOTIVE Care Bundle. It includes their cognitive grasp of when and how to apply each element; Early detection using calibrated drapes, Massage of the uterus, Oxytocin (or other uterotonics), Tranexamic acid, IV fluids, and Escalation of care in the management of postpartum haemorrhage at the selected secondary health institutions in Ibadan.

Management of Postpartum Haemorrhage: This refers to the clinical steps and interventions taken by midwives to detect, control, and treat excessive blood loss (≥ 500 mL after vaginal delivery or $\geq 1,000$ mL after cesarean section) occurring within 24 hours of childbirth. It involves early recognition, prompt intervention using standardized protocols like E-MOTIVE, and escalation when needed.

Midwives: Registered midwives with NMCN specialized in childbirth and postpartum care working in the selected Secondary health institution in Ibadan, Oyo State.

Postpartum Haemorrhage: Excessive bleeding of 500 ml or more within 24 hours after childbirth.

Utilisation of E-MOTIVE: This refers to the actual and consistent application of the complete E-MOTIVE Care Bundle by midwives during the management of postpartum haemorrhage in the secondary health institutions in Ibadan.

Endnotes

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Chapter Two

Literature Review

2.1 Conceptual Review

2.1.1 Postpartum Haemorrhage

2.1.2 E-MOTIVE Bundle

2.1.3 Level of Knowledge of Midwives Regarding the Components of E-MOTIVE Care Bundle in the Management of Postpartum Haemorrhage

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2.2 Theoretical Framework

2.2.1 Knowledge-to-Action (KTA) Theory

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2.4.1 Application of the Knowledge-to-Action (KTA) Theory to the Study

2.5 Summary of the Reviewed Literature

Endnotes

2.1 Conceptual Review

This chapter deals with the review of relevant literature on the knowledge and utilization of E-MOTIVE Care Bundle by midwives for the detection and management of postpartum haemorrhage. It explores existing scholarly works, research findings, and theoretical perspectives that relate to the major variables of the study. Empirical studies on midwives'

knowledge and use of E-MOTIVE care bundles, the effectiveness of early detection and response to postpartum haemorrhage, and identified management practices. Theoretical Review underpinning the study is also discussed, providing a basis for understanding midwives' behaviour and practice. The chapter concludes with a summary of key findings from the literature and highlights gaps that this study aims to address.

2.1.1 Postpartum Haemorrhage

Maternal mortality remains a persistent global health challenge and a crucial indicator of the accessibility and quality of reproductive health services in any society. The World Health Organization (WHO) defines maternal mortality as the death of a woman during pregnancy, childbirth, or within 42 days of termination of pregnancy, from any cause related to or aggravated by the pregnancy or its management, excluding accidental or incidental causes⁸. Despite various national and international interventions, maternal mortality continues to affect hundreds of thousands of women annually, particularly in low- and middle-income countries (LMICs), where health systems are fragile and emergency obstetric care is limited. Globally, approximately 287,000 women died in 2020 due to maternal causes, translating to a global maternal mortality ratio (MMR) of 223 deaths per 100,000 live births. Sub-Saharan Africa remains the region most affected, accounting for nearly 70% of all maternal deaths worldwide¹. This region alone recorded an MMR of 545 per 100,000 live births, a figure more than 130 times higher than that in high-income countries. In contrast, developed nations such as the United Kingdom, Norway, and Canada have achieved MMRs below 10 deaths per 100,000 live births, owing to strong healthcare infrastructure, skilled birth attendance, and well-established emergency obstetric protocols². In Nigeria, maternal mortality remains

unacceptably high and is a major contributor to the global burden. Nigeria alone accounts for approximately 20% of the world's maternal deaths. According to the 2018 Nigeria Demographic and Health Survey (NDHS), the national MMR stands at 512 deaths per 100,000 live births, which is far above the Sustainable Development Goal (SDG) 3.1 target of reducing global MMR to fewer than 70 per 100,000 live births by 2030³. The country's persistently high maternal mortality is reflective of systemic weaknesses, including poor antenatal coverage, inadequate emergency obstetric care, skilled health worker shortages, and weak referral systems.

The causes of maternal mortality are broadly categorized into direct and indirect causes. Globally and nationally, the leading direct causes include postpartum haemorrhage, hypertensive disorders of pregnancy (such as pre-eclampsia and eclampsia), sepsis, obstructed labour, and complications from unsafe abortion. Postpartum haemorrhage alone accounts for approximately 27% of maternal deaths globally and nearly one-third of all maternal deaths in Nigeria. Hypertensive disorders contribute to about 14% of global maternal deaths, while sepsis is responsible for approximately 10%⁴. Unsafe abortion continues to be a significant contributor, particularly in countries with restrictive laws and limited access to safe family planning services. It is estimated that over 13% of maternal deaths in Nigeria are linked to unsafe abortion practices. Obstructed labour, often due to limited access to caesarean section and timely intervention, remains a critical issue in rural and under-served areas. Indirect causes such as anemia, HIV/AIDS, malaria, diabetes, and cardiovascular diseases also contribute substantially to maternal mortality in Nigeria, especially when poorly managed during pregnancy. Many of these deaths are preventable with timely and skilled care, yet their persistence reflects deep inequities in health service

delivery, particularly for women in marginalized communities. The Nigerian government, through various maternal health programs and global partnerships, has made attempts to improve maternal health outcomes. However, progress remains slow and uneven. The introduction of evidence-based interventions such as E-MOTIVE Care Bundle represents a strategic step forward in addressing one of the deadliest complications of childbirth postpartum haemorrhage. Enhancing the knowledge and practical application of such interventions among frontline providers, especially midwives, is crucial to reversing current trends in maternal mortality in Nigeria and achieving global targets.

2.1.1.1 Types of Postpartum Haemorrhage

Postpartum haemorrhage is classified based on the timing of onset and the cause of bleeding⁵. Understanding the types of postpartum haemorrhage is crucial for prompt identification, diagnosis, and management. The two main types of postpartum haemorrhage are:

Primary (Early) Postpartum Haemorrhage: Primary postpartum haemorrhage is defined as excessive bleeding that occurs within the first 24 hours after the birth of the baby. It is the most common and life-threatening type of postpartum haemorrhage. Clinically, it is diagnosed when blood loss exceeds 500 mL after a vaginal delivery or 1,000 mL after a caesarean section within this time frame⁶. Primary postpartum haemorrhage is often dramatic and requires immediate intervention. It accounts for the majority of maternal deaths associated with haemorrhage, particularly in low-resource settings where delays in detection and management are common. Early recognition and targeted treatment based on these causes are essential to reduce morbidity and mortality. Management typically involves

uterotonic drugs (e.g., oxytocin), manual removal of retained products, surgical repair of trauma, or correction of coagulopathies⁷.

Secondary (Late) Postpartum Haemorrhage: it occurs after 24 hours postpartum and may present up to six weeks following childbirth⁸. Though less common than primary postpartum haemorrhage, it remains a serious complication if not promptly identified and managed. Secondary postpartum haemorrhage refers to excessive vaginal bleeding occurring after 24 hours and up to six weeks following childbirth. Several underlying conditions may contribute to this delayed bleeding. One common cause is subinvolution of the uterus, which occurs when the uterus fails to return to its pre-pregnancy size. This is often due to infection or the presence of retained placental tissue. Another cause is the retention of products of conception, where residual placental fragments or blood clots remain within the uterus, leading to ongoing or recurrent bleeding. Endometritis, an infection of the endometrial lining, can also trigger secondary postpartum haemorrhage.

This condition is more likely to occur in women who have experienced prolonged labour or undergone caesarean delivery. In rare cases, molar pregnancy or gestational trophoblastic disease a group of pregnancy-related tumours may present as or contribute to secondary postpartum haemorrhage, requiring specialized diagnosis and management. The presentation of secondary postpartum haemorrhage is usually less acute than primary postpartum haemorrhage, often featuring persistent vaginal bleeding, foul-smelling lochia, or uterine tenderness. Diagnosis may require ultrasound scanning, speculum examination, and laboratory tests. Treatment includes antibiotics, uterotonic agents, and, when necessary, surgical evacuation of retained tissue.

Classification by Blood Loss Severity: In addition to its classification based on timing, postpartum haemorrhage (postpartum haemorrhage) may also be categorized according to the volume of blood lost. Blood loss between 500 and 1,000 milliliters is typically considered minor postpartum haemorrhage, while loss exceeding 1,000 milliliters is classified as major postpartum haemorrhage. Major postpartum haemorrhage can be further subdivided into moderate, when blood loss ranges from 1,000 to 2,000 milliliters, and severe, when it exceeds 2,000 milliliters⁹. The severity of blood loss affects clinical decision-making, including the need for blood transfusion, surgical intervention, and intensive care. However, visual estimation of blood loss is often inaccurate, and standardized tools such as calibrated drapes or weighing soaked materials are recommended to improve assessment.

2.1.1.2 Causes of Postpartum Haemorrhage

Understanding the causes and risk factors of postpartum haemorrhage is essential for timely prevention, early detection, and effective management. The causes of postpartum haemorrhage are usually grouped under the mnemonic "The Four Ts" Tone, Tissue, Trauma, and Thrombin which reflect the main mechanisms contributing to excessive bleeding. In addition to these immediate causes, numerous predisposing risk factors increase the likelihood of postpartum haemorrhage¹⁰.

Uterine Atony (Tone): Uterine atony is the most prevalent cause of primary postpartum haemorrhage, accounting for approximately 70–80% of cases. It occurs when the myometrium fails to contract effectively after the expulsion of the placenta, leading to ongoing bleeding from the placental bed¹¹. Under physiological conditions, postpartum uterine contraction compresses the blood vessels supplying the placental site, thereby

arresting haemorrhage¹². However, when atony occurs, this process is disrupted, resulting in continuous and potentially life-threatening bleeding. Risk factors contributing to uterine atony include uterine over distension (as seen in cases of multiple gestation, polyhydramnios, or fetal macrosomia), prolonged or precipitous labour, high parity, chorioamnionitis, and the use of uterine-relaxant medications such as magnesium sulfate or general anaesthesia¹³.

Retained Placental Tissue (Tissue): The retention of placental fragments within the uterine cavity is another significant cause of postpartum haemorrhage¹⁴. Retained tissue interferes with effective uterine contraction and may lead to uterine atony. Additionally, retained products of conception may serve as a nidus for infection, further complicating the clinical course and increasing the risk of secondary postpartum haemorrhage¹⁵. Pathological adherence of the placenta, known as abnormal placentation including placenta accreta, increta, or percreta is often implicated in cases of retained tissue. Manual removal of the placenta, particularly in unskilled hands or in the absence of adequate uterine tone, may also result in incomplete evacuation and increased haemorrhagic risk¹⁶.

Genital Tract Trauma (Trauma): Trauma to the genital tract constitutes a considerable proportion of postpartum haemorrhage cases, particularly in women who deliver vaginally¹⁷. Lacerations of the cervix, vagina, perineum, or uterine rupture may cause significant blood loss even in the presence of a well-contracted uterus¹⁸. Instrumental deliveries using forceps or vacuum extractors, episiotomies, and macrosomic deliveries are notable predisposing factors for traumatic postpartum haemorrhage¹⁹. Additionally, precipitous labour, which does not allow sufficient time for the soft tissues of the birth canal to accommodate the descending foetus, may result in spontaneous tears. Uterine rupture, although rare, is a catastrophic event

often associated with a history of uterine surgery, such as caesarean section or myomectomy, or with obstructed labour in settings lacking skilled obstetric care²⁰.

Coagulation Disorders (Thrombin): Coagulopathies represent a less frequent but equally critical cause of postpartum haemorrhage²¹. In such cases, the bleeding results not from structural or mechanical failure but from the blood's inability to clot effectively. These conditions may be pre-existing (e.g., von Willebrand disease, haemophilia) or acquired during pregnancy or the peripartum period. Acquired causes include disseminated intravascular coagulation (DIC), severe pre-eclampsia or HELLP syndrome (Haemolysis, Elevated Liver enzymes, and Low Platelets), amniotic fluid embolism, sepsis, and abruptio placentae²². In such cases, clinical management must be aimed not only at controlling external bleeding but also at correcting the underlying haematological abnormalities²³.

Beyond the primary etiological classifications, other factors may contribute to the onset or exacerbation of postpartum haemorrhage. These include uterine inversion, which typically results from improper traction on the umbilical cord before placental separation, and uterine rupture secondary to inappropriate use of oxytocic drugs or previous uterine surgery²⁴. Iatrogenic causes, such as inappropriate administration of medications, poor adherence to the active management of the third stage of labour (AMTSL)²⁵, or lack of immediate postpartum monitoring, have also been documented as contributing significantly to maternal morbidity in poorly resourced settings²⁶.

2.1.1.3 Risk Factors for Postpartum Haemorrhage

Although postpartum haemorrhage can occur in any woman after childbirth, several risk factors can increase its likelihood. These factors are commonly categorized into antenatal,

intrapartum, and postnatal risks²⁷. Antenatal risk factors refer to conditions present during pregnancy that predispose a woman to postpartum haemorrhage²⁸. Grand multiparity, defined as having five or more previous births, can weaken the uterine muscles, making them less likely to contract effectively after delivery, thereby increasing the risk of uterine atony. Multiple gestations, such as twin or triplet pregnancies, and polyhydramnios (excessive amniotic fluid) both contribute to overstretching of the uterus, which also raises the risk of uterine atony²⁹. Conditions such as placenta previa and placental abruption involve abnormal positioning or premature separation of the placenta, leading to complications during delivery. Additionally, maternal anaemia reduces the body's ability to cope with blood loss, heightening the danger of complications³⁰. Intrapartum risk factors are those that arise during labour and delivery. Prolonged labour can exhaust the uterine muscles, while very rapid (precipitous) labour may not allow the uterus to contract efficiently, both of which can lead to uterine atony³¹.

The use of uterine stimulants such as oxytocin or misoprostol, though necessary in many cases, can also cause uterine fatigue or even rupture if not properly monitored³². Operative deliveries, including the use of forceps, vacuum extractors, or caesarean sections, are associated with higher risks of trauma and increased blood loss. Additionally, manually removing the placenta can damage uterine tissues and increase the likelihood of retained placental fragments. While postnatal risk factors emerge after childbirth. Inadequate uterine massage or poor postpartum monitoring can delay the identification of excessive bleeding. When the administration of uterotonic drugs is delayed, the uterus may not contract properly, leading to haemorrhage. Infections during the postpartum period can interfere with uterine involution and result in secondary haemorrhage. Moreover, the absence of skilled birth

attendants significantly delays the recognition and management of bleeding, which can worsen outcomes.

2.1.1.4 Impact of Postpartum Haemorrhage

The impact of postpartum haemorrhage varies by region and country, but its consequences remain severe across all settings, especially in Africa and Nigeria. Globally, postpartum haemorrhage accounts for approximately 27% of maternal deaths, making it the leading direct cause of maternal mortality, according to the World Health Organization (WHO)³³. Each year, it is estimated that over 14 million women experience postpartum haemorrhage, with about 70,000 deaths resulting from the condition³⁴. Many more women suffer long-term health issues such as severe anaemia, hypovolemic shock, or Sheehan's syndrome (postpartum pituitary necrosis)³⁵. Even in high-income countries where maternal deaths are rare, postpartum haemorrhage is still a top cause of **severe maternal morbidity**, including the need for intensive care admission, blood transfusion, and hysterectomy³⁶. The economic cost of treating postpartum haemorrhage-related complications can also be high due to prolonged hospital stays and the need for advanced medical interventions³⁷. Global health initiatives have increasingly recognized the urgency of improving postpartum haemorrhage detection and management. Interventions like the WHO-recommended E-MOTIVE care bundle are now being implemented to reduce maternal deaths and improve care outcomes³⁸.

The burden of postpartum haemorrhage is most severe in sub-Saharan Africa, which accounts for nearly two-thirds of global maternal deaths. In many African countries, health facilities lack access to essential obstetric supplies such as uterotonics, blood products, and trained midwives. Cultural practices, poor health-seeking behaviours, and transportation

challenges further exacerbate the risk³⁹. A study found that the case fatality rate of postpartum haemorrhage in Africa is 10 times higher than in high-income countries⁴⁰. Women in rural and remote areas often give birth without skilled birth attendants, making them particularly vulnerable to unrecognized or untreated bleeding⁴¹. The psychological and social impacts of maternal death or severe morbidity due to postpartum haemorrhage are also considerable. Surviving women may face infertility, emotional trauma, and economic hardship, particularly in communities where women serve as primary caregivers and income contributors⁴². Nigeria bears a significant share of the global maternal mortality burden. According to the Nigeria Demographic and Health Survey the maternal mortality ratio is 512 per 100,000 live births, and postpartum haemorrhage is one of the top three causes of these deaths⁴³.

Several factors contribute to the high impact of postpartum haemorrhage in Nigeria. One of the most significant challenges is the weakness of the health system, particularly at the primary care level, where many facilities lack essential life-saving drugs such as oxytocin and misoprostol. Additionally, poor referral systems mean that women experiencing complications often face delays in accessing secondary or tertiary health facilities equipped to manage obstetric emergencies effectively. Another major issue is the inadequate training of midwives and birth attendants. Many frontline healthcare workers do not receive sufficient education or hands-on experience in emergency obstetric care, limiting their ability to respond promptly and appropriately to postpartum haemorrhage. Furthermore, cultural beliefs and widespread poverty compound the problem. Some women choose to deliver at home or delay seeking medical help due to traditional practices, fear of stigma, or the inability to afford the cost of care. Together, these systemic, educational, and socio-cultural

factors significantly hinder timely and effective management of postpartum haemorrhage in Nigeria⁴⁴. A study demonstrated that proper implementation of E-MOTIVE bundle in selected Nigerian hospitals led to a 60% improvement in early detection of postpartum haemorrhage and significant reduction in severe bleeding⁴⁵. This underscores the importance of knowledge, availability of interventions, and prompt response in improving maternal outcomes.

2.1.1.5 Management of Postpartum Haemorrhage

Management of postpartum haemorrhage is time-sensitive and requires immediate recognition and intervention. The first step in the management of postpartum haemorrhage is the early identification of excessive bleeding, followed by the administration of appropriate treatment based on the cause.⁴⁶

Active Management of Third Stage Labour (AMTSL) and Uterotonics: WHO and international guidelines emphasize prophylaxis to prevent postpartum haemorrhage⁴⁷. Active management of the third stage of labour (AMTSL) involving prophylactic uterotonics, early cord clamping/traction, and uterine massage is the standard of care to reduce postpartum haemorrhage risk⁴⁸. The most critical component is routine uterotonics: preferably 10 IU oxytocin given intramuscularly or intravenously immediately after the baby's birth. Oxytocin is more effective and has fewer side effects than ergometrine or prostaglandins, and is recommended for all births.⁴⁹ Misoprostol (usually 600–800 µg orally or sublingually) is advised when oxytocin is unavailable or cold-chain cannot be ensured. Ergometrine (200 µg IM/IV) or methylergonovine can be used as an adjunct (with caution in hypertension) if

bleeding persists. International reviews confirm AMTSL significantly lowers postpartum haemorrhage incidence⁵⁰.

In practice, controlled cord traction is also performed (once the uterus is contracted) to deliver the placenta efficiently, and fundal massage may follow to promote uterine contraction and limit bleeding⁵¹. In many Nigerian settings, AMTSL is part of standard protocols, but challenges impede its full implementation.⁵² Oxytocin is widely recommended and used, but supply-chain and storage problems compromise its quality. Nearly half of uterotonic samples in LMIC surveys fail quality tests, and in Nigeria oxytocin frequently has reduced potency due to poor manufacturing and lack of refrigeration. As a result, providers often co-administer misoprostol or use it instead of oxytocin⁵³. One Nigerian survey notes that oxytocin and misoprostol remain the principal agents used for postpartum haemorrhage prevention, albeit “largely of suboptimal quality”⁵⁴.

