

HEALTH CARE STAFFING AND MATERNAL HEALTH OUTCOMES IN TEREGO DISTRICT, UGANDA

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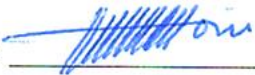


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DECLARATION

I, Candia Morris, declare that this research dissertation, entitled "Health care staffing and maternal health outcomes," is my original work and has not been submitted for any other degree or professional qualification. All sources of information and contributions from other researchers are properly acknowledged in the report.

Signature:  _____

23rd May 2026

APPROVAL

This is to certify that the research dissertation submitted by Candia Morris on “Health care staffing and maternal health outcomes in Terego district, Uganda” was carried out under my supervision. It is ready for submission to the Academic Board of Uganda Christian University.

Approved by;

Name. Dr. David Sekamale

Sign: 

24th May 2026

DEDICATION

This research dissertation is dedicated to my beloved wife, Mrs Drijaru Agnes, my children, Sakaru Gladies, Letaru Winny, and Asianzu Queen Patricia.

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I thank the Almighty God for His guidance and protection throughout this work. My gratitude also goes to Principal Mrs Aliwaru Daizy for her support and guidance.

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TABLE OF CONTENTS

DECLARATION.....	ii
APPROVAL	iii
DEDICATION.....	iv
ACKNOWLEDGEMENT.....	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
ABSTRACT.....	xii
CHAPTER ONE	1
INTRODUCTION.....	1
1.0 Introduction.....	1
1.1 Background of the Study	1
1.2 Problem statement.....	3
1.4 Specific objectives	3
1.5 Research Questions	4
1.6 Scope of the Study	4
1.7 Justification of the Study	5
1.8 Significance of the Study	6
1.9 Conceptual framework.....	7
1.11 Operational Definitions.....	8
CHAPTER TWO	9
LITERATURE REVIEW	9
2.0 Introduction.....	9
2.1 Theoretical Review	9
2.2 Health Care Staffing and Maternal Health Outcomes	10
2.3 Staffing Adequacy and Maternal Health Outcomes	12
2.5 Health workers' skills, training and Maternal Health Outcomes	15
2.6 The Link Between Health Care Staffing and Maternal Health Outcomes.....	16
2.7 Conclusion	17
CHAPTER THREE	18
RESEARCH METHODOLOGY	18
3.0 Introduction.....	18

3.1 Research Design.....	18
3.2 Area of Study	18
3.3 Sources of Information	19
3.4 Population and Sampling Technique	19
3.5 Variables and Indicators	21
3.5 Data Collection Methods and Instrumentation	21
3.6 Quality/Error control.....	22
3.7 Data processing and analysis strategy.....	24
3.7.1 Collection & Entry of Data	24
3.7.2 Quantitative Analysis.....	24
3.8 Reporting and Documentation.	25
3.9 Ethical Considerations.	25
3.9.1 Ethical Clearance	25
3.9.2 Informed Consent.....	25
3.9.3 Confidentiality	26
3.9.4 Privacy	26
3.10 Expected methodological limitations.....	26
CHAPTER FOUR.....	28
PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS	28
4.0 Introduction.....	28
4.1 Response Rate and Final Sample Size	28
4.2 Demographic Characteristics of Participants.....	28
4.2.1 Gender of Respondents	28
4.2.2 Age of Respondents	30
4.2.3 Educational Qualification	31
4.2.4 Professional Experience	32
4.3 Normality Test	33
4.4 Key Findings.....	40
4.4.1 Objective One: Staff Adequacy and Maternal Health Outcomes	40
4.4.3 Objective Two: Staff Motivation and Maternal Health Outcomes	42
4.4.4 Staff Training and Maternal Health Outcomes	46
4.5 Qualitative Findings.....	49
CHAPTER FIVE	52
DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS	52

5.1 Introduction.....	52
5.2 Summary of Findings.....	52
5.2 Discussion of Findings.....	53
5.2.1 Effect of Healthcare Staff Adequacy on Maternal Health Outcomes.....	53
5.2.2 Influence of Healthcare Staff Motivation on Maternal Health Outcomes	54
5.2.3 Effect of Healthcare Workers' Skills and Training on Maternal Health Outcomes.....	54
5.3 Conclusions.....	55
5.3.1 Staff Adequacy and Maternal Health Outcome	55
5.3.2 Staff Motivation in relation to Maternal Health Outcomes.	55
5.3.3 Staff Professional Development and Maternal Health Results.....	55
5.4 Recommendations.....	56
5.4.1 For Staff Adequacy	56
5.4.2 For Staff Encouragement	56
5.4.3 For Staff Training	56
5.5 Future Research Issues.....	56
REFERENCES.....	57
APPENDICES	63
Appendix A: Table for Determining Sample Size for a Finite Population.....	63
Appendix B: Consent Form For Participants.....	64
Appendix C: Interview guides	66
Appendix D: Questionnaire	67
Appendix E: Proposed budget.	71
Appendix F: Proposed Work plan.....	73
Appendix G: Signed Introductory Letter Data Collection.....	74
Appendix H: Notification of Research Institutions Response	75

LIST OF TABLES

Table 1: Proportionate Stratified Sampling	21
Table 2: Age Group of Participants	30
Table 3: Educational Qualifications of Respondents.....	31
Table 4: Tests of Normality	33
Table 5: Staff Adequacy and Maternal Health Outcomes responses.....	40
Table 6: Staff Adequacy and Maternal Health Outcomes Correlation	41
Table 7: Regression Analysis.....	41
Table 8: Hypothesis Testing	41
Table 9: Descriptive Statistics for Staff Motivation Variables	43
Table 10: Correlation Analysis for Staff Motivation.....	44
Table 11: Regression Analysis for Staff Motivation	44
Table 12: Descriptive Statistics for Staff Training Variables.....	46
Table 13: Correlation Analysis for Staff Training.....	47
Table 14: Regression Analysis for Staff Training	48

LIST OF FIGURES

Figure 1: MAP SHOWING THE LOCATION OF TREGO DISTRICT	4
Figure 2: Chart Showing Gender of Participants.....	29
Figure 3: Work Experience of Respondents	32
Figure 4: Normality Test Result for Staff Adequacy	34
Figure 5: Normality Test Result for Staff Motivation	36
Figure 6: Normality Test Result for Staff Training	37
Figure 7: Normality Test Result for Maternal Health Outcome	38

LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CARMMA	Campaign on Accelerated Reduction of Maternal Mortality in Africa
CHW	Community Health Worker
CPD	Continuing Professional Development
DHO	District Health Office
DHS	District Health Service / Demographic and Health Survey
EONC	Emergency Obstetric and Newborn Care
HMIS	Health Management Information System
IV	Independent Variable
LMIC	Low- and Middle-Income Countries
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
MOH	Ministry of Health
NGO	Non-Governmental Organisation
PHC	Primary Health Care
SDG	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences
UBOS	Uganda Bureau of Statistics
UCUREC	Uganda Christian University Research Ethics Committee
UHC	Universal Health Coverage
UDHS	Uganda Demographic and Health Survey
VHT	Village Health Team
WHO	World Health Organisation

ABSTRACT

Maternal mortality is still a major public health concern for Uganda and especially this problem in rural areas such as Terego. Although it has universally been acknowledged that health staffing is a significant factor that influences maternal health, the unique ways that staffing-related factors (such as adequacy, motivation, and training) impact on these results in underserved contexts in Uganda has not been investigated. This work investigated impact of healthcare staffing on maternal health outcomes in Terego District, Uganda. Three objectives: The study aimed at: (1) determining the effect of healthcare staff adequacy on maternal health; (2) determining what role motivated staff play in maternal health improvements; (3) knowledge on healthcare workers' skills and training to improve maternal health outcomes. Methodology METHODS AND METHODS The methodology used mixed-methods and includes quantitative and qualitative data collection. Descriptive, correlational design was employed as the part of the quantitative part with the collection of data from 136 HCWs, district health managers, health unit management committee members, village health teams and community beneficiaries by the way of a structured questionnaire. The qualitative data were gathered through semi-structured interviews and analysed in a thematic manner. The data were examined using descriptive statistics, Pearson correlation, and SPSS regression analysis and thematic narrative analysis. Separate associations between staffing levels were identified for each staff level variable via the study. Staff adequacy did not significantly correlate with maternal health outcomes ($r = 0.034$, $p = 0.696$), owing to widespread and consistent shortages among all facilities. Staff motivation showed a statistically significant positive association with outcomes ($r = 0.333$, $p < 0.001$), representing 11.1% of the variance. Staff training and skills was found to be the largest predictor of maternal health outcomes ($r = 0.400$; $p < 0.001$), accounting for 16.0% of variance. Based on a qualitative research finding, these problems were confirmed, indicating acute shortages of skilled staff with low pay and poor living conditions, as well as urgent training in emergency obstetric and neonatal care.

