MIDWIVES' KNOWLEDGE AND PRACTICE REGARDING SAFE ESSENTIAL MATERNAL AND NEWBORN CARE AT A REGIONAL REFERRAL HOSPITAL IN CENTRAL UGANDA

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RM1911/101M

A DISSERTATION SUBMITTED TO THE FACULTY OF PUBLIC HEALTH, NURSING AND MIDWIFERY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A DEGREE OF MASTER OF NURSING SCIENCE OF UGANDA CHRISTIAN UNIVERSITY

April, 2026

UGANDA CHRISTIAN UNIVERSITY

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Declaration

I, Grace Birungi Baguma, declare that the work presented in this dissertation is mine and that it has not been submitted to any other institution of higher learning or university for any academic purposes. Where other people's work has been used, it was acknowledged.

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Date: 27-12-2025

Approval

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List of Acronyms

ANC- Ante-Natal Care

CCT-Controlled Cord Traction

CHC-Child Health Clinics

CPD-Continuous Professional Development

CPR -Cardiopulmonary resuscitation

EONS- Early On-Set Neonatal Sepsis

EPMM-Ending Preventable Maternal Mortality

HTN- Hypertension

ICM- International Confederation of Midwives

LONS- Late On-Set Neonatal Sepsis

MMR-Maternal Mortality Rates

MoH- Ministry of Health

NMRs- Neonatal Mortality Rates

PPH- Postpartum Haemorrhage

PROM- Prolonged Rupture of Membranes

UCU- Uganda Christian University

UNIPH- Uganda National Institute of Public Health

WHO-SCC- World Health Organization Safe Childbirth Checklist

TABLE OF CONTENTS

Abstract

Background

Maternal and neonatal mortality remain major challenges in Uganda, where midwives are central to delivering safe, essential care. Evidence on their knowledge and practice is limited, yet critical for improving outcomes in resource-constrained settings.

Methods

A cross-sectional study was conducted among 66 purposively sampled midwives at a regional referral hospital in Central Uganda. Guided by the Knowledge–Practice dimensions of the KAP framework, knowledge was assessed using multiple-choice questions aligned to the WHO Safe Childbirth Checklist pause points, while practice was measured with a four-point Likert scale on self-reported frequency of essential care. Direct observations and structured checklists validated responses. Descriptive statistics summarised knowledge and practice, while ANOVA and chi-square tests examined differences across stages and associations between knowledge and practice.

Results

Knowledge was highest before pushing ($M = 83.3$, $SD = 7.5$) and lowest immediately after birth ($M = 65.2$, $SD = 9.6$), with significant variation across stages, $F(3, 164) = 15.40$, $p < .001$. Practice scores were consistently high, peaking immediately after birth ($M = 3.72$, $SD = 0.50$). Knowledge and practice were positively associated, $\chi^2(1, N = 66) = 5.10$, $p = .024$.

Conclusion

Midwives demonstrated strong intrapartum knowledge and practice, but gaps in postpartum discharge education, recognition of danger signs, and emergency

preparedness remain. Strengthening stage-specific training and supportive supervision will address these gaps at the bedside, while embedding the WHO Safe Childbirth Checklist into national guidelines can standardise care and improve accountability. Sustained investment in resources and monitoring frameworks is essential to empower midwives and enhance maternal and newborn outcomes in low-resource settings.

Overall Message

Midwives in Uganda provide strong intrapartum care, but targeted training, supervision, and WHO Safe Childbirth Checklist use are vital to strengthen postpartum care and emergency preparedness.

Keywords: Maternal and newborn care; midwives' knowledge and practice; WHO Safe Childbirth Checklist; postpartum care; Uganda

Chapter One: Introduction

The well-being of mothers and newborns is fundamentally dependent on the provision of quality, safe, and essential maternal and newborn care (Li et al., 2022). Evidence consistently demonstrates a strong correlation between positive childbirth outcomes and midwives' knowledge and practices in delivering such care (Li et al., 2022). Adherence to evidence-based maternal and newborn care protocols has the potential to prevent up to 85% of maternal and neonatal deaths, underscoring its critical role in improving survival and health outcomes (Li et al., 2022).

Midwives, as primary caregivers during pregnancy, childbirth, and the postpartum period, play a pivotal role in safeguarding maternal and neonatal health. Their competence in applying evidence-based interventions—including timely assessments, recognition of danger signs, and effective management of complications—remains a decisive factor in reducing preventable morbidity and mortality (Dohbit et al., 2021; Molina et al., 2021; WHO, 2020). Assessing midwives' knowledge and practices is therefore essential for identifying gaps, strengthening clinical performance, and enhancing the overall quality of maternal and newborn care across the continuum of services.

Background of the Study

Maternal and neonatal mortality rates remain unacceptably high worldwide, with the greatest burden concentrated in Sub-Saharan Africa, including Uganda (Kourouma et al., 2020). Complications such as prolonged labour, pre-eclampsia, maternal infections, unrepaired cervical lacerations, and intrapartum haemorrhage account for nearly half of

maternal deaths, 23% of neonatal deaths, and 32% of intrauterine deaths annually (Kourouma et al., 2020).

Encouragingly, Uganda has made notable progress in improving maternal and newborn health outcomes (UBOS, 2023). The 2022 Uganda Demographic and Health Survey (UDHS) reported a decline in the maternal mortality ratio (MMR) from 336 deaths per 100,000 live births in 2016 to 189 per 100,000 in 2022—a 44% reduction (UBOS, 2023). Infant mortality also decreased from 43 deaths per 1,000 live births in 2016 to 34 per 1,000 in 2022 (UDHS, 2022; UBOS, 2023). These improvements are largely attributed to strengthened surveillance systems and the Ministry of Health's increased focus on identifying and monitoring women at risk (UBOS, 2023).

Despite these gains, obstructed labour remains a significant contributor to maternal and neonatal morbidity and mortality, even in facility-based deliveries (Masaba et al., 2020). Adherence to recommended labour monitoring protocols is a key intervention for mitigating complications arising from undetected prolonged labour (Varghese et al., 2019). The labour guide, or partograph, developed by Friedman over four decades ago, was designed to assist midwives in systematically recording cervical dilation, fetal descent, uterine contractions, and fetal heart rate. As an early warning system, it enables timely detection of pathological labour patterns and prompt obstetric intervention, thereby improving maternal and fetal outcomes (Varghese et al., 2019).

Although the labour guide is widely acknowledged as a critical maternal care protocol, consistent knowledge and practice among midwives remain limited (WHO, 2018). In-service training programs have attempted to improve adherence, but evidence suggests limited long-term success, with many midwives failing to apply the tool

consistently (USAID, 2013). To further strengthen maternal and newborn care, the World Health Organization introduced the Safe Childbirth Checklist (SCC), which reinforces adherence to evidence-based practices across four critical pause points: admission, before birth, immediately after delivery, and before discharge (WHO, 2018; Julius et al., 2021; Li et al., 2022). These checkpoints serve as life-saving reminders for midwives to implement essential interventions, including timely labour assessment, administration of oxytocin, infection prevention, neonatal resuscitation preparedness, and postpartum monitoring (Dohbit et al., 2021; Kourouma et al., 2020).

In Uganda, midwives are legally defined under the Uganda Nurses and Midwives Act of 1996 as professionals registered or enrolled to care for mothers and newborns throughout childbirth (UNMC, 2022). While labour guide protocols are integrated into midwifery curricula at certificate, diploma, and bachelor's levels, implementation in clinical practice remains inconsistent (Bireka et al., 2017; Kulwa & Nabbosa, 2019; Smith & Lee, 2020; Mukisa et al., 2019). This gap between training and practice is a recurring concern in the delivery of safe maternal and newborn care.

Limited research exists on how midwives systematically incorporate protocols across the four critical stages of labour management to ensure safe outcomes. This lack of contextual understanding hampers the development of targeted training, supervision, and systemic quality improvement initiatives. At regional referral hospitals in central Uganda, qualified midwives face challenges in consistently delivering quality care, leading to untimely detection of intrapartum complications and delays in intervention. Despite their training, concerns persist regarding their knowledge and practice of safe maternal and newborn care.

This context underscores the urgent need for a systematic assessment of midwives' knowledge and practices in relation to safe essential maternal and newborn care. Identifying gaps at referral-level facilities is critical for strengthening implementation of evidence-based protocols, improving maternal and neonatal outcomes, and guiding targeted quality improvement strategies.

Problem Statement

Maternal and neonatal mortality remain pressing global public health challenges, with a disproportionate number of preventable deaths occurring during labour, childbirth, and the immediate postpartum period. In Uganda, intrapartum complications such as obstructed labour, postpartum haemorrhage, sepsis, and birth asphyxia continue to contribute significantly to adverse outcomes, despite recent improvements in national mortality indicators.

Midwives, as the primary providers of intrapartum and immediate postnatal care, play a pivotal role in monitoring labour, recognising danger signs, and initiating timely interventions. To strengthen adherence to evidence-based practices, the World Health Organisation introduced the Safe Childbirth Checklist (WHO-SCC), which emphasises four critical pause points along the childbirth continuum: upon admission, just before pushing (before birth/caesarean section), immediately after delivery, and before discharge. Although labour guide protocols are integrated into midwifery curricula at certificate, diploma, and bachelor's levels, evidence shows that their consistent and correct application in clinical practice remains suboptimal. Persistent gaps in midwives' knowledge and adherence to recommended labour management practices limit early

detection of complications and delay timely intervention, even in facility-based deliveries.

At a regional referral hospital in central Uganda, concerns persist regarding delayed recognition and management of intrapartum complications and inconsistent adherence to safe maternal and newborn care practices, despite the presence of trained midwives. Furthermore, limited context-specific evidence exists on how midwives apply safe essential maternal and newborn care across the four WHO-SCC pause points within this setting.

Therefore, this study seeks to assess midwives' knowledge and practice of safe essential maternal and newborn care at a regional referral hospital in central Uganda, using the WHO-SCC framework, with the aim of identifying critical gaps and informing targeted quality improvement strategies to reduce preventable maternal and neonatal morbidity and mortality.

Purpose of the Study

This study seeks to describe the midwives' knowledge and practice regarding safe essential maternal and newborn care practices at a regional referral hospital in central Uganda.

Research Question

What is the midwives' knowledge and practice regarding safe essential maternal and newborn care practices at a regional referral hospital in central Uganda?

Research Objectives

- To determine the midwives' knowledge of safe essential maternal and newborn care practices at a regional referral hospital in central Uganda

- To describe the midwives' practice regarding safe essential maternal and newborn care practices at a regional referral hospital in central Uganda.

Justification of the Study

This study is justified by the persistent gap between midwives' knowledge and their clinical practice in delivering safe, essential maternal and newborn care, particularly during labour and the immediate postpartum period. Despite the availability of evidence-based guidelines and standardised frameworks such as the World Health Organisation Safe Childbirth Checklist (WHO-SCC), discrepancies between recommended protocols and actual implementation continue to compromise the safety and quality of maternal and newborn services (WHO, 2023).

At regional referral hospitals in Uganda, concerns regarding delayed recognition of intrapartum complications and inconsistent adherence to essential care practices underscore the need for a systematic assessment of midwives' competencies. The Uganda Ministry of Health's Maternal and Perinatal Death Surveillance and Response (MPDSR) Report (2023) highlights that preventable causes such as birth asphyxia, haemorrhage, and sepsis remain leading contributors to maternal and neonatal mortality, with gaps in timely and appropriate care at referral-level facilities. National statistics further emphasise the urgency: Uganda's neonatal mortality rate stands at 27 deaths per 1,000 live births, while maternal mortality remains high despite recent improvements (Uganda Bureau of Statistics, 2024).

By examining midwives' knowledge and practice across the four WHO-SCC pause points, this study directly addresses the identified research gap and provides context-specific evidence on adherence to safe maternal and newborn care standards. The

findings will generate empirical data to inform targeted training, supportive supervision, and quality improvement initiatives. Ultimately, this study seeks to strengthen adherence to safe childbirth protocols within referral-level facilities, thereby contributing to improved maternal and neonatal outcomes in Uganda and supporting progress toward Sustainable Development Goals (SDG 3.1 and 3.2).

Significance of the Study

This study provides critical facility-level evidence on midwives' knowledge and practice of safe maternal and newborn care, assessed through the four critical care points: upon admission, just before pushing, immediately after delivery, and just before discharge. By systematically examining adherence to these care points, the study generates actionable insights that can strengthen maternal and newborn health systems in Uganda.

Policy Relevance

Findings will inform the Uganda Ministry of Health's maternal and newborn health strategies, guide in-service training priorities, and reinforce supportive supervision models.

Hospital Administration

Results will highlight specific practice gaps across the four critical care points, enabling targeted mentorship and quality improvement initiatives to enhance intrapartum care outcomes.

Professional Regulation

The Uganda Nurses and Midwives Council (UNMC) can use the evidence to strengthen continuing professional development (CPD) requirements and licensure

processes by addressing areas where knowledge does not consistently translate into practice.

Training Institutions

The study offers valuable feedback for curriculum review and skills-based training, ensuring graduates are better prepared to implement WHO-SCC protocols in clinical practice.

Academic contribution

By integrating the Knowledge, Attitudes, and Practices (KAP) model with the WHO-SCC framework, the study advances theoretical understanding of how provider competencies interact with system-level determinants of care quality in resource-constrained settings.

This study contributes to global health priorities, particularly the Sustainable Development Goals (SDG 3.1 and 3.2), which aim to reduce maternal mortality and end preventable neonatal deaths. By generating context-specific evidence from Uganda's regional referral hospitals, it strengthens international efforts to promote safe childbirth practices and reduce preventable maternal and newborn deaths (WHO, 2023; Ministry of Health, 2023; Uganda Bureau of Statistics, 2024). Specifically, the study provides practical evidence to improve the quality of maternal and newborn care by identifying where midwives' knowledge does not consistently translate into safe practice at the four WHO-SCC critical care points. The findings will inform targeted training, supportive supervision, and policy reforms that enhance adherence to safe childbirth protocols, ultimately advancing Uganda's progress toward SDG 3.1 and 3.2. Strengthening safe,

essential maternal and newborn care practices in Uganda requires closing the gap where midwives' knowledge does not consistently translate into safe practice.

Figure 1: The KAP Model: Theoretical Framework

This study employed the Knowledge, Attitude, and Practice (KAP) model as its conceptual framework.

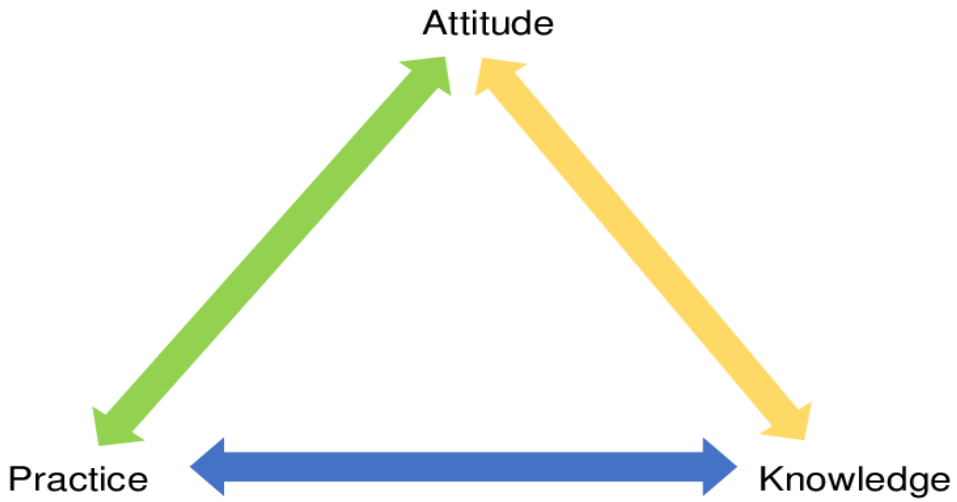


Figure 1 (Andrade et al., 2020; Nourah et al., 2022

The Knowledge-Attitude-Practice (KAP) Model:

The Knowledge-Attitude-Practice (KAP) model is a widely recognized theoretical framework within public health, behavioural interventions, and health education. Developed by American sociologist Everett M. Rogers in the late 1950s and early 1960s, the model initially emerged from family planning and population studies. Over time, it has evolved into a prominent survey-based tool utilized in social and health research to examine the interrelationships between knowledge, attitudes, and practices (Andrade et al., 2020; Liao et al., 2022; Sharma, 2024; USAID, 2011).

The KAP model is structured around three interrelated components:

- **Knowledge acquisition** – the foundation of the model- refers to individuals' understanding, information, and skills obtained through education and experience.
- **Attitude development** – the internalization of knowledge into personal values or beliefs, shaping one's disposition toward specific behaviours.
- **Practice construction** – the observable behaviours and actions that stem from one's knowledge and attitudes.

This model posits that an increase in knowledge precipitates positive shifts in attitudes, which subsequently facilitate the adoption of desirable practices. Consequently, knowledge functions as the primary catalyst for behavioral change, exerting influence on attitudes that ultimately determine practical actions (Andrade et al., 2020; Liao et al., 2022; Sharma, 2024).

A KAP survey typically employs a standardized, structured questionnaire administered to a target population. This approach enables the quantitative assessment of individuals' knowledge (**what people know**), beliefs (**attitudes**), and behaviours (**practices)** concerning a specific issue. The data generated from such surveys facilitates the identification of knowledge gaps, misconceptions, and negative attitudes that may impede the adoption of optimal practices. Furthermore, the findings support the development of targeted interventions that are culturally and contextually appropriate for the population under study (USAID, 2011; Liao et al., 2022). Ultimately, the KAP model provides a practical framework for understanding the cognitive, emotional, and behavioral aspects of health-related actions. By identifying patterns and barriers to

desired behaviour, it facilitates the development of evidence-based interventions aimed at enhancing health outcomes.

Operationalization of the KPA Model

This study adopted the Knowledge–Attitude–Practice (KAP) model as the guiding theoretical framework. In line with the research objectives, only two dimensions—knowledge and practice—were applied, as these were most relevant to the study's focus. The attitudinal component was excluded because the primary aim was to assess midwives' factual knowledge of safe maternal and newborn care and examine how this translated into reported clinical practices. This selective adaptation ensured methodological coherence by concentrating on the dimensions most directly aligned with the study objectives.

Data were collected at a regional referral hospital in Central Uganda from midwives working in the maternity, labour, and postnatal units. A structured questionnaire was developed in accordance with the World Health Organization's Safe Childbirth Checklist (WHO-SCC), which provided a standardized framework for assessing care at four critical pause points: upon admission, just before pushing (or caesarean delivery), immediately after birth, and just before discharge. Each pause point comprised essential actions that, when correctly implemented, improve maternal and newborn outcomes.

The questionnaire operationalised the adapted KAP model by assessing:

- Knowledge through multiple-choice questions covering key aspects of care at each WHO-SCC pause point.

- Practice through a four-point Likert-type scale measuring the self-reported frequency with which midwives performed essential maternal and newborn care practices.

By explicitly linking the KAP framework to the WHO-SCC, the study reinforced methodological rigour and provided a clear lens for analysing the knowledge–practice relationship within the maternity care context. This integration allowed for systematic evaluation of whether midwives possessed the necessary knowledge and whether their reported practices aligned with internationally recognised standards of care.

Figure 2: Theoretical Conceptual Framework (Adapted from the KAP Model).

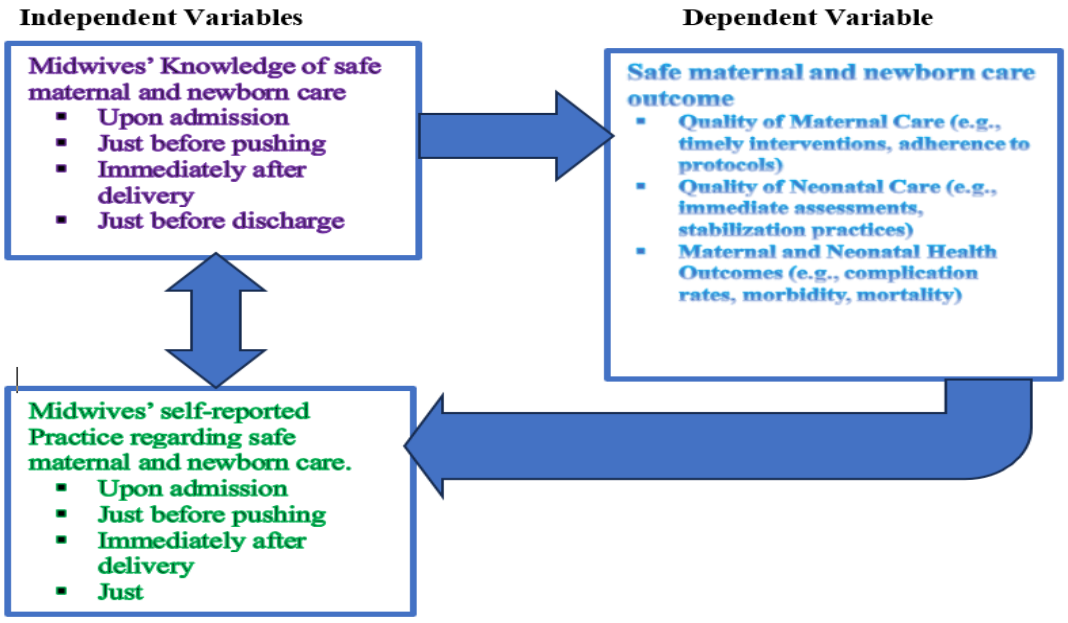


Figure 2 Operationalization of Theoretical Fame Work (Adapted from KAP Model, Andrade et al., 2020

Figure 2 is the conceptual framework illustrating the relationship between midwives' knowledge and self-reported practices of safe maternal and newborn care

across the four WHO Safe Childbirth Checklist pause points, and their influence on maternal and neonatal care outcomes.

Study Variables: Knowledge, Practice and Outcomes

This study examined three interrelated variables—knowledge, practice, and outcomes—within the framework of safe maternal and newborn care guided by the World Health Organisation Safe Childbirth Checklist (WHO-SCC; WHO, 2015). Collectively, these variables formed a unidirectional framework in which knowledge influenced practice, and practice shaped care quality and health outcomes (Polit & Beck, 2017). This framework facilitated identification of gaps and strengths in care delivery, supporting targeted interventions and quality improvement efforts.

Independent Variables: Midwives' Knowledge

Midwives' knowledge was operationalised as the cognitive ability to accurately recall and understand evidence-based safe maternal and newborn care practical guidelines as recommended in the WHO-SCC. This includes understanding the rationale, timing, and timely correct implementation of key clinical interventions during the four critical pause points: Upon admission, just before pushing, immediately after birth and just before discharge.

Knowledge encompasses familiarity with procedures such as: Taking a complete obstetric history, monitoring maternal vital signs and fetal well-being, practising active management of the third stage of labour (AMTSL), providing essential newborn care and postnatal counselling, taking a complete obstetric history, monitoring vital signs and fetal well-being, practising active management of the third stage of labour (AMTSL).

Midwives' Self-Reported Practice

Midwives' self-reported practices were referred to as the routine clinical actions midwives claimed to perform in providing safe maternal and newborn care. This was reflected in the frequency and consistency with which recommended interventions were implemented at the four WHO-SCC pause points (WHO, 2015). Reported practices included: Completing admission assessments and documentation, conducting fetal and maternal monitoring before delivery, practicing amtsl and immediate newborn care, and offering essential postnatal care and discharge instructions.

Dependent Variable: Outcomes

Quality of Maternal and Newborn Care**:** Outcomes represented the clinical effectiveness resulting from the interaction of knowledge and practice. This is inferred from how closely midwives' knowledge and practices align with the safe, essential maternal and newborn care practices as derived from the four pauses outlined in the WHO-SCC (WHO, 2015). This variable captured effectiveness in preventing complications, ensuring timely interventions, and promoting positive health results. The study assumed a unidirectional influence: enhanced knowledge leads to improved practice, which in turn results in better outcomes (Polit & Beck, 2017).

Conceptual Framework

The conceptual framework for this study was grounded in the assumption that knowledge exerted a unidirectional influence on practice. It was posited that increased or adequate knowledge of safe maternal and newborn care translated into improved and consistent clinical practices aligned with WHO guidelines. In this regard, knowledge was

considered the foundation upon which practice was built, shaping the quality, reliability, and sustainability of care delivered in maternal and newborn health settings.

The framework further recognised the moderating role of the WHO Safe Childbirth Checklist (SCC). The SCC, with its four structured pauses, acted as the guiding mechanism that shaped both knowledge and practice domains. Each pause provided specific standards for safe maternal and newborn care, ensuring that clinical actions were systematically aligned with evidence-based recommendations. By embedding these pauses into routine practice, the framework reinforced the translation of knowledge into consistent, high-quality care.