Tranexamic Acid: Anti-fibrinolytic therapy with tranexamic acid (TXA) is a major advance in postpartum haemorrhage management⁵⁵. Multiple large trials (notably the WOMAN trial) demonstrated that early TXA significantly reduces death from postpartum haemorrhage without added harm⁵⁶. Consequently, WHO now recommends 1 g IV tranexamic acid given as soon as possible (ideally within 3 hours of birth) for any woman with clinically diagnosed postpartum haemorrhage, followed by a second 1 g dose if bleeding continues after 30 minutes⁵⁷. This regimen – part of standard care in many guidelines – was shown to reduce postpartum haemorrhage mortality (relative risk ~0.69 if given within 3 hours)⁵⁸. In practice, TXA should be given immediately when atony or other causes of haemorrhage are identified. In Nigeria, awareness of TXA is growing, but ensuring ready availability remains a challenge. Efforts by WHO and partners have emphasized including TXA on national postpartum

haemorrhage protocols and essential medicine lists, but anecdotal reports suggest it is still not universally stocked in all delivery wards.⁵⁹

Hemodynamic Resuscitation and Transfusion: Rapid resuscitation is critical once postpartum haemorrhage begins. Intravenous fluids (usually isotonic crystalloids) should be initiated immediately to maintain circulating volume⁶⁰. In severe haemorrhage, uterine atony plus hypovolemic shock mandates blood transfusion. Blood products should be arranged early: crossmatch 2–4 units of red cells (or whole blood in resource-poor settings) and transfuse as needed to restore hemodynamics. Massive-transfusion protocols (1:1:1 of packed cells, plasma, platelets) may be adapted to obstetric patients, though formal guidelines are often lacking in low-resource settings⁶¹. In Nepal, for example, reviewers note that even tertiary hospitals had no clear postpartum haemorrhage transfusion policy, leading to delays in giving blood.⁶² In Nigeria similar issues occur: a recent tertiary hospital audit found no institutional transfusion protocol, with physicians typically transfusing at a hemoglobin ~18%–21% (PCV ≤18–21%) and for obvious hypovolemia. In that study, about 8.4% of obstetric patients received transfusions, and haemorrhage (including 44% postpartum haemorrhage) was the leading indication⁶³. These data underscore that lack of standard triggers and blood availability can delay life-saving transfusions. In practice, providers often begin IV crystalloids immediately (e.g. 1–2 L Ringer’s lactate) and prepare for blood while simultaneously addressing uterine bleeding.⁶⁴

Manual and Mechanical Interventions: When bleeding persists, manual compression and mechanical techniques can be life-saving. Uterine massage remains a first-line response in atonic postpartum haemorrhage: continual fundal massage can help the uterus contract even before medications take effect⁶⁵. If external massage is insufficient, bimanual uterine

compression (one hand on the fundus inside the vagina, another on the abdomen) may tamponade bleeding temporarily. Another measure is uterine packing (balloon tamponade): WHO explicitly recommends intrauterine balloon tamponade for atonic postpartum haemorrhage not responding to uterotonics. Low-cost devices (e.g. condom-catheter balloons) have been effective in many settings⁶⁶. The 2021 WHO recommendation notes balloon tamponade should be used in settings where blood and surgical backup are available, reflecting that it is an intermediate step before surgery⁶⁷. In Nigeria, interest has grown in practical tamponade techniques; a 2023 review found that some Nigerian hospitals now stock Bakri balloons and train staff in condom-catheter tamponade as part of postpartum haemorrhage kits. (By contrast, historical reliance was mostly on uterotonics alone)⁶⁸. Early detection is also vital: WHO now advocates quantitative blood-loss measurement (e.g. calibrated drapes) rather than visual estimation, to trigger intervention more promptly. Although not widely implemented yet, initiatives like E-MOTIVE care bundle (calibrated drape + first-response bundle) are being piloted in Nigeria to improve early postpartum haemorrhage recognition and response⁶⁹.

Surgical Interventions: If medical and manual measures fail, surgical intervention is indicated. The goal is to control bleeding while preserving fertility if possible. Options include compression sutures and arterial ligation: for example, the B-Lynch brace suture compresses the uterus, and uterine artery ligation (or hypogastric/uterine devascularization) reduces arterial inflow⁷⁰. In experienced hands, these uterus-sparing procedures can arrest bleeding. In Nigeria, the first reports of such approaches appeared only in the 2010s. One case series from southwestern Nigeria described a successful combined B-Lynch suture with bilateral uterine artery ligation in a primiparous woman with severe atony; the authors recommended

this “as an alternative to obstetric hysterectomy” for selected cases⁷¹. However, many Nigerian centers – especially until recently – moved quickly to hysterectomy when postpartum haemorrhage was refractory⁷². Obstetric hysterectomy (subtotal or total) definitively stops bleeding but sacrifices future fertility. It is still the ultimate life-saving procedure when all else fails. Other approaches (e.g. uterine devascularization by O’Leary or triple ligation of utero-ovarian anastomoses) have been described but are less common.⁷³

Where available, interventional radiology (arterial embolization) can be highly effective, but few Nigerian hospitals have this capacity. Thus, Nigerian clinicians often face a stark choice: attempt compression sutures (if skilled personnel and time allow) or proceed to hysterectomy to save the mother. Training in surgical postpartum haemorrhage techniques is part of advanced obstetric care, but in low-resource settings gaps remain. WHO guidelines explicitly note that in some settings early recourse to hysterectomy may be needed, but encourage capacity-building for conservative measures.

Blood Transfusion and Shock Management: Concomitant with the above treatments, aggressive blood-loss management is essential. Blood transfusion should be given as soon as indicated by hemodynamics or measured haemoglobin⁷⁴. In many Low-Middle Income Country hospitals, whole blood is still the most available product; in better-equipped centers, packed red cells and plasma/platelets are transfused (ideally following a massive-transfusion ratio)⁷⁵. In Nigeria, transfusion practices vary widely. For example, a recent audit in Port Harcourt found haemorrhage was the indication in 65.6% of obstetric transfusions (postpartum haemorrhage accounting for 44.3% of cases), and 67% of units given were whole blood. Notably, the same study reported *no formal institutional policy* on transfusion thresholds – decisions were largely clinical, with many practitioners using PCV ≤ 18 –21%

(Hb ~6–7 g/dL) as a trigger⁷⁶. Such variability means some women may get delayed transfusion. WHO emphasizes treating shock promptly: leg elevation, oxygen if available, and transfusing blood even on “worst-case” presumptions if needed. The key is not to withhold transfusion pending laboratory results; clinical judgment should err on the side of maintaining perfusion⁷⁷.

Many of these interventions face implementation barriers in Nigeria. As noted, uterotonic quality is often poor; ensuring oxytocin cold chain or adopting heat-stable carbetocin is a priority. Skilled birth attendance is not universal, and home deliveries (often using misoprostol) make AMTSL inconsistent⁷⁸. Training and equipment for UBT or surgical measures may be lacking outside tertiary centers. Blood is often in short supply and transfusion services fragmented. Nigeria’s national guidelines have begun to emphasize postpartum haemorrhage bundles and commodities, but studies document gaps: for example, one survey found that even in tertiary hospitals, staff lacked clear written protocols for postpartum haemorrhage management and transfusion. Adaptations are emerging – e.g. wider use of postpartum haemorrhage kits (uterotonics plus condom-catheter kits) and task-shifting to train more providers in emergency obstetric care but much work remains⁷⁹.

2.1.1.6 Early Detection and Prevention of Postpartum Haemorrhage

Postpartum haemorrhage (postpartum haemorrhage) is a life-threatening complication that requires rapid identification and timely intervention. The cornerstone of reducing postpartum haemorrhage-related morbidity and mortality is early detection and effective prevention, which can significantly improve maternal outcomes both globally and in low-resource settings like Nigeria. Early detection begins with accurate and prompt recognition of

abnormal blood loss after delivery. Traditionally, postpartum haemorrhage has been defined as blood loss of ≥ 500 mL following vaginal delivery or $\geq 1,000$ mL after cesarean section. However, visual estimation is often inaccurate, leading to underdiagnosis and delayed treatment. As a response, the World Health Organization (WHO) now recommends objective quantification of blood loss using calibrated blood collection drapes or other measurement tools during and after delivery. This practice improves detection and allows quicker response to haemorrhage onset⁸⁰.

One major advancement is E-MOTIVE care bundle developed through WHO-led research. This includes the use of a calibrated drape (e.g., the BRASS-V drape) to measure postpartum blood loss accurately. E-MOTIVE approach also incorporates other interventions such as uterine massage, administration of tranexamic acid, uterotonics, IV fluids, and genital tract examination all initiated promptly upon early signs of bleeding⁸¹. Early detection also involves the use of clinical signs such as tachycardia, hypotension, pallor, dizziness, and reduced urinary output, which may indicate ongoing blood loss and hypovolemic shock. Midwives and obstetricians are trained to assess these warning signs during the immediate postpartum period, especially in the first two hours after birth, when postpartum haemorrhage is most likely to occur⁸².

Prevention strategies focus on minimizing the risk of postpartum haemorrhage through proactive interventions during the third stage of labour. The most evidence-based preventive measure is the Active Management of the Third Stage of Labour (AMTSL), which includes: Prophylactic administration of uterotonics is crucial. Oxytocin (10 IU IM or IV) is the first-line drug recommended by WHO to prevent uterine atony, the leading cause of postpartum

haemorrhage. In facilities where cold storage is unavailable or oxytocin quality is compromised, misoprostol (600–800 mcg orally or sublingually) is a feasible alternative⁸³. Another component of AMTSL is controlled cord traction (CCT) which assists in expediting placental delivery, reducing the risk of retained placenta and associated haemorrhage⁸⁴. Also, uterine massage is done. After placenta delivery, massaging the uterus promotes contraction and reduces bleeding⁸⁵. Use of heat-stable carbetocin is done in settings where oxytocin is not reliably available due to cold chain limitations, WHO recommends heat-stable carbetocin (HSC) for postpartum haemorrhage prevention. HSC is as effective as oxytocin and does not require refrigeration, making it particularly suitable for low-resource settings like rural hospitals in Nigeria⁸⁶.

Prevention also includes antenatal identification of women at increased risk for postpartum haemorrhage. Risk factors such as multiple gestation, polyhydramnios, previous history of postpartum haemorrhage, anaemia, prolonged labour, and macrosomia should be recognized early⁸⁷. At-risk women can be managed with enhanced surveillance during labour and delivery, ensuring that uterotonics, IV access, blood transfusion options, and skilled personnel are available. Routine haemoglobin testing and management of antenatal anaemia are key components of postpartum haemorrhage prevention. WHO recommends universal iron and folic acid supplementation during pregnancy to reduce the impact of blood loss when it occurs⁸⁸. Continuous professional training on postpartum haemorrhage recognition and emergency response is vital. Simulation drills, guideline updates, and mentorship help midwives and doctors improve their confidence and skill in managing early signs of haemorrhage. Hospitals must also ensure postpartum haemorrhage kits (with uterotonics, IV fluids, calibrated drapes, and tranexamic acid) are readily available and protocols are in

place⁸⁹. In Nigeria, the implementation of such strategies varies by region and facility level. Urban tertiary centers may have more consistent access to uterotonics and trained personnel, while rural health posts may face logistical and staffing limitations. Government efforts to standardize postpartum haemorrhage protocols and increase the availability of essential commodities are ongoing but require stronger policy enforcement.

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2.1.2 E-MOTIVE Bundle

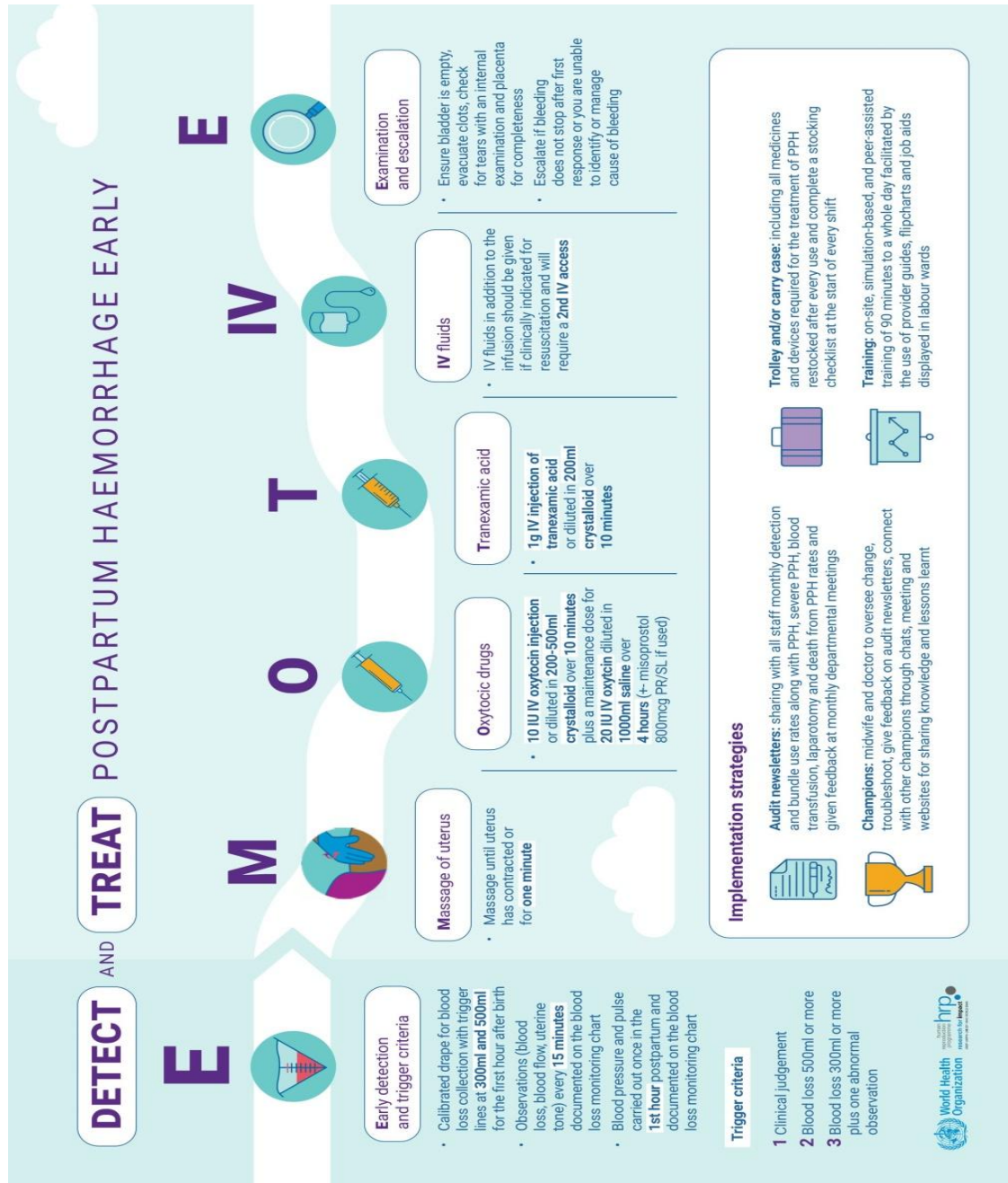


Fig 2.1: WHO E-MOTIVE Care Bundle for Managing Postpartum Haemorrhage

The foundation for E-MOTIVE was laid in 2012 and 2017, when WHO released updated guidelines on the prevention and treatment of PPH, emphasizing timely use of uterotonics, tranexamic acid (TXA), and other life-saving interventions. However, the actual implementation of these recommendations remained inconsistent in many parts of the world. E-MOTIVE care bundle is an evidence-based intervention designed to enhance the management of Postpartum Haemorrhage by standardizing care to improve maternal outcomes⁹⁰. The term "E-MOTIVE" stands for a series of steps that, when followed in order, can effectively manage the causes of postpartum haemorrhage, especially in low-resource settings. The bundle is particularly useful because it provides a structured approach to timely and effective interventions that can save lives by addressing the leading causes of postpartum haemorrhage: uterine atony, genital trauma, retained placenta, and coagulopathies⁹¹.

The development of E-MOTIVE care bundle stemmed from the need for comprehensive protocols that could be easily implemented by midwives and other healthcare providers in both hospital and community settings. The goal is to standardize practices, minimize delays, and ensure that critical actions are taken rapidly when postpartum haemorrhage occurs. Research has shown that adherence to such structured care bundles leads to a significant reduction in maternal mortality from postpartum haemorrhage by guiding healthcare providers through critical interventions⁹².

2.1.2.1 Components of E-MOTIVE Care Bundle

E-MOTIVE care bundle consists of eight core interventions that are designed to address the various causes of postpartum haemorrhage⁹³. These interventions are specifically tailored to

improve the identification and treatment of postpartum haemorrhage during the first few critical hours after delivery. The components of E-MOTIVE care bundle are as follows:⁹⁴

- i. **E – Early Diagnosis and Recognition of postpartum haemorrhage:** Timely recognition of excessive bleeding is the first step in preventing maternal morbidity and mortality from postpartum haemorrhage. The Care bundle stresses the importance of healthcare providers being able to identify postpartum haemorrhage early. This includes monitoring blood loss, uterine tone, and overall clinical condition of the mother after delivery. Early detection allows for early intervention, which is crucial in reducing severe complications.
- ii. **M – Manual Removal of Placenta:** In cases where the placenta is retained and cannot be expelled naturally, **manual removal** is recommended. Retained placenta is one of the leading causes of postpartum haemorrhage, and it may lead to significant blood loss if not promptly addressed. The manual removal of the placenta involves carefully extracting the placenta and any membranes from the uterus to prevent haemorrhage and infection.
- iii. **O – Oxytocin Administration:** The use of oxytocin, a uterotonic drug, is one of the key interventions in managing uterine atony, which is the most common cause of postpartum haemorrhage. Oxytocin stimulates uterine contractions, helping to constrict blood vessels at the placental site and reduce bleeding. E-MOTIVE care bundle advocates for early and routine administration of oxytocin after the birth of the baby.
- iv. **T – Trauma Assessment and Repair: Genital tract trauma,** such as tears in the cervix, vagina, or perineum, can be a significant cause of postpartum haemorrhage.

- The bundle emphasizes the importance of promptly identifying and repairing any tears or lacerations to prevent further blood loss. Traumatic injuries during childbirth are often missed in the rush of delivery, so careful examination and repair are critical to reducing haemorrhage.
- v. **I – Intrauterine Balloon Tamponade:** In cases of severe bleeding that is resistant to pharmacological intervention, intrauterine balloon tamponade can be used as a temporary measure to control haemorrhage. This involves inserting a balloon into the uterus and inflating it to apply pressure to stop the bleeding. This technique has been shown to be effective in controlling postpartum haemorrhage when uterine atony persists despite oxytocin administration.
 - vi. **V – Venous Access and Fluid Resuscitation:** Establishing venous access and beginning fluid resuscitation are vital in managing severe blood loss. It is important to restore circulating blood volume and maintain perfusion to vital organs. Intravenous (IV) fluids, such as saline or Ringer's lactate, are used to prevent shock, while blood products (e.g., red blood cells) may be required if the haemorrhage is severe.
 - vii. **E – Emergency Hysterectomy:** If all conservative measures fail and bleeding continues uncontrollably, an emergency hysterectomy may be necessary to save the life of the mother. This surgical intervention involves the removal of the uterus, which is the last resort to stop bleeding. Though it is a life-saving procedure, it comes with significant risks, including the loss of future fertility, which underscores the importance of preventing postpartum haemorrhage in the first place⁹⁵.
 - viii. **Bundle Evaluation:** The final step of E-MOTIVE bundle involves evaluating the outcomes of the interventions. This includes assessing whether the interventions were

effective in controlling postpartum haemorrhage and whether there were any complications. It also involves documenting the entire process to improve future care and learn from the experience⁹⁶.

2.1.2.2 The Importance of E-MOTIVE Care Bundle in Reducing postpartum haemorrhage-Related Mortality

E-MOTIVE bundle represents a comprehensive and structured approach to the management of postpartum haemorrhage that can be applied universally⁹⁷. It is especially valuable in settings where resources may be limited and where healthcare workers may not have access to the latest technology or interventions. By following these evidence-based steps, healthcare providers can effectively reduce the risk of maternal death and improve patient outcomes. The bundle empowers midwives, obstetricians, and other healthcare providers by providing them with clear guidelines on how to manage postpartum haemorrhage in real-time. In low-resource settings, where maternal mortality from postpartum haemorrhage is highest, E-MOTIVE care bundle offers a way to improve care without relying on expensive equipment or medications. Studies have demonstrated that the implementation of care bundles like E-MOTIVE care bundle in hospitals significantly decreases the rate of maternal deaths from postpartum haemorrhage, improves the quality of obstetric care, and enhances the confidence of healthcare workers in handling emergencies⁹⁸.

2.1.2.3 E-MOTIVE Care Bundle and its Use in Ibadan Hospitals

In Ibadan, where maternal health remains a significant concern, implementing E-MOTIVE care bundle could lead to a notable reduction in maternal morbidity and mortality. Ibadan, being a major urban center in Nigeria, has a mix of public and private healthcare facilities,

some of which may have limited access to necessary equipment or highly skilled professionals⁹⁹. The introduction of a structured protocol like E-MOTIVE Care bundle could assist in addressing these challenges by ensuring that midwives and other healthcare workers are properly trained and adhere to evidence-based practices in the management of postpartum haemorrhage¹⁰⁰.

Despite the clear benefits, challenges remain, such as lack of training, inconsistent use of protocols, and insufficient resources in some hospitals. Therefore, it is crucial for healthcare institutions in Ibadan to invest in the education of midwives on E-MOTIVE care bundle and ensure that these practices are consistently followed across all healthcare settings¹⁰¹.