Keywords: maternal health, healthcare staffing, staff motivation, staff training and health outcomes

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter outlines the study's background, problem statement, purpose, objectives, research questions, conceptual framework, justification, significance, and summary.

1.1 Background of the Study

Globally, the provision of health care is a basic human right and a critical component of sustainable development, with Universal Health Coverage (UHC) recognized by the World Health Organization as a global priority aimed at ensuring that all people receive essential health services without financial hardship (Adams & Brown, 2021). Despite global efforts to improve maternal health, maternal mortality, availability of antenatal care services, accessibility of health care services, and the percentage of health facility deliveries continue to pose major public health challenges, particularly in low- and middle-income countries (LMICs). Maternal mortality remains an important indicator of health system performance because it reflects the quality, accessibility, and effectiveness of maternal health services (WHO, 2022). Globally, the Millennium Development Goals (MDGs) sought to reduce maternal mortality by three-quarters between 1990 and 2015, while the Sustainable Development Goals (SDGs) further emphasized the need to reduce maternal deaths through improved access to quality maternal health services and skilled birth attendance (WHO, 2019; WHO, 2020). In response to these challenges, the African Union launched the Campaign on Accelerated Reduction of Maternal Mortality in Africa (CARMMA) in 2009 to improve access to antenatal care services, promote health facility deliveries, and strengthen maternal health systems across the continent (African Union, 2019).

African countries, particularly those in Sub-Saharan Africa, continue to face challenges arising from inadequate healthcare infrastructure, shortages of skilled health workers, limited medical supplies, and increasing pressure from both communicable and non-communicable diseases, all of which negatively affect maternal health outcomes. In Uganda, maternal mortality remains high despite government interventions such as the Health Sector Strategic Plan and the National Health Policy aimed at improving maternal health care services (MOH, 2022). Poor maternal health

outcomes are reflected in inadequate antenatal care services, inaccessible health care services, and low percentages of health facility deliveries, especially in rural districts where financial constraints, insufficient healthcare infrastructure, and shortages of qualified healthcare providers persist (MOH, 2022; WHO, 2022). The Uganda healthcare system operates under a decentralized District Health Service (DHS) structure in which local governments are responsible for staffing and managing district health services following fiscal allocations from the central government (Nsibambi, 1998). Nevertheless, concerns remain regarding the effectiveness of this system in improving maternal health outcomes. Healthcare staffing, which includes the availability, distribution, and competence of doctors, nurses, midwives, and other health professionals, plays a critical role in determining access to and quality of maternal health services, including antenatal care, skilled birth attendance, emergency obstetric care, and postnatal services (MOH, 2022). Adequate healthcare staffing is associated with reduced maternal mortality, improved accessibility and availability of antenatal care services, and increased percentages of deliveries conducted in health facilities under skilled personnel. Maternal health outcomes, which refer to the health status of women during pregnancy, childbirth, and the postnatal period, are commonly measured through indicators such as maternal mortality, accessibility and availability of antenatal care services, and the percentage of health facility deliveries conducted by trained health workers (Namirembe et al., 2020; Kisia et al., 2022).

In Uganda, the maternal mortality ratio was estimated at 375 deaths per 100,000 live births in 2016, while the Uganda Demographic and Health Survey indicated that many women still deliver outside health facilities or in facilities lacking essential medical supplies and emergency obstetric care services (World Bank, 2021). The situation is particularly concerning in Terego District, which became independent from Arua District in 2015 and continues to experience significant maternal health challenges characterized by high maternal mortality, inadequate antenatal care services, inaccessible health care services, and low percentages of health facility deliveries. Although the district has adopted national health policies aimed at improving maternal health outcomes, the underlying causes of these poor outcomes remain insufficiently understood. Therefore, there is a need for research to examine how healthcare staffing influences maternal mortality, availability of antenatal care services, accessibility of health care services, and the percentage of health facility deliveries in Terego District, while also exploring broader governance

and health system challenges affecting maternal health outcomes in the district (UDHS, 2022; Orem, Kakungulu & Aliku, 2018).

1.2 Problem statement

Health units require sufficient, well-trained staff qualified to provide quality health services (Thompson, 2019). Despite health sector reforms and increased domestic funding in Uganda in recent years, there remain gaps in access to and quality of maternal health services, thus undermining health outcomes, especially in rural areas (Smith & Brown, 2020). Maternal health in Uganda and Terego in particular remains a threat, with 360 maternal deaths per 100,000 live births (World Bank data 2020). The Ministry of Health (2023) reports that Terego District recorded 83 maternal deaths in 2020, 83 in 2021, 85 in 2022, and 95 in 2023 (MoH, 2023). The Greater Arua District, which includes Yumbe, Koboko, Terego, and Maracha have some of the lowest maternal health indicators, with 300 mothers dying per 100,000 annually, particularly at Health Centre II and III levels (Braun & Grote, 2000; Jeppsson, 2001, 2004; MoH, 2015; UBOS, 2018).

Research by several scholars in sub-Saharan Africa has focused primarily on primary health care services and citizens' satisfaction (Masiira et al., 2021; Musoke & Kawuki, 2016; Patrick, 2024; Thompson, 2019), with little attention to health care staffing and maternal health outcomes. Moreover, other scholars have addressed health care staffing and maternal health outcomes separately (Wireko 2020), without linking the two. Therefore, this study aims to establish the effect of health care staffing on maternal health outcomes in Terego district, Uganda.

1.3 Purpose of the study

The purpose of this study was to investigate effect of health care staffing and maternal health outcomes in the Terego district, Uganda.

1.4 Specific objectives

1. To establish the effect of healthcare staff adequacy on maternal health outcomes in Terego District.
2. To examine the effect of healthcare staff motivation on improving maternal health outcomes in Terego District.

3. To find out the effect of healthcare workers' skills on enhancing maternal health outcomes in Terego District.

1.5 Research Questions

1. How does the healthcare staff adequacy in Terego District affect maternal health outcomes?
2. How does healthcare staff motivation affect maternal health outcomes in Terego District?
3. What is the effect of healthcare workers' skills on maternal health outcomes in Terego District?

1.6 Scope of the Study

1.6.1 Geographical Scope

This research focused on the Terego District in the West Nile sub-region of Uganda, as indicated on the map below.

Figure 1: MAP SHOWING THE LOCATION OF TREGO DISTRICT



Map 1: Showing the location of the Terego district.

The district was selected as a study location because it's the newest district and faces unique socio-economic and health challenges, particularly in maternal health, given its status as a refugee-hosting district. The research specifically targeted the sub-counties of Bileafe, Aii-vu, and Katrini.

1.6.2 Time Scope

The study was conducted between 2019 and 2024 in its reference period. It was during this time that maternal health outcomes in the district suffered. On a routine basis, by the UNFPA, the United Nations Population Fund, 2019 data regarding their assessment of service delivery has revealed maternal mortality increased from 10.4% in 2019 to 10.8% in 2024, as reported by the Health Management Information System (HMIS). In addition, HMIS found that the percentage of deliveries given at health centres is still low at 5%.

1.6.3 Content Scope

The study was focused on Healthcare Staffing and Maternal Health Outcomes. Healthcare staffing, defined as the recruitment, management and retention of personnel who provide a wide range of medical and support services in a health context (World Health Organisation, 2021). That means doctors, nurses, allied health workers, administrative staff and support personnel. The study investigated the impact of healthcare staffing on maternal healthcare services access, quality and availability. This study assessed the maternal health outcomes in Terego District, particularly with respect to maternal mortality rates, maternal morbidity, accessibility of skilled birth attendants, antenatal and postnatal care services, and emergency obstetric care. It assessed the effect of healthcare staffing on these results and whether staffing levels are associated with improvements in maternal health services.