Stepwise, the framework operated as follows:

1. Knowledge Acquisition – Midwives demonstrated acquired knowledge of safe maternal and newborn care through training, guidelines, and professional development. This knowledge encompassed evidence-based practices recommended by the WHO-SCC.

2. Knowledge Translation into Practice – It was assumed that once knowledge was adequate, it informed clinical decision-making and guided the execution of safe practices during childbirth and newborn care.

3. Moderation by the SCC – The WHO-SCC acted as a structural moderator, ensuring that knowledge was not only present but also applied consistently. The four pauses: upon admission, just before pushing, immediately after birth, and just before discharge, served as checkpoints where knowledge was operationalised into practice.

4. Practice Outcomes – The moderated interaction between knowledge and practice was expected to result in improved maternal and newborn outcomes, reduced errors, and adherence to WHO standards of care.

Purpose of the Framework in the Study

Operationalized the research focus: To investigate whether midwives' knowledge of safe maternal and newborn care practices corresponded with their reported practices.

Guided the development of the data collection tool: The questionnaire was directly informed by this conceptual framework, ensuring alignment between the study objectives and the variables being measured.

Informed data analysis: The framework facilitated the exploration of associations or gaps between midwives' knowledge **(what midwives knew)** and their actual practices **(what the midwives do).**

This framework illustrated a logical flow in which knowledge informed practice, while the WHO Safe Childbirth Checklist (SCC) moderated this relationship to ensure consistency and adherence to global standards. Adequate knowledge of safe maternal and newborn care was expected to translate into improved clinical practices aligned with WHO guidelines. The SCC, through its four structured pauses, provided checkpoints that reinforced the application of knowledge into routine practice, thereby reducing variability and promoting standardised, evidence-based care.

In this study, the conceptual framework enabled an examination of the extent to which midwives' knowledge of maternal and newborn care was reflected in their self-reported clinical practices. By highlighting the moderating role of the SCC, the

framework supported the identification of areas of alignment and discrepancy between knowledge and practice. This, in turn, informed the recognition of strengths, gaps, and opportunities for targeted interventions, capacity building, and the enhancement of quality of care in maternal and newborn health services.

Operational Definition of Key Concepts

Safe Essential Maternal and Newborn Care (SEMNC)

Safe Essential Maternal and Newborn Care (SEMC) refers to evidence-based practices and protocols designed to safeguard maternal and newborn health, aligned with internationally recognised World Health Organisation (WHO) standards (WHO, 2015). In this study, SEMNC was operationally defined as the cognitive ability to accurately recall key protocols **(knowledge)** and the consistent translation of knowledge into safe application **(practice)** of maternal and newborn care at the four WHO Safe Childbirth Checklist (WHO-SCC) pause points: upon admission, just before pushing or caesarean delivery, immediately after birth, and before discharge (WHO, 2015; Polit & Beck, 2017).

Knowledge

In the context of this study, knowledge is defined as the cognitive ability to accurately recall and understand Safe Essential Maternal and Newborn Care (SEMNC) protocols, including recognition of danger signs, infection prevention measures, and management of common obstetric complications (WHO, 2015; Hussein, Karanja, & Wanjiru, 2017). It encompasses midwives' awareness of evidence-based practices required to safeguard maternal and neonatal outcomes, particularly at the four WHO Safe

Childbirth Checklist (WHO-SCC) pause points: upon admission, just before pushing or caesarean delivery, immediately after birth, and before discharge (WHO, 2015).

Operationally, knowledge was assessed through a structured questionnaire comprising multiple-choice and true/false items (Polit & Beck, 2017). Scores were assigned based on correct responses, with higher scores indicating greater mastery of SEMNC protocols. This measurement captured both recall and comprehension, reflecting the extent to which midwives could identify and apply essential safety practices in routine care (WHO, 2018).

Practice

In the context of this study, practice is defined as the behavioural frequency, consistency, and accuracy with which midwives implement evidence-based interventions to consistently apply Safe Essential Maternal and Newborn Care (SEMNC) protocols in routine clinical settings at the four WHO-SCC pause points: upon admission, just before pushing or caesarean delivery, immediately after birth, and before discharge (WHO, 2018). It reflects the translation of knowledge into observable actions and procedures aimed at safeguarding maternal and neonatal outcomes (WHO, 2015; Hussein, Karanja, & Wanjiru, 2017). Specifically, practice encompasses

Operationally, practice was assessed through a structured questionnaire using a four-point Likert scale (Polit & Beck, 2017). Midwives reported how often they performed recommended interventions such as admission assessments, maternal and fetal monitoring, active management of the third stage of labour (AMTSL), immediate newborn care, and postnatal counselling. Higher scores indicated greater adherence to

SEMNC protocols, thereby capturing the extent to which knowledge was consistently enacted as safe clinical practice (WHO, 2015; Polit & Beck, 2017).

Outcomes

Outcomes are defined as the clinical effectiveness resulting from the interaction of knowledge and practice in delivering Safe Essential Maternal and Newborn Care (SEMNC). They represent the quality and safety of care achieved when midwives' cognitive ability to recall and understand SEMNC protocols is consistently translated into behavioural practice at the four WHO Safe Childbirth Checklist (WHO-SCC) pause points: admission, just before pushing or caesarean delivery, immediately after birth, and before discharge (WHO, 2015; WHO, 2018).

Operationally, outcomes were inferred from the degree of alignment between midwives' knowledge and self-reported practices. Higher levels of knowledge combined with consistent adherence to recommended protocols were expected to yield improved maternal and neonatal results, including timely interventions, reduced complications, and enhanced survival (Polit & Beck, 2017; Hussein, Karanja, & Wanjiru, 2017). Outcomes, therefore, served as the ultimate indicator of care effectiveness, reflecting how well evidence-based standards were applied to safeguard mothers and newborns.

World Health Organisation Safe Childbirth Checklist (WHO-SCC)

The WHO-SCC is a structured checklist developed to enhance the quality of maternal and newborn care during childbirth. It summarises emergency intrapartum complications and outlines essential practices to be followed at four pause points: (1) upon admission, (2) just before pushing or caesarean delivery, (3) immediately after birth (within one hour), and (4) just before discharge. The checklist functions as both a

reminder and a quality improvement tool to support midwives in delivering safe, evidence-based care (World Health Organisation [WHO], 2015).

Competence

Competence is defined as the integration of knowledge, skills, and professional judgment that enables midwives to perform maternal and newborn care tasks effectively and safely. It reflects the capacity to translate cognitive understanding into appropriate clinical actions that safeguard maternal and neonatal outcomes (Polit & Beck, 2017). In this study, competence was implied in the measurement of practice and operationalised as the ability to execute timely and appropriate interventions at each of the four WHO Safe Childbirth Checklist (WHO-SCC) pause points: upon admission, just before pushing or caesarean delivery, immediately after birth, and before discharge (World Health Organisation [WHO], 2015).

Newborn

A newborn refers to a baby from birth up to 28 days of age. This neonatal period is critical for survival and health, encompassing all assessments and care practices aimed at ensuring immediate well-being, safety, and development (WHO, 2018).

Maternal Mortality

Maternal mortality is defined as the death of a woman during pregnancy, childbirth, or within 42 days of termination of pregnancy, regardless of pregnancy duration or delivery location. This definition aligns with WHO's classification of maternal deaths (WHO, 2019).

Neonatal Deaths

Neonatal deaths are defined as the death of a newborn before 28 completed days of life. In this study, the focus is on deaths resulting from intrapartum complications, as classified by WHO (WHO, 2019).

Intrapartum Period

The intrapartum period refers to the phase of childbirth beginning with the onset of labour and ending with the delivery of the placenta. It includes all stages of labour and encompasses monitoring, communication with the mother, informed consent, and necessary clinical interventions (Maleta, Banda, & Phiri, 2024).

Note: Definitions for additional key terms, such as midwives and the four pause points, are provided in the background section to aid reader comprehension**.**

Summary of the Background of the Study

Chapter One established the study's foundation by presenting the background, problem statement, purpose, objectives, research questions, justification, and significance. It also outlined the conceptual framework, clarified key concepts, and defined study variables, situating the research within the broader context of safe maternal and newborn care (WHO, 2015; Polit & Beck, 2017). Building on this groundwork, Chapter Two critically reviews relevant literature, engaging with empirical evidence, theoretical perspectives, and global frameworks on safe childbirth. This transition highlights existing gaps, identifies best practices, and underscores the importance of midwives' knowledge and practice in shaping maternal and neonatal outcomes, thereby establishing the study's contribution to strengthening maternal and newborn health systems (WHO, 2018; Hussein, Karanja, & Wanjiru, 2017).

Chapter Two: Review of Literature

Chapter Two presents a comprehensive review of the literature on midwives' knowledge and practices regarding safe and essential maternal and newborn care. The discussion begins with an exploration of safe essential maternal and newborn care from global, regional, and national perspectives, providing context for how international standards and local realities shape practice. It then examines midwives' knowledge of safe maternal and newborn care and their reported practices, highlighting the link between professional competence and health outcomes. The review proceeds to the application of theoretical models that guide understanding of knowledge and practice, followed by an analysis of the integration of the World Health Organisation Safe Childbirth Checklist (WHO-SCC) as a quality improvement intervention. Finally, it considers the implications of these findings for future research and policy.

Taken together, these thematic areas provide a structured synthesis of empirical evidence, theoretical perspectives, and global frameworks that inform safe childbirth practices. They highlight existing gaps, identify best practices, and emphasise the importance of midwives' knowledge and practice in shaping maternal and neonatal outcomes (World Health Organisation [WHO], 2015; WHO, 2018; Polit & Beck, 2017; Hussein, Karanja, & Wanjiru, 2017). This synthesis establishes the scholarly foundation for the study's contribution to strengthening safe essential maternal and newborn care protocols, particularly in resource-constrained settings.

Safe Essential Maternal and Newborn Care: A Global, Regional, and National Perspective

Safe Essential Maternal and Newborn Care (SEMC) refers to evidence-based practices that safeguard maternal and neonatal health across pregnancy, childbirth, and the postpartum period. These practices include timely clinical assessments, early recognition of danger signs, effective management of complications, infection prevention, and provision of respectful, supportive care. Globally, progress has been made in reducing maternal and newborn mortality, yet preventable deaths remain unacceptably high, particularly in resource-constrained settings where systemic barriers hinder consistent delivery of quality care (Koblinsky et al., 2016; WHO, 2018). This global challenge provides the foundation for examining SEMC from global, regional, and national perspectives, highlighting achievements, persistent gaps, and the critical role of midwives in strengthening health systems. Against this backdrop, the global perspective on Safe Essential Maternal and Newborn Care highlights how worldwide initiatives, policies, and evidence-based frameworks have shaped progress in reducing maternal and neonatal mortality, while exposing persistent gaps that demand renewed attention.

Global Perspective

Globally, adherence to safe maternal and newborn care protocols remains inadequate, despite decades of investment in maternal health. Evidence indicates that fewer than 60% of midwives consistently perform comprehensive assessments—such as monitoring vital signs and screening for danger signs at admission—practices critical for early detection and management of complications (Achola et al., 2022; Maleta et al., 2024). The World Health Organisation estimates that approximately 810 women die each

day from preventable pregnancy- and childbirth-related causes, underscoring the urgent need for standardised, evidence-based practices and stronger accountability mechanisms worldwide (WHO, 2019).

Regional Perspective

Sub-Saharan Africa bears the highest burden of maternal and neonatal mortality, with maternal mortality ratios ranging from 336 to 542 per 100,000 live births and neonatal mortality averaging 29 per 1,000 (WHO, 2019). Practice deficiencies—including inadequate recognition of danger signs, inconsistent fetal monitoring, and poor infection control—have significantly contributed to adverse outcomes (Mukisa et al., 2020; Tolu et al., 2020). These challenges are compounded by limited refresher training, persistent resource shortages, and weak health system infrastructure. Fewer than 40% of midwives in the region have received recent in-service training, constraining their ability to conduct critical assessments and emergency interventions in line with established protocols (Varghese et al., 2019; WHO, 2020).

Facilities often lack readiness for obstetric emergencies, with only 60–70% adequately equipped. Midwives frequently encounter difficulties verifying equipment functionality, monitoring labour, and providing emotional support—factors essential for positive maternal and neonatal outcomes. Delayed responses to fetal distress and poor adherence to infection control further exacerbate mortality rates (Goudar et al., 2017; WHO, 2017).

National Perspective (Uganda)

Uganda reflects these regional trends, with persistently high maternal and neonatal mortality. In 2020, the country recorded an estimated 300,000 maternal deaths

and 2.4 million neonatal deaths (Boerma et al., 2023). These figures highlight the urgent need to strengthen maternal and newborn care across the continuum of care, including expanded access to skilled birth attendants, comprehensive antenatal services, and adequate postnatal support (Boerma et al., 2023; Kourouma et al., 2025; Li et al., 2022).

Evidence from referral hospitals reveals significant gaps in midwives' knowledge and practice. Studies indicate that only 55–60% routinely perform comprehensive labour assessments, while admission documentation and discharge counselling remain inadequate (Kiggundu et al., 2019; Mugisha et al., 2020; Negussie et al., 2018). Knowledge of essential newborn care is limited, with only 35% demonstrating competence in neonatal resuscitation and thermal management (Namwaya et al., 2020). Contributing factors include limited exposure to simulation-based training, weak supervision, and the predominance of certificate- and diploma-level programs that emphasize routine care over emergency response, compounded by scarce opportunities for advanced education and continuous professional development (Okal et al., 2018; UDHS, 2021).

Although midwives often possessed theoretical knowledge of maternal and newborn care protocols, this knowledge did not consistently translate into effective clinical practice or improved outcomes (Kato et al., 2018; Nabunya et al., 2020). The knowledge–practice gap was evident at the four WHO Safe Childbirth Checklist pause points: inconsistent monitoring of maternal vital signs and use of the partograph on admission, delayed recognition and response to danger signs before birth, incomplete provision of immediate newborn care, and inadequate assessment, documentation, and counselling before discharge. These deficiencies were exacerbated by systemic

constraints such as inadequate equipment, limited refresher training, and weak supportive supervision, collectively undermining adherence to evidence-based interventions (Negussie et al., 2018).

Moderating Frameworks: WHO-SCC and KAP Model

The literature emphasised the need for structured frameworks to strengthen care quality. The WHO Safe Childbirth Checklist (WHO-SCC) provided standardised pause points that moderated the translation of knowledge into practice, ensuring consistency and adherence to global standards. Similarly, the Knowledge–Attitude–Practice (KAP) model offered a structured approach for assessing midwives' knowledge and practices, identifying gaps, and informing targeted quality improvement strategies in referral-level health facilities (Kumakech et al., 2020; Launiala & Kulicek, 2020; McFadden et al., 2018).

For this study, two core components—knowledge and practice—were reviewed to determine the extent to which midwives understood and implemented SEMC protocols (Tunc et al., 2017). The synthesis of existing evidence informed the development of practical, evidence-based approaches to strengthen midwifery practice, with the ultimate goal of improving maternal and neonatal outcomes in regional referral hospitals in Central Uganda (Lawn et al., 2019; WHO, 2018).

Midwives' Knowledge of Safe Essential Maternal and Newborn Care: A Global, Regional, and National Challenge

Midwives' knowledge is a fundamental determinant of the quality and safety of maternal and newborn care. Extensive literature demonstrates that adequate, current, and evidence-based knowledge is essential for preventing avoidable maternal and neonatal

morbidity and mortality. Hussein, Karanja, and Wanjiru (2017) emphasise that midwives' understanding of evidence-based practices underpins their ability to make timely and appropriate clinical decisions, particularly in high-risk obstetric situations. Similarly, Koblinsky et al. (2016) and the World Health Organisation (WHO, 2015) highlight that continuous professional development and access to updated clinical guidelines are critical for sustaining midwives' knowledge and competency. Collectively, these studies underscore that without sufficient and current knowledge, midwives are less able to deliver safe, standardised, and effective maternal and newborn care (Hussein et al., 2017; Laufer & Midlarsky, 2010; Koblinsky et al., 2016; WHO, 2015).

Safe maternal and newborn care requires midwives to possess comprehensive knowledge across the continuum of care, including antenatal, intrapartum, and postnatal periods. Maternal care involves informed decision-making based on scientific evidence, clinical guidelines, and best practices aimed at safeguarding the health of both mothers and newborns (Maleta et al., 2024). Despite global efforts to reduce maternal and neonatal mortality, gaps in midwives' knowledge of essential maternal and newborn care remain a major barrier to achieving these goals (Kakyo et al., 2018; Orach et al., 2014; WHO, 2019).

Global Challenge

Globally, deficiencies in midwives' knowledge of safe maternal and newborn care continue to contribute significantly to preventable adverse outcomes. The WHO (2019) estimates that approximately 810 women die each day from preventable pregnancy- and childbirth-related causes, many of which are linked to failures in timely recognition and management of complications—processes that depend heavily on provider knowledge. In

many settings, midwives lack adequate knowledge of updated clinical guidelines, emergency obstetric care, and essential newborn interventions, limiting their ability to provide safe and effective care (WHO, 2019).

Midwives are expected to demonstrate knowledge of critical maternal and newborn care interventions, including labour monitoring, identification of complications, infection prevention, and immediate newborn care. However, global evidence indicates persistent gaps in knowledge, particularly in low- and middle-income countries, where access to continuing education and updated training is limited (Bireka et al., 2017). Knowledge of care at the four critical stages of childbirth—on admission, before delivery, immediately after birth, and before discharge—is essential for standardising care and reducing preventable risks (Maleta et al., 2024). Without sustained educational support and regular updates, midwives' knowledge may become outdated, compromising the safety and quality of care (Bireka et al., 2017; Maleta et al., 2024).

Regional Challenge: Sub-Saharan Africa

In Sub-Saharan Africa, gaps in midwives' knowledge of safe maternal and newborn care remain a major contributor to the region's high maternal and neonatal mortality rates. Maternal mortality ratios range from 336 to 542 per 100,000 live births, while neonatal mortality rates remain approximately 29 per 1,000 live births (WHO, 2019). Many of these deaths are associated with preventable conditions that require midwives to have strong knowledge in early recognition, assessment, and management of complications during labour and childbirth.

Studies across the region reveal substantial deficiencies in midwives' knowledge of key maternal and newborn care components. Midwives frequently demonstrate limited

knowledge in interpreting fetal distress, monitoring labour progress, and identifying obstetric emergencies (Mukisa et al., 2020; Mukunya et al., 2021; Tolu et al., 2020). For example, Ayebare et al. (2021) found that only 45% of midwives correctly identified key signs of fetal distress, while fewer than half had adequate knowledge of partograph use for labour monitoring. Knowledge gaps are also evident in infection prevention, with many midwives lacking adequate understanding of standard hand hygiene and sterilisation protocols (Ndeezi et al., 2021).

These deficiencies are strongly linked to inadequate access to refresher training and continuing professional development. Varghese et al. (2019) reported that fewer than 40% of midwives in the region had received refresher training within the previous two years, limiting their exposure to updated clinical guidelines. Consequently, insufficient knowledge in areas such as hypertensive disorders of pregnancy and emergency newborn care persists, increasing the risk of delayed recognition and inappropriate responses to complications (WHO, 2020). Strengthening midwives' knowledge through standardised, ongoing education remains a critical regional priority.

National Challenge: Uganda

In Uganda, midwives' knowledge gaps represent a significant obstacle to improving maternal and newborn health outcomes. Evidence indicates that only about 35% of practicing midwives demonstrate adequate knowledge of essential newborn care, including immediate newborn resuscitation, thermal protection, and early initiation of breastfeeding (Namwaya et al., 2020). Knowledge related to labour monitoring is also limited, with fewer than 50% of midwives demonstrating adequate understanding of correct partograph use (Kumakech et al., 2020).

Further assessments reveal substantial deficiencies in midwives' knowledge of infection prevention and management of obstetric complications. Only 40% of midwives demonstrate adequate knowledge of hand hygiene and sterilisation guidelines, while approximately 30% possess sufficient knowledge for early detection and management of hypertensive disorders such as pre-eclampsia and eclampsia (Namwaya et al., 2020; Kumakech et al., 2020). Limited exposure to simulation-based emergency obstetric training further constrains midwives' knowledge and preparedness to manage obstetric emergencies effectively (Okal et al., 2018).

These knowledge gaps are partly attributed to the level of pre-service training. Most midwives in Uganda are trained at certificate or diploma level, which primarily provides foundational knowledge for routine care rather than advanced or emergency maternal and newborn care (Kumakech et al., 2020). Opportunities for higher education, in-service training, and continuous professional development remain limited, restricting midwives' ability to update their knowledge in line with evolving WHO guidelines (Uganda Ministry of Health, 2017; Muzaale et al., 2020). As a result, knowledge of evidence-based tools such as the WHO Safe Childbirth Checklist remains inconsistent among midwives (WHO, 2021)

At the national level, Uganda continues to face significant challenges related to midwifery workforce capacity and systemic support, which directly impact maternal and neonatal health outcomes (Kumakech et al., 2020; Uganda Ministry of Health, 2017; WHO, 2019). The country struggles with a critical shortage of highly trained midwives, compounded by limited documentation and inadequate data systems for workforce planning and monitoring (Kumakech et al., 2020; Uganda Ministry of Health, 2017;

WHO, 2019). This workforce deficit is further exacerbated by insufficient opportunities for ongoing professional development, with many midwives lacking access to continuous education and skill enhancement programs necessary to meet evolving standards of care (Atuhaire et al., 2018; Muzaale et al., 2020; WHO, 2021).

The World Health Organization (2021) emphasizes that systemic barriers, including training gaps and poor documentation, hinder the implementation of evidence-based interventions, thereby compromising the quality of care. Additionally, systemic issues such as workforce shortages and inadequate training documentation constrain efforts to improve midwifery competencies across the country, especially in high-burden regions such as Central Uganda, which require targeted interventions (Kirumira et al., 2020; Nakanwagi et al., 2019).

Given these challenges, this study aims to address the national gap by specifically assessing the knowledge and self-reported practices of midwives working at regional referral hospitals in Central Uganda regarding safe, essential maternal and newborn care, utilizing the framework of the WHO-SCC. The findings will provide critical insights to inform policy reforms and training programs designed to strengthen midwifery practices and ultimately improve maternal and neonatal health outcomes in the region and beyond.

At the regional referral hospital in Central Uganda, where maternal and neonatal mortality rates remain high, the knowledge gap among midwives is particularly concerning. These hospitals face a dual burden of high patient volumes and limited workforce capacity, which magnifies the consequences of inadequate knowledge (Kirumira et al., 2020; Nakanwagi et al., 2019). Midwives are frequently required to manage complex obstetric and neonatal cases with minimal support, making deficiencies

in their knowledge base especially critical. Addressing these gaps through structured training initiatives, consistent updates on national and international clinical guidelines, and the integration of tools such as the WHO Safe Childbirth Checklist (WHO, 2021) is essential to strengthening midwifery competencies and improving maternal and newborn health outcomes in the region.

Midwives' Knowledge Across the Four WHO-SCC Pause Points: Global and Sub-Saharan Perspectives

Globally, midwives' knowledge is central to safe maternal and newborn care, yet persistent gaps remain across the four WHO-SCC pause points.

Upon admission: Global Perspective

Globally, midwives play a critical role in admission assessments, conducting biomedical evaluations such as maternal vital signs and fetal monitoring (Kourouma et al., 2020; WHO, 2018). Research demonstrates that comprehensive admission assessments can improve survival rates by up to 75%, yet practice remains inconsistent Tolu et al., 2020). For example, the WHO's Safe Childbirth Checklist pilot revealed that in India, only 54% of midwives consistently checked maternal blood pressure, while in Kenya, fewer than 40% assessed fetal heart rate (WHO, 2019; Perry et al., 2017). These gaps are often linked to workload pressures and the absence of standardised protocols, which compromise the quality of care at the very first point of contact(Kourouma et al., 2020).

Regionally, in Sub-Saharan Africa, the challenges are even more pronounced. Studies show that fewer than half of midwives can accurately interpret clinical findings during labour, undermining early risk detection. In Malawi, only 41% correctly

interpreted maternal vital signs, while in Uganda and Tanzania, incomplete admission assessments were directly associated with delays in care. Emergency preparedness also reveals significant weaknesses: in Tanzania, fewer than 30% of midwives routinely checked emergency equipment functionality, and in Benin, only 25% demonstrated adequate knowledge of obstructed labour management. Furthermore, supportive practices such as allowing birth companions—proven to enhance maternal comfort and reduce adverse outcomes—are inconsistently applied, reflecting systemic gaps in both training and institutional support.