2.1.3 Level of Knowledge of Midwives Regarding the Components of E-MOTIVE Care Bundle in the Management of Postpartum Haemorrhage

E-MOTIVE care bundle is a strategic, evidence-based approach aimed at enhancing the early detection and management of postpartum haemorrhage a major cause of maternal death globally, particularly in low-resource settings like Nigeria¹⁰². This bundle combines six key interventions that must be implemented together and without delay when postpartum haemorrhage is suspected: Early detection using a calibrated drape, uterine Massage, administration of Oxytocics, Tranexamic acid, IV fluids, and Examination of genital tract with escalation if needed (E-MOTIVE)¹⁰³. Midwives play a frontline role in maternal care, especially in sub-Saharan Africa where they often manage deliveries independently. Their knowledge of E-MOTIVE bundle directly affects the timely and effective management of postpartum haemorrhage, which can reduce preventable maternal deaths. Awareness and

understanding of each component of the bundle, the order of application, and the rationale for their combined use are essential to ensure successful outcomes¹⁰⁴.

Globally, several studies have found varying levels of awareness and training on E-MOTIVE components by midwives. For example, a study in Kenya found that only 58% of midwives were able to correctly identify all components of active postpartum haemorrhage management, with the majority lacking hands-on experience with calibrated drapes and tranexamic acid¹⁰⁵. Similarly, in South Africa, a 2022 survey revealed significant knowledge gaps in the application of tranexamic acid and the importance of early genital tract examination¹⁰⁶. In Nigeria, the situation is mixed. A study conducted in tertiary hospitals in Lagos showed that while most midwives were familiar with oxytocin and uterine massage, less than half had received formal training on calibrated drapes and tranexamic acid use¹⁰⁷. Many relied on clinical judgment or visual estimation of blood loss, which is prone to error. The lack of continuous professional development, resource constraints, and non-availability of all E-MOTIVE components contribute to this knowledge gap.

Limited knowledge by midwives impairs the effective implementation of E-MOTIVE bundle. This results in missed or delayed diagnosis of postpartum haemorrhage, ineffective treatment, and a higher risk of maternal morbidity and mortality. Additionally, knowledge deficits can compromise the confidence of midwives to initiate life-saving measures, particularly in emergency situations where decisions must be made quickly¹⁰⁸. A cross-sectional study conducted in Uganda among 150 midwives revealed that only 40% could correctly identify all components of E-MOTIVE care bundle, and even fewer had practical experience in applying all of them¹⁰⁹. This indicates a knowledge gap that could be fatal during obstetric

emergencies. Similar findings were reported in a study in Ethiopia, where over half of the participating midwives demonstrated inadequate knowledge of postpartum haemorrhage protocols, despite years of clinical experience¹¹⁰. In contrast, studies from developed countries such as the United Kingdom and Sweden show a higher knowledge rate by midwives regarding structured care bundles like E-MOTIVE. This has been attributed to continuous professional education, periodic clinical drills, and institutionalized guidelines that mandate adherence to postpartum haemorrhage management protocols¹¹¹.

In Nigeria, the picture is mixed. While midwives in tertiary hospitals often receive updates and in-service training on emergency obstetric care, those in secondary and primary healthcare facilities may lack such opportunities. A study in Enugu State showed that only 35% of surveyed midwives had received formal training on E-MOTIVE bundle or a similar postpartum haemorrhage management tool¹¹². This suggests that knowledge gaps could be more pronounced at lower levels of healthcare delivery.

2.1.3.1 Factors Influencing Knowledge of midwives

The knowledge level of midwives regarding postpartum haemorrhage (postpartum haemorrhage) management, including E-MOTIVE care bundle, is influenced by a variety of personal, institutional, and environmental factors. Scholarly literature consistently identifies education, workplace setting, clinical exposure, access to job aids, and mentorship as significant determinants of clinical knowledge and competence. Educational background and professional training have been widely cited as primary contributors to midwives' knowledge of emergency obstetric care. Midwives who possess higher educational qualifications or who have undergone recent training are more likely to demonstrate accurate knowledge of

evidence-based protocols such as E-MOTIVE care bundle. It was found that midwives who had participated in continuing professional development programs, especially those focusing on the active management of the third stage of labor (AMTSL), showed significantly improved understanding and recall of postpartum haemorrhage protocols¹¹³. Similarly, it was observed that structured in-service training and workshops had a positive impact on midwives' ability to identify and implement critical interventions in postpartum haemorrhage management¹¹⁴.

The workplace environment also plays a crucial role in shaping midwives' knowledge levels. Midwives employed in tertiary and teaching hospitals are more likely to have access to up-to-date clinical protocols, peer review, and mentorship, which contributes to higher levels of competence. Another study found that midwives in well-resourced urban facilities demonstrated better adherence to clinical guidelines compared to those working in rural or under-resourced settings¹¹⁵. The difference was attributed to access to clinical resources, supervision, and regular capacity-building exercises.

Clinical experience and practical exposure to obstetric emergencies are also influential. Midwives with direct experience managing postpartum haemorrhage cases tend to retain knowledge more effectively and exhibit greater confidence in implementing protocols such as E-MOTIVE¹¹⁶. The accumulation of hands-on experience reinforces theoretical knowledge and improves response time during actual emergencies. Moreover, the availability of clinical guidelines and visual job aids at the point of care has been identified as an enabling factor for knowledge reinforcement. In a multi-center study, it was observed that midwives working in labor wards where guidelines and decision-making charts were visibly

displayed were more likely to recall and correctly apply standardized procedures¹¹⁷. These tools serve as constant reminders and support consistent adherence to clinical standards. Supervision and mentorship are also vital to enhancing knowledge and practice by midwives. It was also noted that supportive supervision from senior healthcare providers helped midwives develop critical decision-making skills and improved their confidence in managing postpartum haemorrhage¹¹⁸. Mentorship fosters a learning environment where feedback and reflection promote both the acquisition and retention of clinical knowledge.

2.1.3.2 Knowledge Gaps and the Need for Training

Various studies highlights significant knowledge gaps by midwives in the understanding and implementation of E-MOTIVE care bundle, underscoring the critical need for ongoing professional education and structured clinical training. While foundational knowledge may be acquired through traditional learning methods such as reading clinical guidelines or attending didactic lectures, evidence suggests that passive knowledge acquisition alone is insufficient for effective clinical application. Active learning strategies such as clinical simulations, practical demonstrations, and scenario-based workshops have been shown to enhance not only knowledge retention but also midwives' confidence and competence in real-time decision-making during obstetric emergencies¹¹⁹.

A recurring concern in studies from similar low-resource settings is the absence of standardized and recurrent training on newly introduced protocols, including E-MOTIVE. Knowledge assessments conducted in such settings often reveal substantial variation in understanding by midwives across different healthcare tiers¹²⁰. In the context of Ibadan, where this present study is situated, preliminary observations and anecdotal reports indicate

that knowledge of E-MOTIVE bundle is unevenly distributed. While midwives working in tertiary or teaching hospitals may demonstrate relatively higher awareness and familiarity with the bundle's components, those practicing in general or primary healthcare facilities often lack comprehensive knowledge of the protocol¹²¹. This discrepancy is particularly concerning, as a considerable proportion of childbirths in the region occur outside of tertiary care institutions, thereby placing frontline midwives in lower-level facilities at the center of maternal care delivery.

The documented knowledge gap underscores the urgent need for targeted interventions aimed at improving the competency of midwives at all levels of healthcare delivery. Policymakers, nursing educators, and hospital administrators have a pivotal role to play in institutionalizing in-service education programs that focus specifically on postpartum haemorrhage management and E-MOTIVE care bundle. Regular updates, hands-on training sessions, and performance audits should be integrated into routine professional development plans to ensure clinical readiness¹²².

Closing the knowledge gap by midwives is essential for strengthening maternal healthcare systems. By equipping midwives with the appropriate knowledge and practical skills to identify and manage postpartum haemorrhage effectively, maternal mortality and morbidity rates can be significantly reduced. This aligns not only with national health objectives but also with global commitments such as the Sustainable Development Goal (SDG) 3.1, which aims to reduce maternal mortality to fewer than 70 deaths per 100,000 live births by the year 2030¹²³.

2.1.4 Detection of Postpartum Haemorrhage by Midwives Using E-MOTIVE Care Bundle

Early and accurate detection of postpartum haemorrhage is a critical factor in preventing maternal morbidity and mortality. E-MOTIVE Care Bundle was developed not only to standardize management but also to improve the detection process through objective methods such as the use of calibrated drapes. Several global, continental, and national studies have examined the impact of E-MOTIVE on enhancing early detection of PPH. In the United Kingdom, it was found that among 4,500 deliveries in NHS hospitals, the implementation of objective blood loss measurement tools led to a 53% improvement in the timeliness of PPH detection. The study reported that most midwives initially underestimated blood loss before training in E-MOTIVE protocols¹²⁴. In India a 42% reduction in delayed PPH diagnoses after E-MOTIVE training and the introduction of calibrated drapes across five primary healthcare centers was observed. Midwives reported greater confidence and clarity in making timely diagnoses, particularly during high-volume shifts¹²⁵. In Ghana, midwives' ability to detect PPH before and after the adoption of E-MOTIVE was assessed; the number of cases detected within the first 15 minutes of blood loss raised from 2,100 out of 5,000 (42%) pre-intervention to 4,100 (82%) post-intervention. The study concluded that standardized detection tools significantly reduced response delays¹²⁶. A Kenyan study reported that out of 9,300 deliveries, early PPH detection increased from 57% to 88% after the implementation of E-MOTIVE detection component. This was largely attributed to midwives' use of calibrated drapes and improved documentation systems¹²⁷.

In Uganda it was found that midwives who received hands-on training on calibrated blood measurement tools detected bleeding early in 86% of PPH cases, compared to 63% among

those using visual estimation¹²⁸. A report that cohort 150 midwives across 12 secondary hospitals in Southwest Nigeria, calibrated drape use for PPH detection rose from 36 midwives (24%) pre-training to 120 midwives (80%) post-training. This shift led to a 60% improvement in the timeliness of haemorrhage identification, allowing for quicker interventions¹²⁹. 3,500 postpartum cases reviewed in three tertiary hospitals in Nigeria found that only 945 cases (27%) of PPH were correctly identified using visual estimation. However, when E-MOTIVE tools were introduced, accurate detection rose to 2,660 cases (76%). The authors highlighted the effectiveness of structured training in transforming detection practices¹³⁰.

2.1.5 Midwives' Utilization of E-MOTIVE Care Bundle Management of Postpartum Haemorrhage

The extent to which midwives utilize E-MOTIVE care bundle in the management of postpartum haemorrhage (postpartum haemorrhage) varies significantly across global, regional, and local settings. Utilization refers to the actual and consistent application of all six components of E-MOTIVE bundle in clinical practice at the point of care. These components include early detection using a calibrated drape, uterine massage, administration of oxytocics, tranexamic acid (TXA), intravenous (IV) fluids, and a thorough genital tract examination with escalation when necessary. Globally, despite the bundle's proven effectiveness in reducing severe bleeding and maternal deaths, studies have shown that its implementation is inconsistent. A WHO-led multi-country trial across Africa and Asia found that while E-MOTIVE bundle significantly reduced the incidence of severe postpartum haemorrhage, only a portion of cases were managed using all components of the bundle.

Many healthcare providers applied uterine massage and administered oxytocin, but the use of TXA, calibrated blood drapes, and prompt escalation remained limited due to gaps in training, drug availability, and institutional support systems¹³¹.

In sub-Saharan Africa, including Ghana and Uganda, similar trends have been observed. Research shows that midwives often use the more familiar and accessible components of the bundle such as uterotonics and uterine massage but do not consistently apply the more recent additions like TXA and calibrated drapes¹³². This pattern suggests that while midwives may have partial knowledge of the bundle, full implementation is hindered by supply constraints and systemic challenges. In Nigeria, where postpartum haemorrhage accounts for a significant percentage of maternal deaths, the situation is similar. A study conducted by midwives in Lagos States revealed that while the majority were familiar with and regularly administered oxytocics and performed uterine massage, far fewer used calibrated drapes or administered TXA in response to postpartum haemorrhage¹³³. This discrepancy was attributed to lack of training on E-MOTIVE protocol, absence of standard operating procedures in health facilities, and inadequate supply of essential materials like TXA and blood drapes. Some midwives also cited high patient loads and under-staffing as reasons for omitting certain components of the bundle during emergencies. Moreover, the practice of escalation where midwives refer or seek assistance from higher-level providers when bleeding does not stop is often not followed due to fear of being blamed, lack of clear referral protocols, or absence of emergency transport services. In many health centers, midwives continue to rely on clinical judgment and informal practices, rather than structured bundles like E-MOTIVE, particularly in rural or low-resource settings¹³⁴.

In a multilevel modeling research to estimate incremental cost-effectiveness ratios from the perspective of the public healthcare system for outcomes of cost per case of severe PPH (blood loss ≥ 1000 mL) prevented and cost per disability-adjusted life-year (DALY) averted; a total of 80 secondary-level hospitals across Kenya, Nigeria, South Africa, and Tanzania, in which 210,132 patients underwent vaginal delivery, were randomly assigned to E-MOTIVE group or the usual-care group. Among hospitals and patients with data, severe PPH was diagnosed in 1.6% of patients in E-MOTIVE group and 4.3% of patients in the usual-care group. E-MOTIVE intervention was deemed cost-effective at contemporary willingness-to-pay thresholds and remained cost-effective across the full range of sensitivity and country-level analyses. Interpretation Use of a calibrated blood-collection drape for early detection of PPH and bundled first-response treatment is cost-effective and should be perceived by decision makers as a worthwhile use of healthcare budgets¹³⁵. In Nigeria, E-MOTIVE implementation is growing, with studies pointing to both achievements and challenges. In a study of 150 midwives in 12 hospitals across Southwest Nigeria, after training, the rate of complete bundle use rose from 24% to 84%, and PPH complications declined by 60%. The availability of equipment and leadership support played a vital role in the outcomes¹³⁶. In a tertiary hospital where E-MOTIVE was applied consistently, PPH-related ICU admissions dropped by 50%. The researchers highlighted gaps in record-keeping and supervision as areas needing attention¹³⁷.

Overall, while E-MOTIVE bundle presents a structured and life-saving intervention, its utilization by midwives remains suboptimal. The most consistently used components are those that have long been part of routine obstetric care, such as uterine massage and oxytocin administration. Conversely, the newer or resource-dependent components like TXA,

calibrated drapes, and escalation protocols are less frequently utilized. To improve outcomes, there is a need for enhanced training, adequate supply of materials, supportive policies, and supervision mechanisms that encourage full implementation of the bundle in real-time clinical scenarios.

2.2 Theoretical Framework

A theoretical review serves as the foundation of a research study, offering the conceptual lens through which the research problem is analyzed and understood. For this study, which explores the knowledge and utilization of the E-MOTIVE care bundle by midwives in the detection and management of postpartum haemorrhage in three state hospitals in Ibadan, the Knowledge-to-Action (KTA) Framework provides a particularly suitable and robust theoretical foundation.

2.2.1 Knowledge-to-Action (KTA) Theory

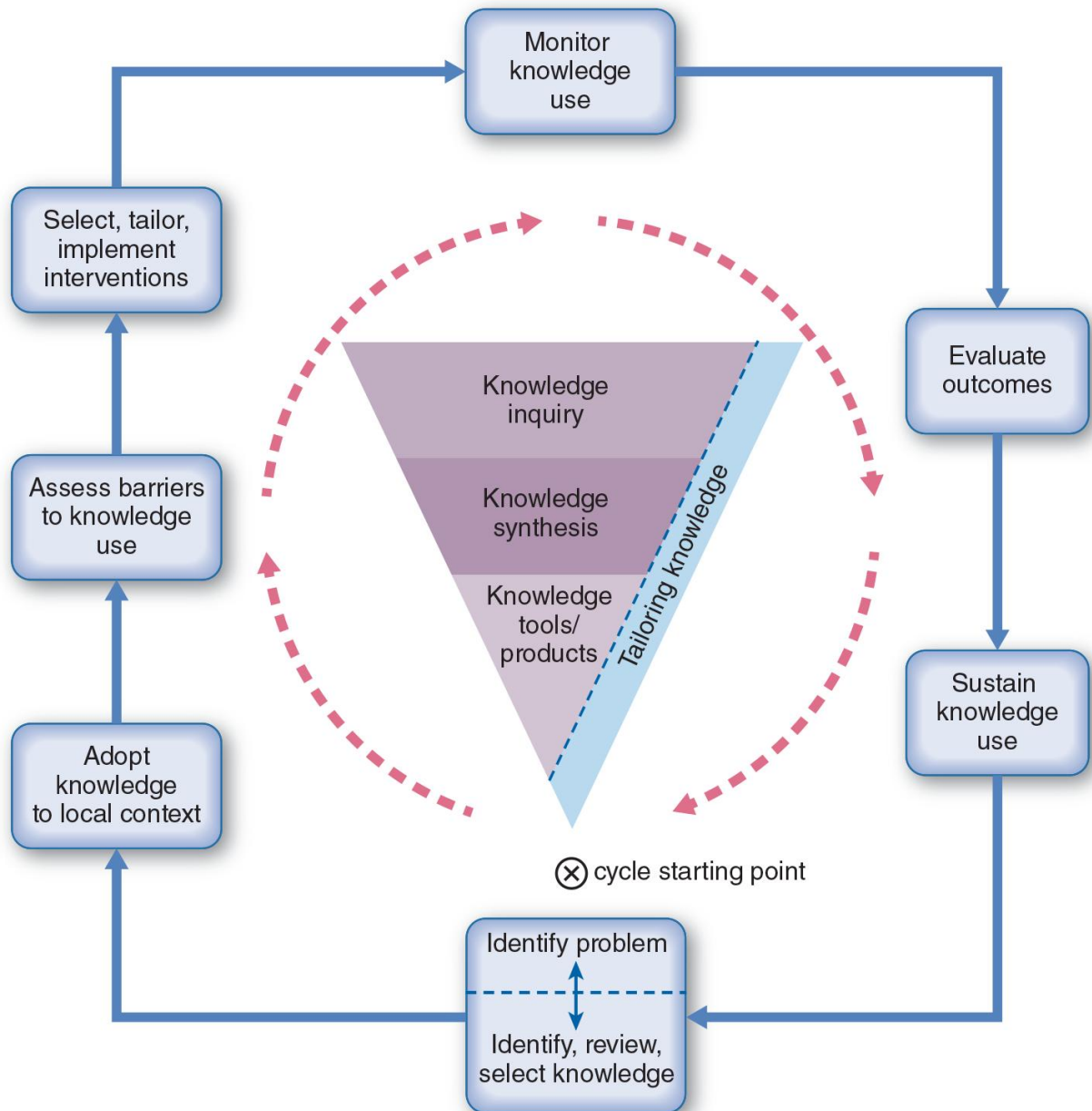


Fig 2.2: Knowledge-to-Action (KTA) theory by Ian Graham (Torres, Mendes and Barbieri-Figueiredo)¹³⁸

The Knowledge-to-Action (KTA) theory, proposed by Ian Graham and but currently used by Torres and colleagues, provides a systematic, process for translating research evidence into meaningful practice. It was born out of a synthesis of over 30 planned-action theories and has since become one of the most cited and adopted frameworks in knowledge translation, particularly within the Canadian Institutes of Health Research (CIHR) and other global health bodies like the World Health Organization (WHO)¹³⁹. The theory has two main components: **Knowledge Creation:** The knowledge creation component is represented as a funnel to illustrate the narrowing process by which raw evidence is refined into more usable forms. It includes three levels: *knowledge inquiry* (primary studies), *knowledge synthesis* (systematic reviews), and *knowledge tools or products* (such as clinical practice guidelines, decision aids, or protocols).

As knowledge moves down the funnel, it becomes increasingly useful and applicable to specific decision-making contexts¹⁴⁰. **Action Cycle:** Surrounding the knowledge creation funnel is the action cycle, which encompasses seven dynamic steps essential to translating knowledge into practice. These include: identifying a problem and selecting relevant knowledge, adapting knowledge to the local context, assessing barriers to knowledge use; selecting, tailoring, and implementing interventions, monitoring knowledge use, evaluating outcomes; and sustaining knowledge use¹⁴¹. Each step in this cycle is iterative, allowing for feedback and revision at any stage of the implementation process. The KTA framework thus acknowledges that knowledge translation is rarely linear and must be adapted to real-world complexities¹⁴².

2.3 Review of Empirical Studies

The aim of this study is to assess the knowledge and utilization of the WHO E-MOTIVE Care Bundle in the management of postpartum haemorrhage among midwives in secondary health institutions in Ibadan, Oyo State. Empirical studies from Nigeria and similar low-resource settings provide valuable insights into current practices, gaps, and the extent of implementation of evidence-based maternal care protocols.