1.7 Justification of the Study

Maternal health is a major issue in Sub-Saharan Africa, much of which includes Uganda with high maternal mortality and poor maternal healthcare access. Although global actions have been undertaken to decrease maternal mortality, Sub-Saharan Africa makes up the largest global share of maternal deaths (Miller et al., 2020). The health status of maternal deaths remains exceedingly high in the region and complications during pregnancy and childbirth remain a common factor for maternal mortality, and WHO (2022) states that complications during pregnancy and childbirth are the major source of deaths among women of reproductive ages. Maternal mortality as a health

outcome indicator remains a major public health problem in Uganda with an estimate of 336 maternal deaths per 100,000 live births (Uganda Demographic and Health Survey [UDHS], 2021). This is clearly well short of the Sustainable Development Goal (SDG) target of less than 70 maternal deaths per 100,000 live births by 2030 (United Nations, 2015). These changes include the introduction of districts in Uganda over the last 10 years where the district health service commission was established to monitor staffing and fill staffing gaps and to oversee health care staffing. There is therefore considerable staffing shortfall in the delivery of quality maternal health services, especially in rural and remote and deprived regions such as Terego District. This study was therefore timely and meaningful by examining the significance of changes in health care staffing levels in Terego District and how it directly affects maternal health. In light of this, this study became significant to address the urgent need to increase maternal health in context, especially in Sub-Saharan Africa, including in Uganda and Terego District. The high level of maternal mortality, low capacity for facility-based deliveries and continuing difficulty with healthcare staffing in Terego District warrant careful inquiry.

1.8 Significance of the Study

The study provided practical insights to a variety of stakeholders:

Local Governments and Health Authorities: Insights can be usefully applied to address staffing challenges in health units, thereby improving resource allocation and governance.

Policymakers: Findings can inform robust health policy interventions that favour staffing adequacy and sustainability and thereby contribute directly to improving PHC quality.

Donor Organisations and NGOs: The study helps understand Terego's staffing position, aiding targeted interventions.

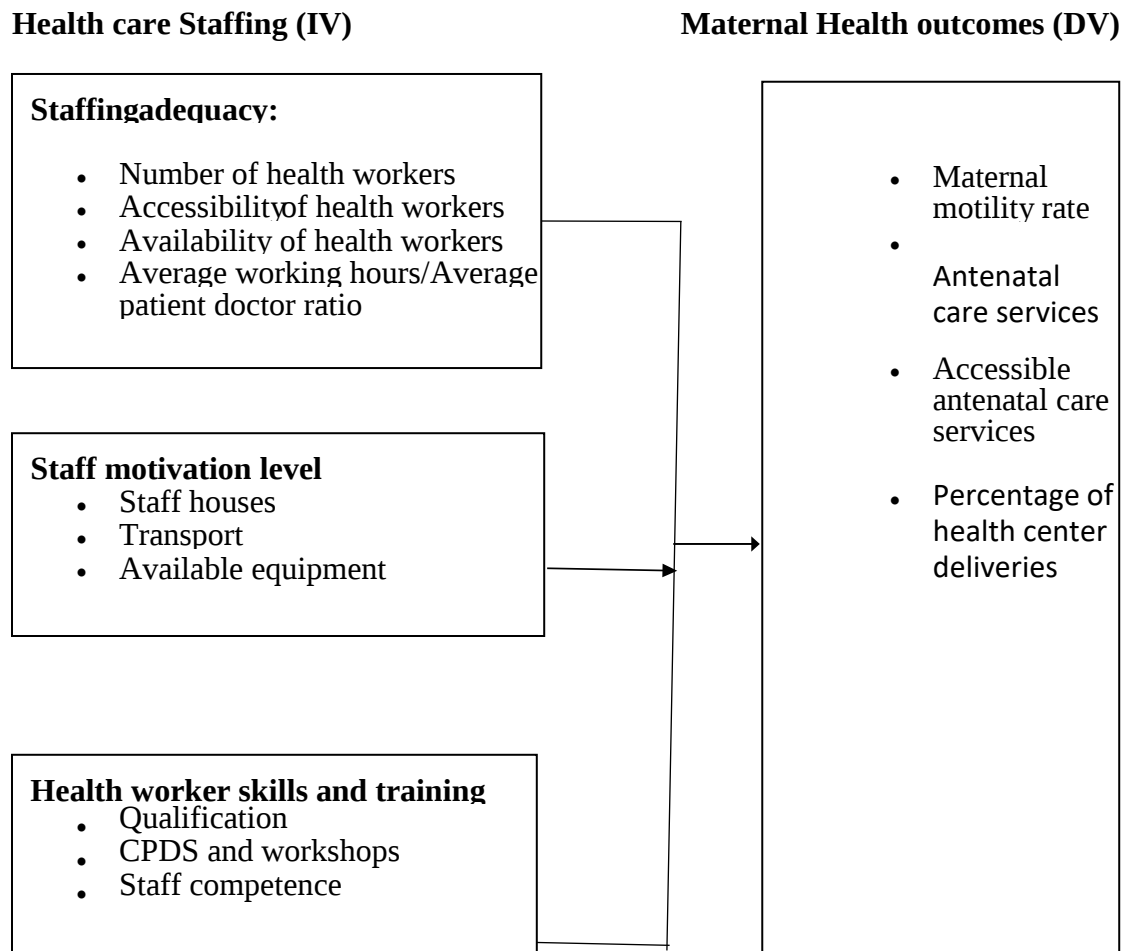
Community Health Outcomes: Improved access to quality services can significantly impact community health, particularly for vulnerable populations.

Academic Contribution: This research has added to the existing literature on health staffing and service delivery in LMICs.

1.9 Conceptual framework

The conceptual framework visually represents the relationship between the independent variables namely healthcare staff adequacy, healthcare staff motivation, and healthcare workers' skills and the dependent variable, maternal health outcomes. The framework demonstrates how each component of healthcare staffing independently contributes to improving maternal health outcomes in Terego District.

Figure 1: Interaction of variables.



Source: Researcher's conceptualization based on WHO (2022)

1.10 Theoretical Perspective

The investigator used Health Systems Theory for this study. As Heywood & Kenley (2021) illustrate, a "System" is a set of related components that work together in a particular environment to perform the functions required to achieve the system's objectives. A system consists of inputs,

processes, and outputs, with feedback loops to determine whether the system's outputs meet the set standards. A well-functioning health system leads to good health outcomes, according to this theory. Financing, governance, human resources, health service delivery, and information systems are the key components of a health system. The researcher selected health system theory because its essential components interact as a system. Deficiencies in any of these components especially financing and service delivery have direct implications for maternal health outcomes. In the Terego District, such insufficiencies may have been responsible for poor maternal health outcomes (WHO, 2022).

1.11 Operational Definitions

Healthcare staffing: the process of recruiting, managing, and retaining qualified health care personnel, including doctors, clinical officers, midwives, nursing staff, administrative staff and support staff individuals who provide healthcare and related services within healthcare facilities.

Primary Health Care: A comprehensive approach emphasising universal access to essential services and community-level health promotion.

Service Delivery: The processes involved in providing health care services, including quality and effectiveness.

Maternal Mortality: Death during pregnancy, childbirth, or within 42 days post-pregnancy due to pregnancy-related causes (WHO, 2021).

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

In this chapter literature about healthcare staffing and maternal health outcomes was reviewed and implications were examined for Terego District, Uganda, focusing on the study area. A literature review summarizes, consolidates findings, integrates, and synthesizes what is known (Oso & Onen, 2009; Mugenda & Mugenda, 2003) in the field of study. It examines the extent to which there is existing scholarship around health care staffing and the impact it has on the delivery of services and the challenges related to maternal health outcomes in low- and middle-income countries. The literature is structured in three major sub-sections per study objectives (staffing adequacy and its influence on maternal health; staff motivation; and health worker skills and training levels) according to the purpose of study.

2.1 Theoretical Review

A review of case studies (Salami, Kamara & Brixiova, 2020; Gert-Jan et al., 2020) offers a comprehensive framework with which to study the various and interrelated facets involved in the operation and effectiveness of healthcare systems. It is on this background that the health service theory forms the foundation for this research. This theory stresses that several components—human resources, financing, governance, service delivery, medical products, and information systems—combine to achieve health outcomes. An integrated approach shows the need for system-wide coordination so that all components are working effectively to meet the health needs of a population. As per Health Systems Theory, sufficient staffing is crucial to the operation of the healthcare system. In order to provide a sufficient level of maternal health services to meet the needs of the population, this study in Terego District will measure the staffing levels. Inadequate staffing may affect the health system's ability to deliver services, resulting in poor maternal health outcomes. The theory also fits the study purpose of determining how staffing adequacy affects maternal healthcare services availability and quality (Kruk et al., 2021). The theory of health service emphasizes the need for more than just staff, but the incentive for staff. Motivating staff within a health service significantly improves individual and organisational performance.