At the national level in Uganda, many midwives lack confidence in interpreting clinical findings, which leads to superficial or inconsistent assessments. This lack of confidence contributes to delays in care and increases the risk of adverse maternal and neonatal outcomes. Maleta et al. (2024) emphasise that inadequate admission assessments remain a critical barrier to timely interventions, highlighting the urgent need for strengthened training and standardised protocols.

Finally, at the Regional Referral Hospital in Central Uganda, the challenges are magnified by heavy patient loads. Midwives often struggle to balance thorough biomedical assessments with the demands of urgent care, resulting in compromised risk detection and incomplete admission evaluations. The combination of understaffing, high patient volumes, and limited resources underscores the systemic pressures that midwives face, ultimately affecting the quality of maternal and newborn care at this crucial stage of admission.

Just Before Pushing: Preparation and Support During Labour

Globally, midwives' preparedness before delivery is inconsistent. While most acknowledge the importance of readiness, fewer demonstrate mastery of specific tasks. For example, in Indonesia, only 35% of midwives reported routinely preparing emergency equipment before delivery (WHO, 2019). In Pakistan, fewer than 40% ensured equipment readiness, and only 35% routinely prepared for complications such as pre-eclampsia (WHO, 2016). Similarly, Osman et al. (2024) found that although 81.7% of midwives recognised the importance of emergency planning, only 20% routinely monitored maternal temperature every four hours, and just 20.5% actively encouraged maternal involvement during labour—a practice associated with improved outcomes and maternal satisfaction (Geller et al., 2017; Namwaya et al., 2020).

In Sub-Saharan Africa, practice gaps are evident in emergency preparedness and maternal support. In Tanzania, fewer than 30% of midwives routinely checked emergency equipment functionality, while in Benin, only 25% demonstrated adequate knowledge of obstructed labour management (Mbaruku et al., 2019; Kakoma et al., 2018). Weak multidisciplinary collaboration and understaffing further limit effective preparedness. Supporting activities such as allowing a birth companion are inconsistently practised, despite evidence that companionship enhances maternal comfort and reduces adverse outcomes (Bohren et al., 2017; WHO, 2018).

In Uganda, midwives' preparedness before pushing remains constrained. Osman et al. (2024) reported that only 54% of midwives knew the correct preparation and dosage of magnesium sulphate for pre-eclampsia, and approximately 70% lacked sufficient knowledge of obstructed labour management, including timely recognition and referral.

Supporting activities such as maternal involvement and emotional reassurance are inconsistently practised, despite their association with improved labour progression (Namwaya et al., 2020).

At the regional referral hospital in Central Uganda, midwives face heavy patient loads and limited resources, which compromise emergency preparedness. Equipment readiness checks are often incomplete, and protocols for maternal support are inconsistently applied (Kirumira et al., 2020; Nakanwagi et al., 2019). In emergencies, midwives are expected to promptly communicate critical information—such as maternal vital signs, fetal status, and interventions performed—but documentation and reporting remain weak (Kourouma et al., 2020; Osman et al., 2024).

Immediately After Delivery: Newborn and Maternal Care

Globally, postpartum care is recognised as a critical component of maternal and neonatal survival, yet midwives' practices remain inconsistent. The WHO (2016) recommends that all birth attendants be trained in neonatal resuscitation, airway management, and Apgar scoring. However, adherence is variable. In Pakistan, only 42% of midwives knew the correct ventilation rate for newborn resuscitation, while in India, fewer than 50% correctly positioned the newborn's head to open the airway (WHO, 2016). In Bangladesh, only 46% of midwives practised correct resuscitation steps, with delays in airway clearance and ventilation (WHO, 2018). These gaps compromise timely intervention and increase risks of hypoxic-ischemic injury.

In Sub-Saharan Africa, practice gaps after delivery are widespread. Moyer et al. (2019) reported that only 60–70% of health workers across the region were trained in basic neonatal resuscitation, and adherence to protocols was inconsistent. In Malawi,

fewer than 40% of midwives routinely recorded Apgar scores, while in Tanzania, only 45% adhered to recommended thermal protection practices such as delayed bathing (Moller et al., 2023). Negussie et al. (2018) found that 66.5% of midwives routinely suctioned every newborn, but 31.6% did so selectively, and some delayed intervention, compromising neonatal outcomes.

In Uganda, midwives' immediate postpartum practices remain constrained by limited training and supervision. Namwaya et al. (2020) found that while 75.4% of midwives recognized the need to resuscitate a newborn who did not cry at birth, only 62.1% correctly identified airway positioning, and just 34.2% knew the recommended ventilation rate of 40–60 breaths per minute. Mugisha et al. (2020) reported that approximately 65% of midwives performed Apgar scoring at 1 and 5 minutes postpartum, but only 40% correctly interpreted the scores to guide interventions. Thermal protection practices were inconsistent, with fewer than half of midwives adhering to delayed bathing protocols (Negussie et al., 2018).

At the regional referral hospital in Central Uganda, practice gaps after delivery are magnified by workload and resource constraints. Midwives often delay suctioning or inconsistently check neonatal breathing during drying, risking hypothermia and respiratory distress (Negussie et al., 2018). Neonatal resuscitation practices remain variable, with inadequate simulation-based training contributing to poor adherence to airway positioning and ventilation protocols (Namwaya et al., 2020). Apgar scoring is inconsistently performed and poorly interpreted, limiting effective monitoring and follow-up care (Mugisha et al., 2020). These deficiencies highlight the urgent need for

refresher training, simulation drills, and dissemination of evidence-based guidelines (WHO, 2016; Kassa et al., 2019).

Just Before Discharge: Postpartum Counselling and Education

Globally, discharge counselling is recognised as a critical step in ensuring safe maternal and newborn care. The WHO (2018) emphasises that midwives should provide comprehensive education on breastfeeding, immunisations, hygiene, and neonatal danger signs before discharge. However, adherence remains inconsistent. In Bangladesh, only 38% of midwives provided comprehensive counselling on newborn danger signs, while in Tanzania, fewer than 45% consistently educated mothers on breastfeeding and hygiene (WHO, 2018). A global review found that fewer than one-third of midwives could correctly identify four or more of the eleven key neonatal danger signs, including poor suckling, breathing difficulties, fever, jaundice, lethargy, and convulsions (Negussie et al., 2018). These gaps delay care-seeking and increase risks of preventable neonatal morbidity and mortality.

In Sub-Saharan Africa, discharge practices remain weak, with significant deficiencies in counselling and education. Negussie et al. (2018) reported that only 40.2% of midwives consistently provided comprehensive birth plan counselling, and just 35.7% adhered to standardized discharge checklists. Knowledge of neonatal danger signs was limited: 59.6% recognized poor suckling, 51.1% identified breathing difficulties, 36.4% were aware of fever and jaundice, 25.7% recognized lethargy, and only 18.8% identified convulsions. Similarly, knowledge of essential newborn care practices was incomplete. While 79.4% understood the benefits of colostrum, only 20.6% were aware of its role in infection prevention. Proper umbilical cord care was accurately described by only 36.4%

of midwives, and fewer than 20% emphasized infection prevention strategies such as hand hygiene and cord care for low-birthweight infants (Negussie et al., 2018; WHO, 2018).

In Uganda, midwives' discharge practices reflect similar gaps. The Uganda Demographic and Health Survey (UDHS, 2021) reported that fewer than half of midwives provided adequate postpartum counselling on breastfeeding, family planning, and recognition of neonatal danger signs. Namwaya et al. (2020) found that only 35% of midwives consistently adhered to standardised discharge protocols, and fewer than one-third could correctly identify multiple neonatal danger signs. These deficiencies limit mothers' preparedness for newborn care at home and delay timely care-seeking.

At the regional referral hospital in Central Uganda, discharge counselling is often superficial due to high patient volumes and limited workforce capacity. Midwives frequently omit comprehensive education on neonatal danger signs, with poor emphasis on infection prevention and cord care (Kirumira et al., 2020; Nakanwagi et al., 2019). Structured discharge checklists are inconsistently applied, and counselling on family planning and follow-up visits is limited. These gaps reduce mothers' ability to recognise complications early, increasing risks of preventable neonatal morbidity and mortality.
Midwives' Practices of Safe Essential Maternal and Newborn Care: A Global, Regional, and National Challenge

Safe essential maternal and newborn care is directly shaped by the practices midwives perform during admission, just before pushing (labour), immediately after delivery, and just before the discharge period. These practices—ranging from biomedical

assessments to supportive care—are critical for early detection of complications and timely interventions that reduce maternal and neonatal morbidity and mortality.

Globally, midwives' practices often fall short of recommended standards. Studies show that fewer than 60% consistently conduct comprehensive admission assessments, including monitoring maternal vital signs, documenting obstetric history, and screening for danger signs in both mother and fetus (Achola et al., 2022; Maleta et al., 2024). Incomplete assessments delay recognition of complications such as fetal distress and postpartum haemorrhage, undermining safe care. Intrapartum monitoring practices are also inconsistent, with irregular fetal heart rate checks contributing to late responses to distress. These gaps highlight how midwives' actual practices—rather than knowledge alone—directly affect outcomes (WHO, 2017).

In Sub-Saharan Africa, practice gaps are more pronounced. Midwives frequently encounter challenges in emergency preparedness, with many facilities lacking functional obstetric and newborn emergency equipment. This limits their ability to respond effectively to complications such as obstructed labour or neonatal asphyxia (Goudar et al., 2017; WHO, 2017). Inconsistent intrapartum monitoring is common, and delayed recognition of fetal distress is strongly associated with adverse neonatal outcomes. Supportive care practices—such as emotional reassurance, respectful communication, and involving women in decision-making—are inconsistently provided, despite evidence linking them to improved maternal satisfaction and birth outcomes (Maleta et al., 2024). These deficiencies reflect systemic barriers, including resource limitations and high workloads, which compromise midwives' ability to consistently apply safe practices.

At the national level, Uganda reflects similar challenges. Evidence indicates that only 55–60% of midwives routinely conduct comprehensive labour assessments, including regular monitoring of maternal vital signs and screening for danger signs (Kiggundu et al., 2019; Mugisha et al., 2020). Documentation of findings is often incomplete, undermining continuity of care. Critical practices such as neonatal resuscitation and emergency response are inconsistently performed, reflecting limited competence and confidence among midwives (Negussie et al., 2018). Postnatal practices are also weak: discharge counselling on maternal and newborn danger signs is inconsistently delivered, leaving families poorly prepared to recognise complications and seek timely care (Kiggundu et al., 2019).

At regional referral hospitals in Central Uganda, practice gaps persist despite the availability of specialized services. Evidence shows that only half of midwives consistently perform comprehensive admission assessments, while emergency equipment and supplies remain inconsistently available (Kato et al., 2018; Nabunya et al., 2020). Documentation practices are frequently incomplete, undermining decision-making and continuity of care. Discharge counselling is rarely systematic, leaving caregivers inadequately prepared to manage newborn care or recognise danger signs. These lapses in practice—admission assessments, intrapartum monitoring, emergency preparedness, documentation, and discharge counselling—collectively compromise the safety and effectiveness of maternal and newborn care in referral-level facilities.

In conclusion, midwives' actual practices—rather than theoretical knowledge—are the decisive factor in ensuring safe, essential maternal and newborn care. Across global, regional, and national contexts, inconsistent admission assessments, weak

intrapartum monitoring, inadequate emergency preparedness, poor documentation, and insufficient discharge counselling continue to undermine maternal and neonatal survival. Strengthening midwives' adherence to evidence-based practices is therefore critical to improving outcomes.

Midwives' Practices Across the Four WHO-SCC Pause Points: Global and Sub-Saharan Perspectives

Globally, midwives' practices according to recommended protocols and WHO guidelines are central to safe maternal and newborn care, yet persistent gaps remain across the four WHO-SCC pause points.

Midwives ' Practices Upon Admission: Global Perspective

Midwives' practices upon admission are a critical determinant of safe, essential maternal and newborn care, as this stage provides the first opportunity to identify risks and initiate timely interventions. Guided by the WHO-SCC pause point framework, the literature reveals that while midwives' knowledge of admission protocols is widespread, translating this knowledge into consistent practice remains a significant barrier across global, regional, national, and hospital contexts.

Global Perspective

Globally, midwives are expected to conduct comprehensive admission assessments, including evaluation of maternal vital signs, obstetric history, and fetal well-being. However, evidence shows that fewer than 60% consistently adhere to these protocols (Achola et al., 2022; Maleta et al., 2024). Delays in recognizing complications such as haemorrhage or fetal distress often result in adverse outcomes, including neonatal mortality. Continuous professional development has been shown to improve diagnostic

accuracy, with trained midwives demonstrating a 20% reduction in missed risk factors (Negussie et al., 2018). This highlights the interlinkage between knowledge and practice: while midwives may know the recommended procedures, systemic barriers such as workload, limited equipment, and weak institutional support prevent consistent application (WHO, 2017).

Sub-Saharan Africa Perspective

In Sub-Saharan Africa, the knowledge–practice gap is more pronounced. Studies reveal that fewer than half of midwives can accurately interpret clinical findings during labour, undermining early risk detection (Mukisa et al., 2020; Tolu et al., 2020). In Malawi, only 41% correctly interpreted maternal vital signs, while in Uganda and Tanzania, incomplete admission assessments were linked to delays in care (Moller et al., 2023). These findings demonstrate that midwives often possess theoretical knowledge but lack confidence or practical skill application. Emergency preparedness further illustrates this barrier: although midwives know the steps for managing obstructed labour, only 25% in Benin demonstrated adequate competence (Mbaruku et al., 2019). Thus, knowledge without consistent practice adherence remains a central challenge in the region.

National Perspective: Uganda

At the national level, Ugandan midwives demonstrate awareness of admission protocols, yet practice remains inconsistent. Evidence indicates that only 55–60% routinely conduct comprehensive labour assessments, including monitoring maternal vital signs and screening for danger signs (Kiggundu et al., 2019; Mugisha et al., 2020). Documentation of findings is often incomplete, undermining continuity of care and clinical decision-making. Inadequate or superficial assessments frequently lead to delays

in care, increasing risks of adverse maternal and neonatal outcomes (Maleta et al., 2024). Limited confidence in neonatal resuscitation further illustrates the knowledge–practice barrier, as midwives may know the procedures but hesitate or perform them incorrectly, delaying life-saving interventions (Negussie et al., 2018).

Regional Referral Hospital, Central Uganda

At the referral hospital level, knowledge is often higher due to specialised training, yet practice gaps persist. Evidence shows that only half of midwives consistently perform comprehensive admission assessments, despite knowing the protocols (Kato et al., 2018; Nabunya et al., 2020). Heavy patient loads and resource constraints prevent midwives from applying their knowledge fully, leading to incomplete risk detection. Documentation is another example: midwives understand its importance but frequently fail to complete records, undermining decision-making. Discharge counselling illustrates the same barrier—midwives know the recommended counselling points, yet only a minority consistently provide systematic education to mothers and companions (Nabunya et al., 2020). These findings underscore how systemic pressures interlink knowledge and practice, creating barriers to adherence even in specialised facilities.

Midwives' Practices Before Pushing: Global, Sub-Saharan, National, and Regional Referral Hospital Perspectives

The period immediately preceding the pushing phase or caesarean section is critical for ensuring maternal and fetal safety. Midwives' practices during this stage—emergency preparedness, continuous monitoring, supportive care, and timely escalation—directly influence labour outcomes. Using the WHO-SCC pause point as a guiding framework, the literature highlights how knowledge and practice interlink, and

how barriers to adherence manifest across global, regional, national, and hospital contexts.

Global Perspective

Globally, midwives are expected to verify the availability and functionality of essential resources such as resuscitation equipment, sterile gloves, oxytocin, magnesium sulfate, and emergency supplies before labour progresses. Yet, studies indicate that only 60–70% of facilities in low-resource settings are consistently fully equipped for obstetric emergencies, leading to delays in critical interventions (Goudar et al., 2017; WHO, 2017). Rigorous monitoring of fetal heart rate, uterine contractions, and maternal blood pressure at recommended intervals is also emphasised, but adherence remains inconsistent. Evidence shows that midwives who strictly follow monitoring protocols are 30% more likely to detect fetal distress early, enabling timely interventions that prevent adverse outcomes (Namagembe et al., 2022). Despite widespread knowledge of these protocols, systemic barriers such as resource shortages and high workloads limit practice adherence.

Sub-Saharan Africa Perspective

In Sub-Saharan Africa, practice gaps are compounded by weak emergency preparedness and inconsistent intrapartum monitoring. Studies reveal that while midwives understand the importance of resource readiness, only a minority consistently check emergency equipment functionality, undermining timely responses to complications (WHO, 2017). Continuous fetal monitoring is often irregular, contributing to delayed recognition of distress and adverse neonatal outcomes. Supportive care practices—such as emotional reassurance, respectful communication, and pain

management—are inconsistently provided, despite evidence that 85% of women receiving consistent emotional support experienced fewer complications and higher satisfaction (Maleta et al., 2024). This demonstrates how knowledge of supportive care exists but is not consistently translated into practice, largely due to workload pressures and limited institutional emphasis on psychosocial support.

National Perspective: Uganda

At the national level, Ugandan midwives adhere to protocols emphasising emergency preparedness, continuous monitoring, and community engagement. However, practice remains uneven. Evidence shows that while midwives are trained to conduct rigorous monitoring and provide supportive care, only about 68% consistently implement pain relief protocols, and fewer than 60% adhere to strict monitoring intervals (Goudar et al., 2017; Namagembe et al., 2022). Education of birth companions is a critical practice, with studies demonstrating that when partners are trained to recognize danger signs, there is a 30% increase in timely help-seeking and emergency response (Namagembe et al., 2022). Yet, companion education is inconsistently delivered, reflecting a gap between knowledge and practice (Namagembe et al., 2022).

Regional Referral Hospital, Central Uganda

At the referral hospital level, midwives often have higher knowledge due to specialised training, but practice gaps persist. Heavy patient loads compromise thorough monitoring, with evidence showing that only half of midwives consistently perform comprehensive intrapartum assessments (Kato et al., 2018; Nabunya et al., 2020). Emergency preparedness protocols, including routine equipment checks and mock drills, are not consistently implemented, despite being part of national guidelines (Ministry of

Health Uganda, 2016). Supportive care practices, such as emotional reassurance and systematic companion education, are inconsistently applied, leaving families inadequately prepared to recognise and respond to danger signs. These findings highlight how systemic pressures—workload, resource limitations, and weak institutional support—interlink knowledge and practice, creating barriers to adherence even in specialised facilities.

Across global, regional, national, and hospital contexts, midwives' practices before pushing or caesarean section reveal a consistent knowledge–practice gap. Midwives often know the recommended protocols for emergency preparedness, monitoring, supportive care, and escalation, but systemic barriers prevent consistent application. This interlinkage between knowledge and practice underscores that improving maternal and newborn outcomes requires not only training but also structural support to enable midwives to translate knowledge into practice.

Midwives' Practices Immediately After Birth: Global, Sub-Saharan, National, and Regional Referral Hospital Perspectives

The immediate postpartum period is a critical stage for both maternal and neonatal survival. Midwives' practices during this pause point—resuscitation, risk assessment, and emergency detection—directly determine outcomes. Using the WHO-SCC pause point framework as a guide, the literature highlights how knowledge and practice interlink, and how barriers to adherence manifest across global, regional, national, and hospital contexts.

Global Perspective

Globally, postpartum care standards emphasise immediate newborn resuscitation, accurate Apgar scoring, and early detection of maternal complications. The World Health Organization recommends that all birth attendants, including midwives, be trained in neonatal resuscitation techniques such as airway management and ventilation, and perform Apgar scoring at 1 and 5 minutes (WHO, 2016). Despite widespread knowledge of these protocols, practice remains inconsistent. Studies show that only about 60–70% of health workers worldwide are trained in basic neonatal resuscitation, and adherence to protocols is uneven, contributing to preventable neonatal deaths (Moyer et al., 2019; WHO, 2017). This demonstrates how knowledge is present but inconsistently applied in practice, often due to systemic barriers such as inadequate training, reinforcement and resource shortages.

Sub-Saharan Africa Perspective

In Sub-Saharan Africa, midwives' practices immediately after birth reveal significant gaps. Although many midwives are aware of recommended resuscitation protocols, only a fraction consistently apply them. Evidence shows that adherence to neonatal resuscitation procedures is inconsistent, with fewer than 70% of midwives demonstrating correct application of airway clearance and ventilation techniques (WHO, 2017). Inconsistent Apgar scoring and poor interpretation of results further delay lifesaving interventions, particularly in cases of birth asphyxia. Early detection of maternal risks such as postpartum haemorrhage and sepsis is also hindered by resource limitations and weak training reinforcement. These findings highlight how knowledge

without consistent practice adherence undermines maternal and neonatal survival in the region.

National Perspective: Uganda

In Uganda, midwives are responsible for immediate newborn resuscitation, Apgar assessment, and maternal risk detection. Evidence indicates that while 70% of midwives are trained in neonatal resuscitation, only 58% adhere to correct procedures during actual resuscitation efforts, such as airway clearance and ventilation (Negussie et al., 2018; Osman et al., 2024). Approximately 65% of midwives perform Apgar scoring at 1 and 5 minutes postpartum, but only 40% correctly interpret the scores to guide interventions, delaying lifesaving actions in cases of birth asphyxia (Mugisha et al., 2020). Early detection of risks such as postpartum haemorrhage and maternal sepsis is inconsistent, with only 55% of midwives regularly conducting comprehensive risk assessments immediately after delivery (Ministry of Health Uganda, 2018; WHO, 2017). Neonatal mortality in Uganda remains high at about 27 per 1,000 live births, with many deaths attributable to delayed recognition and management of asphyxia and other emergencies (Uganda Demographic and Health Survey, 2021).

Regional Referral Hospital, Central Uganda

At the referral hospital level, midwives often have higher knowledge due to specialised training, yet practice gaps persist. Evidence shows that while midwives are trained in neonatal resuscitation, adherence to correct procedures remains inconsistent, with fewer than 60% demonstrating confidence in managing postpartum haemorrhage (WHO, 2017; Nabunya et al., 2020). Documentation practices are frequently incomplete, undermining continuity of care and decision-making. Discharge counselling on newborn

danger signs is rarely systematic, leaving caregivers inadequately prepared to recognise complications. These findings underscore how systemic pressures, workload, resource limitations, and weak institutional support interlink knowledge and practice, creating barriers to adherence even in specialised facilities.

Across global, regional, national, and hospital contexts, midwives' practices immediately after birth reveal a consistent knowledge–practice gap. Midwives often know the recommended protocols for neonatal resuscitation, Apgar scoring, and risk detection, but systemic barriers prevent consistent application. This interlinkage between knowledge and practice underscores that improving maternal and newborn outcomes requires not only training but also structural support to enable midwives to translate knowledge into practice.

Midwives' Practices Before Discharge: Global, Sub-Saharan, National, and Regional Referral Hospital Perspectives

The discharge phase is a critical pause point in maternal and newborn care, as it provides the final opportunity for midwives to reinforce safe practices and empower families to recognise danger signs. Discharge protocols are clearly outlined in WHO standards and Uganda's Essential Maternal and Newborn Clinical Care Guidelines (Uganda Ministry of Health, 2022). These protocols include:

- Maternal counselling on postpartum danger signs (e.g., heavy bleeding, severe headache, fever, convulsions).
- Newborn counselling on danger signs (e.g., poor feeding, difficulty breathing, fever, hypothermia, convulsions).
- Breastfeeding support and education on hygiene and nutrition.

- Documentation of counselling provided, clinical findings, and follow-up instructions.
- Referral and follow-up plans, including community health worker engagement and scheduled postnatal visits.

Despite these clear guidelines, evidence shows variability in what is done well and what is not consistently implemented across different settings.

Global Perspective

Globally, midwives demonstrate strong knowledge of discharge protocols, but practice adherence is uneven. Studies report that 81.6% of midwives regularly counsel mothers on newborn care and danger signs, yet only 45% can correctly identify all key neonatal danger signs (Maleta et al., 2024; Negussie et al., 2018). This gap contributes to delays in care-seeking and increased neonatal mortality. Documentation of discharge counselling is also inconsistently applied, with fewer than half of facilities systematically recording counselling sessions (WHO, 2018). Thus, while counselling is widely practised, the accuracy and completeness of information provided remain weak.

Sub-Saharan Africa Perspective

In Sub-Saharan Africa, discharge counselling is compromised by systemic barriers. A multi-country study found that while midwives routinely provide basic counselling on breastfeeding and hygiene, only 52% consistently counsel mothers on neonatal danger signs, and fewer than 40% document counselling sessions (Kassahun et al., 2020; Moller et al., 2023). Staffing shortages and high patient loads limit the time available for comprehensive education, while weak documentation undermines continuity of care. These findings highlight that although midwives know the protocols, practice is

constrained by systemic challenges, leaving mothers inadequately prepared to recognise complications.