2.3.1 Knowledge of E-MOTIVE Care Bundle Among Midwives

Empirical findings consistently reveal a significant gap in midwives' knowledge of the full E-MOTIVE Care Bundle. ¹⁴³ conducted a cross-sectional study in Enugu State, Nigeria, to assess healthcare providers' knowledge of tranexamic acid (TXA) a key component of the bundle. The study revealed that only **23.7%** of respondents demonstrated good knowledge of TXA, and just **16.4%** used it routinely during PPH management. Similarly, in a multi-country implementation study covering Nigeria, Kenya, and South Africa, ¹⁴⁴ found that while midwives were generally aware of individual interventions like oxytocin or uterine massage, few could identify and apply all six components of the E-MOTIVE Care Bundle. The findings reflect a pressing need for structured training that integrates newer components such as calibrated drapes and escalation protocols. In a study conducted in South Western Nigeria ¹⁴⁵, it was shown that healthcare workers with greater knowledge of emergency obstetric care were significantly more likely to adhere to evidence-based practices during delivery. This suggests that improving knowledge directly influences clinical behaviour and maternal outcomes.

In a multi-country cluster-randomized trial covering Kenya, Nigeria, South Africa, and Tanzania, E-MOTIVE Care bundle which includes early detection using a calibrated blood-collection drape and bundled treatment protocols significantly reduced the incidence of severe postpartum haemorrhage. The trial involved women in 78 hospitals, showing that midwives in intervention sites demonstrated increased adherence to evidence-based practices and a reduction in blood loss and maternal complications. This large-scale study involved over 210,132 women undergoing vaginal deliveries and demonstrated a reduction in severe PPH cases from 4.3% to 1.6% in the intervention group when compared to usual care. The trial concluded that midwives' utilization of the bundle contributed to a 2.6% reduction in severe postpartum haemorrhage cases compared to usual care, confirming the bundle's effectiveness in real-world clinical settings.¹⁴⁶

A quasi-experimental study in Egypt assessed the effect of E-MOTIVE bundle on enhancing nurses' knowledge, practice, and self-efficacy related to postpartum haemorrhage. Prior to the intervention, fewer than 50% of participants demonstrated satisfactory knowledge or practice. Post-intervention results showed that over 75% of the nurses advanced from low to high knowledge categories, and 91.2% achieved satisfactory implementation of E-MOTIVE components. The findings showed statistically significant improvements in knowledge and clinical practice post-intervention. The researchers reported that over 75% of participating nurses moved from low to high knowledge levels after receiving targeted training on E-MOTIVE components, demonstrating the effectiveness of structured educational interventions.¹⁴⁷ Nurses showed greater confidence in administering uterotonics, performing uterine massage, and executing escalation protocols, suggesting that regular in-service training is vital to the bundle's sustainability and effectiveness.

2.3.2 Steps in the Management of Postpartum Haemorrhage using E-MOTIVE bundle

Several studies have evaluated how midwives respond to postpartum haemorrhage in practice. ¹⁴⁸ conducted a qualitative study among midwives in Ekiti and Eastern Nigeria and reported that many midwives depended heavily on experience and available resources rather than standardized protocols. The most common interventions reported included uterine massage, oxytocin administration, and use of non-standardized tools to estimate blood loss. However, the lack of calibrated drapes and poor documentation of bleeding patterns were identified as gaps in care. These practices illustrate the urgent need to standardize the stepwise management of PPH using WHO-recommended guidelines like E-MOTIVE.

Similarly, ¹⁴⁹ assessed the use of Active Management of the Third Stage of Labour (AMTSL) among skilled birth attendants in Nigeria and found that only 42% fully adhered to AMTSL protocols. Given that AMTSL forms a foundation upon which E-MOTIVE builds, the findings underscore the broader issue of poor compliance with standardized maternal care practices. A quasi-experimental study in Ghana, where 100 midwives were trained in E-MOTIVE practices, findings showed a jump in PPH case resolution rates from 58% to 85% post-training, with a corresponding drop in maternal complications.¹⁵⁰ In Kenya, 9,300 deliveries were tracked over one year; hospitals applying E-MOTIVE practices saw a 28% reduction in emergency hysterectomies and a 34% decrease in haemorrhage-related maternal deaths.¹⁵¹ The study attributed success to continuous training, team-based care, and access to supplies.

A Ugandan cross-sectional study reported that in facilities using all components of E-MOTIVE, 84.6% of PPH cases were successfully managed, compared to 63.2% in hospitals

with partial implementation. Staff confidence and mentorship were critical to consistent performance. In a multilevel modelling research to estimate incremental cost-effectiveness ratios from the perspective of the public healthcare system for outcomes of cost per case of severe PPH (blood loss ≥ 1000 mL) prevented and cost per disability-adjusted life-year (DALY) averted; a total of 80 secondary-level hospitals across Kenya, Nigeria, South Africa, and Tanzania, in which 210,132 patients underwent vaginal delivery, were randomly assigned to E-MOTIVE group or the usual-care group. Among hospitals and patients with data, severe PPH was diagnosed in 1.6% of patients in E-MOTIVE group and 4.3% of patients in the usual-care group. E-MOTIVE intervention was deemed cost-effective at contemporary willingness-to-pay thresholds and remained cost-effective across the full range of sensitivity and country-level analyses. Interpretation Use of a calibrated blood-collection drape for early detection of PPH and bundled first-response treatment is cost-effective and should be perceived by decision makers as a worthwhile use of healthcare budgets¹⁵². In Nigeria, E-MOTIVE implementation is growing, with studies pointing to both achievements and challenges. In a study of 150 midwives in 12 hospitals across Southwest Nigeria, after training, the rate of complete bundle use rose from 24% to 84%, and PPH complications declined by 60%. The availability of equipment and leadership support played a vital role in the outcomes¹⁵³. In a tertiary hospital where E-MOTIVE was applied consistently, PPH-related ICU admissions dropped by 50%. The researchers highlighted gaps in record-keeping and supervision as areas needing attention¹⁵⁴.

2.3.3 Utilization of E-MOTIVE Care Bundle

Evidence on the utilization of the E-MOTIVE bundle remains limited, as it is a relatively new WHO recommendation. However, available studies suggest low but improving uptake.

In a randomized implementation trial led by WHO and partners across several LMICs, facilities trained on the E-MOTIVE protocol reported a **significant reduction in severe PPH cases**, but this success depended on ongoing supervision, access to required materials, and refresher training.

In Nigeria, ¹⁵⁵ investigated the practice of using TXA in northern regions and found that utilization was primarily hindered by unavailability and lack of knowledge, even among skilled providers.⁶ Another study by ¹⁵⁶ found that facilities with clinical audit systems and routine training were significantly more likely to adopt bundled care practices. These findings suggest that successful utilization is closely tied to institutional support and capacity development. These studies suggest that while midwives may possess foundational knowledge about postpartum haemorrhage management, awareness and consistent application of structured tools like E-MOTIVE bundle are limited by factors including training access, facility readiness, and supervision. These findings highlight the need for both knowledge enhancement and systemic reform to ensure full utilization of E-MOTIVE care bundle in postpartum haemorrhage management.

2.4 Conceptual Model

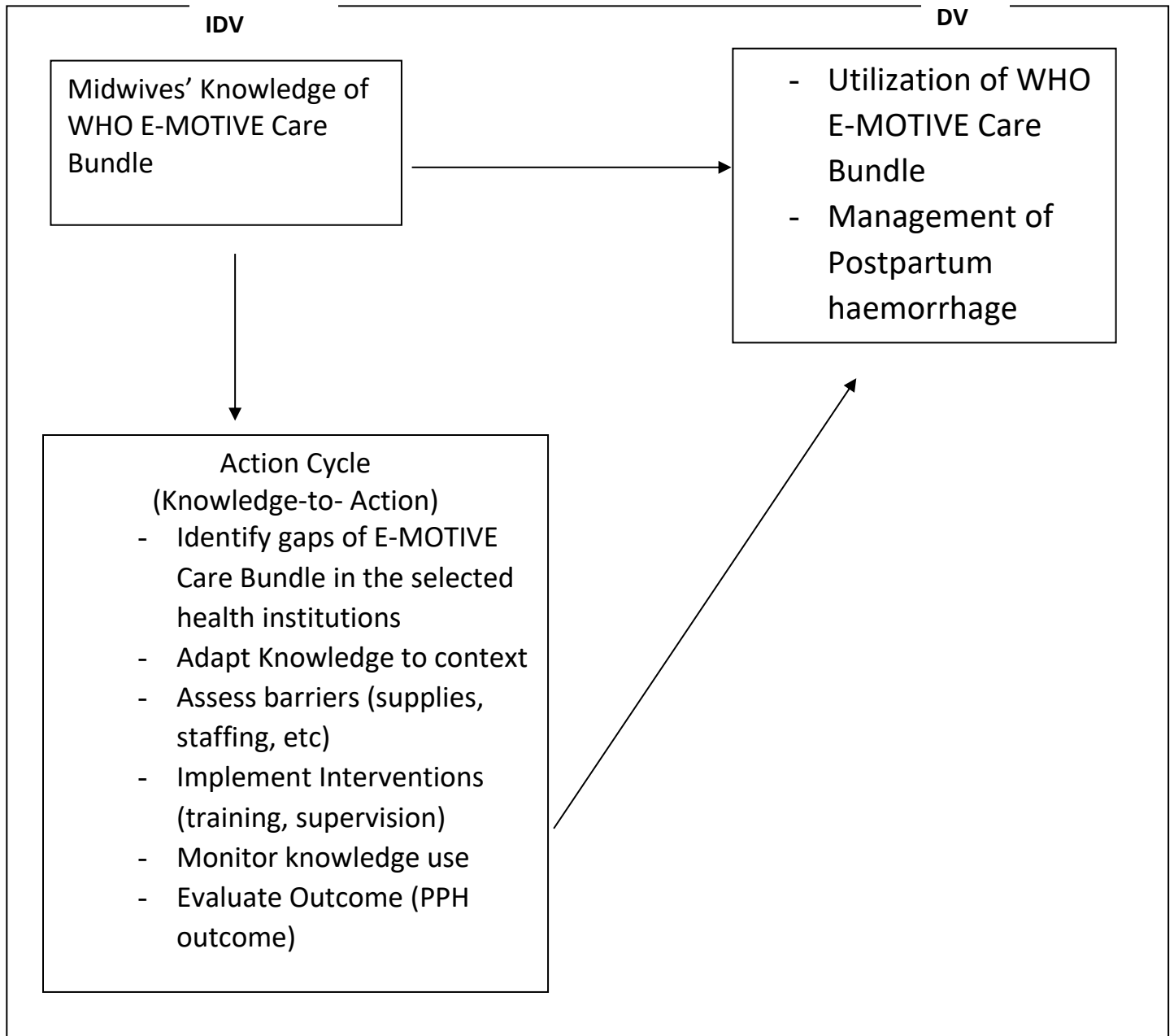


Fig. 2.3: Conceptual Model of Knowledge to Action theory towards the Midwives' Knowledge and Utilization of E-motive Care Bundle management of Postpartum Haemorrhage in selected Secondary Health Institutions in Ibadan, Nigeria.

Source: Researcher's Concept, 2025

2.4.2: Explanation on Application of the Knowledge-to-Action (KTA) Framework in Implementing the E-MOTIVE Care Bundle

The Knowledge-to-Action (KTA) Review is essential for exploring the institutional and systemic factors that influence the implementation of the E-MOTIVE Care Bundle across healthcare centers. This framework provides a structured pathway to examine how research-based interventions are translated into clinical practice within Nigerian healthcare settings, particularly among midwives.

Knowledge Creation: The process begins with the generation and dissemination of the E-MOTIVE Care Bundle, which integrates evidence-based tools, protocols, and training designed to manage postpartum haemorrhage (PPH). This study examines whether midwives in various centers have received exposure to this knowledge through formal training, workshops, or continuous professional development programs.

Identify Gaps: At this stage, the review identifies existing gaps in knowledge and utilization of the E-MOTIVE Care Bundle among midwives across different healthcare centers. It explores variations in understanding, familiarity, and practical application, which could influence the success of the intervention.

Adapt to Context: The study assesses how well the E-MOTIVE Care Bundle has been adapted to different hospital environments, considering factors such as available resources, existing local practices, and the level of knowledge of the intervention within various hospitals. The contextual adaptation also reflects how cultural and institutional realities affect its application.

Assess Barriers: This step involves identifying barriers that hinder the effective implementation of the care bundle such as inadequate supplies, insufficient staffing, heavy workload, or limited access to training. Recognizing these constraints is vital to understanding the systemic challenges facing midwives in PPH management.

Implement Strategies: Here, attention is given to the actual execution of strategies such as training sessions, adherence to clinical protocols, and the presence of supervision systems that facilitate correct use of the E-MOTIVE Care Bundle in hospital settings.

Monitor Use: The review emphasizes tracking how midwives apply the E-MOTIVE Care Bundle in real clinical scenarios specifically monitoring how they manage PPH cases, assess timeliness of response, and ensure compliance with established protocols.

Evaluate Outcomes: This phase focuses on evaluating the outcomes of implementing the E-MOTIVE Care Bundle in terms of maternal health improvements and the number of successfully managed PPH cases. It provides evidence of the intervention's impact on clinical effectiveness and patient outcomes.

Sustain Practice: Finally, sustainability is examined through ongoing initiatives such as refresher training, supportive policies, mentorship programs, and ensuring adequate supply of E-MOTIVE materials. These measures promote continuous learning and long-term integration of best practices into midwifery care.

The KTA Review offers a comprehensive lens through which policy formulation, leadership engagement, and continuous quality improvement can be aligned to strengthen knowledge

use, enhance maternal health outcomes, and sustain evidence-based practice within Nigerian healthcare institutions.

2.5 Summary of the Reviewed Literature

The literature reviewed in this chapter highlighted the global and local burden of postpartum haemorrhage (postpartum haemorrhage) as one of the leading causes of maternal mortality, especially in low- and middle-income countries such as Nigeria. Despite being preventable and treatable, postpartum haemorrhage remains a persistent public health challenge due to late detection, inadequate clinical response, and inconsistent use of evidence-based interventions. The conceptual review defined key constructs such as postpartum haemorrhage, its types, causes, risk factors, and consequences. The review also discussed the role of midwives as frontline healthcare providers in the management of maternal emergencies, emphasizing their critical position in reducing postpartum haemorrhage-related deaths.

A key intervention discussed is E-MOTIVE care bundle, an evidence-based package comprising Early detection through blood loss measurement, Massage, Oxytocics, Tranexamic acid, IV fluids, and Examination. It is designed to prompt rapid and effective treatment for postpartum haemorrhage. Studies reviewed suggest that while E-MOTIVE bundle is a proven approach to improving maternal outcomes, its successful application depends largely on midwives' knowledge, training, and workplace support systems. Furthermore, the chapter underscores the impact of structured, context-specific training and supportive supervision in improving knowledge, practice, and self-efficacy among midwives. Theoretical underpinning is provided through the Knowledge-to-Action (KTA) framework,

which explains how evidence-based interventions like E-MOTIVE can be adapted and sustained in real-world clinical practice.

Empirical studies revealed varying levels of knowledge by midwives about the components and application of E-MOTIVE bundle. Barriers identified in the literature included lack of training, unavailability of medications, limited protocols, and poor policy enforcement. Despite these, evidence supports the effectiveness of E-MOTIVE bundle in reducing severe maternal outcomes when properly implemented.

Overall, the literature review demonstrated a gap between knowledge and practice by midwives, necessitating further investigation into the factors influencing the implementation of E-MOTIVE bundle. This study is, therefore, timely and significant in addressing the pressing need for improved clinical responses to postpartum haemorrhage in Nigerian health facilities.

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Chapter Three

Research Methodology

3.1 Research Design

This study employed descriptive survey design. The design was considered appropriate for ascertaining the midwives' knowledge and utilization of E-MOTIVE care bundle management of postpartum haemorrhage in secondary health institutions in Ibadan which allowed data collection at a single point in time from a defined population.

3.2 Population of the Study

The study was conducted in three selected secondary health institutions in Ibadan, Oyo State, Nigeria: Adeoyo Maternity Teaching Hospital, Jericho Specialist Hospital, and Ring Road State Hospital. These facilities are public secondary-level health institutions offering comprehensive maternal and child health services, including antenatal, delivery, and postnatal care. Midwives at these hospitals are directly involved in the management of postpartum haemorrhage and are expected to be familiar with or utilize evidence-based interventions like E-MOTIVE care bundle. Adeoyo Maternity Teaching Hospital, Yemetu, Ibadan, was established in 1927 by the Church Missionary Society in collaboration with the colonial government. Initially known as Adeoyo Maternity Home, it was designed to provide maternal and child health services to Ibadan and its environs. Between 1948 and 1954¹, it served as a College Hospital for the University of Ibadan, marking its first academic affiliation. During this period, it was upgraded with additional infrastructure including 50 beds, a laboratory, X-ray annex, medical lecture rooms, and a mortuary. It has evolved into a comprehensive teaching and referral hospital specializing in

maternal and child health. In 2020, it was approved for reaccreditation as a full-fledged teaching hospital, with a focus on training midwives and other healthcare professionals. The hospital offers services ranging from antenatal care to delivery and postnatal care. It also plays a key role in the training of medical and nursing students. Today, Adeoyo Maternity Teaching Hospital boasts 17 wards, a total of 153 beds, and operates across several specialized maternal and child health service units, including antenatal clinics, labour wards, gynecological and post-caesarean sections wards, immunization clinics, and a well-equipped special care baby unit (SCBU). The facility is staffed by 115 midwives out of 139 nurses, along with a support team that includes 50 non-health workers.

Jericho Specialist Hospital, established on 1st January 1976, is a well-regarded secondary-level healthcare facility located in Ibadan North West local government, Ibadan, Oyo State. The hospital is known for offering specialized services, especially in obstetrics and gynecology, with a strong reputation for managing high-risk pregnancies and maternal emergencies including postpartum haemorrhage. The facility operates with a staff strength of 184, across 12 departments, and has a capacity of 54 beds. Its dedicated maternity unit is a critical component of its service delivery. Currently, 45 midwives out of 58 nurses work in the maternity unit, providing quality care and expert management of labour and delivery. Jericho Specialist Hospital also plays a strategic role in the training and mentorship of healthcare professionals, particularly those specializing in maternal and child health.

Ring Road State Hospital, established in 1978, is located in the Ibadan South-West Local Government Area of Ibadan, Oyo State. It is one of the major secondary healthcare facilities serving the city's population and is operated under the Oyo State Hospital Management Board. Over the years, it has grown into a central institution for maternal and child health services,

offering a broad range of clinical and public health functions. The hospital plays a significant role in the management of obstetric emergencies, including postpartum haemorrhage. Currently, the facility is staffed by 117 nurses, including 45 licensed midwives who oversee antenatal care, deliveries, and postnatal management. The hospital also provides emergency services, immunization, family planning, and routine outpatient and inpatient care. With its well-established structure and highly experienced workforce, Ring Road State Hospital remains a critical pillar in the delivery of secondary-level healthcare within the Ibadan metropolis. Each of these hospitals plays a vital role in the provision of maternal healthcare in Ibadan, and the midwives are essential members of the healthcare teams. Together, they ensure the health and safety of mothers during labour and delivery, addressing complications like postpartum haemorrhage and other obstetric emergencies.

3.3 Sample and Sampling Techniques

The total number of midwives across the selected secondary health institutions were 205. Due to the relatively small and manageable number of midwives across the three selected state hospitals in Ibadan, the study adopted a total enumeration (census) approach. The census strategy is appropriate for small populations where complete data collection is feasible and desirable. The study involved all 205 midwives across three selected state hospitals, because they have larger numbers of midwives in Ibadan, Oyo State. The use of total population sampling ensures that all perspectives are captured and improves the robustness of the analysis. The distribution across facilities are as follows:

Table 3.1: Population of Midwives in selected Health Institution in Oyo State

Hospital	Number of Midwives
Adeoyo Maternity Hospital	115
Jericho Specialist Hospital	45
Ring Road State Hospital	45
Total	205

Source: Survey field work, 2025

3.4 Description of the Research Instrument

The instrument for data collection in this study was a validated questionnaire based on relevant literature and guided by the research objectives was used. The questionnaire was divided into five sections (A to E), with each section designed to elicit specific information related to the variables of the study.

Section A; focused on the socio-demographic characteristics of the respondents. It contained nine (9) items designed to obtain essential background information, including the age, religion, marital status, tribe, educational qualifications and years of experience of the midwives participating in the study.

Section B; addressed the midwives' knowledge regarding E-MOTIVE Care Bundle. This section comprised of thirty (32) questions with Yes or No response options. Each correct response was scored as one (1) mark, and each incorrect response was scored as zero (0). The scores were interpreted using a two categorization: scores below 50% indicated low knowledge; while scores from 51% to 100% was considered as high knowledge.

Section C; focused on the utilization of E-MOTIVE Care Bundle in practice. It consisted of thirty-nine (39) items designed to assess how frequently midwives apply the bundle in clinical settings with Yes or No response options. Higher scores indicated greater utilization. The level of utilization was categorized into three: low utilization (less than 50%), and high utilization (70–100%).