Motivated staff are more likely to be engaged, committed, and focused on delivering high-quality care. They are much more likely to do more than is expected, benefiting the patients, fostering teamwork and ultimately, efficiency. Motivated staff also have higher job satisfaction resulting in lower turnover and absenteeism. It supports a healthy work life, enhances ongoing development of practices within healthcare. Finally, a committed workforce translates into improved service, greater patient satisfaction and a more resilient healthcare environment. This study will investigate the impact of staff motivation towards the quality of maternal health services being provided, focusing on the most rural districts that lack social services (Brito et al., 2020). Health professional skills and training affects health service quality, efficiency and safety. Highly-trained healthcare workers can diagnose, treat and manage patient care. This study focused on assessing the health worker skills and training levels in Terego District and how it has affected maternal health outcomes (Hatt et al., 2021). This theory suggests that the health system's components are not isolated in interacting but that they exist through intricate, interconnected relationships. A staffing shortage, for instance, can impact not just patient care quality but contribute to heightened stress and burnout among staff already working in healthcare, lower morale, and longer wait times for patients (Mills et al., 2020). It then potentially becomes very detrimental to the success of the general health system, stresses resources and worsens health results all emphasising that all system facets are interrelated. In conclusion, Health Systems Theory is relevant for the current study as it forms a comprehensive structure covering all aspects of healthcare staffing, governance, service provision and maternal health. Using this framework, the study can examine how the motivation, skills and training of health care workers impact the quality of, and service access to, maternal care in Terego District. The theory also informs potential systemic weaknesses and suggests ways to improve maternal health through appropriate staff management and governance (Civita et al., 2021).

2.2 Health Care Staffing and Maternal Health Outcomes

Health care staffing is the presence or absence of health care personnel, such as doctors, nurses, midwives, and community health workers, providing maternal health services. To ensure effective delivery of maternal health care during pregnancy, childbirth, and the postpartum period adequate, well-trained health care staff are essential (MoH, 2020). For quality care, skilled health staff are necessary to control complications during pregnancy, offer the highest quality treatment available,

and maintain care given appropriately in time since health care staffing is essential for maternal health outcomes such as maternal mortality and morbidity. Namirembe et al. (2020) explains that maternal health outcomes refer to the health of women in pregnancy, childbirth and the postpartum period. Maternal mortality is a major marker of maternal health outcomes and remains an international public health problem, especially in low-resource settings. Maternal mortality is a key indicator of the ability of a health system to provide maternal care. Maternal mortality is defined by the WHO (2020) as the death of a woman during pregnancy, childbirth, or within 42 days of termination of pregnancy due to pregnancy-related causes. Higher quality, well-staffed health care systems help to improve maternal health outcomes. Maternal health outcomes around the world have been inextricably tied to the adequacy of health care staffing. In low- and middle-income countries (LMICs) inadequate staffing of health care facilities poses one of the primary obstacles to achieving best maternal health outcomes. The WHO (2020) stress that countries with more skilled health practitioners, especially midwives and obstetricians, are associated with better maternal health indicators, also with lower maternal mortality. Countries lacking staffing, however, tend to have higher maternal mortality and complications. Staffing shortages are acute, particularly in sub-Saharan Africa, where many countries have a shortage of qualified health professionals to support the expansion of maternal health care access (Namirembe et al., 2020). For example, Rwanda has made large investments in skilled birth attendants and trained them which leads to better maternal health outcomes (Munyakazi et al., 2021). But countries in the region still experience major issues stemming from under-trained staff with maternal deaths that could have been minimised. Uganda employs different healthcare staffing mechanisms, where government provides resources, donors support, and community health worker programs. While Uganda has taken the step of increasing the number of registered midwives and health workers with a background in human capital training, disparity in staffing levels has affected quality as well as consistency in maternal health care across districts (Bukonya et al., 2021). In understaffed districts, maternal health status endures as an issue and maternal mortality rates are still relatively greater in underserved areas.

2. 3 Staffing Adequacy and Maternal Health Outcomes

There is an obvious link between staffing adequacy and maternal health outcomes, specifically maternal mortality rates. Countries with larger numbers of trained health care staff have lower maternal mortality rates (Munyakazi et al., 2021). For example, Rwanda's efforts to raise the pool of skilled health workers have led to significant progress in maternal health outcomes. Adequacy of staffing (in the sense of the number of health workers, their accessibility and availability and patients per doctor), is a key driver for the delivery of high-quality maternity services. There needs to be adequate staff, both among obstetricians, midwives, nurses and support staff, for antenatal care, birthing support, and in cases of complications emergency obstetric care (Otto et al., 2021). WHO (2020) argues that an adequately staffed health system ensures women receive skilled care during pregnancy and childbirth which is essential for preventing maternal deaths and improving health outcomes. So too the study by Pillai et al. (2019), limited staffing contributes to high maternal mortality rates through delays in provision of emergency obstetric care. Accessibility of health workers: The ease of access to health workers by pregnant women. According to Wandabwa et al. (2020), lack of access to health workers can lead to a delay in implementing interventions in pregnancy and childbirth that increases maternal morbidity and mortality. Accessibility involves not just physical distance but also, workers being available at key times of the day, such as in emergency situations. Availability of the health worker is the availability of staff in the workplace to meet the needs of an expectant mother. A study by Kankya et al. (2020) reported that, in some districts in Uganda, lack of utilization of health workers for illness and health leave, as well as migration, has resulted in absenteeism. A lack of availability leads to overworked staff, poor care quality and bad maternal health outcomes. The average patient/doctor ratio, average working hours of health workers and patient-doctor ratio were also highly influential for maternal health. According to Oni et al. (2018) long working hours without breaks may cause fatigue and lead to burnout thus compromising the quality of nursing care. A high ratio of doctors to patient typically exists in resource deprived environments and leads to a decrease in patient-provider interaction and may lead to delays in identifying pregnancies complications, which can then result in decisions during emergencies. Mugisha (2020) emphasized that when nurses and health care workers are burdened with too many patients, maternal care becomes routine, not a care tailored to the individual. Globally, staffing adequacy has been shown to be an important factor in reducing maternal mortality. In many parts of Latin America and East Asia, for example, there is growing

capacity for care providers; people who work within well-dispersed but well-educated health care systems see good results. Meanwhile in East Asia, we are inching towards better health outcomes for mothers, with staffing supply and skilled care readily available (Munyakazi et al., 2021). And sufficient staffing will help ensure that health services are sustainable and accessible, for example in under-resourced or rural communities. Staffing problems represent a major obstacle to maternal health in Sub-Saharan Africa: and the ability for the provision of affordable health care is very limited. A WHO study (2020) determined that inadequate human resources including for rural and remote settings leads to poor quality care, which affect the health outcomes of mothers. This highlights the importance of more staff trained at the health level, especially if they were working in locations with high risk for maternal health and related problems. Indeed, despite a national framework in Uganda for health care staffing, its adequacy for maternal health services, particularly in the Terego district, is not well known. Research by Ochieng et al. (2021) notes that the number of staff affected the level of care given to mothers and the shortage of personnel contributes to poor health. Although the overall staff position and maternal health outcomes were established, to determine the contribution of Health Care staffing ability to maternal health outcomes, the adequacy of staffing needs to be studied in Terego District. Research has indicated that insufficient staffing tends to add to workload on health workers, resulting in burnout, poor quality of care and delayed response to maternal and child health emergencies (Peterson, 2022). Proper staffing management such as recruitment, training and retention strategy plays an important role in the successful enhancement of the operational capability of health care facilities (Smith, 2020). Inevitably, delays in recruiting or misallocation of personnel contribute to a poorer quality of care for pregnant women (Thompson, 2019). Furthermore, Masiira et al. (2021) found that in districts with insufficient staffing, rural health facilities often lack adequate care, which widens health disparities. Uganda's health system is made up of a mix of government staffing, donations and community health worker initiatives (MoH, 2021). Despite efforts of the Ugandan government to train and mobilize health workers, especially midwives, there are still staffing shortages and their numbers differ from one district to another. Donor support is crucial in staffing, as it is often sporadic and limited, often to certain projects, thereby leaving little room for responding to the health needs of communities (Bukonya et al., 2021). Smith and Jones (2019), local involvement in staffing and managing health programs at the community level has been shown to improve staffing sustainability. Additionally, Johnson et al. (2019) of East Africa have investigated staffing reforms, and have reported through policy changes regarding domestic workforce development

that improved health outcomes can be achieved. Their research offers important insights for Uganda in drawing lessons from colleagues elsewhere who have faced similar staffing problems. Atuyambe et al. (2019) point out that over-reliance on external funds for staff can result in the instability of qualified health workers readily available. Such inconsistency can interfere with the provision of timely and effective care especially in rural or underserved areas negatively impacting maternal health consequences.