National Perspective: Uganda

In Uganda, national guidelines emphasise structured discharge counselling and documentation (Uganda Ministry of Health, 2022). However, studies reveal significant gaps in practice. Evidence shows that while 70% of midwives provide some form of discharge counselling, only 55% consistently cover all maternal and neonatal danger signs (Kiggundu et al., 2019). Documentation is inconsistently applied, with fewer than 50% of facilities recording discharge counselling sessions (Nabukenya et al., 2020). Resource shortages and inadequate training further compromise the quality of counselling, leaving mothers poorly equipped to seek timely care.

Regional Referral Hospital, Central Uganda

At referral hospitals in Central Uganda, midwives often have higher knowledge due to specialised training, yet practice gaps persist. Evidence shows that while 65% of midwives provide discharge counselling, only 40% deliver comprehensive education covering both maternal and neonatal danger signs (Nabukenya et al., 2020). Documentation practices are frequently incomplete, undermining continuity of care and follow-up. Heavy patient loads and limited time further constrain midwives' ability to provide thorough counselling. These findings underscore how systemic pressures interlink knowledge and practice, creating barriers to adherence even in specialised facilities.

Midwives' Knowledge and Practices Across the Four WHO-SCC Pause Points

This study was guided by two objectives: to assess midwives' knowledge and to determine midwives' practices of safe essential maternal and newborn care, using the WHO Safe Childbirth Checklist (WHO-SCC) pause points as a moderating framework. The integrated analysis across admission, before pushing, immediately after birth, and before discharge demonstrates that while midwives generally possess adequate knowledge of recommended protocols, consistent practice adherence is undermined by systemic barriers.

Upon admission, midwives know the importance of comprehensive assessments, yet practice is weakened by incomplete evaluations, poor documentation, and workload pressures. Before pushing, knowledge of emergency preparedness and monitoring protocols is widespread, but practice is compromised by inadequate equipment, staffing shortages, and inconsistent supportive care. Immediately after birth, midwives are trained in neonatal resuscitation and Apgar scoring, but practice gaps persist due to limited confidence, poor interpretation, and resource constraints. Before discharge, midwives understand the importance of counselling mothers and families, yet counselling is inconsistently delivered, and documentation is weak.

Expected Outcome as Dependent Variable

The expected outcome of adherence to safe essential maternal and newborn care practices is improved maternal and neonatal survival and reduced morbidity. When midwives consistently apply their knowledge across the four pause points, outcomes such as early risk detection, timely emergency response, effective neonatal resuscitation, and comprehensive counselling are achieved. Conversely, the knowledge–practice gap

undermines these outcomes, perpetuating preventable complications such as postpartum haemorrhage, birth asphyxia, sepsis, and delayed care-seeking.

Integrated Analytical Insight

For the study objectives, the literature consistently demonstrates that knowledge alone is insufficient without examining how practice is enacted. Midwives' knowledge provides the foundation, but practice is shaped by contextual realities such as staffing shortages, resource limitations, weak supervision, and workload pressures that either enable or constrain adherence. Across all four WHO-SCC pause points, the evidence reveals a recurring knowledge–practice gap: midwives often know the recommended protocols but face challenges in consistently applying them.

In summary, strengthening midwives' practices requires bridging this divide. Continuous professional development, improved emergency preparedness, strengthened documentation, and structural reforms to reduce workload pressures are essential. The WHO-SCC framework provides a practical lens for identifying these gaps, but sustainable improvements in maternal and neonatal outcomes—the dependent variable—will depend on enabling midwives to consistently translate knowledge into practice across all stages of care.

Implementation of the KAP Model in This Study

Building on the reviewed literature on safe maternal and newborn care, this study adopted the Knowledge–Practice (KAP) model as its guiding analytical framework. The choice of this model was deliberate, as it provides a structured approach for examining how midwives' knowledge translates into clinical practice, while also revealing systemic barriers that hinder this progression. Although the full KAP model traditionally includes

attitudes, the present study focused exclusively on knowledge and practice, in line with its objectives to assess midwives' competencies in maternal and newborn care at a regional referral hospital in Central Uganda.

Conceptual Foundation

The Knowledge–Practice (KAP) model provided the analytical framework for this study, focusing exclusively on knowledge and practice as the study objectives. The model assumes that knowledge informs behaviour, yet evidence shows that adequate knowledge alone does not guarantee consistent practice. Systemic barriers such as high workloads, limited supervision, resource shortages, and inadequate training often mediate the translation of knowledge into practice (Laufer & Midlarsky, 2010; Launiala & Kulicek, 2020; Gama et al., 2024). This makes the model particularly relevant for maternal and newborn health research, where gaps between what providers know and what they do in practice remain a persistent challenge.

Global and Regional Applications

Globally, the KAP model has been widely applied to assess healthcare providers' competencies in maternal and newborn care, consistently revealing discrepancies between knowledge and practice. For example, studies in Asia and Africa have shown that while providers often demonstrate adequate knowledge of obstetric danger signs, adherence to protocols such as infection prevention and neonatal resuscitation remains inconsistent (Launiala & Kulicek, 2020; Gama et al., 2024).

Regionally, in Sub-Saharan Africa, the KAP model has been used to evaluate midwives' competencies across the four critical stages of childbirth. In Nigeria, Okafor et al. (2020) applied the framework to assess midwives' knowledge and practice at

admission, before pushing, immediately after delivery, and before discharge. Their findings revealed that although 82% of midwives demonstrated adequate knowledge of maternal assessments, only 65% consistently identified early signs of complications, highlighting a significant knowledge–practice gap.

National Applications in Uganda

In Uganda, researchers have also employed the KAP framework to assess maternal and newborn care. For instance, Nampijja et al. (2024) conducted a cross-sectional study at a regional referral hospital in Southwestern Uganda, evaluating caregivers' knowledge and practices regarding newborn care. The study found that while 78% of respondents demonstrated adequate knowledge of essential newborn care, only 62% consistently practised infection prevention measures, underscoring the persistent gap between knowledge and practice.

Similarly, Waiswa et al. (2021) institutionalised a regional model for improving newborn care across hospitals in Eastern Uganda. Their findings demonstrated that structured interventions improved health worker knowledge and documentation practices, but gaps remained in consistent application of protocols such as intrapartum monitoring and discharge counselling. These Ugandan studies confirm that the KAP model has been used to evaluate maternal and newborn care, and they provide statistical evidence of the knowledge–practice gap within referral hospital contexts.

The Referral Hospital Context

At the referral-hospital level, systemic constraints are particularly pronounced. High patient volumes, resource shortages, and weak supervision exacerbate the knowledge–practice gap. For example, Nabunya et al. (2020) reported that midwives in

Ugandan referral hospitals often demonstrated adequate knowledge of obstetric danger signs but struggled with consistent documentation and discharge counselling. These findings highlight the importance of applying the KAP model to systematically capture both individual competencies and contextual barriers.

Application of the KAP Model in this Study

In line with the study objectives, the KAP framework was applied to assess midwives' knowledge and practice at the Regional Referral Hospital in Central Uganda.

- Knowledge Assessment: Structured questionnaires evaluated midwives' understanding of maternal and newborn care protocols, including recognition of obstetric danger signs, use of the partograph, infection prevention, neonatal resuscitation, and postpartum complication management.
- Practice Assessment: Self-reported practices and observational data measured adherence to the WHO Safe Childbirth Checklist (WHO-SCC) pause points, focusing on monitoring, documentation, emergency preparedness, and discharge counselling.

The KAP model was operationalised across the four critical stages of childbirth:

1. Upon Admission – initial maternal and fetal assessment; practice of vital sign monitoring and screening for intrapartum complications.
2. Before Pushing –Emergency preparedness, monitoring of labour progress and fetal presentation; practice of continuous monitoring and timely identification of abnormalities.

3. Immediately after Delivery – neonatal resuscitation and postpartum haemorrhage management; practice of APGAR scoring, infection prevention, and documentation.

4. Before Discharge – Discharge protocols, which include postpartum danger signs and neonatal infection prevention; practice of counselling, maternal assessment, newborn checks and follow-up advice.

This application ensured that the methodology was grounded in a framework capable of capturing both individual competencies and contextual constraints, thereby strengthening the study's capacity to generate actionable insights for improving maternal and newborn care in Uganda.

Integration of the WHO Safe Childbirth Checklist in the Study

The discussion of the KAP model naturally leads to the integration of the WHO Safe Childbirth Checklist (WHO-SCC), which served as a moderating framework in this study. While the KAP model provided the lens for assessing knowledge and practice, the WHO-SCC offered a structured benchmark for evaluating these competencies across the four critical pause points of childbirth.

The WHO-SCC is a structured quality-improvement tool designed to strengthen or reinforce consistent adherence to evidence-based practices at admission, before birth, immediately after birth, and before discharge (WHO, 2018). By embedding systematic reflection at these points, the checklist promotes consistency, accountability, and timely decision-making, thereby strengthening maternal and newborn care (WHO, 2018; Launiala & Kulicek, 2020).

Globally, the WHO-SCC has complemented the KAP model by translating providers' knowledge into observable clinical actions (Goudar et al., 2017). Evidence from diverse settings demonstrates that implementation of the checklist improves adherence to guidelines, enhances documentation, reduces omissions, and strengthens preparedness for obstetric and neonatal emergencies (Ojo et al., 2018; Mwangi et al., 2020). In Sub-Saharan Africa, pilot studies show that integrating the WHO-SCC into routine maternity care increases compliance with essential practices such as fetal monitoring, infection prevention, immediate newborn care, and postpartum assessment.

In Uganda, application of the WHO-SCC has facilitated systematic audits and strengthened accountability within maternity units, revealing gaps in intrapartum monitoring, documentation, emergency preparedness, and discharge counselling (Nabukenya et al., 2020; Ugandan Ministry of Health, 2021). When integrated with the KAP model, the WHO-SCC provides a robust framework for assessing midwives' knowledge and practices across the four critical points of care. At the referral hospital level, this integrated approach is particularly valuable for identifying both individual- and system-level barriers—such as inconsistent fetal monitoring, inadequate maternal education, and weak documentation—and for informing targeted quality improvement interventions.

Integrating the WHO-SCC into Midwifery Practice

The literature highlights the need for sustained investment in strengthening midwifery capacity through targeted education, structured assessment tools such as the WHO-SCC, and supportive supervision. Future research should evaluate the long-term effectiveness and sustainability of WHO-SCC–guided interventions in resource-limited

settings. At the policy level, institutionalizing the WHO-SCC as a quality improvement tool within national health systems through continuing professional development frameworks, alongside strengthened supervision and quality assurance mechanisms, is essential for sustaining improvements in maternal and newborn care outcomes.

Literature Review: Implications for Future Research and Policy

Education and Training

The literature consistently underscores the importance of targeted education and training in strengthening midwifery capacity. Studies highlight that structured curricula, competency-based learning, and continuous professional development are essential for equipping midwives with the skills required to deliver safe and effective maternal care. Evidence suggests that investment in education not only improves clinical outcomes but also enhances professional confidence and retention within the workforce. However, gaps remain in ensuring equitable access to training opportunities, particularly in resource-limited settings where midwives often face systemic barriers to skill acquisition and career progression.

Assessment Tools

Structured assessment tools, most notably the World Health Organisation's Safe Childbirth Checklist (WHO-SCC), have emerged as pivotal instruments for standardising maternal care practices. Research demonstrates that the WHO-SCC, as a reminder tool, can reduce variability in clinical decision-making and improve adherence to evidence-based protocols. By providing a systematic framework, the checklist facilitates consistency in care delivery and helps identify preventable complications during childbirth. Nonetheless, scholars caution that the effectiveness of such tools depends on

contextual adaptation, integration into routine workflows, and sustained use over time. Further research is needed to evaluate the long-term impact of WHO-SCC implementation, particularly in low-resource environments where infrastructural and staffing challenges may impede reliability or fidelity.

Supervision and Support

Supportive supervision is widely recognised as a critical factor in reinforcing adherence to clinical guidelines and fostering professional growth among midwives. The literature highlights that regular mentorship, peer support, and supervisory feedback can enhance both technical competence and morale. Supervision also plays a role in accountability, ensuring that structured tools like the WHO-SCC are consistently applied in practice. However, studies point to persistent challenges in supervision systems, including limited supervisory capacity, inadequate resources, and fragmented quality assurance mechanisms. Strengthening supervisory structures is therefore essential for sustaining improvements in maternal and newborn care outcomes.

Policy Integration

At the policy level, scholars advocate for institutionalizing the WHO-SCC within national health systems. Embedding the checklist into maternal health guidelines and continuing professional development frameworks ensures that its use becomes routine rather than optional. Policy reforms should also prioritise strengthened supervision and quality assurance mechanisms to safeguard fidelity of implementation. Moreover, sustained investment in training, monitoring, and evaluation is necessary to prevent checklist adoption from becoming a one-off initiative. Equity considerations are

particularly important, as policies must ensure that underserved regions—where maternal and newborn mortality rates are highest—receive adequate support for implementation.

Synthesis and Future Directions

Taken together, the literature points toward a dual agenda. On the one hand, empirical research must advance to establish the long-term effectiveness, sustainability, and cost-effectiveness of WHO-SCC interventions across diverse contexts. On the other hand, policy reforms must institutionalise the checklist within national health systems through education, supervision, and accountability structures. This convergence of research and policy priorities positions the WHO-SCC not merely as a clinical tool but as a catalyst for systemic transformation in maternal health care delivery.

Summary of the Review of Literature

Chapter Two has critically reviewed global, regional, and national evidence on midwives' knowledge and practices of safe maternal and newborn care, highlighting persistent gaps that undermine adherence to evidence-based standards. The synthesis demonstrated that while frameworks such as the KAP model and the WHO-SCC provide structured approaches for bridging the knowledge–practice gap, systemic barriers—including inadequate training, resource constraints, weak supervision, and heavy workloads—continue to compromise care quality, particularly in low-resource settings such as Uganda (WHO, 2015; WHO, 2018; Polit & Beck, 2017; Hussein, Karanja, & Wanjiru, 2017).

Persistent practice gaps remain despite sustained efforts to improve outcomes. In Uganda, strengthening midwifery capacity through continuous education, supportive supervision, and structured tools such as the WHO-SCC is essential for reducing

preventable maternal and neonatal deaths. Evidence from referral hospitals demonstrates that integrating these frameworks into routine care enhances accountability, facilitates early identification of complications, and improves continuity of care. However, few studies in Uganda have comprehensively examined midwives' knowledge and practice using structured frameworks such as the KAP model and WHO-SCC. Existing research has largely focused on isolated aspects of maternal and newborn care, leaving a limited understanding of how systemic barriers interact with midwives' competencies to influence outcomes across the continuum of care.

This gap underscores the necessity of the present study, which applies the combined KAP–WHO-SCC framework to systematically assess midwives' knowledge and practices at referral-level facilities. By addressing this underexplored intersection, the study is positioned to generate context-specific insights that can inform targeted interventions, strengthen midwifery capacity, and guide evidence-based policy for improving maternal and newborn health in Uganda. Accordingly, the conclusion of this chapter provides the rationale for the methodological approach outlined in Chapter Three. The next chapter presents the research design, study population, sampling procedures, data collection methods, and analytical strategies employed to investigate midwives' knowledge and practices across the WHO-SCC pause points in Uganda's referral-level facilities.

Chapter Three: Methodology

This chapter outlines the methodology adopted to investigate midwives' knowledge and practices of safe maternal and newborn care. Guided by the conceptual framework presented in the literature review, which integrated the Knowledge–Attitude–Practice (KAP) model with the WHO Safe Childbirth Checklist (WHO-SCC), the research design was structured to ensure coherence between study objectives, data collection instruments, and analysis. The chapter is organised into the following sections: Study Design and Setting; Population and Sampling; Inclusion and Exclusion Criteria; Data Collection Process; Results of previous study. Validity, Reliability, Data Collection Management Plan and Analysis Plans; Ethical Approval and Ethical Considerations, Informed consent, Privacy, Confidentiality, Benefit, Incentive, Socio-Cultural Issues; and Conflict of Interest. Taken as a whole, these components establish the methodological rigour and contextual relevance necessary for generating credible evidence to inform quality improvement in maternal and newborn healthcare in a regional referral hospital in Central Uganda.

Study Design

This study adopted a quantitative descriptive cross-sectional design to assess midwives' knowledge and self-reported practices regarding safe maternal and newborn care at a single point in time. A cross-sectional design was appropriate because the objective was to describe characteristics of a population without establishing causal relationships, thereby providing a numerical snapshot of existing conditions (Polit & Beck, 2017).

Quantitative research emphasises the collection and analysis of numerical data using structured instruments and statistical techniques to objectively summarise phenomena (Polit & Beck, 2017). In this study, standardised questionnaires guided by the World Health Organisation's Safe Childbirth Checklist (WHO-SCC) were used to collect data on midwives' knowledge and practices.

The design was selected for its practicality, objectivity, and efficiency in generating quantifiable data within the available time and resource constraints. It enabled the concurrent assessment of knowledge levels and reported practice patterns, facilitating the identification of gaps and variations in adherence to recommended practices. The findings provided a baseline to inform future training, quality improvement initiatives, and further research.

Overall, the quantitative descriptive cross-sectional design effectively addressed the study's focus on describing "what is" concerning midwives' knowledge and practices in a regional referral hospital in central Uganda (Creswell, 2014; Cohen, Manion, & Morrison, 2018; Levin, 2006; Polit & Beck, 2012, 2017). While descriptive statistics are appropriate for summarising cross-sectional survey data, they are limited in scope. Specifically, they cannot establish causal relationships or explain underlying mechanisms; they only provide a snapshot of variables at a single point in time (Polit & Beck, 2017; Creswell & Creswell, 2018). Findings were therefore interpreted as indicative of patterns and distributions rather than evidence of causality, underscoring the need for cautious interpretation and highlighting opportunities for future research employing inferential or longitudinal designs.

Study Setting

The study was conducted at a regional referral hospital in central Uganda. The specific name of the hospital is withheld to uphold ethical standards and protect participant confidentiality. As a public, government-owned facility under the Uganda Ministry of Health, the hospital functions as the primary referral centre for maternal and newborn care in the region. It serves a large catchment population and receives referrals from surrounding health facilities, thereby providing a representative context for examining midwives' knowledge and practices.

The hospital has an optimal bed capacity of approximately 196 beds, which may increase during periods of high patient influx. It is staffed by a multidisciplinary workforce, including approximately 80 qualified midwives who provide continuous maternity services, alongside physicians, nurses, and allied health professionals. The hospital also serves as an internship training centre for medical interns as well as graduate interns in nursing and midwifery, thereby contributing to workforce development and professional capacity building in Uganda's health system.

The hospital comprises several specialized departments, including Obstetrics and Gynaecology, Pediatrics, Surgery, Internal Medicine, Anesthesiology, Orthopaedics, and Mental Health, supported by functional laboratory, radiology, and pathology units. The institution is headed by a physician specialist serving at the level of Executive Director, as prescribed by the Uganda Ministry of Health gazette.

Between 2023 and 2024, the hospital experienced notable challenges in maternal and newborn care, including postpartum haemorrhage, infections, neonatal respiratory complications, and increased admissions to the neonatal intensive care unit. These

contextual realities, combined with the availability of skilled midwives, internship training programs, and comprehensive maternity services, made the hospital an appropriate and relevant setting for assessing midwives' knowledge and practices related to safe maternal and newborn care (Ministry of Health, 2024; Regional Referral Hospital Administration Report, 2024). Given the hospital's role as a public referral centre, internship training site, and provider of comprehensive maternal and newborn services, the study population was drawn from midwives actively engaged in maternity care within this setting.

Study Population

The study population comprised midwives working in regional referral hospitals in central Uganda who were directly involved in the provision of safe maternal and newborn care. Specifically, the target population included midwives assigned to maternity, labour, and postnatal wards. These midwives were selected because of their frontline role in implementing evidence-based interventions and their central responsibility for ensuring safe childbirth and postnatal outcomes (Mwakawanga et al., 2023; Namutebi et al., 2023). Their professional responsibilities and clinical experience positioned them as key informants for assessing current knowledge levels and reported practice standards within the study setting (Abdu et al., 2019; Moridi et al., 2022)

Sampling method.

A convenience sampling strategy, a non-probability technique, was employed to recruit study participants. Midwives who were readily available and actively engaged in safe maternal and newborn care during the data collection period were included

(Mwakawanga et al., 2023; Namutebi et al., 2023). This approach was considered appropriate given the clinical setting, staffing schedules, and time constraints.

It is important to clarify that convenience sampling is distinct from consecutive sampling. Convenience sampling involves recruiting participants who are easily accessible at the time of data collection, without necessarily including all eligible individuals (Etikan et al., 2016). In contrast, consecutive sampling requires enrolling every eligible participant who is present during the study period until the desired sample size is reached (Sedgwick, 2013). In this study, convenience sampling was used because participation depended on midwives' availability within their clinical schedules, rather than enrolling all consecutive eligible individuals.

Although convenience sampling limits the generalizability of findings beyond the study site, it is widely recognised as suitable for descriptive studies conducted in specific contexts (Nikolopoulou, 2022). To minimise selection bias, the researcher sought to include all eligible midwives present during the data collection period. The limitations of this approach were acknowledged, and transparency was maintained in reporting. Having clarified the sampling strategy and its limitations, the study then proceeded to determine the appropriate sample size required to ensure representativeness and methodological rigour (Thewes, Rietjens, & Van den Berg, 2018; Polit & Beck, 2008). Consequently, the study involved all bedside midwives actively engaged in providing safe, essential maternal and newborn care at the time of data collection.

Sample size.

The sample size was determined using the Krejcie and Morgan (1970) sample size determination table. From a total population of 80 (N) midwives employed at the regional

referral hospital, a sample size (n) of 66 participants was calculated to achieve representativeness at a 95% confidence level with a 5% margin of error. This method was selected for its simplicity and suitability for relatively small populations, ensuring a balance between statistical precision and feasibility (Krejcie & Morgan, 1970).

Together, the sampling method and sample size determination ensured that the study achieved adequate representation of midwives while remaining feasible within the study context, thereby providing a solid foundation for subsequent data collection and analysis.

Table 1: The Krejcie and Morgan (1970)

Sample size (N)	Sample size (S)
60	52
65	56
70	59
75	63
80	**66**

Note: N is the population size, and S is the sample size (Krejcie & Morgan, 1970).

Inclusion Criteria:

Midwives were eligible to participate in the study if they met the following criteria:

- Employed full-time at the Regional Referral Hospital in Luweero District and directly involved in providing maternal and newborn care.
- Possessed valid professional registration and licensure to practice midwifery in Uganda.
- Were not on annual, maternity, or sick leave during the data collection period.
- Had at least one year of clinical experience in maternal and newborn care.

- Actively engaged in routine clinical responsibilities within maternity, labour, or postnatal wards.
- Had not participated in similar research within the preceding 12 months.

Provided informed consent and demonstrated willingness to comply with all study procedures.

Exclusion Criteria:

Midwives who were otherwise eligible but on maternity, sick, or extended leave during the data collection period were excluded from participation.

Data Collection Process

Data Collection Tool: Structured Questionnaire

A validated, structured questionnaire served as the primary data collection instrument. It was specifically developed to evaluate midwives' knowledge and self-reported practices concerning safe maternal and newborn care. The questionnaire focused on the four critical pause points as outlined in the WHO-SCC: Upon admission, just before pushing or caesarean delivery, immediately after birth and just before discharge. The self-administered questionnaire was written in clear, concise English to accommodate the literacy and professional level of the participants. It was organized into three key sections (A, B, and C).

Section A: Sociodemographic Characteristics of Participants

This section comprised eight closed-ended items (Questions 1–8) designed to capture essential sociodemographic variables of the participating midwives. These variables provided the contextual background necessary for interpreting their factual and

procedural knowledge of maternal and newborn care. Collecting such information was critical for situating the findings within the realities of the study population and ensuring that knowledge and practice patterns could be meaningfully understood.

In addition, the sociodemographic data facilitated potential subgroup analyses, thereby enhancing the depth and relevance of the study results. By examining variations across categories such as age, years of professional experience, level of training, and workplace setting, the study could identify patterns that might inform targeted interventions and policy recommendations.

Section B: Knowledge Assessment

This section comprises multiple-choice questions (MCQs) designed to evaluate whether midwives possessed the theoretical knowledge required to provide safe and essential maternal and newborn care in accordance with the World Health Organisation's Safe Childbirth Checklist (WHO-SCC). The items were structured to capture what midwives knew about safe childbirth and newborn care across the four WHO-SCC pause points.