Section D; assessed the management steps taken by midwives in handling postpartum haemorrhage. This section included forty-eight (48) items, each with Agree or Disagree response options with Yes or No response options. The total score for each respondent was used to determine the perceived strength of their adherence to best practices, categorized as weak adherence (below 50%), or strong adherence (51–100%)

3.5 Validity of Research Instrument

The questionnaire was validated by experts in maternal and child health nursing as well as specialists in research methodology to ensure content validity, clarity, and relevance. Content validity was ensured by adapting the items from the relevant literature similar to the study. The Promoter (Supervisor) with experts in research also assessed the relevance, clarity, and coverage of the questionnaire items in relation to the study objectives and research questions.

3.6 Reliability of Research Instrument

Reliability of the instrument was assessed through a pretest of instrument involving 10% of the total sample size (21 respondents). The pretest was conducted at General Hospital Aremo, which shares similar characteristics with the study sites but was not included in the final sample. The purpose of the pretest was to test the clarity, consistency, and reliability of the questionnaire

items. Responses obtained from the pretest participants was analyzed using Cronbach's alpha to measure internal consistency². Data collected from the pretest respondents were subjected to Cronbach's alpha reliability analysis to evaluate the internal consistency of the instrument. The results, presented in the table below, showed that the Cronbach's alpha coefficients for all sections of the instrument were well above the recommended threshold of 0.70, indicating excellent internal reliability. The overall Cronbach's alpha value of 0.974 confirmed that the questionnaire items were highly consistent and reliable in measuring the constructs under investigation.

Table 3.2: Reliability Results of Cronbach's Alpha from Pretest

Section	No of Items	Cronbach's alpha Result
Section B	32	0.900
Section C	39	0.957
Section D	48	0.962

Source: Survey field work, 2025

The results therefore affirmed that the research instrument was both valid and dependable for assessing the midwives' knowledge and utilization of the E-MOTIVE Care Bundle in the management of postpartum haemorrhage in selected Secondary health institutions in Ibadan, Oyo State.

3.7 Method of Data Collection

The process of data collection began by obtaining letter of introduction from the Head of Department of Nursing Sciences. This was followed by a written request for permission from the Oyo State Ethical Review Committee Secretariat Ibadan, under whose authority the selected

hospitals operate. Upon receiving board approval, administrative permission was sought from the medical directors or heads of each hospital where the study was conducted. After all institutional permissions had been granted, data collection was done at the facility level. The researcher visited each hospital and met with eligible midwives during their shifts. A brief explanation of the study's objectives, benefits, and permission was given. Informed consent was obtained from each participant before the distribution of questionnaires. The instrument, a validated questionnaire, were given to the consenting midwives, who were asked to complete and return within 24 hours by the researcher and the assistants. Participation was entirely voluntary, and anonymity was maintained throughout the process.

3.8 Method of Data Analysis

Data was collected coded and entered into Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics (mean, frequency, percentage) was used to analyze demographic data and responses on knowledge and utilization. Inferential statistics of Pearson Chi-square correlation coefficient was employed to test association between variables at a significance level of $p < 0.05$.

3.9 Ethical Approval

Approval was obtained from the Ethical Review Board of the Oyo State Ministry of Health. Informed consent was sought from all participants. Participation was voluntary, and respondents were assured of confidentiality and anonymity. No identifying information will be collected. Data was used solely for academic purposes.

¹ www.amthlibrary.org

² Hamed Taherdoost, "Validity and Reliability of the Research Instrument: How to Test the Validation of a Questionnaire/Survey in a Research," **International Journal of Academic Research in Management** 5, no. 3 (2016): 28–36.

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Chapter Four

Results and Discussion of Findings

This chapter presents the results of the study conducted to assess the midwives' knowledge and utilization of E-MOTIVE Care Bundle management of postpartum haemorrhage in selected secondary health institutions in Ibadan, Oyo State. A total of 205 validated questionnaires were distributed to registered practicing midwives working in Adeoyo Maternity Teaching Hospital, Jericho Specialist Hospital, and Ring Road State Hospital. All the questionnaires were properly completed, retrieved, and analysed, yielding a 100% response rate.

4.1 Demographic Data Analysis

Table 4.1 Demographic information of the respondents (N=205)

	Frequency (N)	Percent (%)
Age		
20-30	92	44.9
31-39	48	23.4
40-50	50	24.4
51 and above	15	7.3
Sex		
Male	62	30.2
Female	143	69.8
Religion		
Christianity	139	67.8
Islam	62	30.2
Traditional	4	2.0
Tribe		
Yoruba	172	83.9
Hausa	15	7.3
Igbo	18	8.8
Marital Status		
Single	55	26.8
Married	127	62.0
Divorced	19	9.3
Widowed	4	2.0
Nationality		
Nigerian	176	85.9
Ghanaian	29	14.1
Educational Qualification		
RN/RM	70	34.1
RM	33	16.1
BSc/BNSC	68	33.2
MSc	18	8.8
PhD	16	7.8
Department (Maternity Unit)		
Labour ward	107	52.2
Labour Room	34	16.6
Lying-in ward	26	12.7
Gynae Ward	38	18.5
Years of Experience		
less than 1 year	50	24.4
1-5 years	74	36.1
6-10 years	24	11.7
above 10 years	57	27.8

Source: Survey field work, 2025

Table 4.1 presents the demographic characteristics of the respondents (N=205). The age distribution of respondents revealed that the majority were within the 20–30 years age group, 92 (44.9%), followed by 40–50 years, 50 (24.4%), and 31–39 years, 48 (23.4%), while the least represented were 51 years and above, 15 (7.3%). This indicates that most of the participants were young and in their productive years. In terms of sex, the respondents were predominantly female, 143 (69.8%), compared to male, 62 (30.2%). This shows a clear gender imbalance, which may be due to the nature of the nursing and midwifery profession being largely female-dominated. Religion-wise, the majority of the respondents were Christians, 139 (67.8%), while 62 (30.2%) were Muslims, and only 4 (2.0%) practiced traditional religion. This implies that Christianity had the highest representation among the sample population. Looking at ethnic distribution, most of the respondents were Yoruba, 172 (83.9%), with fewer Igbo, 18 (8.8%), and Hausa, 15 (7.3%). This is expected since the study was conducted in the South-Western part of Nigeria, which is predominantly Yoruba.

Marital status revealed that majority of the respondents were married, 127 (62.0%), followed by single, 55 (26.8%). A smaller proportion were divorced, 19 (9.3%), while widows were 4 (2.0%). This suggests that most respondents were in stable family settings. In terms of nationality, the bulk of respondents were Nigerians, 176 (85.9%), while 29 (14.1%) were Ghanaian. The majority were holders of RN/RM, 69 (34%), closely followed by those with BSc/BNsc, 68 (33%). This indicated that a substantial portion of the respondents possessed either diploma-level or degree-level professional qualifications in nursing and midwifery, which form the foundation of clinical practice. Respondents with only RM accounted for 34 (17%) MSc degree holders made up 18 (9%), while PhD holders represented 16 (8%) of the sample. Concerning departmental distribution in the maternity unit, most of the respondents worked in the Labour

Ward, 107 (52.2%), followed by Labour Room, 34 (16.6%), and Lying-in Ward, 26 (12.7%). The remaining 38 (18.5%) fell under gynae ward department. This demonstrates that the Labour Ward had the highest concentration of staff respondents. Regarding years of experience, the highest proportion of respondents had 1–5 years, 74 (36.1%), followed by those with above 10 years, 57 (27.8%). While 50 (24.4%) had less than one year of experience and the least represented group were those with 6–10 years' experience, 24 (11.7%). This distribution suggested that most of the respondents were relatively early in their careers, but there was still a good representation of experienced practitioners.

4.2 Presentation of Data

4.2.1 Analysis of Research Question

Research Question One: What is the level of knowledge of the E-MOTIVE Care Bundle in the management of postpartum haemorrhage among midwives in secondary health institutions in Ibadan, Oyo State?

Table 4.2a: Descriptive Analysis on Knowledge of E-MOTIVE Care Bundle Components

Items	Yes	No
Have you heard about the E-MOTIVE Care Bundle?	131 (64%)	74 (36%)
Your sources of information about E-MOTIVE Care Bundle is:		
a. Internet	127 (62.0%)	78 (38.0%)
b. Workplace	41 (20.0%)	164 (80.0%)
c. WHO Bulletin	130 (63.4%)	75 (36.6%)
Where were you trained on the use of E-MOTIVE care bundle?		
a. Workshop	42 (20.5%)	163 (79.5%)
b. MCPDP	22 (10.7%)	183 (89.3%)
c. Seminar	77 (37.6%)	128 (62.4%)
d. Clinical Presentations	27 (13.2%)	178 (86.8%)
What is E-MOTIVE Care Bundle used for		
a. management of haemorrhage	27 (13.2%)	178 (86.8%)
b. management of antepartum haemorrhage	48 (23.4%)	157 (76.6%)
d. management of postpartum haemorrhage	126 (61.5%)	79 (38.5%)
What are the components of E-MOTIVE Care Bundle?		
a. Early Detection	184 (89.8%)	21 (10.2%)
b. Massage of uterus	186 (90.7%)	19 (9.3%)
c. Oxytocic drugs	180 (87.8%)	25 (12.2%)
d. Tranexamic acid	178 (86.8%)	27 (13.2%)

Source: Survey field work, 2025

Table 4.2b: Descriptive Analysis on Knowledge of E-MOTIVE Care Bundle Components

Items	Yes	No
e. Intravenous (IV) fluids	169 (82.4%)	36 (17.6%)
f. Examination and Escalation	172 (83.9%)	33 (16.1%)
Which intravenous (IV) fluids is recommended in the management of PPH under E-MOTIVE Care Bundle?		
a. Dextrose 5% in water	148 (72.2%)	57 (27.8%)
b. Normal saline	93 (45.4%)	112 (54.6%)
c. Ringer's lactate	147 (71.7%)	58 (28.3%)
d. Hypertonic saline	76 (37.1%)	129 (62.9%)
Examination in E-MOTIVE Care Bundle means:		
a. examining the cervix for laceration	115 (90.0%)	90 (43.9%)
b. examining the vagina for laceration	100 (48.0%)	105 (51.2%)
c. examining the uterus for laceration	109 (53.2%)	96 (46.8%)
Escalation in E-MOTIVE Care Bundle means:		
a. referring the patient for advance care if bleeding persist	158 (77.1%)	47 (22.9%)
b. continuous monitoring of the patient	106 (51.7%)	99 (48.3%)
Components of E-MOTIVE Care Bundle should be applied:		
Unanimously	60 (29.3%)	145 (70.7%)
a. simultaneously	76 (37.1%)	129 (62.9%)
b. separately	133 (64.9%)	72 (35.1%)
Importance of Documentation of all E-MOTIVE steps in the management of PPH are for:		
a. for legal purpose	72 (35.1%)	133 (64.9%)
b. for training purpose	143 (69.8%)	62 (30.2%)
c. for future research endeavour	122 (59.5%)	83 (40.5%)

Source: Survey field work, 2025

Majority of respondents, 131 (64%), reported having heard about the E-MOTIVE Care Bundle, while a smaller proportion, 74 (36%), had not. These findings suggested that while more than half of the respondents have knowledge of the existence of the E-MOTIVE Care Bundle, there remains a significant proportion of who are still unknowledgeable. The findings on the sources

of information about the E-MOTIVE Care Bundle showed that majority of the respondents obtained information through the Internet, 127 (62.0%), while a comparable number also cited the WHO Bulletin, 130 (63.4%) as their main source. A smaller number of respondents, 41 (20.0%), mentioned the workplace, suggesting that institutional dissemination of knowledge on the E-MOTIVE protocol was still limited. This highlighted the heavy reliance on external and online sources for knowledge acquisition. Regarding training exposure, the most frequently mentioned medium was seminars, 77 (37.6%), followed by workshops, 42 (20.5%), while clinical presentations, 27 (13.2%), and MCPDP, 22 (10.7%), were the least common.

This reflects that while some midwives are gaining knowledge through academic or professional gatherings, there is still a low level of structured training and retraining on the care bundle across clinical settings. In terms of the purpose of the E-MOTIVE Care Bundle, most respondents rightly indicated that it is used for the management of postpartum haemorrhage, 126 (61.5%). Meanwhile, 48 (23.4%) incorrectly linked it to antepartum haemorrhage, and 27 (13.2%) associated it with the general management of haemorrhage. This showed that while the majority understood its correct application, a notable proportion still held misconceptions.

Knowledge of the components of the E-MOTIVE Care Bundle was encouragingly high. Nearly all respondents identified massage of the uterus, 186 (90.7%), and early detection, 184 (89.8%), as core components. A slightly lower but still strong number mentioned oxytocic drugs, 180 (87.8%), tranexamic acid, 178 (86.8%), and intravenous fluids, 169 (82.4%). Similarly, examination and escalation were identified by 172 (83.9%). This suggests a broad knowledge of the clinical components required for effective PPH management. On intravenous fluid preference for PPH management under the care bundle, most respondents selected dextrose 5% in water,

148 (72.2%), and ringer's lactate, 147 (71.7%). Fewer respondents chose normal saline, 93 (45.4%), while hypertonic saline was the least identified at 76 (37.1%).

This variation highlighted some uncertainty among respondents regarding the recommended IV fluids. Concerning what constitutes examination in the bundle, 115 (56.1%) agreed it involves examining the cervix for laceration, 109 (53.2%) indicated examining the uterus, and 100 (48.0%) mentioned examining the vagina. These responses showed that respondents understood that multiple examinations are required, there was no single dominant view on the exact clinical emphasis. When escalation was discussed, most respondents identified it as referring the patient for advanced care if bleeding persists, 158 (77.1%), while others saw it as continuous monitoring of the patient, 106 (51.7%). This reflected an understanding of escalation, but also some confusion between ongoing monitoring and referral for advanced care.

Highest proportion of the respondents 133 (64.9%) believed E-MOTIVE components should be applied separately. Another 76 (37.1%) supported simultaneous application, while 60 (29.3%) indicated they should be applied unanimously. This variation pointed to gaps in clarity about protocol implementation and suggests that further training is needed. On the importance of documentation, most respondents viewed it as necessary for training purposes, 143 (69.8%), and for future research, 122 (59.5%), while a smaller number, 72 (35.1%), emphasized documentation for legal purposes. These findings revealed that the respondents value documentation more for knowledge sharing and research advancement rather than for medico-legal accountability.

Table 4.3: Data Analysis of Knowledge Level of E-MOTIVE Care Bundle Among Respondents

Knowledge Category	Frequency (N)	Percentage (%)
low (< 50 %)	59	28.8
High (51–100 %)	146	71.2
Total	205	100.0

Source: Survey field work, 2025

The majority of respondents 71.2% demonstrated high knowledge of E-MOTIVE Care Bundle, while a smaller portion 28.8% exhibited low knowledge. This indicated that most respondents are well-informed about the care bundle, which could positively influence its utilization in practice.

Research Question Two: How are the steps in the management of postpartum haemorrhage implemented by midwives in secondary health institutions in Ibadan, Oyo State?

Table 4.4a: Descriptive Analysis on Utilization of E-MOTIVE Care Bundle in the Management of Postpartum Haemorrhage

Items	Yes	No
E-MOTIVE Care Bundle should be initiated when:		
a. after medical consultation	167 (81.4%)	38 (18.6%)
b. postpartum haemorrhage is suspected	99 (48.3%)	106 (51.7%)
c. blood loss exceeds 300–500 ml	162 (79.0%)	43 (21.0%)
Team collaboration involves:		
a. Obstetrician	121 (59.0%)	84 (41.0%)
b. Midwives	144 (70.3%)	61 (29.8%)
c. Haematologist	152 (74.2%)	53 (25.8%)
Health professionals will ensure steps are:		
a. completely used	128 (62.4%)	77 (37.6%)
b. effectively used	89 (43.4%)	116 (56.6%)
c. timely used	137 (66.8%)	68 (33.2%)
Primary use of calibrated drape:		
a. measure maternal blood pressure	61 (29.8%)	144 (70.2%)
b. accurately quantify postpartum blood loss	85 (41.5%)	120 (58.5%)
c. detect early onset of PPH	97 (47.3%)	108 (52.7%)
Recommended time frame:		
a. 30 minutes	63 (30.7%)	142 (69.3%)
b. within 15 minutes	88 (43.0%)	117 (57.0%)
c. 1 hour	133 (64.9%)	72 (35.1%)
Care bundle to control bleeding involves:		
a. administering Tranexamic acid	87 (42.4%)	118 (57.6%)
b. administering Oxytocin	110 (53.7%)	95 (46.3%)
c. combination of TXA & Oxytocin	97 (47.3%)	108 (52.7%)
Best support for routine use includes:		
a. essential drugs & staff training	149 (72.7%)	56 (27.3%)
b. patient demand	153 (74.6%)	52 (25.4%)
c. religious beliefs	135 (65.9%)	70 (34.1%)

Source: Survey field work, 2025

Table 4.4b Descriptive Analysis on Utilization of E-MOTIVE Care Bundle in the Management of Postpartum Haemorrhage

Items	Yes	No
Timely use improves:		
a. chances of postpartum recovery	163 (79.5%)	42 (20.5%)
b. long-term complications	140 (68.3%)	65 (31.7%)
c. maternal health	110 (53.7%)	95 (46.3%)
Escalation in E-MOTIVE starts when:		
a. bleeding continues	156 (76.1%)	49 (23.9%)
b. there is dizziness	176 (85.9%)	29 (14.1%)
c. there is imminent shock	156 (76.1%)	49 (23.9%)
Factors influencing utilization:		
a. availability of bundle	158 (76.9%)	47 (23.1%)
b. training & retraining	154 (75.1%)	51 (24.9%)
c. institutional support	169 (82.4%)	36 (17.6%)
Using the bundle will:		
a. boost midwives' confidence	155 (75.6%)	50 (24.4%)
b. make midwives not confident	158 (77.1%)	47 (22.9%)
c. help midwives act independently	155 (75.6%)	50 (24.4%)
Barriers faced:		
a. resistance to new protocol	147 (71.7%)	58 (28.3%)
b. delay in teamwork	164 (79.5%)	41 (20.5%)
c. delay in communication	146 (71.3%)	59 (28.7%)
Advanced care requires:		
a. surgical intervention	101 (49.3%)	104 (50.7%)
b. hysterectomy	158 (77.1%)	47 (22.9%)
c. referral to tertiary institution	162 (79.0%)	43 (21.0%)

Source: Survey field work, 2025

From table 4.4a, the findings indicate that many respondents answered Yes to initiating the E-MOTIVE Care Bundle after medical consultation, as 167 (81.4%) selected Yes while 38 (18.6%) selected No, showing strong preference for starting the bundle after professional assessment. When postpartum haemorrhage is suspected, the responses were divided, with 99 (48.3%) choosing Yes and 106 (51.7%) choosing No, reflecting uncertainty among the respondents.

However, when blood loss exceeds 300–500 ml, most respondents 162 (79.0%) answered Yes, while 43 (21.0%) answered No, indicating strong agreement that significant bleeding warrants immediate activation of the bundle. Regarding team collaboration during emergencies, 121 (59.0%) answered Yes that obstetricians play an active role, while 84 (41.0%) said No. Collaboration with midwives had stronger support, with 144 (70.3%) saying Yes and 61 (29.8%) saying No. Similarly, the involvement of haematologists was confirmed by 152 (74.2%) who responded Yes, while 53 (25.8%) responded No. These findings portray midwives and haematologists as key collaborators in implementing the E-MOTIVE Care Bundle. On adherence to the care bundle steps, 128 (62.4%) answered Yes that all steps are completely used, while 77 (37.6%) responded No. Only 89 (43.4%) said Yes to the steps being effectively used compared to 116 (56.6%) who said No, showing a perceived gap in effective utilisation. Timeliness was viewed more positively, as 137 (66.8%) answered Yes to timely use of steps, whereas 68 (33.2%) said No. The primary use of the calibrated drape was assessed, and only 61 (29.8%) answered Yes that it measures maternal blood pressure, while 144 (70.2%) said No, indicating correct understanding of its purpose. For accurate quantification of postpartum blood loss, 85 (41.5%) responded Yes, and 120 (58.5%) said No. Concerning early detection of PPH, 97 (47.3%) answered Yes, while 108 (52.7%) answered No, showing divided perceptions about the drape's usefulness.