2.4 Health Care Staff Motivation and Maternal Health Outcomes

The motivation of health care professionals contributes significantly towards successful operation of the health facilities, particularly in maternal care. Good housing and reliable transportation are crucial for health workers' job satisfaction and productivity (Sacks et al., 2020). When such basic needs are not provided, staff absenteeism, burnout and poor quality medical care may result which has adverse effects on maternal health. Staff housing and transportation have been shown in previous studies around the world to have a meaningful influence on health service quality. Even in remote or rural settings in many developing countries, inadequate working accommodation and transit facilities for health workers typically lead to attrition, staff absence, and delays in delivering maternal care (Mirembe et al., 2021). According to the WHO (2020), adequate housing and transportation of health personnel should be key to reducing staff turnover and maintaining the continuity of health services. Numerous African countries, such as Kenya, have implemented programs to motivate local health care workers, by providing housing and transport to health care workers working in rural locations. The reason for these measures is to allow health workers to continue their services in underserved areas, where the health professionals are not burdened with long commutes and/or poor conditions of living (World Bank, 2021). Limited funding, insufficient infrastructure, and logistical issues, however, frequently block the successful implementation of such programs. Staff housing and transport in Uganda is largely the responsibility of the Ministry of Health but is also the responsibility of NGOs and private sector partners. Good working environments (like better housing and transport) can have a larger effect on wellness: Motivation of staff can also impact health outcomes. Without the motivating factors, health workers are less likely to be in the rural setting and can have challenges delivering consistent, high quality maternal care. Enhancing staff and health workers motivation with adequate housing and transportation can not only help the staff but improve the system as a whole so that all health facilities are full on

duty to deliver uniform and high-quality maternal health care. Terego, as a new district, offers little information on health care staff motivation.

2.5 Health workers' skills, training and Maternal Health Outcomes

Maternal health services will function if professionals in the health field are adept at improving on their skills. And a study by Byerlee et al. (2021) discovered that professional skilled-specialists should take a pivotal role in enhancing the quality of care for pregnant women through pregnancy, giving birth, and the postpartum period. Insufficient training and inadequate expertise may produce substandard care that contributes to the poor maternal health outcomes. It is well-known that health workers' competencies are closely linked to their provision of good quality care. Bossa et al. (2019) found that maternal death rates were significantly lower in regions that have higher proportions of skilled health manpower such as midwives and obstetricians. Continuous professional development (CPD) workshops are essential to keep health workers informed with up-to-date knowledge and skills on an ongoing basis to manage maternal health issues. Atuoye et al. (2020) highlight that regular training by way of CPD improves health workers' technical competence, which helps them to be trained in handling complications of pregnancy, including haemorrhage, preeclampsia, and obstructed labour. Training programmes which target health workers are being extensively implemented across Sub-Saharan Africa to improve their competence (Mutebi and Tumushabe, 2021). They are intended to prepare health workers for maternal health emergencies that play a critical role in health management outcomes across the region. More recent studies have emphasized that properly designed training programs have proven to improve healthcare providers' knowledge and skills massively, not least in the areas of emergency obstetric and neonatal care. Examples include short in-service training to address these issues, which improved skills in healthcare workers significantly in both Sub-Saharan Africa and Asia. However, further training and support are needed for healthcare workers to effectively utilise tools like the partograph, a critical tool for monitoring labour progression (Nsubuga et al., 2021). Uganda is among those countries that has improved skilled health professionals significantly. Training programmes aim to prepare healthcare workers sufficiently for quality maternal care that is critical to decrease maternal mortality (Ssebuufu et al., 2021). The Global Financing Facility's Investment Case for Uganda focuses on targeting districts with the highest rates of maternal and child mortality to close geographical gaps in reproductive, maternal, newborn, child and adolescent health outcomes.

Training Community Health Workers (CHWs), termed Village Health Teams (VHTs), has been proven to help educate pregnant women, which has led to improved maternal and child health outcomes in Uganda. Ssebunya et al. (2021) found that health workers in the Ugandan context who undertook CPD performed better in emergency obstetric care, directly improving maternal survival rates. Staff competence — both clinical skills as well as the ability to make sound decisions under pressure — is the key to achieving optimal maternal health outcomes. Salah et al. (2019) found that maternal mortality rates were significantly lower in areas where health workers displayed excellent competence in managing pregnancy complications. Mugisha et al. (2017) also indicated that health workers possessing sufficient competencies in obstetric care were more capable of identifying high-risk pregnancies and treating them promptly, e.g., in cesarean section surgery, when required. The training requirements of mid-level health care workers should also be addressed. A review of curricula and training programs in such countries as Kenya, Nigeria, South Africa, and Uganda has identified several areas that require improvement in order to supply these workers with the necessary tools to deliver effective maternal healthcare (Mugisha et al., 2022). These could be skills training, emergency responses, as well as knowledge of contemporary issues of maternal health complications. In conclusion, training and competency improvement are fundamental to maternal health service delivery for healthcare workers. Tailored continuous training programs which can accommodate the particular needs of healthcare workers or support professional development can lead to improved health outcomes for mothers and neonates alike. As revealed by the Uganda study, to ensure better health outcomes of mothers and child health, they require training healthcare workers at different levels, including mid-level professionals and CHWs as well as geographic disparities (reducing population-based inequalities through targeted interventions).

2.6 The Link Between Health Care Staffing and Maternal Health Outcomes

The relationship between healthcare staffing and maternal health outcomes has been studied extensively for several years. Adequate staffing levels within health systems correlate with better indicators of maternal health (Williams & Roberts, 2023). There is also evidence to suggest that areas with a higher proportion of maternal care trained healthcare workers tend to have lower rates of maternal death (MoH, 2022). But the workforce quality and competency will influence staffing effectiveness. Indeed, even in the presence of sound staffing provisions, inefficiencies in service

provision or deficiencies in training and healthcare infrastructure make it difficult to experience substantial, if any, improvements in maternal health (Smith, 2020). Poor-quality services and delays in personnel deployment are issues that can further complicate the impact of healthcare staffing on maternal health (Smith & Brown, 2020).

2.7 Conclusion

To summarize, it is crucial to acknowledge the link between healthcare staffing and maternal health outcomes for improving maternal health and decreasing mortality. Appropriate staffing especially of skilled health professionals is critical for meeting quality maternal health services needs such as antenatal care, safe deliveries, and emergency obstetric care. But staffing alone is not sufficient good healthcare staff, training, and deployment must be optimised so services can be delivered. In regions like Sub-Saharan Africa and Uganda, addressing staffing shortages, strengthening training programs, and improving motivation are key in improving maternal health outcomes. Ultimately, investing in both the quantity and quality of healthcare workers is essential for improving maternal health systems and ensuring healthier outcomes for mothers and newborns.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

Methodology is the detailed approach used in answering research questions, including research design, sampling techniques, instrumentation, and data analysis (Grey, 2020; Creswell & Poth, 2022; Williams, 2021). It is a strategic framework that begins with philosophical assumptions and ends with the study population, sampling, data collection methods, instruments, and analysis (Flick, 2020; Creswell & Creswell, 2022). The study design is described in this chapter, combining quantitative and qualitative research designs with an interpretive orientation. It details data collection techniques, instruments, data control, and analysis principles necessary to meet the research goals associated with knowledge creation and generation (Saldana, 2021).

3.1 Research Design

Using a concurrent mixed-methods approach (Creswell & Plano Clark, 2020), this study explored the relationship between healthcare staffing and maternal health outcomes in Terego District. This methodological approach allowed quantitative and qualitative data to be collected and integrated at the same time, providing both statistical measurements and contextual understanding of the relationships being examined. The quantitative part of the intervention used a correlational design (Ary, Jacobs, & Sorensen, 2020) to systematically assess the relationships between staffing variables (adequacy, motivation, training) and maternal health outcomes. This provided a way by which statistically to explore hypothesised connections by survey instruments. This was supplemented by a qualitative design of semi-structured interviews and descriptive thematic analysis. By using this methodology, the participants' lived experiences and perspectives were captured, enabling it to identify emergent patterns and examine what such patterns would mean for healthcare staffing dynamics and their implications for maternal health services.