Specifically, the questions assessed knowledge such as:

- The correct actions to be performed upon a mother's admission to the maternity ward.
- The rationale and components of active management of the third stage of labour (AMTSL).
- Key procedures for neonatal care immediately after birth and before discharge.

By focusing on these domains, the knowledge assessment provided insight into the extent to which midwives were theoretically prepared to implement evidence-based practices that reduce maternal and newborn morbidity and mortality.

Section C: Assessment of Self-Reported Practice

This section measured the self-reported frequency of safe maternal and newborn care practices among participating midwives. Practices were assessed using a structured 4-point ordinal scale adapted from validated tools employed in clinical settings and aligned with WHO guidelines (Dohbit et al., 2021; Varghese et al., 2019; WHO, 2016).

Each item was rated on a Likert-type scale ranging from 1 to 4, where:

- **1 = Never** (the practice is not performed),
- **2 = Partially done** (inconsistently or incompletely performed),
- **3 = Adequately done** (usually performed, meeting basic requirements), and
- **4 = Fully done according to protocol** (always performed according to established clinical standards) (Likert, 1932; Joshi et al., 2015).

This scaling allowed for systematic quantification of practice frequency, enabling comparisons across participants and facilitating subgroup analyses. The use of validated instruments ensured methodological rigour and strengthened the reliability of the findings (Likert, 1932; Joshi et al., 2015)

Self-reported practice was employed as a primary data collection method to obtain insight into midwives' perceived routines and behaviours. This approach involved administering questionnaires that prompted participants to reflect on their usual clinical actions, thereby providing valuable data on actual practice patterns. While self-reporting was influenced by recall or social desirability bias, the method remained useful for

identifying gaps between knowledge and routine care and for understanding the degree to which midwives adhered to clinical guidelines in real-world settings. Clarity in question phrasing and the use of specific, scenario-based examples enhanced the reliability of the collected data.

Sample items included:

- "How often do you complete full documentation of a mother's obstetric history upon admission?"
- "How often do you assess the mother and fetus just before pushing or surgery?"
- "How frequently do you practice AMTSL immediately after delivery?"
- "How often do you provide essential postnatal care before discharge?"

The responses provided insight into what midwives **do** in their routine care, reflecting the reported practices aligned with the WHO-SCC recommendations.

Item analysis.

Structure of the Questionnaire

The questionnaire consisted of three structured sections (A, B, and C), comprising closed-ended questions to facilitate ease of analysis and consistency of responses. The design of the instrument was aligned with the objectives of the study and the framework of the World Health Organization Safe Childbirth Checklist (WHO-SCC).

Section A: Sociodemographic Characteristics of Participants

This section of the questionnaire was designed to collect essential background information about the respondents. Understanding the demographic profile of the participating midwives enabled a more nuanced interpretation of the study findings and helped to explain variations in knowledge levels and self-reported practices.

The section comprised eight closed-ended items (Questions 1–7) that captured the following sociodemographic variables:

- Age
- Gender
- Highest educational qualification attained
- Years of experience in maternal and newborn care
- Participation in in-service training related to maternal or newborn care within the past two years
- Current department or unit of deployment

These variables were vital for contextualising midwives' reported knowledge and practices. They also supported subgroup analyses, enabling the identification of trends across different demographic categories, which could inform targeted interventions and policy recommendations.

Section B: Midwives' Knowledge Assessment of Safe Essential Maternal and Newborn Care (Questions 8–28)

Section B of the questionnaire was designed to evaluate midwives' knowledge of essential maternal and newborn care practices, structured around the four critical pause points outlined in the World Health Organization Safe Childbirth Checklist (WHO-SCC): **upon admission, just before pushing, immediately after birth, and before discharge**.

This section comprised 21 multiple-choice questions (Questions 8–28), each targeted at specific clinical actions recommended during these key moments in care. The items aimed to assess the midwives' cognitive thinking of appropriate procedures and

rationale for interventions that ensured safe and evidence-based care throughout the childbirth continuum.

Pause Point 1: Upon Admission (Items 8–13)

This section assessed midwives' knowledge regarding initial assessment and preparedness when a mother is admitted in labour. Topics included triage, appropriate use of antibiotics, key examination protocols, initiation of the partograph, and necessary supplies for safe delivery care. For example, midwives were expected to understand that partograph plotting begins once cervical dilation reaches 4 cm, and that fetal heart rate, contractions, and maternal pulse should be documented every 30 minutes, maternal temperature every two hours, and blood pressure every four hours (WHO, 2022). Additionally, appropriate administration of antihypertensive medications and magnesium sulphate is crucial when specific clinical indicators are present, such as a diastolic blood pressure ≥110 mmHg and proteinuria ≥+3 (WHO, 2022).

Pause Point 2: Just Before Pushing (Items 14–19)

Items in this subsection evaluated knowledge related to key assessments before the second stage of labour. Midwives were expected to understand the importance of confirming full cervical dilation and assessing fetal descent before allowing pushing to commence. Questions also tested knowledge on recognizing signs of complications (e.g., visual disturbances, epigastric pain) and the conditions under which magnesium sulphate was expected to be administered. Furthermore, midwives were expected to demonstrate awareness of the birth companion's role in labour support and in recognizing and reporting maternal complications, such as excessive bleeding, severe headache, and visual changes (WHO, 2022).

Pause Point 3: Immediately After Birth (Items 20–24)

This section evaluated midwives' knowledge of immediate postpartum care. For the mother, this included monitoring vital signs, assessing uterine tone, and evaluating the need for antibiotics, antihypertensives, or antiseizure medications. For the newborn, knowledge of essential practices, such as initiating breastfeeding within 30 minutes, conducting a full physical assessment, and implementing evidence-based cord and skin care, was examined (WHO, 2022). Midwives were also assessed on their understanding of postpartum haemorrhage surveillance and fluid balance monitoring for the mother.

Pause Point 4: Before Discharge (Items 25–28)

This final subsection examined midwives' knowledge of postnatal education and discharge protocols. Questions focused on the minimum period recommended facility stay (at least 24 hours), as well as key discharge instructions regarding maternal and newborn danger signs, follow-up schedules, and final clinical evaluations. Midwives must also be knowledgeable about counselling the mother and caretaker on newborn jaundice, feeding difficulties, infection risks, and maternal warning signs such as fever, abdominal pain, and hypertensive symptoms (WHO, 2022).

Measurement of Midwives' Knowledge

Each correct response was awarded a score of 1, while incorrect or missing responses were scored as 0. The total score was then converted into a percentage to represent the respondent's overall knowledge level. In line with the classification proposed by Aboul-Fotouh et al. (2022), knowledge levels were interpreted using distinct cutoff points:

Scoring and Interpretation

Each correct response was scored as 1, while incorrect or missing responses were scored as 0. The total score was converted to a percentage, representing the respondent's overall knowledge level. Following the classification proposed by Aboul-Fotouh et al. (2022), the knowledge levels were interpreted as follows:

- 85%–100% = Excellent: Demonstrates comprehensive mastery of safe maternal and newborn care protocols, reflecting readiness to consistently apply evidence-based standards.
- 75%–84.9% = Very Good: Indicates strong knowledge with only minor gaps, suggesting the ability to deliver care effectively with limited need for reinforcement.
- 65%–74.9% = Good: Reflects adequate knowledge of essential practices, though some inconsistencies may exist that require targeted improvement.
- 60%–64.9% = Fair: Shows partial understanding of protocols, with notable gaps that could compromise adherence to best practices.
- Below 60% = Poor: Represents insufficient knowledge, raising concerns about the ability to provide safe maternal and newborn care according to established standards.

Midwives scoring below 60% were considered to lack the minimum knowledge required to deliver safe care, underscoring the need for additional training and supportive supervision. These cutoff points provided a structured framework for categorising knowledge levels, ensuring methodological rigour and facilitating meaningful subgroup comparisons.

Section C: Reported Practice of Safe Essential Maternal and Newborn Care.

This section assessed how frequently midwives reported performing the recommended care practices as outlined in the WHO-SCC during the four critical moments of childbirth. The four-point Likert-type scale or frequency scale was used to capture the extent of adherence to best practices. This scale allowed for the quantification of clinical behaviour and provided a nuanced understanding of how consistently recommended care practices were implemented. These insights helped to identify gaps between knowledge and practice, informing targeted interventions to improve maternal and newborn outcomes.

Section C of the questionnaire was designed to assess midwives' self-reported practices in providing safe and essential maternal and newborn care, based on the four critical pause points identified in the World Health Organization Safe Childbirth Checklist (WHO-SCC).

Measurement of Reported Clinical Practice

Midwives' self-reported practice was assessed through self-administered questionnaires designed to capture the frequency with which essential maternal and newborn care procedures were performed. This method provided valuable insight into routine behaviour and adherence to evidence-based protocols in real-world settings.

Practices were evaluated using a structured four-point Likert-type scale adapted from validated clinical assessment tools and aligned with World Health Organization (WHO) guidelines (Dohbit et al., 2021; Varghese et al., 2019; WHO, 2016). The differences between scale points were determined objectively, with each response category anchored to explicit behavioural criteria derived from WHO-SCC

recommendations and prior empirical applications of similar scales in maternal health research (Opoku & Nguah, 2015; Ollerhead & Osrin, 2014; Lanssens et al., 2022). For example, “Never” denoted complete absence of the practice, while “Fully done according to protocol” required consistent and thorough adherence to established clinical guidelines. Intermediate points (“Partially done” and “Adequately done”) were operationalised using scenario-based examples to ensure clarity and reduce subjectivity in interpretation.

Although self-reporting is subject to limitations such as recall bias and social desirability bias, the use of clearly defined scale anchors and validated tools enhanced reliability and validity. This structured approach ensured that responses were systematically guided by evidence-based standards, thereby providing a consistent and defensible measure of midwives’ adherence to maternal and newborn care protocols (Joshi et al., 2015; Likert, 1932; McLeod, 2023; Moridi et al., 2022).

Definitions of Each Scale Point

- Never (1): The practice has not been performed at all during the relevant period or in response to the clinical situation.
- Partially done (2): The practice has been performed but not consistently or fully aligned with recommended procedures, indicating incomplete adherence.
- Adequately done (3): The practice has been performed correctly and sufficiently according to minimal standards, demonstrating acceptable adherence but lacking full consistency.

- Fully done according to protocol (4): The practice has been performed completely, correctly, and in strict accordance with established protocols or guidelines, reflecting optimal adherence.

This method of data collection relied on participants' honest self-assessment and was valuable for capturing routine behaviour in real-life clinical settings. Clear item definitions and examples were provided to enhance the reliability and interpretability of responses. This approach supported the identification of discrepancies between knowledge and practice and helped evaluate the degree of compliance with evidence-based care protocols (Opoku & Nguah, 2015; Ollerhead & Osrin, 2014).

The four-point Likert-type scale ranged from 1 to 4:

- 1 = Never (the action is not performed at all),
- 2 = Partially done (performed inconsistently or incompletely),
- 3 = Adequately done (usually performed, meeting the minimum standard),
- 4 = Fully done according to protocol (performed consistently and thoroughly as per clinical guidelines).

The four-point Likert-type scale has been widely applied in studies evaluating the implementation of the World Health Organization Safe Childbirth Checklist (WHO-SCC) and the use of partographs in low-resource settings (Dohbit et al., 2021; Opoku & Nguah, 2015; Ollerhead & Osrin, 2014; Varghese et al., 2019; WHO, 2016). This scale offered a structured and reliable approach to capturing midwives' self-reported clinical behaviours and facilitated the identification of gaps in practice that may have impacted maternal and newborn health outcomes (Joshi et al., 2015; Likert, 1932; McLeod, 2023; Moridi et al., 2022).

Definitions of Each Scale Point

- Never (1): The midwife reports that the specific practice or activity has not been performed at all during the relevant period or in response to the particular clinical situation.
- Partially done (2): The practice has been performed but not consistently or fully aligned with recommended procedures. This indicates some level of engagement, but incomplete adherence or execution.
- Adequately done (3): The practice has been performed correctly and sufficiently according to minimal standards, demonstrating acceptable adherence but perhaps lacking full consistency or thoroughness.
- Fully done according to protocol (4): The practice has been performed completely, correctly, and in strict accordance with established protocols or guidelines, reflecting optimal adherence.

Sample Items Include:

Pause Point 1: Upon Admission (Items 29–32)

How often do you complete full documentation of a mother's obstetric and medical history upon admission? How often do you check and document the mother's vital signs (e.g., blood pressure, temperature) on admission? How often do you assess fetal well-being using fetal heart rate monitoring or similar methods upon admission?

Pause Point 2: Before Pushing (Items 33–36)

How often do you ensure the availability of necessary supplies and equipment before pushing or a caesarean delivery? How often do you administer prophylactic

antibiotics (if indicated) before caesarean delivery or as per hospital protocol? How often do you reassess maternal and fetal conditions before initiating pushing or surgery?

Pause Point 3: Immediately After Birth (Items 37–40)

How often do you initiate Active Management of the Third Stage of Labour (AMTSL) immediately after delivery? How often do you assess and record postpartum vaginal bleeding within the first hour after birth? How often do you ensure the newborn is dried, kept warm, and begins breastfeeding within one hour of birth? How often do you assess the newborn's breathing and cord status immediately after birth?

Pause Point 4: Before Discharge (Items 41–43)

How often do you provide essential education to mothers on newborn danger signs before discharge? How often do you assess the mother for signs of postpartum complications before discharge? How often do you document that the newborn has received essential postnatal checks (e.g., immunisation, weight assessment) before discharge?

Scoring and Interpretation

Following data collection, mean scores were calculated for each respondent to assess overall practice levels. Responses were scored on a four-point Likert scale, where never = 1, partially done = 2, adequately done = 3, and fully done according to protocol = 4. The interpretation of these mean scores followed the classification proposed by Lanssens et al. (2022). Specifically, a mean score between 1.00 and 1.49 indicated poor practice, reflecting practices that were rarely performed or not performed at all. A mean score ranging from 1.50 to 2.49 denoted fair practice, suggesting that practices were performed partially or inconsistently. Scores between 2.50 and 3.49 were considered

indicative of good practice, meaning that practices were performed most of the time adequately. Lastly, a mean score of 3.50 to 4.00 signified excellent practice, where practices were performed fully and consistently according to protocol (Lanssens et al., 2022).

This structured, evidence-based approach ensured a consistent and objective evaluation of midwives' adherence to clinical standards for maternal and newborn care throughout the intrapartum continuum.

The mean scores were interpreted using the classification proposed by Lanssens et al. (2022), as follows:

- **3.5–4.0 = Excellent Practice**
- **3.0–3.4 = Very Good Practice**
- **2.5–2.9 = Good Practice**
- **2.0–2.4 = Fair Practice**
- **Below 2.0 = Poor Practice**

This structured and evidence-based approach ensured a consistent and objective evaluation of midwives' adherence to clinical standards for maternal and newborn care throughout the intrapartum continuum.

Determination of Scale Differences (Subjective or Objective)

The differences between scale points in the Likert scale were determined objectively rather than subjectively. Each category was anchored to explicit behavioural criteria derived from the World Health Organization Safe Childbirth Checklist (WHO-SCC) as a validated maternal health assessment tool (Dohbit et al., 2021; Varghese et al., 2019; Lanssens et al., 2022). For example, Never (1) denoted the

complete absence of the practice, Partially done (2) indicated initiation but inconsistent or incomplete performance, Adequately done (3) reflected practices performed most of the time to minimum standards, and fully done according to protocol (4) required consistent and thorough adherence to established guidelines. The interpretation of mean scores followed the structured classification proposed by Lanssens et al. (2022), thereby reducing subjectivity by applying published benchmarks rather than arbitrary thresholds.

Despite this objective anchoring, some subjectivity inevitably remained. Respondents may have introduced self-reporting bias by overestimating or underestimating their adherence. Researchers also exercised judgment in operationalising "adequately" across diverse clinical contexts, while cultural and institutional variations influenced how "protocol" was understood in practice. Thus, although the scoring framework itself was objectively defined, its lived application involved elements of subjective interpretation. To mitigate these limitations, the study employed a triangulated design that integrated sociodemographic characteristics, knowledge assessment, and self-reported practice. This approach enhanced methodological rigour, balanced potential biases, and enabled subgroup analyses that revealed both strengths and gaps in adherence to evidence-based protocols. Consequently, the findings were not only descriptive of knowledge and practice but also contextualised within midwives' professional backgrounds, providing a comprehensive basis for interpretation and informing targeted training, supervision, and policy interventions (Polit & Beck, 2017; Moridi et al., 2022; WHO, 2016).

Definitions of Terms for Participants

To guide data collection and analysis, the key study variables were clearly defined following the study objectives and conceptual framework. The dependent variable, safe maternal and newborn care, was influenced by two independent variables: *midwives'* knowledge *and* midwives' self-reported practice. Each variable was operationalized based on established literature and the World Health Organization Safe Childbirth Checklist (WHO-SCC) framework. Midwives' self-reported practice captured the frequency with which these actions were carried out during routine care.

Vital Signs

Vital signs refer to measurements that provide information about a person's health status, including blood pressure, body temperature, pulse rate, and respiration (WHO, 2013).

Maternal Danger Signs

Maternal danger signs are symptoms indicating potential complications during pregnancy or childbirth, such as heavy bleeding, convulsions, or blurred vision (WHO, 2013).

Medical and Obstetric History

The American College of Obstetricians and Gynaecologists (ACOG) (2020) states that Medical and obstetric history involves reviewing a woman's previous health issues and pregnancy experiences, which help guide current care (ACOG, 2020).

Emergency equipment and supplies

Emergency equipment and supplies include tools and medications prepared to manage obstetric emergencies, such as resuscitation devices and medications (WHO, 2013).

Hand Hygiene

Hand hygiene is the practice of cleaning hands thoroughly with soap and water or an alcohol-based sanitiser to prevent infection (WHO, 2009).

Fetal Heart Rate Monitoring

Fetal heart rate monitoring involves checking the baby's heartbeat during labour to assess fetal well-being (ACOG, 2020).

Resuscitation equipment

Resuscitation equipment includes devices such as bag-valve masks used to assist newborn breathing if necessary (WHO, 2013).

Birth Plan

A birth plan is a discussion and agreement between the mother and healthcare team about preferences for labour and delivery (WHO, 2013).

Oxytocin

Oxytocin is a medication used postpartum to stimulate uterine contractions and reduce bleeding (WHO, 2013).

Skin-to-Skin Contact

Skin-to-skin contact (SSC) involves placing the dried, naked baby prone on the mother's bare chest, immediately after birth, promoting bonding and breastfeeding. Immediate SSC means within 10 minutes of birth, while early SSC means between 10

minutes and 24 hours after birth. SSC is a powerful vagal stimulant, through sensory stimuli such as touch, warmth, and odour, which, among other effects, releases maternal oxytocin. Oxytocin causes the skin temperature of the mother's breast to rise, providing warmth to the infant. This time frame immediately post-birth may represent a 'sensitive period' for programming future physiology and behaviour (Moore et al., 2016).

Danger Signs in Newborns

Danger signs in a newborn include symptoms such as difficulty breathing or abnormal temperature that require urgent medical attention (WHO, 2013).

The placenta and membranes

The placenta and membranes are the organ and surrounding sac that nourish and protect the foetus during pregnancy; their complete expulsion after birth is essential to prevent infection (WHO, 2013).

Maternal postpartum monitoring

Maternal postpartum monitoring involves assessing vital signs, bleeding, and pain before discharge to ensure maternal recovery (WHO, 2013).

Feeding and warming the newborn

Feeding and warming the newborn are essential steps to ensure the baby receives adequate nutrition and maintains proper body temperature (WHO, 2013).

Maternal postpartum monitoring

Maternal postpartum monitoring involves checking the health status of the mother after delivery, including vital signs (WHO, 2013).

Postpartum danger signs

Postpartum danger signs are symptoms such as heavy bleeding, fever, or severe pain that indicate the need for immediate medical care after delivery, before the mother leaves the health facility within 24 hours (WHO, 2013).

Follow-up care

Follow-up care involves providing guidance and scheduled visits for the mother and baby after discharge to monitor recovery and address potential health issues. This involves advice on what to look out for and when to return to the health facility for check-ups after delivery (WHO, 2013).

Study Procedure

The study followed a systematic procedure to identify, approach, assess, and enrol participants in accordance with ethical standards and methodological rigour. Eligible midwives were identified from staff rosters at a regional referral hospital in central Uganda. Inclusion criteria ensured that only those actively engaged in maternal and newborn care were considered.

Research assistants approached potential participants during scheduled data collection periods, explained the study objectives and procedures, and emphasised voluntary participation. Each potential participant was assessed against the inclusion and exclusion criteria. Those who met the requirements were informed about confidentiality measures and their right to withdraw at any stage without penalty.

Midwives who agreed to participate provided written informed consent. Research assistants emphasised anonymity, assuring participants that responses would be coded

and securely handled. This systematic enrollment process ensured transparency, ethical compliance, and methodological consistency.

Data Collection Procedure

Before data collection, the researchers clearly articulated the study's objectives and obtained informed consent from each participant. A research assistant distributed the self-administered questionnaires to conveniently sampled midwives. Each midwife received a questionnaire along with a plain envelope to maintain privacy and confidentiality.

During the distribution process, the research assistant assigned a unique code number to each participant. This code was written on the questionnaire in the presence of the midwife to ensure proper tracking. A separate master list linking participants' names to their assigned code numbers was securely maintained by the research assistant. This list was used solely to track questionnaire return rates and was kept separate from the completed questionnaires to ensure anonymity.

To reduce social desirability bias and encourage honest responses, participants were instructed to complete the questionnaire privately and independently at a time convenient to them. Upon completion, each participant placed the questionnaire in a plain envelope and sealed it to enhance confidentiality. The research assistant collected the sealed questionnaires either directly from the participants at a designated time and location or via a secure collection point. This systematic approach helped to ensure that the data collection process was confidential, well-organized, and conducive to high-quality data analysis.

Pilot Study (Results of the Preliminary Study)

A pilot study was conducted with 5–10 midwives from the same hospital, recruited through the convenience sampling strategy planned for the main study, but excluded from the final sample. The purpose of the pilot was to evaluate the feasibility of the questionnaire and study procedures, ensuring clarity, comprehensibility, and methodological soundness before full deployment.

The pilot tested the 43-item questionnaire under conditions simulating the main study. Participants completed the instrument privately and provided feedback during debriefing sessions on clarity, length, and sensitivity of items. Observations of hesitation, confusion, and recorded completion times further informed revisions. Ethical approval was obtained from Uganda Christian University, and ethical principles of voluntary participation, informed consent, and confidentiality were strictly observed throughout the process.

Feedback from participants and expert review guided refinements to item wording, structure, and clarity. Items with low Content Validity Index (CVI) values were revised or removed, and ambiguous phrasing was corrected. Preliminary reliability testing using Cronbach's alpha demonstrated internal consistency above the recommended threshold, while CVI calculations confirmed strong content validity.

The outcomes of the pilot study established that the questionnaire was feasible, acceptable, and methodologically robust. The refinements enhanced clarity, reduced ambiguity, and strengthened both validity and reliability. Collectively, these findings confirmed the readiness of the instrument for full deployment in the main study,

providing confidence that it would generate accurate and dependable data on midwives' knowledge and practice of safe maternal and newborn care.

Validity

Validity refers to the extent to which a research instrument measures the constructs it is intended to assess (Creswell & Creswell, 2018). Building on the refinements and preliminary evidence of feasibility obtained from the pilot study, the finalised questionnaire underwent systematic validity testing to ensure that it accurately measured midwives' knowledge and practice of safe maternal and newborn care. Multiple strategies were employed to strengthen the validity of the 43-item questionnaire, as follows:

Content Validity

Established through expert review. Five maternal and newborn health experts evaluated the questionnaire for relevance, clarity, coverage, and alignment with essential practices. Each item was rated on a four-point relevance scale (1 = not relevant to 4 = highly relevant).

Item-Level CVI (I-CVI)

Calculated as the proportion of experts rating each item as 3 or 4. Items with I-CVI values below 0.78 were revised or removed.

Scale-Level CVI (S-CVI)

Computed using two methods as follows:

Universal Agreement (S-CVI/UA): 21 of 43 items achieved unanimous endorsement, yielding 0.49.

Average Method (S-CVI/Ave): [(22 × 0.80) + (21 × 1.00)] ÷ 43 = 0.90, exceeding the recommended threshold of 0.80 (Polit & Beck, 2006).

Construct Validity

Strengthened by grounding the questionnaire in the WHO Safe Childbirth Checklist framework (WHO, 2016), ensuring alignment with internationally recognised standards.

Face Validity

Assessed during the pilot phase, where participants reviewed the questionnaire for clarity and appropriateness of language. Feedback-informed refinements to item wording and structure.