Regarding the recommended time-frame for completing all E-MOTIVE steps, 63 (30.7%) answered Yes to completing them within 30 minutes, while 142 (69.3%) answered No. For completion within 15 minutes, 88 (43.0%) said Yes and 117 (57.0%) said No, suggesting that respondents view these time-frames as challenging. However, the longer duration of one hour received higher acceptance, with 133 (64.9%) saying Yes and 72 (35.1%) saying No. In

managing bleeding, 87 (42.4%) answered Yes to administering Tranexamic acid, while 118 (57.6%) answered No. Oxytocin administration had 110 (53.7%) responding Yes and 95 (46.3%) responding No. Combination therapy using both TXA and oxytocin received 97 (47.3%) Yes responses and 108 (52.7%) No responses, indicating mixed understanding and acceptance. Support for routine use of the E-MOTIVE Care Bundle was mostly positive. A total of 149 (72.7%) answered Yes that availability of essential drugs and training supports routine use, while 56 (27.3%) answered No. Patient demand was also supported by 153 (74.6%) who answered Yes, compared to 52 (25.4%) who answered No. Concerning religious beliefs, 135 (65.9%) said Yes, while 70 (34.1%) said No. Respondents strongly recognized the benefits of timely use of the care bundle. For improvement of postpartum recovery, 163 (79.5%) answered Yes, whereas 42 (20.5%) answered No. Reduction of long-term complications had 140 (68.3%) answering Yes and 65 (31.7%) answering No. Improved maternal health was supported by 110 (53.7%) who answered Yes, compared to 95 (46.3%) who answered No.

Escalation of care when necessary was well understood. Continuous bleeding was identified as an escalation trigger by 156 (76.1%) who answered Yes, while 49 (23.9%) answered No. Dizziness was recognized by 176 (85.9%) who responded Yes and 29 (14.1%) who responded No. Imminent shock was identified by 156 (76.1%) who answered Yes, compared to 49 (23.9%) who answered No. Key factors influencing successful utilization included availability of the care bundle, with 158 (76.9%) answering Yes and 47 (23.1%) answering No. Training and retraining had 154 (75.1%) Yes responses and 51 (24.9%) No responses. Institutional support received strong endorsement, with 169 (82.4%) saying Yes and 36 (17.6%) saying No. The perceived effect of the care bundle on midwives' confidence showed mixed responses. A total of 155 (75.6%) answered Yes that the bundle boosts confidence, while 50 (24.4%) answered No.

Interestingly, 158 (77.1%) answered Yes that the bundle makes midwives “not confident,” while 47 (22.9%) answered No, suggesting varied interpretation of this item. Concerning helping midwives act independently, 155 (75.6%) answered Yes, while 50 (24.4%) answered No. Barriers to utilization were also identified. Resistance to new protocols was acknowledged by 147 (71.7%) Yes responses and 58 (28.3%) No responses. Delay in teamwork was confirmed by 164 (79.5%) answering Yes, while 41 (20.5%) answered No. Delay in communication was similarly perceived, with 146 (71.3%) answering Yes and 59 (28.7%) answering No. The need for advanced care was evaluated. Surgical intervention received 101 (49.3%) Yes responses and 104 (50.7%) No responses, showing equal division. Hysterectomy was supported by 158 (77.1%) answering Yes, compared to 47 (22.9%) answering No. Referral to a tertiary institution was supported by 162 (79.0%) answering Yes, while 43 (21.0%) answered No, indicating strong recognition of the importance of escalation for severe cases.

Table 4.5: Data Analysis of Utilization Level of the E-MOTIVE Care Bundle Among Respondents

Utilization Category	Frequency (N)	Percentage (%)
Low utilization (< 50 %)	68	33.2
High utilization (≥ 50 %)	137	66.8
Total	205	100.0

Source: Survey field work, 2025

The results in Table 4.5 indicated that the majority of respondents demonstrated a high level of utilization of the E-MOTIVE Care Bundle in clinical practice. 66.8% were categorized as having high utilization, meaning they applied half or more of the bundle components consistently. Conversely, 33.2% of respondents were classified as having low utilization, suggesting that less than half of the recommended steps were implemented.

Research Question Three: What is the level of utilization of E-MOTIVE Care Bundle in the management of postpartum haemorrhage among midwives in secondary health institutions in Ibadan, Oyo State

Table 4.6a: Descriptive Analysis on Steps in the Management of Postpartum Haemorrhage Using E-MOTIVE Care Bundle

Item	Yes	No
Critical action threshold for blood loss on the calibrated drape while managing PPH using E-MOTIVE Care Bundle is:		
a. 150 ml	137 (66.9%)	68 (33.1%)
b. 250 ml	162 (79.0%)	43 (21.0%)
c. 350 ml (warning line)	171 (83.4%)	34 (16.6%)
d. 500 ml (action line)	150 (73.2%)	55 (26.8%)
Vital signs are monitored under E-MOTIVE care bundle:		
a. once every hour	171 (83.4%)	34 (16.6%)
b. every 15 minutes (if normal)	165 (80.5%)	40 (19.5%)
c. once a day	162 (79.0%)	43 (21.0%)
According to E-MOTIVE care bundle protocol, when should oxytocin (10 IU) be administered:		
a. one minute after delivery of the baby	160 (78.0%)	45 (22.0%)
b. at delivery of anterior shoulder	163 (79.5%)	42 (20.5%)
c. after signs of PPH	164 (80.0%)	94 (20.0%)
Recommended dose of oxytocin for initial treatment according to E-MOTIVE Care Bundle for managing PPH is:		
a. 10 IU in 1000 ml over 1 hour	157 (75.9%)	48 (24.1%)
b. 10 IU in 500 ml given over 10 minutes	161 (78.5%)	44 (21.5%)
c. 20 IU in 500 ml over 2 hours	150 (73.2%)	55 (26.8%)
a. 5 IU in 250 ml over 5 minutes	160 (78.0%)	45 (22.0%)
The recommended dose of Tranexamic acid to be given for the management of PPH is:		
a. 5g	162 (79.0%)	43 (21.0%)
b. 3g	124 (60.5%)	81 (39.5%)
c. 1g	113 (55.1%)	92 (44.9%)

Source: Survey field work, 2025

Table 4.6b: Descriptive Analysis on Steps in the Management of Postpartum Haemorrhage Using E-MOTIVE Care Bundle

Item	Yes	No
The recommended dose of crystalloid to dilute Tranexamic acid is:		
a. 500ml	121 (59.0%)	84 (41.0%)
b. 250ml	94 (45.9%)	111 (54.1%)
c. 300ml	128 (62.4%)	77 (37.6%)
Other medications that can be administered for PPH treatment in E-MOTIVE care bundle includes:		
a. Misoprostol	90 (43.9%)	115 (56.1%)
b. Synthometrine	129 (63.0%)	76 (37.0 %)
c. 2 nd dose of Tranexamic acid	155 (75.9%)	50 (24.4%)
d. Ergometrine	138 (67.3%)	67 (32.7%)
Tranexamic acid should not be given to a woman that has been diagnosed with:		
a. renal failure	113 (55.1%)	92 (44.9%)
b. eclampsia	119 (58.0%)	86 (42.0%)
c. hypersensitive to antifibrinolytic agents	123 (59.8%)	82 (40.2%)
Uterine tone is checked after delivery to:		
a. ensure contraction of the uterus	96 (46.8%)	109 (53.2%)
b. identify atony as a cause of bleeding	86 (42.0%)	119 (58.0%)
The first action to take when bleeding persists after placenta delivery in E-MOTIVE care bundle is to:		
b. massage the uterus	110 (53.7%)	95 (46.3%)
c. check for genital lacerations	148 (72.0%)	57 (28.0%)
Suturing of laceration in E-MOTIVE care bundle to stop bleeding should be:		
a. immediately	113 (55.1%)	92 (44.9%)
b. 30 mins later	88 (42.9%)	117 (57.1%)
c. 1 hour later	109 (53.2%)	96 (46.8%)

Source: Survey field work, 2025

Table 4.6c: Descriptive Analysis on Steps in the Management of Postpartum Haemorrhage Using E-MOTIVE Care Bundle

Item	Yes	No
Examination of the genital tract after delivery in E-MOTIVE care bundle is to:		
a. identification of laceration	114 (55.6%)	91 (44.4%)
b. bleeding without cause	123 (60.0%)	82 (40.0%)
Immediately after delivery in E-Motive care bundle, midwives should:		
a. check and empty the bladder	115 (56.1%)	90 (43.9%)
b. check the amount of blood loss on the drape	161 (78.6%)	44 (21.5%)
c. check for uterus contraction after placenta delivery	141 (68.8%)	64 (31.2%)
d. check placenta and membranes for completion	77 (36.6%)	128 (63.4%)
e. examine the genital tract for any laceration	81 (39.5%)	124 (60.5%)
Reassessment of bleeding after delivery is necessary to prevent:		
a. escalation	102 (49.8%)	103 (50.2%)
b. maternal morbidity	127 (61.5%)	78 (38.5%)
c. maternal mortality	121 (59.0%)	84 (41.0%)
Importance of education on early reporting of postpartum bleeding is to:		
a. prepare patient for surgery	123 (60.0%)	82 (40.0%)
b. reduce time spent in the hospital by patients	149 (72.2%)	56 (27.8%)
c. enable prompt intervention and reduce complications	139 (67.8%)	66 (32.2%)

Source: Survey field work, 2025

From the data presented in table 4.6a, the results show that 137 (66.9%) respondents indicated Yes to 150 ml as a critical threshold on the calibrated drape, while 68 (33.1%) indicated No. For 250 ml, 162 (79.0%) responded Yes and 43 (21.0%) responded No. Similarly, 171 (83.4%) selected Yes to 350 ml (warning line), whereas 34 (16.6%) selected No. For the 500 ml action line, 150 (73.2%) indicated Yes while 55 (26.8%) indicated No. With regard to vital signs monitoring under the E-MOTIVE care bundle, 171 (83.4%) responded Yes to monitoring once

every hour, while 34 (16.6%) responded No. Monitoring every 15 minutes (if normal) was selected by 165 (80.5%) under Yes and 40 (19.5%) under No. For once-a-day monitoring, 162 (79.0%) responded No, while 43 (21.0%) responded Yes. For oxytocin administration, 160 (78.0%) responded Yes to administering 10 IU one minute after delivery of the baby, while 45 (22.0%) responded No. Administration at delivery of the anterior shoulder had 163 (79.5%) Yes and 42 (20.5%) No. Giving oxytocin after signs of PPH had 164 (80.0%) marked No and 94 (20.0%) marked Yes. Regarding recommended oxytocin dosages, 157 (75.9%) responded Yes to 10 IU in 1000 ml over one hour, while 48 (24.1%) responded No. For 10 IU in 500 ml over 10 minutes, 161 (78.5%) selected Yes and 44 (21.5%) selected No. For 20 IU in 500 ml over two hours, 150 (73.2%) indicated Yes and 55 (26.8%) indicated No. For 5 IU in 250 ml over five minutes, 160 (78.0%) marked Yes while 45 (22.0%) marked No.

Tranexamic acid dosage, 162 (79.0%) responded Yes to 5 g and 43 (21.0%) responded No. A total of 124 (60.5%) responded Yes to 3 g, while 81 (39.5%) responded No. For the 1 g option, 113 (55.1%) indicated Yes and 92 (44.9%) indicated No. Regarding crystalloid volumes for diluting Tranexamic acid, 121 (59.0%) selected Yes for 500 ml and 84 (41.0%) selected No. The 250 ml option had 94 (45.9%) Yes and 111 (54.1%) No. The 300 ml option had 128 (62.4%) Yes and 77 (37.6%) No. In terms of other medications used for PPH management, 90 (43.9%) responded Yes to misoprostol and 115 (56.1%) responded No. For syntometrine, 129 (63.0%) selected Yes, while 76 (37.0%) selected No. The option for a second dose of Tranexamic acid had 155 (75.9%) Yes and 50 (24.4%) No. Ergometrine showed 138 (67.3%) Yes and 67 (32.7%) No. For contraindications to Tranexamic acid, renal failure had 113 (55.1%) Yes and 92 (44.9%) No. Eclampsia had 119 (58.0%) Yes and 86 (42.0%) No. Hypersensitivity to antifibrinolytic agents had 123 (59.8%) Yes and 82 (40.2%) No. Regarding checking uterine tone, 96 (46.8%)

responded Yes that it ensures contraction of the uterus, while 109 (53.2%) responded No. For identifying atony as a cause of bleeding, 86 (42.0%) indicated Yes and 119 (58.0%) indicated No. When bleeding persists after placenta delivery, 110 (53.7%) responded Yes to massaging the uterus, while 95 (46.3%) responded No. Checking for genital lacerations had 148 (72.0%) Yes and 57 (28.0%) No.

Suturing lacerations, 113 (55.1%) selected Yes for immediate suturing while 92 (44.9%) selected No. The 30-minute option had 88 (42.9%) Yes and 117 (57.1%) No. Suturing after 1 hour recorded 109 (53.2%) Yes and 96 (46.8%) No. Examination of the genital tract as part of E-MOTIVE care was selected by 114 (55.6%) under Yes for identifying lacerations, while 91 (44.4%) responded No. Identifying bleeding without an obvious cause had 123 (60.0%) Yes and 82 (40.0%) No. Immediately after delivery, 115 (56.1%) selected Yes for checking and emptying the bladder, while 90 (43.9%) selected No. Assessing blood loss on the drape had 161 (78.6%) Yes and 44 (21.5%) No. Checking uterine contraction after placenta delivery showed 141 (68.8%) Yes and 64 (31.2%) No. Checking placenta and membranes for completeness had 77 (36.6%) Yes and 128 (63.4%) No. Examination of the genital tract for lacerations recorded 81 (39.5%) Yes and 124 (60.5%) No. Reassessment of bleeding after delivery to prevent escalation had 102 (49.8%) Yes and 103 (50.2%) No. To prevent maternal morbidity, 127 (61.5%) responded Yes while 78 (38.5%) responded No. For preventing maternal mortality, 121 (59.0%) selected Yes and 84 (41.0%) selected No. The importance of educating women on early reporting of postpartum bleeding was indicated by 123 (60.0%) Yes and 82 (40.0%) No for preparing patients for surgery. Reducing time spent in the hospital had 149 (72.2%) Yes and 56 (27.8%) No. Enabling prompt intervention and reducing complications recorded 139 (67.8%) Yes and 66 (32.2%) No.

Table 4.7: Management Level of PPH Using the E-MOTIVE Care Bundle Among Respondents

Management Level Category	Score Range (%)	Frequency (n)	Percentage (%)
Strong Adherence	51 – 100%	149	72.7%
Weak Adherence	Below 50%	56	27.3%
Total	—	205	100%

Source: Survey field work, 2025

The results indicated that a substantial proportion of midwives demonstrated strong adherence 72.7% to the recommended management steps for postpartum haemorrhage under the E-MOTIVE Care Bundle. While 27.3% exhibited weak adherence, highlighting areas where further training and reinforcement are needed. Overall, the findings suggested strong but improvable adherence to evidence-based PPH management practices.

4.2.2 Research Hypotheses

H01: There is no significant association between the knowledge and utilization of E-MOTIVE care bundle in the management postpartum haemorrhage among midwives in secondary health institutions in Ibadan, Oyo State?

Table 4.8: Chi-Square analysis showing association knowledge and utilization of E-MOTIVE care bundle in the management postpartum haemorrhage among midwives in secondary health institutions in Ibadan, Oyo State

		utilization of E-MOTIVE care bundle		Total	Chi-Square	df	P-value
		Yes	No				
Have you heard about E-MOTIVE Care Bundle?	Yes	71	60	131	16.026 ^a	3	0.048
	No	28	46	74			
Total		99	106	205			

The relationship between knowledge and utilization of the E-MOTIVE Care Bundle was examined using the chi-square test. The table shows the relationship between respondents' knowledge of the E-MOTIVE Care Bundle and its utilization. Among 131 respondents who had heard about the bundle, 71 utilized it while 60 did not. Among those who had not heard about the bundle (74), 28 utilized it and 46 did not. This indicated that even without prior knowledge, some midwives intuitively supported early initiation, though opinions remained divided. The chi-square analysis confirmed these observations. The Pearson Chi-Square value was 16.026 with 3 degrees of freedom and a significance level of .001. Since the p-value was less than 0.05, the null hypothesis was rejected. This finding indicated a statistically significant relationship between knowledge and utilization of the E-MOTIVE Care Bundle in the management of postpartum haemorrhage. The likelihood ratio (.001) further supported this result, while the linear-by-linear association ($p = .048$) demonstrated a significant trend linking increased knowledge with higher

utilization. The analysis showed that knowledge of the E-MOTIVE Care Bundle significantly influences its utilization among midwives in secondary health institutions in Ibadan. However, the mismatch between knowledge and correct practical application such as initiating the bundle at suspicion of haemorrhage suggested that although knowledge plays a crucial role, it must be reinforced with continuous training and clinical supervision to ensure proper and timely use in practice.

H₀₂: There is no significant association between midwives' years of experience and utilization of E-MOTIVE care bundle in the management of postpartum haemorrhage among midwives in secondary health institutions in Ibadan, Oyo State?

Table 4.9: Chi-Square analysis of association between midwives' years of experience and utilization of E-MOTIVE care bundle in the management of postpartum haemorrhage among midwives in secondary health institutions in Ibadan, Oyo State

		utilization of E-MOTIVE care bundle		Total	Chi-Square	df	P-value
		Yes	No				
Years of Experience	less than 1 year	44	6	50	73.927 ^a	9	0.000
	1-5 years	35	39	74			
	6-10 years	10	14	24			
	above 10 years	10	47	57			
Total		99	106	205			

The association between respondents' years of experience and the suspicion of postpartum haemorrhage (PPH). Overall, 99 (48.3%) of the respondents reported that PPH was suspected, while 106 (51.7%) indicated it was not suspected. Respondents with less than 1 year of experience were more likely to suspect PPH (44 of 50; 88%), demonstrating high vigilance despite limited experience. Those with 1–5 years of experience had mixed responses, with 35

(47.3%) suspecting PPH and 39 (52.7%) not suspecting it. Among respondents with 6–10 years and above 10 years of experience, only 10 of 24 (41.7%) and 10 of 57 (17.5%), respectively, suspected PPH, suggesting that more experienced staff may rely more on clinical judgment and past experience rather than immediate suspicion. The chi-square test confirmed the statistical significance of these differences. The Pearson Chi-Square value was 73.927 with 9 degrees of freedom and a p-value of .000, which is well below the 0.05 threshold. Similarly, the likelihood ratio (.000) and the linear-by-linear association (.000) further established a strong significant relationship between years of experience and utilization of the E-MOTIVE Care Bundle. Based on this result, the null hypothesis (H_0) was rejected, indicating that midwives' years of experience significantly influence their utilization of the E-MOTIVE Care Bundle management of postpartum haemorrhage. Interestingly, the findings suggested that less experienced midwives were more likely to initiate the bundle promptly at suspicion of haemorrhage, while those with longer years of experience often preferred to delay until symptoms became more evident. This pattern reflected differences in exposure to recent training or reliance on traditional practices by older, more experienced practitioners. It highlights the need for continuous retraining across all experience levels to harmonize practices in line with evidence-based guidelines.

4.3 Discussion of Findings

The demographic analysis of respondents in this study revealed that midwifery practice in secondary health institutions in Ibadan is highly female-dominated, with 90.2% females compared to 9.8% males. This finding was consistent with earlier studies which had reported that nursing and midwifery remain gender-skewed professions globally and in Nigeria, with women constituting the overwhelming majority of the workforce¹. The dominance of females in this

study underscored the cultural and historical association of midwifery with women and reflected similar gender distributions observed in maternal health studies in Enugu and Ekiti States^{2, 3}. In terms of age, the largest group of respondents were between 31–40 years, 37.6%, followed by those aged 21–30 years, 29.3%, while 22.0% were between 41–50 years, and 11.2% were above 50 years. This suggested that most midwives are within their productive years, which aligned with the findings of previous research in Ghana and Kenya where the majority of midwives were reported to be in the 25–40 age bracket, an age range associated with both physical resilience and career maturity^{4, 5}. The predominance of relatively young midwives may contribute positively to the adaptability and uptake of new interventions such as the E-MOTIVE Care Bundle, as younger practitioners are often more receptive to training and innovative practices.

Respect to marital status, majority of respondents were married 74.1%, while 19.0% were single, 3.9% widowed, and 2.9% divorced. The dominance of married respondents was consistent with prior Nigerian studies which found that marital stability often contributes to work-life balance among healthcare workers⁶. This demographic may also influence midwives' perspectives on maternal health, as married practitioners might draw on personal and family experiences in shaping their attitudes toward maternal care. Regarding educational qualifications, 42.0% held a Registered Midwife Certificate, 28.3% had diplomas, 20.0% possessed a Bachelor's degree in Nursing, and 9.8% had other qualifications. This indicated that the majority of midwives had formal training, which is essential for evidence-based practice. It also aligned with findings from Egypt, where structured education significantly improved nurses' knowledge and practice of PPH management⁷. However, the relatively small proportion of degree holders suggested that higher academic qualifications are still limited among midwives in Ibadan, which may affect advanced critical thinking and leadership in maternal healthcare.

On years of professional experience, 36.1% had 1–5 years of experience, 27.8% had more than 10 years, 50 (24.4%) had less than 1 year, and 11.7% had 6–10 years. This distribution showed a mix of both younger and more seasoned practitioners, ensuring that maternal health services benefit from both updated training and practical experience. Similar patterns were reported in multi-country studies, where experience levels influenced adherence to evidence-based practices; however, it was noted that younger midwives often displayed higher compliance with new protocols compared to their older counterparts^{8, 9}. This corresponds with the findings of this study, where less experienced midwives were more likely to initiate the E-MOTIVE Care Bundle promptly, while older practitioners tended to delay.