3.2 Area of Study

The study was carried out in Terego district located in the West Nile sub-region in Uganda, bordered by Arua District to the west, Maracha to the North-West, Yumbe District to the north, and Madi Okollo District to the east. Formed on July 1, 2017, as a result of the split of Arua

District. Under this division there was a general reform in government, intended to enhance access and governance.

3.3 Sources of Information

The research utilised a variety of primary and secondary data sources to effectively address the study's objectives.

3.3.1 Primary Data Sources

Surveys and Questionnaires: Structured instruments and interview guides designed to collect insights on perceptions, attitudes, and barriers related to health service delivery.

3.3.2 Secondary Data Sources

Government Reports and Documents: Official publications from the government. Context and statistical data are supplied by the Ministry of Health and local authorities.

Academic Literature: Research studies and articles on healthcare systems and public health interventions relevant to the study.

NGO and Donor Reports: Evaluations from NGOs and international donors on healthcare initiatives.

Community Records and Media Sources: Local news and community platforms to gather public sentiment regarding health services. By integrating primary and secondary sources, the research aims to achieve a thorough understanding of healthcare dynamics in the Terego District.

3.4 Population and Sampling Technique

3.4.1 Study Population

In total, the participants of this study had been 250 members (the district health management committee; health workers from six health centres, two from each selected sub-county; health unit management committees of the six health centres; village health teams of the six health centres (VHTs); and community beneficiaries from Terego). The target population of a total of 250 participants consisted of 10 district health management committees, 58 health workers of six health centres, two from each selected sub-county, 42 health unit management committees of six health centres, 50 village health teams of six health centres (VHTs), and 90 community beneficiaries from

Terego. The Village Health Teams (VHTs) were members of six villages where the six selected health centres are located (DHO Terego).

3.4.2 Sample Size determination

Determining an appropriate sample size was crucial because it affects the reliability, validity, and generalizability of the study's results, ensuring that the findings can be confidently applied to the population at large (Creswell & Creswell, 2020).

3.4.2.1 Sample Size for Qualitative Data Collection

This was guided by the concept of data saturation: the point at which no new information emerges from additional data collection. Saturation is a subjective judgement based on researchers' assessments and is often reached with smaller samples than in quantitative research. In this regard, the sample size included: DHO, twelve (12) health workers (Civil Servants), five (6) health unit management committees and six (6) village health teams.

3.4.2.2 Sample Size for Quantitative Data Collection

The sample size has been determined using Yamane's (1967) formula at a confidence level of 95%.

$$n = N / (1 + N(e^2))$$

Where: n = sample size, N = total population size = 250, e = margin of error (usually 0.05 or 5%),
 $1 + N(e^2)$ = adjustment factor.

$$n = 250 / (1 + 250 \times 0.0025)$$

$$n = 154$$

Study sample = 154 respondents.

This means 154 respondents were selected from a total population of 250 using the Proportionate Stratified Sampling technique to ensure each subgroup is adequately represented.

Table 1: Proportionate Stratified Sampling

Category of Respondents	Total Population	Method Used	Sample population
District Health team	10	10/250x 154	06
Health workers	58	58/250 x 154	36
Health unit management committees	42	42/250 x 154	26
Village health teams	50	50/250 x 154	31
Community Beneficiaries	90	90/250 x 154	55
Total	250		154

Source: Primary Data

The final sample was selected using simple random sampling.

3.5 Variables and Indicators

Variables are essential in study design and implementation. They can be categorised as independent (health care staffing) and dependent (maternal mortality) variables. Indicators for health care staffing include an increased number of health workers recruited and the availability and accessibility of motivated, trained, and skilled health workers. Indicators for primary healthcare service delivery encompass accessibility and quality of services in the community.

3.5 Data Collection Methods and Instrumentation

The study used a quantitative and qualitative methods approach, enabling the collection of primary and secondary data through a questionnaire survey (Hagaman & Wutich, 2020). And key information guides.

3.5.1 Questionnaire Survey and Interviews

The standard questionnaire was prepared and used based on the research objectives: financial adequacy for health outcomes, timeliness and functioning of the procurement process, and gender. The questionnaire had a five-point Likert scale of 5- Strongly Agree; 4- Agree; 3- Not Sure; 2-

Disagree; 1- Strongly Disagree. It was used to collect information from health workers and health unit management committees because it enabled reaching a large number of respondents within a short time, and the information was validated using secondary data. The questionnaire allowed respondents to provide detailed information due to its open-ended nature.

The researcher collected data from purposively selected district authorities through key informant interviews, with structured thematic areas linked to the objectives. The key information guides were open-ended, allowing probing of key insights into the topic.

3.6 Quality/Error control

Validity and reliability in research findings were managed using robust quality control and error control. Here are some actions that researcher used to prevent quality and error issues. Through pilot Testing, validity was maintained. Before collecting the data on a large scale, pilot tests were performed to detect the possible difficulties with research tools including interview guides and questionnaires. This step enabled the development of the instruments to be specific in capturing the desired information. The higher the reliability coefficient, the greater the instrument's reliability. The pilot study was conducted on 10 respondents. Content validity refers to this instrument's capability for measuring the overall domain or content area it is intended to examine. Content validity was ascertained by discussing all questions and items to ensure the theoretical background and purpose of the study were met. Standardisation of the data collection procedure minimises errors and variability. Protocols for the use of interviews, focus group and observation data collection methods will be clear. Routine quality control procedures have been integrated in the data collection and data preparation processes. This included: checking the collected data samples for completeness, accuracy, validating data-entry and errors, reconciling source. After data entry was complete or consistent between datasets were identified and cleaned, the data validation and cleaning step by step systematic validation procedures was used to identify and correct any errors or inconsistencies (e.g. discrepancies) and correct them. This involved detecting outliers, addressing missing values and removing the logical gaps in the data. In order to preserve the quality of the qualitative part of the research study, the researcher ensured that trustworthiness was the basis of valid, reliable, and credible findings. It included four building blocks: credibility, confirmability, transferability and dependability. Here's how every one was tackled in the study. Credibility refers to the degree to which trust can be put in the veracity of research findings; it is

the qualitative equivalent of internal validity. The researcher undertook a series of methods (interviews, focus groups, and observation) to ensure that results accurately represented participants' perspectives. These sources verified findings by triangulating together. Thus, bias was reduced and depth and richness of data were enhanced. Meanwhile the researcher carried out member verification, in which subjects had to review and confirm the findings' interpretations with their own eyes. This has been really helpful in corroborating such results and interpretations of the findings;

Confirmability is about how people can prove that a given result is truly valid. Thus findings are shaped out from the participants' experiences rather than those of the researcher who may have biased his or her viewpoints and preconceptions. In this way, the researchers record all their decisions, actions with an "audit trail" --it documented in full (including detailed notes on every decision from the start to completion, procedures chosen and data analyses carried out on site). It also made it transparent how things got here and gives other researchers a step-by-step guide to that process. In addition, the researcher applied reflexivity here, realizing that they were part of guiding his or her own creation and interpretation research, as well as recognizing personal prejudice. The findings, by maintaining a transparent process, rooted the analysis in the data and not the researcher's assumptions. Transferability refers to the extent of generalizability of study findings to other locations, environments or populations, similar to the external validity in quantitative studies. To enhance transferability, this researcher provided thick descriptions (rhetoric densely) of research context, participants and method of study methodology. Through an in-depth account of the health care system of the Terego District, socio-cultural conditions and specific challenges faced by maternal health care services, readers will be able to appraise the applicability and relevance of the findings in other contexts. The researcher may also add studies that do the same in other parts of the world to see if it generalizes. Dependability is the degree to which the process of research is consistent over time for the same data set to be produced for the same population. In order to be trustworthy, the researcher designed a well-defined, repeatable research procedure and applied the same data collection procedures for all participants and locations. Standard quality control standards were used to ensure any inconsistencies, disparities or variances in the approach to data collection. Additionally, peer review was employed, meaning a peer independent researcher or researcher checked (or read) the research process and results for uniformity. Changes made to questions during the study (for example, in an interview) were

reported and explained and any variation highlighted and justified. These strategies help the researcher improve the credibility, confirmability, transferability, and dependability of the qualitative component of the study, such that the findings are significant, accurate, and reliable. Such approaches guarantee that the findings of the investigation are robust by the information collected — thus fostering a comprehensive appreciation of the implications of health care financing for maternal health outcomes under Terego District.