Criterion Validity

Addressed by comparing questionnaire items with those used in existing validated instruments in maternal and newborn health, ensuring consistency with established measures.

Collectively, expert review, CVI quantification, theoretical framework alignment, pilot feedback, and benchmarking strengthened the validity of the instrument. These measures ensured that the data collected accurately reflected midwives' knowledge and practices related to safe maternal and newborn care. Having established validity, the next section turns to Reliability Testing, which examines the consistency and stability of the instrument across time and conditions.

Reliability

Reliability, on the other hand, concerns the consistency and stability of the instrument across time and conditions (Gliem & Gliem, 2003). Establishing and

interpreting these findings is essential for methodological rigour and for ensuring that the questionnaire generates dependable data (Nunnally & Bernstein, 1994; Polit & Beck, 2006; WHO, 2016). To ensure methodological rigour, reliability testing strategies were employed to establish the reliability of the 43-item questionnaire to assess midwives' knowledge and practice of safe essential maternal and newborn care, as follows;

Internal Consistency Reliability

Internal consistency was assessed using Cronbach's alpha coefficient, which determines the degree of homogeneity among items.

Formula:

$$\alpha = [N \times \bar{r}] \div [1 + (N - 1) \times \bar{r}]$$

Where:

N = number of items (43)

$\bar{r}$ = average inter-item correlation

Pilot data analysis yielded $\alpha = 0.84$, exceeding the recommended minimum threshold of 0.70 (Nunnally & Bernstein, 1994). This confirmed strong internal consistency and demonstrated that the items reliably measured the same underlying constructs.

Test–Retest Reliability

The questionnaire was administered to the same pilot participants at two different time points. The consistency of responses across administrations demonstrated the stability of the instrument over time.

Inter-Rater Reliability

Although the instrument was self-administered, inter-rater reliability was strengthened through the training of research assistants to provide standardised instructions and neutral clarifications, thereby minimising variability in administration.

Procedural Reliability

Standardised data collection procedures, including private questionnaire completion and sealed returns, reduced external influence and response bias. These measures reinforced consistency in data collection.

Collectively, these reliability measures confirmed that the questionnaire produced dependable and reproducible results, thereby strengthening the methodological rigour of the study. With both validity and reliability firmly established, the finalised questionnaire was deemed methodologically sound and ready for deployment, leading to the next stage of the study—its systematic administration under standardised data collection procedures.

Data Collection

Data Collection Procedures and Quality Assurance

Following the establishment of validity and reliability measures, data collection was conducted in a structured and systematic manner. Research assistants were trained before data collection to ensure consistency in administering and completing the questionnaires. After enrolment, they distributed self-administered questionnaires to the recruited midwives. Participants completed the questionnaires privately and independently at their convenience, reducing social desirability bias. Each questionnaire was accompanied by a plain envelope to safeguard privacy, and a unique code number was assigned in the participant's presence. A separate master list linking names to codes

was securely maintained apart from the completed instruments. Upon completion, participants sealed the questionnaires in envelopes, which were collected either directly by research assistants or via secure collection points.

To ensure the integrity of the process, the principal investigator reviewed completed questionnaires daily to check for completeness and accuracy. Any omissions or inconsistencies identified were addressed promptly with the research assistants, thereby ensuring that all instruments were fully and correctly filled before coding and entry into the Statistical Package for the Social Sciences (SPSS, version 26). These procedures safeguarded confidentiality, minimised bias, and reinforced the reliability of the study findings. By integrating systematic procedures with daily oversight, the data collection process complemented the validity and reliability measures described earlier and reinforced the methodological rigour of the study.

Data Collection Management Plan

Data collection was conducted using a structured, self-administered questionnaire aligned with the World Health Organisation Safe Childbirth Checklist and the Knowledge–Attitude–Practice (KAP) model. A total of 66 midwives completed the instrument independently in private settings, encouraging honest responses.

Research assistants, trained for consistency, distributed questionnaires, provided neutral clarifications, and collected sealed envelopes. Each questionnaire carried a unique code, while the master list linking names to codes was securely stored separately to protect confidentiality. Consent forms and completed questionnaires were kept securely in locked boxes in the field until they were transported to the research office at Uganda Christian University (UCU).

At UCU, questionnaires were checked for completeness, and responses were entered into the Statistical Package for the Social Sciences (SPSS), version 26. Data entry was performed by trained research assistants under the supervision of the principal investigator. A double-entry verification process was employed to minimise errors, and electronic files were password-protected to ensure security. Hard-copy questionnaires and consent forms were stored separately in locked cabinets accessible only to the research team.

These procedures—private completion, sealed returns, secure storage of consent forms, systematic coding, and controlled data entry—ensured ethical compliance, safeguarded anonymity, and reinforced data integrity. Collectively, they provided a robust foundation for subsequent analysis.

Data Analysis Plan

This descriptive cross-sectional study was designed to assess midwives' knowledge and self-reported practice of safe maternal and newborn care, utilizing the World Health Organisation's Safe Childbirth Checklist (WHO-SCC) as the guiding framework. Data were collected through structured questionnaires and observational checklists to capture both knowledge levels and adherence to recommended practices.

The analysis process began with systematic data cleaning to identify and address missing, incomplete, or inconsistent responses, thereby ensuring the accuracy and reliability of the dataset. Descriptive statistics were then employed to provide a comprehensive summary of the findings. Frequencies and percentages were calculated to describe categorical variables, while measures of central tendency (means) and dispersion (standard deviations) were used to summarise continuous variables. These techniques

facilitated clear presentation of participants' demographic characteristics and the key variables related to knowledge and practice (Polit & Beck, 2017).

The choice of descriptive statistics was methodologically appropriate given the cross-sectional design. Cross-sectional surveys aim to provide a snapshot of a population at a specific point in time, and descriptive statistics are the most effective means of summarising such data without inferring causality (Scribbr, 2023). They enable researchers to identify distributions, highlight patterns, and detect variability across participants, which is essential for understanding the breadth of knowledge and practice within the study population. Furthermore, descriptive statistics simplify complex datasets, making them accessible and interpretable for diverse audiences, including policymakers and practitioners (Lee, 2025).

Collectively, these analytic procedures ensured that the study findings were presented with clarity, accuracy, and methodological rigour. The results generated provide a reliable evidence base to inform maternal and newborn health interventions in Uganda.

Data Analysis Software

Following data collection, completed questionnaires and consent forms were securely stored in locked boxes at the field sites until they were transported to the research office at Uganda Christian University (UCU). At UCU, the questionnaires were checked for completeness and coded before entry. Data were then entered into the Statistical Package for the Social Sciences (SPSS), version 26, which was selected for its robustness in handling survey data and generating descriptive statistics.

Data entry was performed by trained research assistants under the supervision of the principal investigator. A double-entry verification process was employed to minimise errors, and electronic files were password-protected to ensure confidentiality. Consent forms and hard-copy questionnaires were stored separately from the coded dataset in locked cabinets, accessible only to the research team. These procedures ensured that data were handled securely, entered accurately, and prepared systematically for analysis, thereby reinforcing the integrity and reliability of the study findings.

Distinction Between Descriptive and Inferential Statistics

In quantitative research, statistical methods are broadly categorised into descriptive and inferential approaches, each serving distinct purposes in data analysis. Descriptive Statistics are methods that summarise and present data in a clear, interpretable form, providing information about the characteristics of the study sample without extending conclusions beyond it. Common measures include frequencies, percentages, means, and standard deviations, which depict distributions, central tendencies, and variability (Creswell & Creswell, 2018). Descriptive statistics are particularly useful in cross-sectional studies, where the aim is to provide a snapshot of phenomena at a single point in time.

Whereas Inferential Statistics are methods that are involved with hypothesis testing, estimation, and prediction, enabling researchers to conclude a larger population based on sample data (Polit & Beck, 2017). Techniques such as regression analysis, chi-square tests, and t-tests are commonly used to assess associations or differences between groups, thereby extending findings beyond the immediate sample.

Given the cross-sectional design and study objectives, this research appropriately relied on descriptive statistics. The primary aim was to provide a snapshot of midwives' knowledge and practice regarding maternal and newborn care, rather than to infer causal relationships or predict outcomes. Descriptive statistics were therefore sufficient to meet the study's objectives, ensuring clarity, transparency, and methodological appropriateness.

Ethical Approval

Formal ethical approval to conduct the study was obtained from the Uganda Christian University Research and Ethics Committee, in line with international standards for research involving human participants. In addition, authorisation from the strategic leadership of a regional referral hospital in central Uganda was required to gain access to the study site. Following approval, an official letter was distributed to maternity ward supervisors, and all midwives working within the wards were informed through their respective in-charges and Principal Nursing Officers. A formal introduction letter was also obtained from the Department of Nursing at Uganda Christian University, Mukono, and presented to the hospital's strategic leadership to secure final clearance and facilitate access to the study site. These approvals ensured compliance with both institutional and national requirements for conducting research in healthcare settings, thereby reinforcing the ethical integrity of the study (Polit & Beck, 2021).

Ethical Considerations

Informed consent was sought from all participants before their involvement, consistent with the principle of respect for persons outlined in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and

Behavioural Research, 1979). Participants were assured that participation was voluntary and that they retained the right to withdraw at any time without penalty or loss of benefits. Confidentiality and anonymity were strictly maintained throughout the research process. Personal identifiers were excluded from the dataset, and all information collected was securely stored and used solely for research purposes, in line with the World Health Organisation's (2016) guidelines on ethical issues in public health surveillance. Collectively, these procedures upheld respect for persons, demonstrated beneficence by safeguarding participants from harm, and ensured justice by providing equitable access and fair treatment of all eligible midwives within the study population.

Informed Consent

Before participation, potential participants were provided with comprehensive information about the study, including its objectives, potential benefits and risks, confidentiality measures, institutional approval, and contact details for further inquiries. Participants were encouraged to ask questions and seek clarification to ensure informed decision-making.

Those who agreed to participate signed a written informed consent form. To minimize bias and preserve voluntariness, the researcher—who also served as Head of the Nursing Division—was not present during the consent process. Instead, a trained research assistant oversaw the administration of consent. Signed forms were collected, placed in sealed envelopes, and securely stored in a locked cabinet to maintain confidentiality.

Privacy

To uphold participant privacy, several safeguards were implemented in accordance with ethical research standards. Each participant was assigned a unique code number, and no personally identifiable information was linked to survey responses. The purpose, use, storage, and protection of collected data were communicated clearly before data collection commenced.

Paper-based questionnaires were stored in locked cabinets, while digital data were maintained on password-protected computers or secure servers with restricted access. Any electronic transmission of data was conducted using secure methods, such as encrypted emails or secure file transfer protocols. Data collection sessions were conducted in private settings to prevent unauthorised observation, and research assistants received training on confidentiality procedures. Reporting and dissemination of findings were conducted in aggregated or anonymized formats to prevent identification of individual participants (Resnik, 2018).

Confidentiality

Confidentiality was strictly maintained throughout the study. Participants' names and other identifying information were not requested or recorded on the questionnaires. All data were used exclusively for research purposes. Access to both physical and electronic data was restricted to authorised members of the research team. Data were analyzed and reported in aggregate form to ensure anonymity. Upon completion of the study, all data will be securely stored for five years, after which they will be permanently destroyed in accordance with ethical guidelines (Resnik, 2018).

Collectively, the procedures for informed consent, privacy, and confidentiality upheld the Belmont principles of respect for persons, beneficence, and justice. These measures ensured voluntary participation, safeguarded participants from harm, and promoted equitable treatment of all eligible midwives within the study population (National Commission for the Protection of Human Subjects of Biomedical and Behavioural Research, 1979).

Ethical Considerations in Data Management

Completed questionnaires and consent forms were stored securely in locked boxes at the field sites until they were transported to the Uganda Christian University (UCU) research office. At UCU, consent forms were kept separately from coded questionnaires to protect participant anonymity.

Data entry was conducted using the Statistical Package for the Social Sciences (SPSS, version 26) by trained research assistants under the supervision of the principal investigator. A double-entry verification process was employed to minimise errors, and electronic files were password-protected with access restricted to authorised members of the research team. Hard-copy questionnaires and consent forms were stored in locked cabinets accessible only to designated personnel.

These measures ensured confidentiality, accuracy, and compliance with both UCU ethical approval requirements and international standards for responsible research conduct. By managing data securely and ethically, the study safeguarded participant trust and integrity—providing a strong foundation to consider the broader benefits anticipated from the research.

Benefits

By safeguarding participant trust through secure and ethical data management, the study was positioned to generate meaningful benefits for maternal and newborn health. This descriptive cross-sectional study, conducted in a regional referral hospital in central Uganda, provided valuable insights into midwives' knowledge and practice of safe maternal and newborn care.

The findings were expected to highlight both strengths and gaps in midwifery competencies, thereby informing strategies to improve service delivery. Such evidence aligns with the World Health Organisation's recommendations on optimising health worker roles to strengthen maternal and newborn health services, particularly in resource-constrained settings where task shifting and targeted training are critical (World Health Organisation, 2025; World Health Organisation, 2013).

By offering a snapshot of midwives' performance at a specific point in time, the study aimed to support stakeholders in designing targeted interventions, developing context-specific training programs, and implementing relevant policy adjustments. The results were anticipated to contribute to local health planning and promote evidence-based improvements in clinical practice. Ultimately, the study sought to enhance maternal and newborn health outcomes within the district, aligning with global priorities to end preventable maternal and newborn deaths (World Health Organisation, 2025).

Incentives

While participation in the study did not provide direct personal benefits, it contributed to a broader understanding of midwives' knowledge and practices in maternal

and newborn care within the regional referral hospital. These insights were expected to inform training programs, support targeted health initiatives, and ultimately enhance the quality of care in the district.

As a gesture of appreciation, participants were offered a soft drink and snack during breaks, along with a modest transport refund of 10,000 Ugandan Shillings. These small, ethically appropriate incentives acknowledged participants' time and effort without exerting undue influence. Literature indicates that such non-monetary and modest monetary tokens foster goodwill and encourage engagement, while participants are often motivated by the opportunity to contribute to science and improve health services rather than financial gain alone (Pforr, 2016; Kouassi, 2025). By combining voluntary participation with appropriate recognition, the study maintained ethical integrity and reinforced trust, ensuring that incentives complemented rather than compromised the research process.

Sociocultural Issues

Although a descriptive cross-sectional study does not explore sociocultural dynamics in depth, acknowledging their potential influence was essential for interpreting the findings accurately. In the context of midwives' knowledge and practice, factors such as cultural beliefs, gender roles, societal norms, and traditional practices surrounding childbirth and maternal health can significantly shape both the provision of care and the responses of healthcare providers.

Evidence from Sub-Saharan Africa demonstrates that cultural norms and socio-economic conditions strongly influence maternal healthcare utilisation and provider practices. For example, traditional beliefs about childbirth, perceptions of biomedical

interventions, and gendered decision-making roles often determine whether women seek skilled care and how midwives deliver services (Kota, Chomienne, Geneau, & Yaya, 2023; Ezeike, 2023). Anthropological perspectives further emphasise that childbirth is a biocultural event, deeply embedded in local traditions and rituals, which can either facilitate or hinder the adoption of evidence-based practices (Selin, 2009; Rugumisa, 2024).

These sociocultural influences may affect midwives' attitudes, behaviour, and reported practices, as well as shape clients' interactions with the healthcare system. Recognizing these dynamics was crucial for understanding variations in responses and for ensuring that recommendations or interventions developed from the study were culturally appropriate and contextually relevant. Public health research underscores that failure to account for cultural practices can perpetuate barriers to care and contribute to maternal mortality in low-resource settings (Omer, Zakar, Zakar, & Fischer, 2021). By situating the study within this broader sociocultural context, the findings were interpreted with greater nuance, ensuring that proposed interventions were not only evidence-based but also culturally sensitive and responsive to the realities of maternal and newborn care in Uganda.

Conflict of Interest

The researcher declared no conflict of interest in relation to this study. Although the principal investigator also served as Head of the Nursing Division at the study site, measures were implemented to minimise any potential influence on participant recruitment or responses. Specifically, the researcher was not present during the consent process or questionnaire administration, which were overseen by trained research

assistants. All procedures were conducted in accordance with institutional ethical approval and international research standards, ensuring that participants' decisions to take part were voluntary and free from coercion. The absence of financial, professional, or personal interests that could compromise objectivity further safeguarded the integrity of the study. By explicitly addressing and mitigating potential conflicts, the study concluded its methodology with transparency and ethical rigour, after which the presentation of results revealed midwives' knowledge and practices in maternal and newborn care.

Summary of Methodology

This study employed a quantitative descriptive cross-sectional design to examine midwives' knowledge and self-reported practices of safe maternal and newborn care at a regional referral hospital in central Uganda. Guided by a conceptual framework integrating the Knowledge–Attitude–Practice model and the WHO Safe Childbirth Checklist, the study assessed care across key stages of the childbirth continuum. Licensed midwives actively involved in maternity, labour, and postnatal care were recruited using convenience sampling, yielding a sample of 66 participants. Data were collected using a structured, self-administered questionnaire assessing sociodemographic characteristics, knowledge, and reported practice. Standardised data collection procedures, ethical safeguards, and quality assurance measures were applied to ensure methodological integrity. Data were analysed using SPSS version 26, with descriptive and inferential statistics used to examine patterns and associations. Overall, the methodology provided a rigorous and contextually relevant snapshot to inform maternal and newborn care improvement.

Chapter Four: Research findings

This chapter presents the findings of the study, derived from the methodological approach outlined in Chapter Three. The analysis was guided by the conceptual framework integrating the Knowledge–Attitude–Practice (KAP) model with the World Health Organisation Safe Childbirth Checklist (WHO-SCC), which informed the assessment of midwives' knowledge and reported practices of safe maternal and newborn care across the four critical stages of the childbirth continuum: upon admission, just before pushing, immediately after birth, and before discharge.

The chapter is organised into four main sections. The first section describes the socio-demographic characteristics of the study participants, providing essential contextual information for interpreting subsequent findings. The second section presents results on midwives' knowledge of safe essential maternal and newborn care, highlighting levels of understanding across the four stages of care and identifying observed variations. The third section reports findings on midwives' self-reported practices, assessing the frequency and consistency of adherence to recommended clinical protocols. The fourth section examines the association between knowledge and practice, focusing on the relationship between theoretical understanding and reported clinical behaviour.

Results are presented using descriptive statistics, including frequencies, percentages, means, standard deviations, and confidence intervals, to summarise the data clearly and precisely. Inferential statistics, specifically analysis of variance and chi-square tests of independence, are reported to examine differences across stages of care

and associations between key variables, with effect sizes included to indicate the magnitude of observed relationships.

The chapter concludes with a summary of key findings, which provides a structured synthesis of the results and prepares the reader for Chapter Five, where the findings are critically interpreted in relation to existing literature, theoretical frameworks, and contextual factors relevant to maternal and newborn care in resource-constrained settings.

Socio-Demographic Characteristics

Table 2 presents the socio-demographic characteristics of the study participants (N = 66). The majority of respondents were young to middle-aged female midwives. Most were between 20–30 years (39.4%) or 31–40 years (47.0%), with only a small proportion aged above 50 years. Nearly all participants were female (97%), with only two male respondents (3%).

In terms of education, over half held diplomas (51.5%), while 34.8% had certificates and 12.1% had bachelor's degrees. Regarding professional experience, almost half (48.5%) had worked for 1–5 years, and 30.3% had 6–10 years of experience. Only a minority had more than 15 years of practice.

A majority (60.6%) reported having received in-service training within the past two years, while 39.4% had not. Continuous professional development was therefore limited among many respondents.

Most participants worked in labour wards (43.9%), followed by antenatal units (21.2%), postnatal units (19.7%), and general wards (15.2%). This distribution reflects

the central role of midwives in intrapartum care, with additional responsibilities in antenatal and postnatal services.

Table 2: Socio-Demographic Characteristics of Participants (n=66)

Category	**Frequency(f)**	**Percentage (%)**
Age (Years)		
20-30	26	39.4
31-40	31	47
41-50	4	6.1
51-60	4	6.1
61-70	1	1.5
Gender		
Female	64	97
Male	2	3
Education		
Certificate	23	34.8
Diploma	34	51.5
Bachelors	9	12.1
Years of experience		
1-5	32	48.5
6-10	20	30.3
11-15	6	9.1
16-20	5	7.6
21-25	3	3
In-service training		
Yes	40	60.6
No	26	39.4
Total	66	100
Current workplace		
Labour	29	43.9
Ward	10	15.2
Antenatal	14	21.2
Postnatal	13	19.7

Midwives' knowledge of safe essential maternal and newborn care

This section assesses midwives' knowledge of essential maternal and newborn care practices. Findings revealed that midwives demonstrated generally very good knowledge of essential maternal and newborn care, with the highest performance

observed upon admission (75%) and just before pushing (83.3%). Knowledge was good immediately after birth (65.2%) and before discharge (70.5%).

Table 3 presents the assessment of midwives' knowledge of safe essential maternal and newborn care across the four critical pause points of the World Health Organisation Safe Childbirth Checklist (WHO-SCC). Descriptive statistics, including means, standard deviations (SDs), and 95% confidence intervals (CIs), are reported to provide precise estimates of knowledge levels and to highlight areas of strength as well as domains requiring improvement. The following subsections present these findings in detail, beginning with knowledge upon admission and progressing through each pause point to before discharge.

Knowledge upon admission.

The mean correct score was 75% (SD = 8.2, 95% CI [72%, 78%]), indicating very good knowledge. Vital signs assessment was correctly identified by 92.4% (SD = 6.1, 95% CI [86%, 98%]), reflecting excellent knowledge of routine assessments. Conversely, only 42.4% (SD = 11.2, 95% CI [31%, 54%]) correctly identified the recommended action for a mother with a blood pressure of 160/100 mmHg, highlighting a critical area of weakness.

Knowledge just before pushing.

The mean correct score increased to 83.3% (SD = 7.5, 95% CI [80%, 86%]), also indicating very good knowledge. Almost all respondents correctly assessed fetal well-being (100%, SD = 0.0, 95% CI [94%, 100%]). In contrast, only 56.1% (SD = 9.8,

95% CI [44%, 67%]) correctly identified items not included in the WHO checklist, suggesting moderate gaps in checklist adherence.

Knowledge immediately after birth.

The mean correct score was 65.2% (SD = 9.6, 95% CI [60%, 70%]), reflecting good knowledge overall. Maternal and neonatal observations were consistently high (>90%). However, knowledge regarding oxytocin administration was limited, with only 53% (SD = 10.4, 95% CI [41%, 64%]) answering correctly. Awareness of minimum fluid intake post-delivery was particularly poor (10.6%, SD = 5.2, 95% CI [3%, 18%]).

Knowledge before discharge.

The mean correct score was 70.5% (SD = 8.7, 95% CI [66%, 75%]), indicating good knowledge. Respondents demonstrated excellent knowledge of the recommended postpartum stay (86.4%, SD = 7.3, 95% CI [78%, 93%]). Conversely, follow-up advice to mothers was poorly understood, with only 45.5% (SD = 10.1, 95% CI [34%, 57%]) answering correctly (as seen in Appendix III).