The findings of this study showed that knowledge of E-MOTIVE Care Bundle among midwives in secondary health institutions in Ibadan was moderate. Majority of respondents 64% reported that they had heard about the E-MOTIVE Care Bundle, while 36% indicated they had not. This level of knowledge reflected an encouraging trend but also underscored a significant information gap among more than one-third of the respondents. This result is consistent with the multi-country implementation study across Nigeria, Kenya, and South Africa which reported that while midwives were generally aware of individual interventions such as oxytocin and uterine massage, only a limited number could identify all six components of the E-MOTIVE Care Bundle¹⁰. In terms of purpose, 61.5% correctly identified the E-MOTIVE Care Bundle as designed for managing postpartum haemorrhage, while 23.4% associated it incorrectly with antepartum haemorrhage, and 13.2% with general haemorrhage. These misconceptions support the findings from Enugu State where only 23.7% of healthcare providers demonstrated good knowledge of tranexamic acid, a key component of the bundle, and just 16.4% reported routine use during PPH

management¹¹. Both findings highlighted that while knowledge exists, comprehensive understanding of the care bundle's focus remains limited.

Knowledge of individual components was generally high among the respondents. Uterine massage was identified by 90.7%, early detection by 89.8%, oxytocic drugs by 87.8%, tranexamic acid by 86.8%, and examination and escalation by 83.9%. These results are higher than those reported in a quasi-experimental study in Egypt, where fewer than 50% of nurses demonstrated satisfactory knowledge of PPH management before training, but over 75% improved to high knowledge categories after intervention¹². The stronger recognition observed in the present study may reflect ongoing sensitization in Nigeria following WHO's adoption of the E-MOTIVE protocol.

However, knowledge gaps were evident in certain critical areas. For instance, only 45.4% correctly identified normal saline as an appropriate intravenous fluid for PPH management, compared to 72.2% who selected dextrose 5% in water and 71.7% who mentioned ringer's lactate. Similarly, regarding application, 64.9% believed the components should be applied separately, contrary to WHO's recommendation of simultaneous use. This misinterpretation of application supports the findings of the multi-country randomized trial, where training and supervision were required before midwives could fully adhere to the integrated application of the care bundle¹³.

The findings of this study revealed that the utilization of E-MOTIVE Care Bundle among midwives in secondary health institutions in Ibadan was high but inconsistent. More than half of the respondents 79% agreed that all steps of the bundle were completely applied, Furthermore, 48.3% midwives reported completing the steps within one hour instead of the recommended 15 minutes, while only 25.4% adhered to the correct timeframe. These findings demonstrated that

although partial knowledge exist, the actual utilization of the bundle in practice is suboptimal. This align with evidence from earlier studies. For instance, in Egypt, a quasi-experimental study reported that fewer than 50% of nurses had satisfactory practice of PPH management before intervention, but following training, 91.2% achieved satisfactory implementation of the E-MOTIVE components¹⁴. Similarly, a study of 150 midwives in 12 hospitals across Southwest Nigeria found that complete bundle use rose significantly from 24% to 84% after training, with a 60% decline in PPH complications¹⁵. Both studies emphasize that utilization depends heavily on structured training and retraining.

In this study, barriers to utilization were prominent. Respondents reported 32.2% delays in teamwork, 5.4% delays in communication, and 23.9% resistance to new protocols. On the other hand, 53.2% identified the availability of essential drugs and staff training as facilitators of effective use. These findings are consistent with WHO's multi-country implementation trial demonstrated that successful utilization of E-MOTIVE was tied to institutional support, supervision, and access to supplies, resulting in a reduction of severe PPH cases from 4.3% to 1.6% in intervention groups¹⁶. The present findings also showed inconsistencies in pharmacological application. 36.6% of midwives reported administering tranexamic acid alone, 28.8% used oxytocin alone, and 30.2% used a combination of both. This reflected partial rather than comprehensive utilization, echoing the report from Northern Nigeria, where low uptake of tranexamic acid was linked to unavailability and lack of adequate knowledge¹⁷.

Despite these challenges, midwives in this study acknowledged the positive impact of E-MOTIVE utilization. 51.7% agreed that timely use increases chances of recovery, while 43.4% noted that it reduces long-term complications. These perceptions resonate with global evidence, including the large-scale WHO-led trial across sub-Saharan Africa, which confirmed that the E-

MOTIVE bundle significantly reduces blood loss, severe PPH incidence, and maternal morbidity¹⁸.

The findings of this study revealed that midwives in secondary health institutions in Ibadan demonstrated high knowledge of the steps involved in managing postpartum haemorrhage, but with considerable inconsistencies in their responses. Majority respondents 73.2% correctly identified 500 ml as the threshold for initiating intervention, in line with WHO standards. However, 28.8% indicated 350 ml, 27.8% selected 250 ml, and 17.6% pointed to 150 ml. These variations suggested that while many midwives recognized the global action line, others lack clarity on earlier warning points, which could lead to delayed interventions. This finding support the qualitative study in Ekiti and Eastern Nigeria, where midwives often relied on personal experience and available resources rather than standardized thresholds and protocols¹⁹.

Monitoring of vital signs, 55.1% midwives indicated hourly checks, 29.8% suggested every 15 minutes if normal, while 35.6% believed once daily monitoring was sufficient. Such inconsistency highlights gaps in the practical application of emergency monitoring protocols. Similar gaps were noted in Nigeria and Ghana, where poor adherence to Active Management of the Third Stage of Labour (AMTSL) was reported, with only 42% of skilled birth attendants fully complying with the guideline²⁰. Since AMTSL forms a foundation for the E-MOTIVE Care Bundle, poor compliance at this level contributes to variation in stepwise management of PPH. Concerning oxytocin administration, 58.0% majority of the respondents correctly reported giving oxytocin at delivery of the anterior shoulder, while 50.7% said it was administered one minute after delivery. Worryingly, 25.9% indicated it was only given after signs of PPH had appeared, contrary to WHO recommendations for preventive use. This reflected a mix of appropriate and

delayed practices, consistent with earlier findings in Uganda, where staff knowledge of timely administration of uterotonics influenced whether PPH was effectively managed²¹.

Knowledge of drug dosages also revealed inconsistencies. For oxytocin, 59.0% supported 5 IU in 250 ml over 5 minutes, 52.7% indicated 20 IU in 500 ml over 2 hours, while 48.3% chose 10 IU in 1000 ml over 1 hour. For tranexamic acid, only 23.4% identified the correct 1 g dose, while higher and incorrect dosages were chosen by others. These findings align with results from Northern Nigeria, where inadequate knowledge and unavailability hindered the correct and consistent use of tranexamic acid in PPH management ²². When asked about next steps following persistent bleeding, 46.3% prioritized checking for retained placenta tissue, while 44.4% suggested uterine massage, and another 44.4% indicated examining for genital lacerations. Although the appropriate actions were identified, the lack of uniform prioritization highlights inconsistency in practice. This resonates with findings from a Ugandan study, where facilities with complete E-MOTIVE implementation successfully managed 84.6% of PPH cases compared to 63.2% in facilities with partial implementation, largely due to better adherence to stepwise protocols ²³. On suturing of lacerations, 44.9% supported immediate repair, while 57.1% suggested waiting 30 minutes, and 46.8% said one hour. This wide variation points to gaps in clinical judgment and protocol adherence. Similarly, in a Ghanaian quasi-experimental study, structured training of 100 midwives improved case resolution rates from 58% to 85% after consistent application of E-MOTIVE steps²⁴.

Post-delivery practices were encouraging, with 54.6% checking blood loss on calibrated drapes, 51.2% checking uterine contraction, 39.5% emptying the bladder, and 21.5% examining the placenta and membranes. Furthermore, respondents recognized the value of patient education, with 58.5% noting that it reduced hospital stay, 54.6% indicating it enables timely intervention,

and 51.2% highlighting its role in preparing patients for surgery. These findings are consistent with evidence from Southwest Nigeria, where E-MOTIVE implementation reduced PPH complications by 60% following improved adherence to stepwise management ²⁵.

For **H₀₁** (knowledge and utilization), the chi-square test ($\chi^2 = 16.026$, $df = 3$, $p = 0.001$) showed a statistically significant association. This indicated that midwives with better knowledge were more likely to utilize the E-MOTIVE Care Bundle. For **H₀₂** (years of experience and utilization), the chi-square test ($\chi^2 = 73.927$, $df = 9$, $p = 0.000$) also revealed a significant association. Interestingly, less experienced midwives (<1 year: 44 who **said yes**) were more likely to initiate the bundle promptly, while those with longer experience (>10 years: **41 who said yes**) often delayed initiation, suggesting reliance on traditional practice rather than updated protocols.

Endnotes

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Chapter Five

Conclusion

5.1 Summary of Findings

This study assessed the midwives' knowledge and utilization of the WHO E-MOTIVE Care Bundle management of postpartum haemorrhage in secondary health institutions in Ibadan, Oyo State. The findings are summarized as follows:

Demographic Information of Respondents: The study involved 205 midwives with varying years of experience. Majority fell within the 1–5 years category, 74 (36.1%), while 57 (27.8%) had more than ten years of practice. The respondents were mostly female 185 (90.2%), reflecting the gender distribution in midwifery practice.

Level of Knowledge of the E-MOTIVE Care Bundle: The findings revealed that the level of knowledge of the E-MOTIVE Care Bundle among midwives in secondary health institutions in Ibadan was high, though not without notable gaps. As shown in Figure 4.2, majority of the respondents 131 (64%) reported that they had heard about the E-MOTIVE Care Bundle, while 74 (36%) indicated that they had not, suggesting a fair level of knowledge but still leaving a sizeable proportion uninformed. In terms of knowledge of its purpose, most midwives 126 (61.5%) correctly identified the bundle as designed for the management of postpartum haemorrhage, while 48 (23.4%) incorrectly associated it with antepartum haemorrhage and 27 (13.2%) with general haemorrhage. This indicated that although knowledge exists, misconceptions about its specific application persist. knowledge of the bundle's components was generally high. The majority of respondents recognized the key interventions: 186 (90.7%) identified uterine massage, 184 (89.8%) mentioned early detection of PPH, 180 (87.8%) selected oxytocic drugs, 178 (86.8%) identified tranexamic

acid, and 172 (83.9%) recognized examination and escalation. Similarly, knowledge of intravenous fluid options was fairly strong, with 148 (72.2%) selecting dextrose 5% in water and 147 (71.7%) indicating ringer's lactate. However, only 93 (45.4%) correctly identified normal saline, highlighting a critical knowledge gap in fluid management for PPH.

Mode of application of components of E-MOTIVE care bundle, the majority of respondents 133 (64.9%) believed that the bundle's components should be applied separately, rather than simultaneously as recommended, while only 72 (35.1%) indicated the correct approach. This shows that while individual components are well known, the integrated and simultaneous nature of the E-MOTIVE approach is less clearly understood. The findings suggested that while midwives demonstrated strong knowledge and recognition of most E-MOTIVE Care Bundle components, misconceptions about its purpose, fluid selection, and application method indicated that knowledge is incomplete and unevenly distributed. These gaps highlighted the need for structured training and regular updates to ensure that midwives not only know the individual components but also understand the integrated use of the bundle in line with WHO recommendations.

Level of Utilization of the E-MOTIVE Care Bundle: The findings of this study showed that although the overall level of utilization of the E-MOTIVE Care Bundle among midwives was high where 66.8% demonstrated high utilization there were considerable inconsistencies in the way the bundle was implemented in practice. The data revealed mixed patterns in how and when midwives initiated the bundle. Majority of the respondents 81.4% reported initiating the E-MOTIVE Care Bundle after medical consultation, while 79% indicated that they applied the bundle when blood loss had already exceeded the 300–500 ml range. In contrast, only 48.3% initiated the bundle when postpartum haemorrhage was merely

suspected. These findings suggest that many midwives delayed initiation until clear evidence of bleeding was present, rather than acting at the earliest suspicion as recommended.

Team collaboration during implementation also appeared uneven. Although most midwives recognized the involvement of various professionals, their responses reflected uncertainty about the specific roles of each team member. Midwives (70.3%) and haematologists (74.2%) were widely acknowledged as part of the PPH management team, whereas only 59% recognized the role of obstetricians. These variations suggest gaps in understanding how interdisciplinary teamwork should function during PPH emergencies. Completeness, effectiveness, and timeliness of bundle use also showed challenges. While 62.4% reported that all steps of the bundle were completely used, only 43.4% believed these steps were used effectively. Timeliness showed slightly better performance, with 66.8% acknowledging timely use of steps. However, discrepancies in perceptions of timeliness indicated that not all midwives consistently followed the recommended sequence or speed of application. Although many understood the purpose of the calibrated drape, fewer correctly identified its role in quantifying blood loss, and responses continued to reflect uncertainties about time-sensitive components.

Drug administration practices further highlighted partial rather than comprehensive utilization. Less than half of the respondents correctly used key medications: 42.4% administered tranexamic acid, 53.7% administered oxytocin, and only 47.3% correctly used a combination of both. This inconsistency suggests that midwives often relied on individual components rather than the integrated bundle approach. Barriers affecting utilization were also clearly identified. A substantial proportion of respondents reported delays in teamwork 79.5%, resistance to new protocols 71.7%, and delays in communication 71.3% as major

obstacles. Conversely, facilitators of utilization included the availability of essential drugs and staff training 72.7%, as well as institutional support 82.4%, highlighting the importance of supportive health system structures.

Despite these challenges, midwives acknowledged the value of E-MOTIVE. Most respondents agreed that timely use of the bundle improves maternal recovery (79.5%) and reduces long-term complications (68.3%). This recognition demonstrates a strong positive attitude toward the bundle, even where gaps in application exist. The study found that although utilization of the E-MOTIVE Care Bundle in Ibadan is generally high, actual practice is often incomplete or delayed. The inconsistencies in initiation, sequence, teamwork, documentation, and medication use indicate that utilization remains partial rather than comprehensive. Strengthening continuous training, improving teamwork structures, ensuring availability of supplies, and reinforcing adherence to standardized PPH protocols are essential steps toward achieving full and effective implementation of the E-MOTIVE Care Bundle.

Steps in the Management of Postpartum Haemorrhage: The findings of this study showed that midwives in secondary health institutions in Ibadan demonstrated mixed levels of accuracy in the management of postpartum haemorrhage (PPH) using the E-MOTIVE Care Bundle. Although many respondents were familiar with the essential steps, the results revealed considerable inconsistencies in threshold recognition, vital signs monitoring, drug timing, drug dosages, and prioritization of interventions during emergencies. One of the most fundamental steps in effective PPH management is recognising the correct blood-loss threshold for action. In this study, 115 midwives (56.1%) correctly identified 500 ml as the action line recommended by WHO. However, a substantial proportion selected lower

thresholds: 59 (28.8%) identified 350 ml, 57 (27.8%) chose 250 ml, and 36 (17.6%) believed that intervention should begin at 150 ml. These variations show that although the majority knew the standard threshold, nearly half of the respondents were uncertain, indicating inconsistent early recognition of PPH.

Patterns in monitoring vital signs further highlighted gaps in practice. A number of midwives, 113 (55.1%), believed vital signs should be checked once every hour, while 61 (29.8%) reported that checks should occur every 15 minutes when vital signs are normal. Most concerning, 73 (35.6%) indicated vital signs could be monitored once a day, a practice that is inappropriate in acute PPH situations. This variation underscores limited understanding of the need for frequent and intensive monitoring during haemorrhage. The administration of oxytocin, a critical uterotonic for preventing excessive bleeding, was also reported inconsistently. A majority, 119 respondents (58.0%), correctly stated that oxytocin should be given at delivery of the anterior shoulder, in line with active management of the third stage of labour. However, 104 (50.7%) believed it should be administered one minute after delivery, while 53 (25.9%) indicated they only gave oxytocin after signs of PPH appeared. This latter group reflects delayed administration, which contradicts WHO recommendations designed to prevent haemorrhage.

Knowledge of specific drug dosages and fluid regimens showed additional gaps. For oxytocin infusion, 121 midwives (59.0%) selected 5 IU in 250 ml over 5 minutes, 108 (52.7%) chose 20 IU in 500 ml over 2 hours, and 99 (48.3%) opted for 10 IU in 1000 ml over 1 hour. The wide spread of responses indicates significant uncertainty about the correct dosage and infusion volume. Gaps were even more pronounced in the use of tranexamic acid: only 48 respondents (23.4%) correctly selected the recommended 1 g dose, while the

remaining midwives chose incorrect higher doses. Given that early administration of tranexamic acid reduces PPH-related mortality, this level of misunderstanding is concerning. When bleeding persisted despite initial measures, respondents identified several appropriate clinical steps, but with no clear consensus on prioritization. Ninety-five (46.3%) reported checking for retained placenta tissue, 91 (44.4%) mentioned performing uterine massage, and another 91 (44.4%) recommended examining for genital tract lacerations. These responses confirm awareness of essential actions but also suggest fragmented understanding of the correct sequence, which may cause delays in achieving haemostasis. Variability also emerged in reported timelines for repairing lacerations. 92 (44.9%) supported immediate suturing, while 117 (57.1%) preferred waiting 30 minutes, and 96 (46.8%) suggested waiting up to one hour. This level of disparity shows non-uniform clinical judgement which may lead to prolonged bleeding and poorer outcomes. Post-delivery assessments, which are crucial components of the E-MOTIVE bundle, were inconsistently practiced. While 112 midwives (54.6%) reported checking blood loss on the calibrated drape, only 105 (51.2%) consistently checked for uterine contraction, 81 (39.5%) ensured the bladder was emptied, and just 44 (21.5%) checked the placenta and membranes for completeness. These findings demonstrate that although many midwives were aware of some steps, comprehensive and consistent adherence remains limited.

Patient education after PPH was better acknowledged but still varied. 120 (58.5%) understood that proper patient education reduces hospital stay, 112 (54.6%) indicated that it enables early intervention, and 105 (51.2%) believed that it prepares the patient for possible surgical procedures. While these responses show appreciation of the value of patient education, inconsistent application suggests that this step may not always be implemented

effectively in practice. The findings reveal that while midwives possess a basic understanding of the steps involved in PPH management, there are substantial inconsistencies in recognizing clinical thresholds, administering medications, monitoring vital signs, prioritizing interventions, and performing essential post-delivery assessments. These gaps demonstrate partial rather than full adherence to the E-MOTIVE Care Bundle, underscoring the need for strengthened training, clearer clinical protocols, regular updates on drug dosing, and continuous supervision to ensure uniformity and effectiveness in PPH management. For H_{01} (knowledge and utilization), the chi-square test ($\chi^2 = 16.026$, $df = 3$, $p = 0.001$) showed a statistically significant relationship, while for H_{02} (years of experience and utilization), the chi-square test ($\chi^2 = 73.927$, $df = 9$, $p = 0.000$) also revealed a significant relationship.

5.2 Conclusion

This study assessed the midwives' knowledge and utilization of E-MOTIVE Care Bundle management of postpartum haemorrhage in secondary health institutions in Ibadan, Oyo State. The findings revealed that while most midwives had high knowledge of individual bundle components such as uterine massage 90.7%, oxytocic drugs 87.8%, and tranexamic acid 86.8%, knowledge gaps existed regarding correct fluid use and the simultaneous application of components. Utilization was high, more than half 79% indicated that initiation should be when blood loss exceeds 300-500ml, and delays in teamwork and communication were common barriers.

Hypothesis testing showed a significant association between knowledge and utilization ($\chi^2 = 16.026$, $p = .001$) and between years of experience and utilization ($\chi^2 = 73.927$, $p = .000$). Interestingly, less experienced midwives were more likely to initiate the bundle promptly,

while older and more experienced practitioners tended to delay, possibly due to reliance on traditional practices. The E-MOTIVE Care Bundle is recognized and partially applied in Ibadan, but inconsistencies in knowledge and utilization limited its full impact. Strengthened training, institutional support, and supervision are essential to ensure consistent, effective, and timely use of the bundle in line with WHO guidelines.

5.3 Recommendations

Based on the findings, the following recommendations were made:

- i. **Structured Training and Retraining:** Regular in-service training should be organized for midwives to bridge knowledge gaps, especially on simultaneous application of bundle components, correct fluid use, and proper drug dosages.
- ii. **Institutional Support and Supervision:** Secondary health institutions should provide necessary supplies such as calibrated drapes, essential drugs, and monitoring tools while ensuring supportive supervision to reinforce adherence.
- iii. **Team-Based Approach:** Strengthening interdisciplinary collaboration among midwives, obstetricians, and haematologists should be prioritized to improve coordinated and timely response to PPH cases.
- iv. **Policy and Protocol Integration:** Hospital management should integrate the E-MOTIVE Care Bundle into standard operating procedures, ensuring uniform practice across all facilities in Ibadan.