3.7 Data processing and analysis strategy.

The strategy is essential in the context of research process to extract the meaning of the conclusions drawn from research findings (Adams & Clark, 2019), as in the previous paragraphs a data processing and analysis plan will be established. Quantitative and qualitative data collection and analysis methods were employed. This method was chosen so as to obtain both strengths of this methodology and quantitative results and also an overall understanding of our research problem.

3.7.1 Collection & Entry of Data

The data was initially compiled through interviews and coded for thematic analysis. To begin, an extensive cleaning process was conducted to catch and correct the mistakes, discrepancies and missing data. It verifies the data to the correctness and integrity of the set before performing analysis. Validation checks for the trustworthiness were performed.

3.7.2 Quantitative Analysis

Data was also cleaned in SPSS following import to detect and eradicate errors, inconsistencies and missing values. Then, data structure was done for statistical analysis. Data analysis was performed using descriptive and inferential statistical methods (Yin, 2009). Descriptive statistics were applied summarizing and explaining the main aspects of data pertaining to health care staffing and maternal health outcome statistics in Terego District, Uganda. These included frequency, percentage, mean, and standard deviation as indicators to make sense of maternal health outputs like visits to the antenatal care department or rates of maternal mortality in relation to health service finances. It also included descriptive statistics that reflected the socio-economic characteristics of health financing sources, including government funding, insurance schemes and out-of-pocket repayments. Statistical inferential measures such as regression. The association between health care financing and the maternal health outcomes, causal and correlational aspects were also analyzed using methods (e.g., regression analysis).

3.8 Reporting and Documentation.

The results were presented in a clear and concise manner following formal reporting guidelines. A full report was produced, which described study methodology, data interpretation, processing and information analyses, main findings and policy and practice implications. This method assisted in resolving the problem areas and strengthened the credibility of findings. Document analysis was a critical examination of either public or private stored information on the content of the questions for which we were investigating (Lewis, 2017). The reasoning behind doing such an analysis is that it allows the researcher to get the language, as well as the words, of the informants. Document analysis allows data to be accessed at researcher's convenience, allows to be collected thoughtful, compiled data, saves time and costs in transcribing (Yin, 2018). With regard to the dimension of staffing shortage, documentary analysis was employed to gather information on: growth in health staff through new hires made by the central and local governments for PHC services; and motivation to staff including staff houses, transportation, and increased salaries to improve PHC services. The third theoretical construct, as an analysis unit, is the evaluation of health workers' competency as well as training in the establishment and provision of primary health care services in Terego district.

3.9 Ethical Considerations.

Ethical considerations were the most critical part of any research venture, more so in sensitive areas such as financing healthcare. For the study titled "Health care staffing and maternal health services in Selected Health Units of Terego District, Uganda," the following ethical principles were followed

3.9.1 Ethical Clearance

Ethical clearance of the study: Health Care staffing and maternal Mortality: A Case of Terego District, Uganda was obtained from UCUREC (Uganda Christian University Research Ethics Committee) and the School of Business at Uganda Christian University. In addition, permission to pursue the research process in the Terego District was granted by the appropriate district authorities and top management.

3.9.2 Informed Consent

For all subjects, before data was acquired, they were adequately informed about the purpose of the study, its procedures, as well as of possible risks and benefits. All participants consented willingly

to participate and had explicit notice that they could withdraw from the study at any stage of the study without consequences. The questionnaire design, and the consent form was prepared and delivered to the respondents prior to data collection. This provided an opportunity for respondents to protest or consent and the researchers respected their decisions.

3.9.3 Confidentiality

Confidentiality of participants was strictly observed during the research. The privacy protections, anonymization and secure storage of data were adhered to (so only authorized users had access to the data). Individuals' identity were protected, and any identifying matter did not appear in the research results.

3.9.4 Privacy

Information was collected, analyzed, and reported maintaining confidentiality of the participants. Interviews and focus group discussions took place in closed quarters to allow frank discussion. No personal information was accessed without permission and all responses were handled with care, including that of the participants.

3.10 Expected methodological limitations

The potential methodological constraints on conducting research in "Health care staffing and maternal mortality in Selected Health Units of Terego District, Uganda" is limited access to data, as both central and local system sources of supply data may not be readily available. Bureaucratic processes or confidentiality concerns of governmental bodies could prevent an examination of staffing inadequacy by limiting access to staffing records. We mitigated these limitations through early partnerships with relevant government agencies, particularly District Health Offices. By engaging with these agencies, the researcher will be able to build trust, which may lead to the procurement of required financial data. The researcher will have to request formal letters of support or get permission from authorities, including UCU, the Chief Administrative Officer of Terego district and the district health office, to help facilitate access to staffing records.

3.10.1 Sampling Bias

Choosing representative health units and stakeholders for the study could be difficult, which can result in sampling bias. Certain health units or stakeholders may be either overrepresented or underrepresented in the study, impacting the generalizability of findings and the ability to draw

valid conclusions. To prevent sampling bias, Stratified Sampling was employed with representation of all relevant health units and stakeholders. This method segments the population into distinct subgroups, and a random sample is drawn from each subgroup based on that division. Multiple data sources shall also be used, with participants representing all types of health units (urban and rural, public and private, large and small) and stakeholders (health workers, health management committees and village health teams) in order to provide a more holistic view and to minimize bias.

3.10.2 Resource Constraints

Limited resources including time, funding, and personnel may limit the breadth and depth of the research. In a field as complex as healthcare management, it takes sufficient time and resources to get comprehensive data collection and analysis. Breaking the research into manageable phases allows you to prioritise critical aspects. The researcher, applying a qualitative and quantitative mixed-methods design, effectively integrated interviews with existing reports and administrative data, thus minimising extensive fieldwork. Online surveys and mobile data collection tools have also minimised the time and cost of data collection. Tackling such methodological limitations will demand thoughtful planning, flexibility, and cooperation with the relevant parties. Rigorous data validation procedures, transparency and accountability in data collection, and adapting research methods to new circumstances were mitigative strategies. Also, it is very important to keep open channels of communication with stakeholders and transparency throughout the research.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF FINDINGS

4.0 Introduction

This chapter analyses and interprets the data obtained in the course of this study. It includes the respondents' demographic profile, tests for normality, and an elaboration on the results within the framework of the study's specific objectives. The chapter encompasses quantitative data (descriptive and inferential statistics) and qualitative information (thematic analysis as elicited from interviews), giving a more in-depth insight into the correlation between healthcare staffing and maternal health outcomes in Terego District.

4.1 Response Rate and Final Sample Size

The initial target of the study was 154 respondents from a study population of 250. After data collection and a strict cleaning process removing incomplete or inconsistent responses, the final valid dataset consisted of 136 complete responses, giving a response rate of 88.3%. This high response rate indicates strong participant engagement and the quality of the data collection process. This sample of 136 was considered sufficient for robust statistical analysis as it exceeds common thresholds for sample size adequacy and maintains the statistical power required for the findings in this study. This final validated dataset of 136 respondents forms the basis for all analyses that will follow in this chapter.

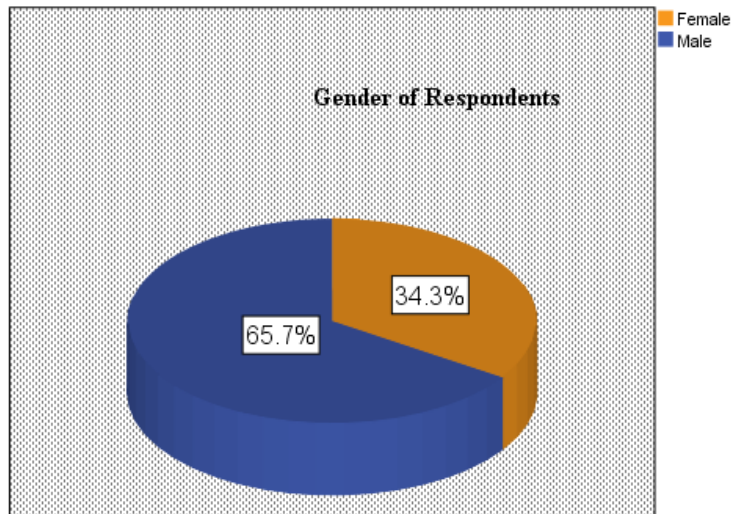
4.2 Demographic Characteristics of Participants

This section provides a detailed profile of the 136 study participants, covering gender, age, education, and professional experience.

4.2.1 Gender of Respondents

The gender distribution of the participants was summarized in the pie chart below.