Table 3: Midwives' knowledge of safe essential maternal and newborn care

	Total Correct Score/ 66	% of correct score	Comment
Midwives' knowledge upon admission			
First clinical action to perform upon admission	57	86.4	Excellent
Key tasks to perform on admission	58	87.9	Excellent
Availability of Essential resources on admission	52	78.8	Very good
Vital signs to assess immediately upon admission	61	92.4	Excellent
Correct frequency for recording MHR in labour	41	62.1	Fair
Recommended action for a mother with a blood pressure of 160/100 mmHg	28	42.4	Poor
Average	*49.5*	*75*	Very good
Midwives' knowledge Just Before Pushing			
Item not part of the WHO checklist before pushing	37	56.1	Poor
Assessment before a mother begins pushing	66	100	Excellent
Advice to a birth companion during labour	57	86.4	Excellent
Emergency Signs requiring immediate attention	49	74.2	Good
The importance of hand hygiene just before delivery	59	89.4	Excellent
Recommended fetal monitoring protocols	62	93.9	Excellent
Average	*55*	*83.3*	*Very good*
Midwives' knowledge immediately after birth (Within 1 Hour)			
Key task immediately after birth	53	80.3	Very good
Key maternal observation immediately after birth	60	90.9	Excellent
Importance of administering oxytocin soon after birth	35	53	Poor
Critical newborn observation immediately after birth	60	90.9	Excellent
Minimum fluid intake post-delivery	7	10.6	Poor
Average	*43*	*65.2*	*Good*
Midwives' Knowledge Just Before Discharge			
Essential newborn care step before discharge	51	77.3	Very good
Key discharge protocols	48	72.7	Good
Recommended period of stay before discharge	57	86.4	Excellent
Follow-up advice to the mother	30	45.5	Poor
Average	*46.5*	*70.5*	*Good*

Figure 3: Overall Scores of Midwives' Knowledge Across the Four Pause Points

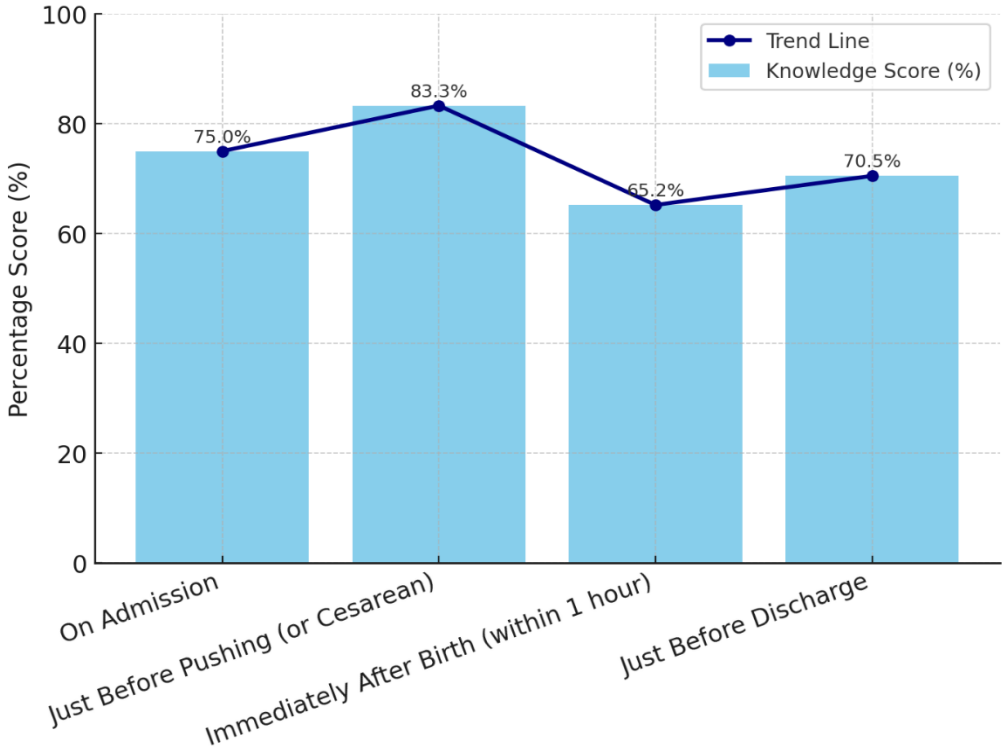


Figure 2: Overall midwives' Knowledge score across the four pauses

Overall Scores of Midwives' Knowledge Across the Four Pause Points

Figure 2 presents the overall knowledge scores of midwives across the four critical pause points of the World Health Organization Safe Childbirth Checklist (WHO-SCC). Midwives demonstrated very good knowledge just before pushing or caesarean delivery (M = 83.3%, SD = 7.5, 95% CI [80%, 86%]), while knowledge was comparatively lower immediately after birth (M = 65.2%, SD = 9.6, 95% CI [60%, 70%]), reflecting good knowledge overall (see Appendix III).

Knowledge upon admission (M = 75.0%, SD = 8.2, 95% CI [72%, 78%]) and before discharge (M = 70.5%, SD = 8.7, 95% CI [66%, 75%]) indicated strong but

variable levels of understanding across the continuum of care. The results in Figure 2 show that midwives' knowledge was very good just before pushing or Caesarean delivery (83.3%). By contrast, knowledge was good immediately after birth (65.2%) (as seen in Appendix III).

Table 4: Relationship between Socio-demographic and Knowledge

Independent Variable	Test Used	Test Statistic	p-value	Interpretation
Education level	ANOVA	F (2,59) = 1.472	0.238	No significant difference in knowledge by education level
Years of experience	ANOVA	F (2,59) = 1.472	0.238	No significant difference in knowledge across experience groups
In-service training	t-test	t (61) = -1.524	0.133	No significant difference in knowledge between those with and without training
Workplace	ANOVA	F (3,59) = 2.513	0.067	No significant difference across workplaces at 5%, though a trend suggests workplace may influence knowledge

Relationships Between Socio-Demographics and Knowledge

Table 4 above presents results on the relationship between selected sociodemographic characteristics (education level, years of experience, in-service training, and workplace) and midwives' knowledge of safe essential maternal and newborn care. The findings highlight whether variations in sociodemographic characteristics were associated with differences in knowledge scores.

Education level: ANOVA results showed no statistically significant difference in midwives' knowledge scores across education levels, $F(2,59) = 1.472$, $p = 0.238$.

Years of experience: ANOVA results indicated no significant difference in knowledge across experience groups, $F(2,59) = 1.472$, $p = 0.238$.

In-service training: Independent samples t-test revealed no significant difference in knowledge between midwives who had received training and those who had not, $t(61) = -1.524$, $p = 0.133$.

Workplace: ANOVA results showed no significant difference in knowledge across workplaces at the 5% level, $F(3,59) = 2.513$, $p = 0.067$, though the p-value suggested a possible trend.

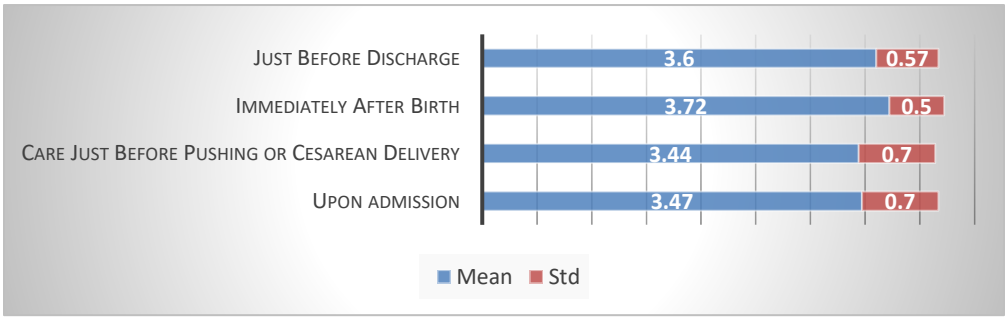
Findings throughout the Four Pauses of the WHO-SCC.

A one-way ANOVA was carried out to assess differences in midwives' knowledge across the four critical pause points of the WHO Safe Childbirth Checklist. The analysis showed a statistically significant variation in knowledge scores, $F(3,164) = 15.40$, $p < .001$, with a moderate effect size ($\eta^2 = 0.22$). Knowledge was found to be highest just before pushing ($M = 83.3\%$, $SD = 7.5$) and lowest immediately after birth ($M = 65.2\%$, $SD = 9.6$), indicating clear differences in knowledge across the continuum of care.

Table 5: Midwives' Reported Practice of safe maternal and newborn care

Midwives' Practice	Not done	Partially done	Adequately done	Fully done according to protocol		
	(f)	(f)	(f)	(f)	Mean	Std
Practice Upon Admission						
Vital signs	0	3	18	45	3.64	0.6
Danger signs	0	1	28	37	3.55	0.5
Past obstetric history	0	7	16	43	3.55	0.7
Check for equipment readiness	1	17	20	28	3.14	0.9
Overall Mean					3.47	00.7
Just Before Pushing						
Performed hand hygiene	1	6	16	43	3.53	00.7
Confirmed FHR	0	2	15	49	3.71	00.5
Checked for equipment	1	9	25	31	3.3	00.8
Birth plan communicated	1	7	36	22	3.2	00.7
Overall Mean					3.44	00.7
Immediately after Birth						
Administered oxytocin	0	1	7	58	3.86	00.4
Initiated skin-to-skin breastfeeding	0	0	23	43	3.65	00.5
Baby's danger signs	0	3	14	49	3.7	00.6
Checked the placenta	1	1	16	48	3.68	00.6
Overall Mean					3.72	00.5
Just Before Discharge						
Monitored vital signs	0	3	21	42	3.59	00.58
Examined the newborn	0	5	19	42	3.56	00.64
Discharge protocols	0	1	18	46	3.69	00.5
Overall Mean					3.6	00.57

Figure 4: Overall Mean of Midwives' Reported Practice Across the Four Pauses



Objective 2: Midwives' Reported Practice of Safe Maternal and Newborn Care

Self-reported practices at each pause point were evaluated using mean scores, standard deviations (SDs), and 95% confidence intervals (CIs), indicating consistently high adherence to recommended protocols.

Practices upon admission.

The overall mean practice score was 3.47 (SD = 0.70, 95% CI [3.33, 3.61]), reflecting very good adherence. Most respondents reported fully performing recommended practices such as checking maternal vital signs (M = 3.64, SD = 0.60) and assessing danger signs (M = 3.55, SD = 0.50). As shown in Table 5, midwives' reported practices upon admission were very good, with an overall mean of 3.47 and a standard deviation of 0.7. Most responses indicated that all practices were fully done according to protocol.

Practices just before pushing.

The mean score was 3.44 (SD = 0.70, 95% CI [3.30, 3.58]), also reflecting very good practice. Compliance was particularly high in confirming fetal heart rate (M = 3.71,

SD = 0.50), while communication of the birth plan was slightly lower (M = 3.20, SD = 0.70). Midwives' practices just before pushing or caesarean delivery were very good, with an overall mean of 3.44 and a standard deviation of 0.07. Apart from communicating the birth plan with the mother and the team, most practices at this stage were largely fully done according to protocol.

Practices immediately after birth.

The highest practice score was observed at this pause point, with a mean of 3.72 (SD = 0.50, 95% CI [3.58, 3.86]), indicating excellent adherence. Administration of oxytocin was performed according to protocol in 98% of cases (M = 3.86, SD = 0.40). Initiation of skin-to-skin contact and early breastfeeding was fully performed by 43 respondents (M = 3.65, SD = 0.50), slightly below other practices but still demonstrating strong compliance. Midwives generally reported excellent practice (M 3.72, SD =0.5) immediately after birth. Administration of oxytocin within one minute of birth was fully done according to protocol (M 3.86, SD=0.4), and was the highest of all the practices. Although initiation of skin-to-skin contact and early breastfeeding were fully done according to protocol by 43 of the midwives, it lagged slightly behind other practices.

Practices before discharge.

Regarding self-reported practices during the just before discharge pause, the majority of the respondents reported fully done according to protocol, with an overall mean of 3.60 and a standard deviation of 0.5 (SD = 0.57, 95% CI [3.48, 3.72]), reflecting excellent practice towards discharge protocols. The mean score was 3.60, and respondents consistently reported providing essential education on newborn danger signs

and conducting maternal assessments for postpartum complications before discharge (M = 3.69, SD = 0.50 for discharge protocols).

Table 4 summarises the reported practice scores across the four pause points, highlighting consistently high adherence to safe maternal and newborn care protocols. A one-way analysis of variance (ANOVA) revealed significant differences in reported practice scores across the four pause points, $F(3,164)=6.82$, $p<.001$, $_n2 = 0.11$, indicating a moderate effect size. This result indicates meaningful variation in midwives' reported practices, with particular strengths observed immediately after birth and comparatively lower adherence just before pushing.

Overall mean of Midwives' reported practice across the Four Pause Points

Midwives' reported practices were excellent immediately after the birth point of care (M = 3.72, SD =0.5) and were very good just before pushing or cesarean delivery point of care (M = 3.44, SD =0.7). To assess whether midwives' knowledge level corresponded with their reported practice level, a chi-square test of independence was conducted; the results are summarized below.

Table 6: Chi-Square Tests of Independence: Association Between Midwives' Knowledge Level and Practice Level

	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	5.103	1	0.024
Likelihood Ratio	5.258	1	0.022
Linear-by-Linear Association	4.986	1	0.026
N of Valid Cases	**66**		

Table 6 shows a Chi-Square test of Independence to determine the association between midwives' knowledge level and practice level. It was found that knowledge level and practice level were significantly associated, χ^2 (1, N = 66) = 5.10, p = .024. Midwives with excellent knowledge were more likely to report excellent practice than those with poor knowledge.

Summary of Key Findings

The findings indicate that midwives demonstrated very good knowledge (75%) of essential maternal and newborn care upon admission. Assessment of midwives' knowledge of safe essential maternal and newborn care just before pushing (or caesarean delivery) was very good (83.3%). Assessment of midwives' knowledge of safe essential maternal and newborn care immediately after birth (within 1 hour) was good (65.2%). Midwives' knowledge of safe essential maternal and newborn care just before discharge was good (70.5%). Midwives' reported practices upon admission demonstrated generally very good practice, with an overall mean of 3.47 and a standard deviation of 0.7. Midwives' practices just before pushing or caesarean delivery were very good, with an overall mean of 3.44 and a standard deviation of 0.7. Midwives generally reported excellent practice (M= 3.72, SD =0.5) immediately after birth. Regarding, just before discharge, respondents indicated excellent practice (M=3.6, SD =0.57). A significant positive association was realized between Midwives' Knowledge Level and Practice Level.

Chapter Five: Discussion of Results, Conclusions, and Recommendations

This chapter discusses the findings presented in Chapter Four and is structured into three main sections. The first section examines the socio-demographic characteristics of participants; the second section explores midwives' knowledge of safe essential maternal and newborn care and its relationship with socio-demographic factors; and the third considers their self-reported practices, incorporating Chi-Square Tests of Independence to assess associations between knowledge and practice. The discussion is then interpreted within the study's theoretical framework, followed by conclusions, recommendations for clinical practice, policy, and future research, strategies for dissemination, and acknowledgment of limitations. The chapter concludes by highlighting areas for further investigation and summarizing the key insights.

Socio-Demographic Characteristics

This section discusses the demographic characteristics of the study participants. The findings are interpreted in relation to existing literature to highlight how factors such as age, education, years of experience, workplace, and exposure to in-service training may shape midwives' knowledge and practice of safe essential maternal and newborn care. The majority of participants were between 31 and 40 years of age, followed by those aged 20–30 years, indicating a predominantly early- to mid-career workforce (Blomgren et al., 2024; Namutebi et al., 2023). This age distribution suggests that midwives are at a stage where they are both adaptable to new clinical guidelines and receptive to skill enhancement. Consequently, targeted training, structured mentorship, and supportive supervision during these formative career years could maximize

knowledge retention, reinforce best practices, and strengthen overall maternal and newborn care outcomes.

The early career stage of midwives is often characterized by rapid development and the acquisition of essential skills, emphasizing the importance of comprehensive knowledge in safe maternal and newborn care. Prior research (e.g., Blomgren et al., 2024; Kakyo et al., 2025; Namutebi et al., 2023) and national policies (Ministry of Health, Uganda, 2022) underscore the critical role of mentorship and supervision in translating knowledge into consistent practice. This study was therefore positioned to investigate the relationship between midwives' knowledge and their reported practices across the four WHO-SCC pause points. Understanding how knowledge influences practice at these key intervention points is essential for identifying gaps and informing targeted strategies to enhance the quality of maternal and newborn care, ultimately improving health outcomes.

The finding that nearly all respondents were female reflects the gender composition of the midwifery workforce, which is predominantly female in Uganda and globally. This aligns with the traditional gendered nature of the profession, where midwifery has historically been considered a female-dominated field due to sociocultural norms and workforce trends (WHO, 2016). The high proportion of female participants also suggests that the study findings are largely representative of the typical midwifery workforce in the region, although it may limit the generalizability of results to male midwives, whose perspectives and practice patterns might differ. The results show that most midwives were diploma holders, with fewer certificates and only a small proportion having bachelor's degrees. This indicates that Uganda's midwifery workforce is largely

trained at a middle-level qualification, which provides adequate clinical competence but may limit timely advanced decision-making.

As regards years of service, most of the midwives were in the early stages of their careers, suggesting a workforce dominated by younger practitioners with limited years of experience. This reflects an encouraging trend of fresh entrants into the profession, but also points to possible gaps in highly experienced staff who are critical for mentorship and handling complex obstetric emergencies. Blomgren et al. (2024) argue that while early-career health workers bring enthusiasm and adaptability, their limited exposure may constrain clinical judgment in complicated cases, thereby underscoring the importance of structured supervision and continuous professional support.

A significant proportion of midwives had attended in-service training within the past two years, which demonstrates a commitment to continuous professional development and skill refreshment. This is particularly important in maternal and newborn care, where adherence to updated guidelines can improve outcomes. Namutebi et al. (2023) emphasize that in-service training is essential in resource-limited settings, as it provides opportunities to bridge knowledge gaps and standardize care practices, especially where access to formal postgraduate training is limited. The findings indicate that ongoing investments in in-service training initiatives are yielding positive outcomes, reflecting improvements in midwives' competencies. However, the limited scope of these training programs suggests a need for scaling up to ensure comprehensive coverage across all midwives, thereby promoting uniformity in knowledge and practice. This aligns with existing literature, such as Negussie et al. (2018), which demonstrates that continuous professional development (CPD) significantly enhances diagnostic accuracy.

Specifically, their study reports a reduction in missed risk factors among trained midwives, highlighting the critical role of sustained training in improving clinical outcomes. Therefore, expanding and institutionalizing CPD programs could be instrumental in bridging gaps in knowledge and practice, ultimately contributing to improved maternal and neonatal health outcomes.

Midwives' Knowledge of Safe Essential Maternal and Newborn Care

Midwives demonstrated very good knowledge of essential care on admission, which reflects a strong grasp of maternal triage, fetal heart rate monitoring, initiation of the partograph, and timely recognition of labour complications. These findings align with WHO (2015) and Namagembe et al. (2022), who emphasized that partograph use and triage strengthen early detection of complications, while Tolu et al. (2020) and WHO (2015) noted that accurate admission assessment can promote safe maternal and newborn best expected outcomes. However, literature cautions that without continuous professional development and supervision, such adherence may decline over time (Bireka et al., 2017; Maleta et al., 2024). Thus, while very good knowledge was observed, sustaining it requires ongoing mentorship and reinforcement. Similar studies suggest that translating knowledge into consistent practice remains a challenge, hence highlighting the need for ongoing training and supervision to improve quality care (Hui, Tey, & Lee, 2019).

Assessment of midwives' knowledge of safe essential maternal and newborn care just before pushing (or caesarean delivery) was very good. This indicates a strong understanding of key second-stage assessments, including supportive midwifery

activities, recognition of danger signs, and the role of a birth companion in monitoring and reporting complications. Critically, conditions such as excessive bleeding, severe headache, and visual disturbances signal obstetric emergencies: the former may precede postpartum haemorrhage, while the latter are hallmark warning signs of pre-eclampsia or eclampsia. Both postpartum haemorrhage and hypertensive disorders remain leading causes of maternal morbidity and mortality globally, yet this study revealed gaps between knowledge and consistent practice. These findings underscore the need to strengthen midwives' capacity for precise recognition and timely intervention to avert preventable maternal deaths (Say et al., 2014; WHO, 2016).

In Uganda, obstetric haemorrhage accounted for significant maternal deaths at a major referral hospital in Kampala (Nakibuuka et al., 2022), highlighting the critical importance of midwives' vigilance during the second stage of labour, where complications such as haemorrhage and pre-eclampsia remain leading causes of maternal mortality. These findings compare favourably with studies from Sub-Saharan Africa that highlight frequent gaps in fetal monitoring and readiness to manage antepartum obstetric complications (Ayebare et al., 2021; Varghese et al., 2019; WHO, 2019, 2020).

The counter reports of misinterpretation of fetal distress and poor labour monitoring are reported regionally (Mukisa et al., 2020; Mukunya et al., 2021; Tolu et al., 2020). Nonetheless, sustaining excellent knowledge requires strengthening team-based emergency readiness and ensuring consistent access to clear, evidence-based maternal and newborn care protocols (Namwaya et al., 2020; Osman et al., 2024).

Midwives demonstrated good knowledge regarding care just before discharge, particularly showing excellent awareness of the recommended 24-hour stay for mothers

and newborns. This duration is critical as it allows sufficient time to monitor for immediate postpartum complications, assess breastfeeding effectiveness, provide counselling on newborn care, and reinforce recognition of maternal and neonatal danger signs, thereby enhancing safety (Maleta et al., 2024).

However, knowledge of follow-up requirements was weak, suggesting inconsistent discharge education and limited safety netting, that is, providing mothers with clear instructions on which signs to monitor, when and where to seek help, and how to act before reaching a health facility. This gap reflects broader patterns reported in the literature, where discharge counselling often fails to cover essential aspects such as newborn danger signs, cord care, breastfeeding, and care of vulnerable infants. While intrapartum knowledge is relatively strong, postpartum haemorrhage prevention and recovery protocols remain insufficiently emphasized across Sub-Saharan Africa (Negussie et al., 2018; Osman et al., 2024).

Midwives' Practice of Safe Essential Maternal and Newborn Care.

Midwives' reported practices upon admission were very good, with most activities, such as checking maternal vital signs, assessing danger signs, and reviewing previous medical and obstetric history, fully done according to protocol. However, Achola et al. (2022) found that in low-resource settings, only about half of the midwives consistently perform comprehensive risk assessments upon admission. This contrast highlights that, despite high adherence in the current study, practices in similar settings may be inconsistent or less comprehensive, possibly due to resource limitations, training gaps, or systemic challenges. This reflects adherence to safe essential maternal and newborn care standards, which emphasize early, time-critical actions to prevent

deterioration and guide appropriate management. The findings are consistent with evidence that continuing professional development strengthens compliance with admission protocols (Negussie et al., 2018; Maleta et al., 2024). However, some regional studies report variability at this stage, particularly in synthesizing comprehensive risk information and recognizing complications early (Bireka et al., 2017). This suggests that the very good practices observed in this study are stronger than often reported in comparable low-resource settings and highlight the need to sustain them through structured mentorship, real-time clinical coaching, and routine audits to reinforce consistent, protocol-based care.

Practices just before pushing or caesarean delivery were very good, with activities such as hand hygiene, routine confirmation of fetal heart rate, verification of resuscitation equipment and supplies, communication of the birth plan with the mother and team, and administration of prophylactic antibiotics reported as mostly fully done according to protocol. Such preparedness is critical because it minimizes infection risk, ensures timely recognition of complications, and enables rapid intervention, thereby reducing the likelihood of antepartum complications that could compromise maternal and newborn outcomes. These findings align with evidence that thorough preparation, effective communication, and continuous monitoring promote safe maternal and newborn care at this stage (Namagembe et al., 2022; Maleta et al., 2024). While Maleta et al. (2024) report high adherence to supportive activities before pushing, gaps in pain management and birth plan coordination remain. Conversely, Sub-Saharan studies reveal variability in labour monitoring and emergency readiness (Tolu et al., 2020; Mukisa et al., 2020; Mukunya et al., 2021). Overall, consistent implementation of supportive activities and

emergency preparedness protocols is essential for sustaining safe essential maternal and newborn care just before pushing or caesarean delivery.

Midwives generally reported excellent practice immediately after birth, indicating that interventions were performed completely, correctly, and in accordance with established protocols. Timely administration of oxytocin within one minute is critical for preventing postpartum haemorrhage, a leading cause of maternal mortality, by stimulating uterine contractions and reducing blood loss (WHO, 2016; Maleta et al., 2024). Similarly, early initiation of breastfeeding promotes neonatal thermoregulation, provides colostrum rich in antibodies, and supports mother-infant bonding, which is essential for newborn immunity, nutrition, and survival (Semrau et al., 2017; Osman et al., 2024). Although skin-to-skin contact was also fully implemented, it lagged slightly behind other practices, reflecting gaps noted in previous research (Negussie et al., 2018).

This pattern suggests that while midwives consistently perform high-priority, lifesaving interventions, non-technical aspects of care, including thermoregulation, fluid monitoring, and supportive counselling, are less reliably applied. These elements, though not immediately lifesaving, are fundamental for preventing complications, ensuring recovery, and promoting continuity of maternal and newborn well-being (WHO, 2016, 2019; Kabwijamu et al., 2016). Comparable trends have been observed elsewhere: Kabwijamu et al. (2016) reported strong adherence to immediate postpartum interventions in Uganda but deficiencies in newborn thermal care, while Osman et al. (2024) found that critical interventions were consistently performed, yet fluid balance monitoring was often overlooked.

Practices just before discharge were excellent, with most activities fully performed according to protocol, including educating mothers on timely recognition of postpartum danger signs. Discharge education is critical for maternal and newborn safety because it equips mothers and caretakers with the knowledge to identify complications early, promotes adherence to feeding and thermal care practices, and supports timely follow-up, thus promoting safe, essential maternal and newborn care, best expected outcomes, and continuity of care in the community. This contrasts with common gaps reported in the literature, where maternal health education, monitoring of vital signs, assessment of bleeding and pain, newborn examination, and ensuring adequate feeding and warmth are often inconsistently applied (Negussie et al., 2018; Tariq et al., 2019).