- v. **Mentorship and Knowledge Transfer:** Senior practitioners should be encouraged to embrace updated protocols, while mentorship programs should support young midwives in consolidating evidence-based practices.

5.4 Contribution to Knowledge

This study contributes to knowledge by providing empirical evidence on the current level of knowledge and utilization of the E-MOTIVE Care Bundle among midwives in secondary health institutions in Ibadan, highlighting areas of strength and weakness. Establishes a significant relationship between knowledge and utilization, showing that improved knowledge translates into better application of the bundle. Uniquely shows that years of experience do not necessarily guarantee better utilization; less experienced midwives were more compliant with updated guidelines than their more experienced counterparts. Also add to the growing body of literature from Nigeria on the practical implementation of WHO's E-MOTIVE Care Bundle, providing context-specific insights for maternal health policy and practice in low-resource settings.

5.5 Suggested Areas for Further Research

- i. A longitudinal study to evaluate the impact of continuous training on midwives' knowledge and utilization of the E-MOTIVE Care Bundle over time.
- ii. A comparative study between secondary and tertiary health institutions in Nigeria to assess differences in knowledge, utilization, and maternal outcomes.
- iii. Qualitative research exploring barriers to utilization from midwives' perspectives, including cultural, institutional, and personal factors.

- iv. Cost-effectiveness studies to determine the financial feasibility of large-scale adoption of the E-MOTIVE Care Bundle in Nigerian health systems.
- v. Research on the effect of mentorship and peer learning models in promoting sustained use of E-MOTIVE practices among midwives.

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Bibilography

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APPENDIX I

Informed Consent Form

I am Iyabode Aderonke Adeleke, a postgraduate student of the Department of Nursing Science, Lead City University, Ibadan. The title of my study is: Knowledge and Utilization of E-MOTIVE Care Bundle in Management of Postpartum Hemorrhage among Midwives in Selected State Government Hospitals in Ibadan, Oyo State. The purpose of this study is to assess the level of knowledge and utilization of E-MOTIVE Care Bundle among midwives in managing postpartum hemorrhage in selected state government hospitals in Ibadan, Oyo State. You have been selected to participate because you are a midwife currently practicing in one of the selected state government hospitals in Ibadan. If you agree to participate, you will be required to respond to a developed questionnaire, which will take approximately 15 minutes to complete. There is no physical or emotional risk involved in your participation. Your responses will contribute to improving knowledge and the effective use of E-MOTIVE Care Bundle to help reduce maternal mortality due to postpartum hemorrhage. Participation in this study is voluntary, and you will not receive any monetary or material compensation. You have the right to withdraw from the study at any time without fear of victimization or penalty. All information you provide will be kept confidential. Your identity will not be revealed in any report or publication resulting from this study. Data will be securely stored and destroyed after the research is completed, in line with ethical guidelines.

If you have any questions or concerns about this study, please contact:

Iyabode Aderonke ADELEKE

Phone number: 08023466178

Questionnaire

Section A: Socio-Demographic Data

Instruction; please, tick (✓) the appropriate box

1. Age: (a) 20-30() (b) 31-39() (c) 40-50() (d) 51 and above ()
2. Sex (a) Male () (b) Female ()
3. Religion: Christianity () (b) Islam () (c) Traditional () (d) Others ()
4. Tribe: (a) Yoruba () (b) Hausa () (c) Igbo () (d) Others ()
5. Marital status: (a) Single () (b) Married () (c) Divorced () (d) Widow ()
6. Nationality: (a) Nigerian () (b) Non-Nigerian ()
7. Educational Qualification: (a) RN/RM () (b) RM (C) BSc/BNSc () (d) MSc () (e) PhD ()
8. Department (Maternity Unit): (a) Labour ward () (b) Labour Room (C) Lying-in ward () (D) others ()
9. Years of Experience (a) less than 1 year () (b) 1-5 years () (c) 6-10 years () (d) above 10 years ()

Section B: Knowledge of E-MOTIVE Care Bundle Components

Kindly respond to the following items by selecting Yes or No.

S/N	Items	Yes	No
1	Have you heard about E-MOTIVE Care Bundle?		
2	Your sources of information about E-MOTIVE Care Bundle is:		
	a. Internet		
	b. Workplace		
	c. WHO Bulletine		
3	Where were you trained on the use of E-MOTIVE care bundle?		
	a. Workshop		
	b. MCPDP		
	c. Seminar		
	d. Clinical Presentations		
4	What is E-MOTIVE Care Bundle used for		
	a. management of haemorrhage		
	b. management of antepartum haemorrhage		
	d. management of postpartum haemorrhage		
5	What are the components of E-MOTIVE Care Bundle?		
	a. Early Detection		
	b. Massage of uterus		
	c. Oxytocic drugs		
	d. Tranexamic acid		
	e. Intravenous (IV) fluids		
	f. Examination and Escalation		
6	Which intravenous (IV) fluids is recommended in the management of PPH under E- MOTIVE Care Bundle?		
	a. Dextrose 5% in water		
	b. Normal saline		
	c. Ringer's lactate		
	d. Hypertonic saline		
7	Examination in E-MOTIVE Care Bundle means:		
	a. examining the cervix for laceration		
	b. examining the vagina for laceration		
	c. examining the uterus for laceration		
8	Escalation in E-MOTIVE Care Bundle means:		
	a. referring the patient for advance care if bleeding persist		
	b. continuous monitoring of the patient		
9	Components of E-MOTIVE Care Bundle should be applied:		
	a. unanimously		

10	b. simultaneously		
	c. separately		
	Importance of Documentation of all E-MOTIVE steps in the management of PPH are for:		
	a. for legal purpose		
	b. for training purpose		
	c. for future research endeavor		

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Section C: Utilization of E-MOTIVE Care Bundle in the Management of Postpartum Haemorrhage

Instruction: Please indicate the extent to which you agree or disagree with the following statements

S/N	Item	Yes	No
1	E-MOTIVE Care Bundle should be initiated when:		
	a. after medical consultation		
	b. postpartum haemorrhage is suspected		
	c. blood loss exceeds 300-500ml		
2	Team collaboration in utilizing E- MOTIVE Care Bundle during obstetric emergencies involves:		
	a. Obstetrician		
	b. Midwives		
	c. Haematologist		
3	Health professionals using E-MOTIVE care bundle will ensure that all steps are:		
	a. completely used		
	b. effectively used		
	c. timely used		
4	Primary use of calibrated drape in E- Motive care bundle during delivery is to:		
	a. measure maternal blood pressure		
	b. accurately quantify postpartum blood loss		
	c. detect early onset of PPH		
5	Recommended time frame for completing all E-MOTIVE care bundle steps in an emergency is:		
	a. 30 minutes		
	b. within 15 minutes		
	c. 1 hour		

6	E-MOTIVE care bundle to control bleeding involves:		
	a. administering Tranexamic acid		
	b. administering oxytocine		
	c. administering combination of Tranexamic acid and oxytocine		
7	The best support routine use of the E- MOTIVE Care Bundle in clinical settings includes:		
	a. availability of essential drugs and staff training		
	b. patient demand		
	c. religious beliefs		
8	Timely use of E-MOTIVE care Bundle improves:		
	a. chances of postpartum recovery		
	b. long-term complications.		
	c. maternal health		
9	Escalation in E-motive starts when:		
	a. bleeding continues		
	b. there is dizziness		
	c. there is eminent shock		
10	Factors that can influence successful utilization of E-MOTIVE Care Bundle:		
	a. availability of E-MOTIVE care bundle		
	b. training and retraining of attending midwives		
	c. institutional support for E-MOTIVE care bundle		
11	Using E-MOTIVE care bundle to manage PPH will:		
	a. boost midwives confidence		
	b. make midwives not to be confident		
	c. help midwives to act independently		
12	What barriers do you face in utilizing the E-MOTIVE care bundle?		
	a. resistance to new protocol		

	b. delay in teamwork		
	c. delay in communication		
13	Advance care requires: a. surgical intervention		
	b. hysterectomy		
	c. referral to tertiary institution		

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Section D: Steps in the Management of Postpartum Haemorrhage Using E-MOTIVE Care Bundle

Instruction: Please indicate the extent to which you agree or disagree with the following statements

S/N	Item	Yes	No
1	Critical action threshold for blood loss on the calibrated drape while managing PPH using E- MOTIVE Care Bundle is:		
	a. 150 ml		
	b. 250 ml		
	c. 350 ml (warning line)		
2	d. 500 ml (action line)		
	Vital signs are monitored under E-MOTIVE care bundle:		
	a. once every hour		
	b. every 15 minutes (if normal)		
3	c. once a day		
	According to E-MOTIVE care bundle protocol, when should oxytocin (10 IU) be administered:		
	a. one minute after delivery of the baby		
	b. at delivery of anterior shoulder		
4	c. after signs of PPH		
	Recommended dose of oxytocin for initial treatment according to E-MOTIVE Care Bundle for managing PPH is:		
	a. 10 IU in 1000 ml over 1 hour		
	b. 10 IU in 500 ml given over 10 minutes		
5	c. 20 IU in 500 ml over 2 hours		
	d. 5 IU in 250 ml over 5 minutes		
	The recommended dose of Tranexamic acid to be given for the management of PPH is:		
	a. 5g		
	b. 3g		
	c. 1g		

6	The recommended dose of crystalloid to dilute Tranexamic acid is:		
	a. 500ml		
	b. 250ml		
	c. 300ml		
	7 Other medications that can be administered for PPH treatment in E-MOTIVE care bundle includes:		
	a. misoprostol		
	b. synthometrine		
	c. 2 nd dose of Tranexamic acid		
	d. ergometrine		
8	Tranexamic acid should not be given to a woman that has been diagnosed with:		
	a. renal failure		
	b. eclampsia		
	c. hypersensitive to antifibrinolytic agents		
9	Uterine tone is checked after delivery to:		
	a. ensure contraction of the uterus		
	b. identify atony as a cause of bleeding		
10	The first action to take when bleeding persists after placenta delivery in E-MOTIVE care bundle is to:		
	a. examine for retained placenta tissue		
	b. massage the uterus		
	c. check for genital lacerations		
11	Suturing of laceration in E-MOTIVE care bundle to stop bleeding should be:		
	a. immediately		
	b. 30 mins later		
	c. 1 hour later		
12	Examination of the genital tract after delivery in E- MOTIVE care bundle is to:		
	a. identification of laceration		
	b. bleeding without cause		
13	Immediately after delivery in E-Motive care bundle, midwives should:		
	a. check and empty the bladder		
	b. check the amount of blood loss on the drape		
	c. check for uterus contraction after placenta delivery		

	d. check placenta and membranes for completion		
	e. examine the genital tract for any laceration		
14	Reassessment of bleeding after delivery is necessary to prevent:		
	a. escalation		
	b. maternal morbidity		
	c. maternal mortality		
15	Importance of education on early reporting of postpartum bleeding is to:		
	a. prepare patient for surgery		
	b. reduce time spent in the hospital by patients		
	c. enable prompt intervention and reduce complications		

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APPENDIX II



Lead City University (LCU)

Motto: Knowledge for Self-reliance

Administrative Building, Lagos-Ibadan Express way, Toll Gate Area, PO Box 30678, Secretariat, Ibadan,
Oyo State Nigeria, Tel: 09064484162, Email: nursing@lcu.edu.ng

**Department of Nursing Science
Faculty of Basic Medical and Health Sciences**

www.lcu.edu.ng

Lead City University, Ibadan,
Faculty of Basic Medical & Health Sciences
Department of Nursing Science,

22nd May, 2025

The Secretary,
Oyo State Research Ethics Review Committee,
Ministry of Health Secretariat,
Ibadan.

Dear Sir,

**LETTER OF INTRODUCTION: ETHICAL APPROVAL
IYABODE ADERONKE ADELEKE – MATRIC NO. LCU/PG/006117**

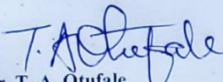
I write to confirm that **Iyabode Aderonke Adeleke** is an MSc student in the Department of Nursing Science, Faculty of Basic Medical and Health Sciences, Lead City University, Ibadan.

She is seeking ethical approval to enable her carry out a research work titled **"KNOWLEDGE, AND UTILIZATION OF WHO E-MOTIVE CARE BUNDLE IN MANAGEMENT OF POSTPARTUM HEMORRHAGE AMONG MIDWIVES IN SECONDARY HEALTH INSTITUTION IN IBADAN OYO STATE."**

I hereby request your kind assistance and approval.

Thank you very much

Yours faithfully


Dr. T. A. Otufale
Head of Department

Lead City University
Department of Nursing Science

APPENDIX III

TELEGRAMS.....

TELEPHONE.....



MINISTRY OF HEALTH

DEPARTMENT OF PLANNING, RESEARCH & STATISTICS DIVISION

PRIVATE MAIL BAG NO. 5027, OYO STATE OF NIGERIA

Your Ref. No.

All communications should be addressed to

the Honorable Commissioner quoting

Our Ref. No. AD 13/479/260

Date 05 June 2025

NAME OF PRINCIPAL INVESTIGATOR: ADELEKE IYABODE

TITLE OF STUDY: KNOWLEDGE AND UTILIZATION OF THE E-MOTIVE CARE BUNDLE
IN MANAGEMENT OF POSTPARTUM HAEMORRHAGE AMONG MIDWIVES IN SELECTED
STATE GOVERNMENT HOSPITALS IN IBADAN, OYO STATE

RESEARCH INSTITUTION: LEAD CITY UNIVERSITY, IBADAN.

NREC ASSIGNED NUMBER: NHREC/OYOSHRIEC/10/11/22

DATE OF RECEIPT OF VALID APPLICATION: 22/05/2025

NOTIFICATION OF EXECUTIVE APPROVAL OF PROTOCOL

This is to notify you that the Oyo State Ministry of Health Research Ethics Committee (HREC) has concluded to give executive approval to your research proposal after necessary reviews and corrections under the regulations guiding experiment in human subjects.

2. This approval is for a period of (1) one year from 26th May, 2025 to 25th April, 2026. If there is hindrance in starting this research, please inform the Oyo State HREC so that dates of approval can be adjusted accordingly. Note that no activity related to this research may be conducted outside these dates. No changes are permitted in the research without prior approval by Oyo State HREC.

3. All forms and questionnaires used in this study must carry the HREC assigned number and the duration of HREC approval. You are to note further that the National Code of Health Research Ethics requires you to comply with all Institutional guidelines, rules and regulation of the codes. Please ensure that any adverse effect from your study is quickly reported to the HREC Oyo State Ministry of Health, Ibadan.

4. You are expected to submit a report to this committee every three (3) months from the date of this approval. The Oyo State HREC reserves the right to conduct compliance visit on your research sites without previous notification.

5. I thank you.


Dr. Adekunle Aremu
Director, Planning, Research & Statistics
Secretary, Oyo State Research Ethics Review Committee

APPENDIX IV

INFORMED CONSENT FORM FOR THE PARTICIPANTS CONFIDENTIALITY

Information obtained will be treated with outmost confidentiality.

Voluntariness

The study allows participants with kin and genuine interest to participate

Management and Care

In any case of injury or assault to the participants in the course of this study, it will be taken care of by the researcher.

Statement of person obtaining Informed Consent

I have fully explained this research to _____
with _____ sufficient and accurate
information including risks and benefits to make an informed decision.

Name _____

Signature _____

Date _____

Statement of person giving consent

I have read the description of the study and that my participation is voluntary. The purpose, risks and benefits of the research have been explained to me. I understand that I can withdraw my participation from the study at any time. I have received a copy of this consent form for my personal keep.

Name _____

Bio-data

A. Personal Data

1. Full Name: Iyabode Aderonke ADELEKE

Zone 5, Alagbayun Area, Akobo, Ibadan, Oyo State.

Email Address: iyabby3@gmail.com

Phone Number: 08023466178

2. Date and Place of Birth: 31st August 1964

Place of Birth: Ibadan, Oyo State

3. Nationality: Nigerian

4. Marital Status: Married

5. No. of Children & their ages: One (1)

6. Name and Address of Spouse: Pastor S. A. Adeleke

Address: Zone 5, Alagbayun Area, Akobo, Ibadan, Oyo State

7. Name and Address of Next of Kin: Pastor S. A. Adeleke

Address: Zone 5, Alagbayun Area, Akobo, Ibadan

Email: shinaadeleke@yahoo.com

Phone Number: 08034302754

8. Date of Assumption of Duty in current establishment: 6th September, 1982

9. Status on first appointment in current establishment: Student Midwife

10. Present position: Principal Lecturer

11. Date of last promotion: 1st January, 2021

12. Date of confirmation of appointment: 10th November, 1987

13. If not confirmed why: Nil

14. Present Salary: Nil

15. Faculty: Maternal and Child Health

16. Department: Midwifery

B. Educational Background

Education Institutions Attended with Dates and Qualification:

i. Higher Educational Institutions Attended with Dates & Qualification

Date	Institution	Qualification
2015	University of Ibadan	Postgraduate Diploma in Education (PGDE) Second Class Upper.
2002	University of Ibadan.	Masters of Social Works (MSW)
1999	University of Ibadan	Bachelor of Science In Nursing (BSc. Nursing)
1986	School of Nursing, Eleyele, Ibadan	General Nursing – Registered Nurse.
1982	Catholic School of Midwifery, Oluyoro, Ibadan	Registered Midwife

C. Awards and Fellowships:

- Ethical Conduct Award by Centre for Ethics and Self Value Orientation
- Harafat Award of Excellence by Haraft Oluyedun Foundation

D. Work Experience: With Dates (including courses taught where relevant)

- Oyo State College of Nursing and Midwifery, Eleyele 2014 - till date.
- Directorate of Nursing Services, Secretariat, Ibadan 2013 – 2014
- School of Midwifery, Yemetu, Ibadan 2008 – 2013
- Savanah Lar-Ma Hospital, Jamiaca West Indies
(Technical Aid Corp) 2006 – 2008
- School of Midwifery, Yemetu, Ibadan 2003 – 2006
- BCOS Clinic 1999 – 2006
- Jericho Nursing Home 1987- 1999
- Primary Health Centre, Iseyin 1986 – 1987
- Primary Health Centre, Asejire 1985 - 1986

E. Membership of Academic Professional Bodies.

- National Association of Nurses and Midwives of Nigeria (NANMN)
- National Association of Nigerian Social Workers
- Association of Jamaican Nurses

F Publications:

- Adeleke Iyabode Aderonke; Impact of Drug Abuse on Mental Health of University Undergraduates: Perspectives of Agbowo Community, *International Journal of Advancements in Research and Technology*, Volume 7, Issue 8, August 2018 1 ISSN 2278-7763
- Adeleke Iyabode A. et al; Knowledge and Utilization of Standardized Nursing Language among Nurses in Adeoyo Maternity Teaching Hospital Yemetu, Ibadan, *IOSR Journal of Nursing and Health Science*, Volume 9, Issue 2, Ser. III, Mar-Apr. 2020.
- Adeleke Iyabode A. et al; Knowledge and Perceived Susceptibility of Traders towards the Prevention of COVID-19 Pandemic at Selected Markets in Ibadan Oyo State Nigeria, *American Journal of Nursing and Health Science*, Volume 2, Issue 2, June 2021, Pp 46-59.

Publications in Journals:

2. Books/Monographs: Nil

(a) Authored Books: Nil

(b) Edited Books: Nil

(c) Contribution to Books: Nil

3. Book Reviews and Commentaries in Scholarly Journals: Nil

4. Technical Reports: Nil

5. Other Publications: Nil

6. Creative Work: Nil

G. Notable Scholarly or Professional Accomplishments: Nil

H. Major Conferences/Workshops Attended

- 2nd Multi-disciplinary International Conference by
Postgraduate College Lead City University 2025
- Artificial Intelligence Research and Grant Writing Training
Postgraduate College Lead City University 2024
- NMCN Examiner's Workshop 2024
- International Workshop for Nurses by Babcock University 2024
- Basic Life Support Course by University College Hospital Ibadan 2024
- NMCN Examiner's Workshop 2021
- NMCN Examiner's Workshop 2018
- A 2 Day Course on Ethical Leadership and Conduct 2018
- NMCN Research Workshop: Scientific Research, A tool for
Development in Nursing in Nigeria 2018
- NANDA International Network Workshop 2016

I. Services in Lead City University:

1. Services Within the University Dept:

2. Services within the Faculty: Nil

3. Services within the University:

4. Services Outside the University (local, State or National or International) Nil

J. Extra Curricular Activities: Reading, Travelling and Meeting People

K. Names and Addresses of Referees:

Dr Gbonjubola O. Owolabi

Provost
Oyo State College of Nursing and Midwifery
Eleyele, Ibadan
Oyo State, Nigeria.
Phone No: 08135490985

Dr G. O. Adeniran

Department of Nursing
LAUTECH, Ogbomoso
Oyo State, Nigeria.
Phone No: 08032421433

Dr. Taiwo Otufale

Department of Nursing
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M. Date:

Signature

Date

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