The high adherence observed in this study indicates that midwives provide thorough, safety-focused care at discharge, consistent with the WHO Safe Childbirth Checklist (SCC) recommendations. These findings demonstrate strong compliance with safe maternal and newborn care protocols, particularly the just-before-discharge education protocols (Maleta et al., 2024).

Association Between Midwives' Knowledge and Practice

The Chi-Square Tests of Independence demonstrated a significant association between midwives' knowledge and practice, confirming that higher knowledge levels correlate with adherence to safe maternal and newborn care protocols across the four WHO-SCC pause points. This finding supports the hypothesis that increased knowledge among midwives positively influences their practice. Additionally, prior studies by Bireka et al. (2017), Kulwa and Nabbosa (2019), and Smith and Lee (2020) have consistently shown a strong association between midwives' knowledge and practices and

the quality of maternal and newborn health outcomes. Together, these results underscore the importance of enhancing midwives' knowledge to improve adherence to protocols and ultimately improve health outcomes for mothers and newborns.

Midwives with excellent knowledge were more likely to report performing interventions fully according to protocol, while those with lower knowledge tended toward partial adherence. Professional education further influenced this knowledge–practice link: diploma-level training provided baseline competence but sometimes limited advanced decision-making and consistent application of high-level protocols, whereas bachelor's-level midwives demonstrated broader competencies in maternal and newborn care (Graduate Midwifery Education in Uganda, 2020). As Kakyo et al. (2025) note, the relatively low number of degree holders constrains the development of specialized midwifery practice and policy influence, underscoring the need to expand access to higher education and professional development opportunities to enhance the quality and consistency of care.

Application of Theoretical Framework: KAP Model

This study employed the Knowledge, Attitudes, and Practices (KAP) model, focusing on two core elements—knowledge and practice—to assess midwives' capacity to provide safe maternal and newborn care. The assessment was conducted at four critical points: upon admission, just before pushing or caesarean delivery, immediately after birth, and just before discharge. This approach enabled a comprehensive and systematic evaluation of midwives' knowledge and practices across all four key stages of maternal and newborn care, providing an in-depth understanding of their competencies and adherence to best practices throughout the entire continuum of care. The model

emphasizes the importance of knowledge as a fundamental determinant of clinical practice and its pivotal role in shaping healthcare behaviour (practices).

Similarly, the application of the KAP model was carried out at the Federal Teaching Hospital in Abuja, Nigeria, to evaluate midwives' knowledge and practice across the same four critical points in the care continuum: upon admission, just before pushing, immediately after delivery, and before discharge. The study demonstrated the effectiveness of the KAP model in identifying gaps in midwives' knowledge and practices, thereby enabling targeted interventions to improve the quality of care (Okafor et al., 2020). Its application facilitated a comprehensive assessment of midwives' knowledge, attitudes, and practices throughout these stages of maternal and newborn care. Studies by Musa et al. (2021) and Tariq et al. (2019) have highlighted the relevance of the KAP model in nursing and midwifery, as it helps identify discrepancies between clinical knowledge and actual care practices (Audrey, 2016; Gama et al., 2024).

Numerous studies support a strong association between knowledge and practice. For example, Oladapo and Babalola (2013) demonstrated that Nigerian midwives with greater knowledge of postpartum haemorrhage management were more effective in implementing recommended interventions. Similarly, Abosi and Omame (2018) found that midwives with a better understanding of breastfeeding techniques provided more consistent and supportive care. Additionally, Alemu et al. (2020) observed that higher knowledge scores among midwives correlated with closer adherence to maternal and neonatal care protocols, ultimately leading to improved health outcomes.

Studies by Bireka et al. (2017), Kulwa and Nabbosa (2019), and Smith and Lee (2020) have also consistently shown a strong link between midwives' knowledge and

practices and the quality of maternal and newborn health outcomes (Bireka et al., 2017; Kulwa and Nabbosa, 2019; Smith and Lee, 2020). The evidence indicates that enhancing healthcare providers' knowledge—particularly through systemic support mechanisms such as training and supervision—is a key facilitator for translating knowledge into practice. Ongoing training and supervision serve as essential feedback mechanisms, helping identify gaps and fostering accountability, which are critical for sustaining behavioural change and improving care quality (Hiu, Tey, & Lee, 2019; Kifle et al., 2020; WHO, 2013). Our findings align with previous research, suggesting that although knowledge influences practice, its effective application heavily depends on organizational support.

Furthermore, our results show that midwives with higher levels of knowledge tend to demonstrate better practice, especially in areas such as fetal monitoring, maternal triage, and early initiation of breastfeeding (Kiggundu et al., 2020; Nakiruka et al., 2021). No significant associations were found between sociodemographic variables and either knowledge or practice, indicating that systemic and contextual factors play a more influential role. This underscores the importance of supportive supervision in effectively translating knowledge into practice (Kifle et al., 2020; WHO, 2013).

Overall, these findings reaffirm the continued relevance of the KAP framework. While knowledge is fundamental, its effective application relies on systemic support mechanisms such as ongoing training and supervision. These strategies are vital for reinforcing knowledge and enhancing clinical practice (Memon et al., 2020; Oyerinde et al., 2019). Supervision, in particular, provides essential feedback, helps identify gaps, and

fosters accountability—activities that are crucial for continuous quality improvement (Kifle et al., 2020; WHO, 2013).

Targeted training and supervision are crucial for reinforcing both knowledge and practical skills, ultimately enhancing the quality of maternal and neonatal care (Hiu, Tey, & Lee, 2019). Ongoing professional development is essential to ensure strict adherence to care protocols and to improve health outcomes. Consequently, the application of the KAP model in this study highlights its continued relevance in elucidating and refining midwives' practice patterns. The findings substantiate that increased knowledge functions as the primary catalyst for behavioural change (practices), fostering positive attitudes that subsequently translate into improved clinical practice. This aligns with the theoretical premise that observable behaviour (practice) originates from foundational knowledge and attitudes, thereby affirming the model's applicability within this context (Andrade et al., 2020; Liao et al., 2022; Sharma, 2024).

Conclusion

This study set out to assess midwives' knowledge and practice of safe essential maternal and newborn care at a regional referral hospital in central Uganda. Guided by the **KAP (Knowledge, Attitudes, and Practices) model**, **knowledge** was assessed through open-ended questions and categorized as poor, moderate, or excellent, while **practice** was measured using a four-point Likert scale (1 = Never, 2 = Partially done, 3 = Adequately done, 4 = Fully done according to protocol) across the four WHO-SCC pause points. Findings revealed that most midwives demonstrated excellent knowledge at admission and just before pushing, and moderate to excellent knowledge immediately

after birth and very good just before discharge, reflecting a strong grasp of safe and evidence-based procedures throughout the childbirth continuum (WHO, 2016).

Reported practice levels were equally strong, with most activities reported as adequately done or fully done according to protocol, particularly immediately after birth and just before discharge, indicating a high self-reported frequency of performing essential maternal and newborn care practices according to protocol (Kabwijamu et al., 2016). Chi-Square Tests of Independence confirmed a statistically significant association between knowledge and practice, reinforcing the KAP model's premise that excellent knowledge translated into reported practices most often done fully according to protocol (Namagembe et al., 2022).

Implications

These findings highlight the importance of sustaining capacity through WHO-SCC–aligned job aids, refresher training, supportive supervision, and audit-and-feedback mechanisms. Expanding professional development, particularly progression from diploma to bachelor's level, remains essential to strengthen both knowledge and consistently high-quality reported practices. Sustaining and strengthening these gains will require ongoing support, including job aids aligned to the WHO-SCC, targeted refresher training for immediate postpartum and discharge care, supportive supervision and mentorship, and routine audit-and-feedback mechanisms to ensure consistent performance across all pause points.

These findings provide a practical baseline for quality improvement guided by the WHO-SCC (WHO, 2016). Future research should triangulate self-reports with direct observations and outcome metrics, while extending to multi-site replication to enhance

generalizability. Importantly, strengthening midwives' professional development—such as expanding opportunities for career progression from diploma to bachelor's level—will be critical in sustaining high levels of knowledge and reported practice and in building long-term capacity for safe maternal and newborn care.

Recommendations

The significant association between knowledge and practice, demonstrated by Chi-Square analysis, underscores the importance of professional development to sustain consistent, high-quality maternal and newborn care. Strengthening midwives' competence through refresher training, structured mentorship, real-time clinical coaching, supportive supervision, and opportunities for progression to bachelor's degrees ensures that knowledge consistently translates into practice, fully done according to protocol.

Clinical practice**:** Address gaps in emergency preparedness, patient-centred care, postnatal monitoring, discharge counselling, and education progression through targeted interventions. These findings collectively reinforce the KAP model's premise that knowledge underpins practice, while also underscoring the importance of ongoing professional development in sustaining safe clinical care.

Policy: Institutionalize continuous professional development, formalize preparedness and discharge communication protocols.

Future research**:** Examine contextual and behavioural determinants influencing practice consistency. Assess links between knowledge, practice, and maternal and neonatal outcomes to strengthen the evidence base for policy and programs. Hence, sustain consistent, high-quality maternal and newborn care in line with the two elements operationalised in the KAP model.

Plans for Dissemination of Findings

The dissemination of this study's findings will be guided by the **Knowledge, Attitudes, and Practices (KAP) framework**, emphasizing how evidence can inform both knowledge and behaviour change (practices) among midwives. After finalizing the dissertation and addressing the viva committee feedback, the results will be shared with the Directorate of Postgraduate Studies and hospital management to inform targeted training, structured mentorship, and supportive supervision programs. Findings will also be prepared for publication in peer-reviewed journals and presented at local, national, and international workshops or conferences on maternal and newborn health. Practical dissemination will include summary briefs and training modules for midwives, emphasizing evidence-based interventions across the WHO Safe Childbirth Checklist (SCC) four pause points. By linking results to the KAP framework, this plan aims to facilitate behaviour change, improve adherence to safe maternal and newborn care protocols, and enhance the continuity and quality of maternal and newborn care.

Limitations of the Study.

This study has several limitations. First, reliance on self-reported practice data may have introduced social desirability and recall bias, potentially inflating adherence to essential maternal and neonatal care protocols. Second, the cross-sectional design limits the ability to assess changes over time and precludes causal inferences between knowledge and practice. Third, conducting the study within a single hospital restricts the generalizability of findings to other settings with different staffing, resources, or training programs. Fourth, the absence of direct clinical observations and measurements of

behavioural and attitudinal factors may limit understanding of how knowledge translates into practice,protocol-adherent care and health outcomes.

Despite these limitations, the study advances existing knowledge by empirically establishing the association between midwives' knowledge and their clinical practice in maternal and neonatal care, emphasizing the critical roles of education and systemic support. It underscores the importance of ongoing training and supportive supervision in translating knowledge into high-quality care. Through the application of the KAP model, the research provides a nuanced understanding of behavioural determinants influencing practice, thereby informing targeted interventions aimed at improving adherence to care protocols and ultimately enhancing maternal and neonatal health outcomes.

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Appendix I: Informed Consent form to participate in the study

Title of the Research Study

Midwives' Knowledge and Practice towards Safe Essential Maternal and Newborn Care Practices at a Regional Referral Hospital in Central Uganda

Principal Investigator, Affiliation, and Contact Information

This study was conducted by Grace Birungi Baguma in partial fulfilment of the requirements for the Master of Nursing Science degree at Uganda Christian University (UCU), Mukono. You may contact the principal investigator at +256 704 525 790 or via email at gbaguma20@gmail.com for any study-related inquiries.

Introduction and Purpose of the Study

You are being asked to participate in a research study. This consent form provides information about the study and your role as a participant. Please read it carefully and take time to ask any questions before deciding whether to participate.
Participation is **voluntary,** and you may withdraw at any time without any penalty.

The purpose of this study is to describe midwives' knowledge and practices regarding safe essential maternal and newborn care at a regional referral hospital in **Central Uganda**. The findings are intended to inform improvements in maternal and newborn care services.

Description of the Research

This study employs a **quantitative descriptive cross-sectional design** to assess midwives' knowledge and self-reported practices related to safe essential maternal and newborn care.

Study Procedures

You are invited to participate in this study because you are a midwife providing maternal and newborn care in the **antenatal, maternity, or postnatal wards**.
If you agree to participate, you will be asked to complete a structured questionnaire by carefully ticking the most appropriate response for each item. Completion of the questionnaire will take approximately **one hour**.

Potential Benefits

This study may provide valuable insights into the current status of maternal and newborn care practices, highlighting strengths and identifying gaps that can be addressed to improve maternal and newborn care service delivery. The findings may assist stakeholders in developing targeted training programs, quality improvement initiatives, and policy interventions. As compensation for your time, you will receive **UGX 10,000** as transport facilitation and a **soft drink** during your participation.

Potential Risks and Discomforts

There are **no foreseeable risks or discomforts** associated with participation in this study.

Confidentiality

To ensure confidentiality, questionnaires will be identified using **code numbers only**, and no personal identifiers will be collected. All information provided will be treated with the utmost confidentiality and used solely for research purposes.
In any reports, publications, or presentations arising from this study, only **aggregate data** will be presented, and no individual participant will be identifiable.

Rights of Participants

Participation in this study is entirely voluntary. Your decision to participate or not participate will not affect your employment, professional standing, or opportunities for promotion. You are free to withdraw from the study at any time before submission of the completed questionnaire, without any penalty or loss of benefits.

Ethical Approval and Contact for Concerns

This study has been approved by the Uganda Christian University Research Ethics Committee (UCU-REC-026). Email: rec@ucu.ac.ug. If you have any questions, concerns, or wish to withdraw your consent, you may contact:

Dr Elizabeth Ekong: Tel: +256 702 741 911, Email: **ekongelizabeth@yahoo.com**

Consent Statement

I have read and understood the information provided in this consent form. I have had the opportunity to ask questions about the study, and all my questions have been answered to my satisfaction. I voluntarily agree to participate in this study. I confirm that I am **18 years of age or older** and that I have received a copy of this informed consent form.

Participant's Name: … .....**Participant's Signature:** ……

Date: ……**Witness Name:** ……

Signature: …… **Date:** ……

Appendix II: Questionnaire on Midwives' Knowledge and Practice

The Questionnaire has three sections: A, B & C. Answer all questions in each section following the instructions given.

SECTION A: Social Demographic Characteristics.

1. What is your age? ----------(Fill in the complete years)
2. What is your gender? Tick the appropriate box
   ☐ Female ☐ Male ☐ Prefer not to say
3. What is your highest level of education in midwifery? Tick the appropriate box.
   ☐ Certificate ☐ Diploma ☐ Bachelor's ☐ Master's
4. How many years of experience do you have working in maternity care? ---------- (full years)
5. Have you received any in-service training in maternal or newborn care in the last 2 years? Tick the appropriate box.
   ☐ Yes ☐ No
6. If the answer is yes to number 6, please specify the type of training received.
   ……
   ……
   ……
7. What department or unit do you currently work in? Tick the appropriate box.
   ☐ Labour Ward ☐ Antenatal ☐ Postnatal ☐ Other (Specify) ----------

SECTION B: Knowledge on Safe Essential Maternal and Newborn Care

This section has four parts: I, II, III, & IV. Answer all questions in each part by circling your choice of response.

Part 1: On Admission

8. **What is the first clinical action a midwife should perform when a mother arrives in labour?**
   A. Start an IV line
   B. Conduct a triage and initial assessment
   C. Administer antibiotics
   D. Begin pushing

9. **Which of the following is a key task to perform on admission?**
   A. Administer oxytocin immediately
   B. Assess for danger signs in the mother
   C. Begin breastfeeding
   D. Perform neonatal resuscitation

10. **What should the midwife ensure is available on admission to manage complications?**
    A. Transport for referral
    B. Basic emergency equipment and drugs
    C. Birth companion
    D. Baby clothing
11. **Which vital sign is essential to assess immediately upon admission?**
    A. Respiratory rate only
    B. Weight only
    C. Blood pressure
    D. Oxygen saturation
12. **What is the correct frequency for recording maternal heart rate during labour?**
    A. Every 30 minutes
    B. Every 1 hour
    C. Every 15 minutes
    D. Every 4 hours
13. **What is the recommended action if the mother has a blood pressure of 160/100 mmHg?**
    A. Administer Magnesium sulphate
    B. Augment labour
    C. Administer antihypertensive medication
    D. Give diazepam

Part II: Just Before Pushing (or before Cesarean delivery)

14. **Which of the following is NOT part of the WHO checklist before pushing?**
    A. Ensure the birth companion is present
    B. Confirm emergency readiness (e.g., resuscitation equipment)
    C. Confirm maternal allergies
    D. Perform heel prick test
15. **What should a midwife assess before allowing a woman to begin pushing?**
    A. Cervical dilation and fetal station
    B. Fetal movement
    C. Amniotic fluid smell
    D. Fundal height
16. **What should a birth companion be advised to do during labour?**
    A. Keep quiet during labour
    B. Identify warning signs and notify staff
    C. Assist with medication
    D. Monitor fetal heart rate

17. **Which of the following is a sign that requires immediate attention before pushing?**
    A. Mild abdominal pain
    B. Mild headache
    C. Severe visual disturbance
    D. Loss of appetite

18. **Why is hand hygiene emphasized just before delivery?**
    A. To prevent discomfort to the mother
    B. To prevent transmission of infections to the mother and newborn
    C. To protect the healthcare provider
    D. For compliance with hospital audits

19. **What is the recommended method to monitor the fetal condition before delivery?**
    A. Maternal report of fetal movement
    B. Vaginal examination only
    C. Intermittent auscultation or continuous fetal heart rate monitoring
    D. Counting maternal heart rate

Part III: Soon After Birth (within 1 hour)

20. **Which of the following is a key task immediately after birth?**
    A. Give mother a drink and allow her to rest
    B. Start massaging the uterus
    C. Initiate skin-to-skin contact and breastfeeding
    D. Begin immunizations

21. **What maternal observation must be conducted immediately after birth?**
    A. Fundal height only
    B. Maternal BP, temperature, and uterine tone
    C. Mother's pulse only
    D. Fetal heart rate

22. **Why is administering oxytocin soon after birth important?**
    A. To stimulate uterine contraction
    B. To help expel the placenta faster
    C. To prevent postpartum haemorrhage
    D. To reduce afterbirth pain

23. **Which newborn observation is critical immediately after birth?**
    A. Feeding interest
    B. Respiratory rate, colour, and tone
    C. Temperature only
    D. Eye movement

24. **What is the minimum fluid intake post-delivery?**
    A. 300 ml/hour
    B. 100 ml/hour
    C. 500 ml/day
    D. Not necessary

Part IV: Before Discharge

25. **Before discharge, which newborn care step must be completed?**
    A. Hepatitis B and BCG immunizations
    B. Feeding instructions
    C. Bathing the baby
    D. Birth certificate registration

26. **What maternal advice is essential before discharge?**
    A. Breastfeeding the baby
    B. Recognizing postpartum danger signs
    C. Dressing the baby properly
    D. Adequate rest

27. **What is the recommended duration of stay in the facility after birth?**
    A. 6 hours
    B. 12 hours
    C. At least 24 hours
    D. Discharge after delivery

28. **What should be done regarding follow-up before discharge?**
    A. Schedule the mother's next visit
    B. Schedule the newborn's immunization and check-up visit
    C. Collect hospital feedback
    D. Offers psychological counselling.

SECTION C: Practice on Essential Maternal and Newborn Care

In this section, determine your practice according to a four-point Likert Scale as follows:

1=Not done
2= Partially done
3=Adequately done
4= Fully done according to protocol

Put a tick in the box that represents your response according to the scale

QN	Pause &Task	1	2	3	4
Upon Admission					
29	Checked maternal vital signs (BP, temperature, pulse, respirations) during Triage.				
30	Assessed for maternal danger signs (bleeding, convulsions, blurred vision)				
31	Reviewed the previous medical and obstetric history				
32	Ensured emergency equipment and supplies are ready				
Just before Pushing		**1**	**2**	**3**	**4**
33	Performed hand hygiene before conducting the delivery				
34	Confirmed fetal heart rate monitoring				
35	Checked for the availability of resuscitation equipment				
36	Communicated birth plan with mother and team. E.g. counselling the birth companion to know danger signs and call for help, when to start pushing and other supportive activities and emergency preparedness.				

Immediately after Birth		**1**	**2**	**3**	**4**
37	Administered oxytocin within 1 minute of birth				
38	Initiated skin-to-skin contact and early breastfeeding				
39	Assessed newborn for danger signs (breathing, temperature)				
40	Checked the completeness of the placenta and membranes				
Just before Discharge		**1**	**2**	**3**	**4**
41	Monitored maternal vital signs, bleeding, and pain before discharge.				
42	Examined the newborn and ensured adequate feeding and warmth before discharge.				
43	Counselled the mother/caretaker about postpartum danger signs and when to return for follow-up				

Appendix III: Midwives' knowledge of safe essential maternal and newborn care (Individual scores)

	Midwives' knowledge upon admission						Midwives' knowledge Just Before Pushing						Midwives' knowledge immediately after birth (Within 1 Hour)					Midwives' Knowledge Just Before Discharge			
S/N	Q1	Q2	Q3	Q4	Q5	Q6	Q1	Q2	Q3	Q4	Q5	Q6	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0
2	1	1	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0
3	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	0	1	1	0
4	1	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	0	0	1	1	1
5	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0
6	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1
7	1	1	1	1	0	2	0	1	1	1	1	1	0	1	0	1	0	1	0	1	0
8	1	1	0	0	0	1	0	1	1	1	1	1	0	1	0	1	1	0	0	0	0
9	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1
10	1	1	1	0	0	0	0	0	1	0	1	1	1	0	1	0	0	1	1	0	1
11	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	1	0	1	0
12	1	1	1	1	1	0	0	1	1	1	1	1	0	1	1	1	0	1	0	1	1
13	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1
14	1	1	1	1	1	0	0	1	1	0	1	1	0	1	0	1	0	1	0	1	1
15	1	1	0	1	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1
16	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
17	0	0	0	1	0	0	0	1	0	1	1	1	0	1	1	1	0	0	1	1	1
18	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0
19	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
20	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0
21	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0
22	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	0	1	1	0
23	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1

	Midwives' knowledge upon admission						Midwives' knowledge Just Before Pushing						Midwives' knowledge immediately after birth (Within 1 Hour)					Midwives' Knowledge Just Before Discharge			
S/N	Q1	Q2	Q3	Q4	Q5	Q6	Q1	Q2	Q3	Q4	Q5	Q6	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0
25	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	1	1	1	0
26	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0
27	1	1	1	0	0	0	1	1	0	0	1	1	1	1	0	1	0	1	1	1	1
28	1	1	1	1	0	1	1	1	0	1	1	1	0	1	0	1	0	1	0	1	0
29	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
30	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	0	1	1	1	0
31	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0
32	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0
33	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1
34	1	1	1	1	1	0	0	1	1	1	1	1	0	1	1	1	0	1	1	1	0
35	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0
36	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0
37	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	0
38	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	0
39	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
40	1	1	0	1	1	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
41	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	0	1	0	0	0
42	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0
43	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0
44	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1
45	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1
46	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1
47	1	1	1	1	0	1	0	4	0	0	0	0	1	1	1	1	0	1	1	1	1
48	1	1	1	1	0	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0

	Midwives' knowledge upon admission						Midwives' knowledge Just Before Pushing						Midwives' knowledge immediately after birth (Within 1 Hour)					Midwives' Knowledge Just Before Discharge			
S/N	Q1	Q2	Q3	Q4	Q5	Q6	Q1	Q2	Q3	Q4	Q5	Q6	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4
49	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1
50	1	1	1	1		1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1
51	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0
52	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	1	0	0	1	1	1
53	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	0	1	1	1
54	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	0
55	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0
56	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	1	1	0
57	1	1	1	1	0	0	1	1	0		1	1	1	1	1	1	1	0	1	1	1
58	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	0	0	0	0	1
59	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0
60	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0
61	1	1	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	1	1
62	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	1	0	1	1
63	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	0	0	1	1
64	1	1	1	1	1	0	0	1	1	0	1	0	1	1	1	1	0	1	0	1	0
65	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0
66	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1
Total Correct Score/ 66	57	58	52	61	41	28	37	66	57	49	59	62	53	60	35	60	7	51	48	57	30
% of correct score	86.4	87.9	78.8	92.4	62.1	42.4	56.1	100.0	86.4	74.2	89.4	93.9	80.3	90.9	53.0	90.9	10.6	77.3	72.7	86.4	45.5
Average % of correct score	**75.0**						**83.3**						**65.2**					**70.5**			