Figure 2: Chart Showing Gender of Participants



Source: Primary Data

The above figure shows that the study participants were predominantly female (65.7%). This skew is illustrative of the maternal health system in Terego District and is particularly prevalent in the professions of nursing, midwifery, and community health. This gender profile is expected in maternal health care service, implying that the results are more likely to represent women working at the forefront of service delivery and perceptions, since they are usually in charge of providing care.

4.2.2 Age of Respondents

The age profile of the participants is presented in the table and bar chart below.

Table 2: Age Group of Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 30 Years	76	55.5	55.9	55.9
	31 - 40 Years	41	29.9	30.1	86.0
	41 - 50 Years	14	10.2	10.3	96.3
	Over 50 Years	5	3.6	3.7	100.0
	Total	136	99.3	100.0	
Missing	System	0	0		
Total		136	100.0		

Source: Primary Data

According to the findings, the workforce is very young in nature, and more than 55.9% of the participants are younger than 30 years of age. This implies a relatively new and likely junior or less experienced Health personnel cohort in Terego District. Although this youthfulness can provide energy and provide recent training, it also may suggest a shallow institutional memory and limited practice level with regards to the provision of complex maternal health cases with significant consequences for service and emergency response.

4.2.3 Educational Qualification

The highest educational qualifications attained by the participants are summarised in the table below.

Table 3: Educational Qualifications of Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Certificate	46	33.6	33.6	33.6
Diploma	56	40.9	40.9	74.5
Graduate	32	23.4	23.4	97.8
Others	2	2.2	2.2	100.0
Total	136	100.0	100.0	

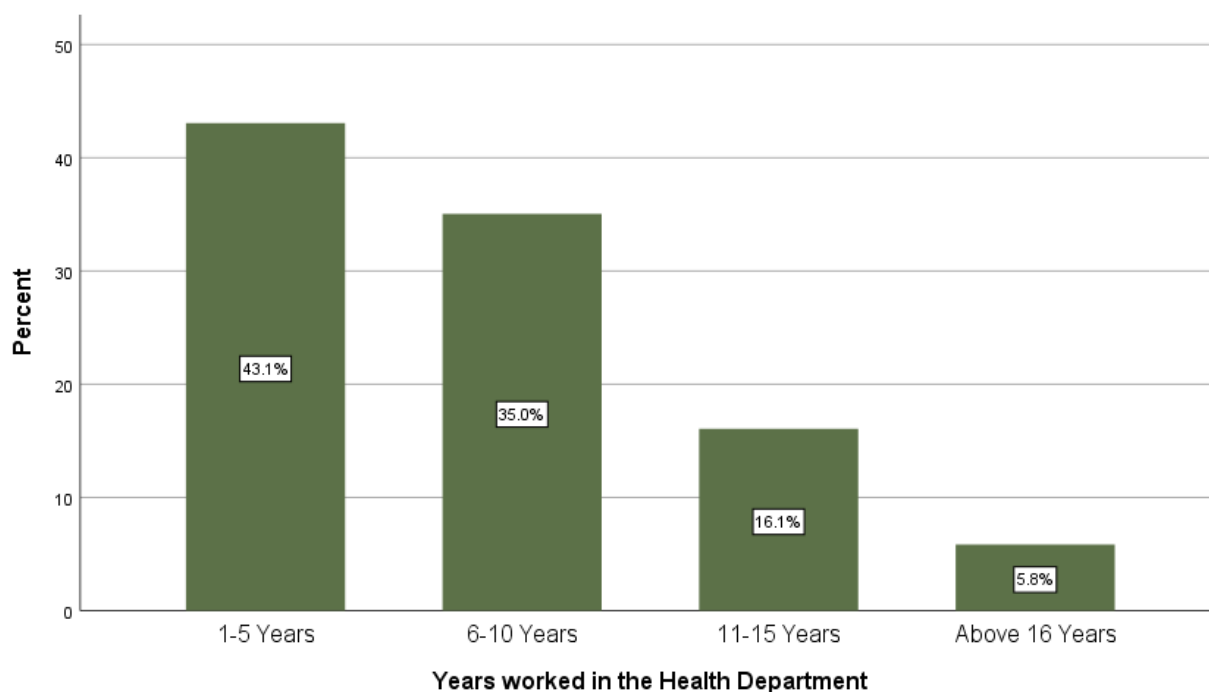
Source: Primary Data

The educational profile indicates that the large majority of health workers (74.5 percent) hold a mid-level Certificate or Diploma. This is characteristic of the district-level health system in Uganda where clinical officers, enrolled nurses, and midwives are the backbone of the system. This shows a trained workforce but a comparatively small ratio of graduates (23.4%) suggests a significant shortage of highly qualified personnel, such as degree-holding nurses, medical doctors, or specialist obstetricians, who are important to manage severe complications and provide leadership.

4.2.4 Professional Experience

The years of professional experience of the participants in the health department are detailed in the table below.

Figure 3: Work Experience of Respondents



Source: Primary Data

The figure above shows a workforce largely in its early to mid-career phase. 43.1% of the respondents have 1-5 years of experience, whereas an astounding 78.1% have ten years or less. This shows the fact that the health system in Terego District depends on a very young and developing cohort of professionals. The small proportion of staff with over 16 years of experience (5.8%) indicates a limited pool of senior-level experts able to mentor and manage the most complex clinical cases. This means there is a low overall resilience level of the maternal health system. In the long term, this may seriously hamper its overall depth, especially where it concerns complex clinical cases.

4.3 Normality Test

The normality of the data distribution in the main variables was examined using histograms and Normal P-P plots. The findings showed that all variables Maternal Health Outcomes, Staff Adequacy, Staff Motivation, and Staff Training approximated a normal distribution. That was demonstrated by their bell-shaped histograms and data points that closely aligned with the diagonal line in P-P plots. This meets the assumption of normality used for the parametric statistical analyses (correlation and regression) performed in this study.

Table 4: Tests of Normality

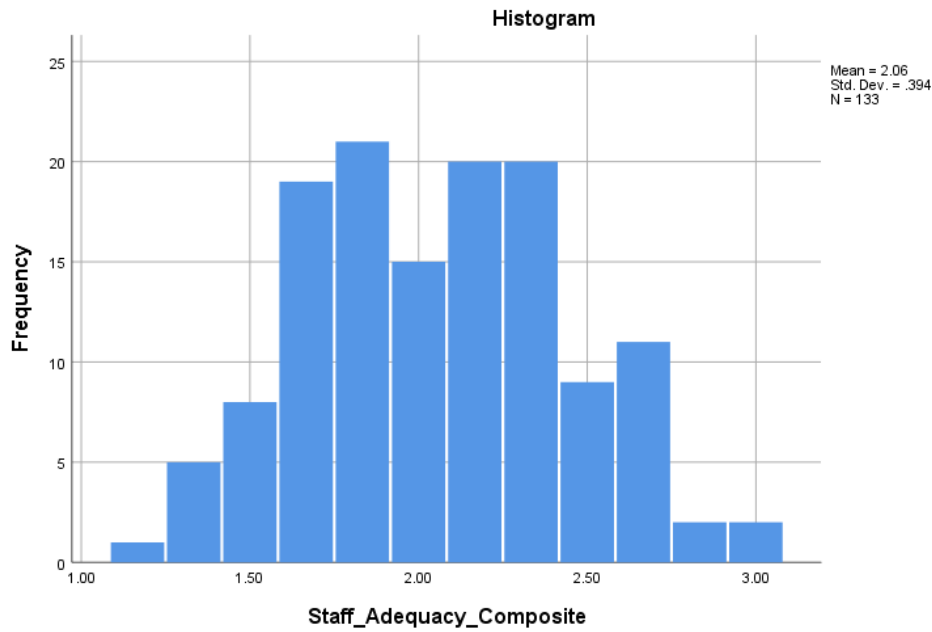
	Gender of Respondents	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Staff Adequacy	Male	.160	46	.005	.953	46	.062
Composite	Female	.135	87	.000	.961	87	.010
Staff Motivation	Male	.126	46	.066	.957	46	.088
	Female	.161	87	.000	.941	87	.001
Staff Training	Male	.243	46	.000	.893	46	.000
	Female	.177	87	.000	.955	87	.004
Maternal Health	Male	.160	46	.005	.953	46	.062
Outcome	Female	.135	87	.000	.961	87	.010

a. Lilliefors Significance Correction

Tests for normality (Kolmogorov-Smirnov and Shapiro-Wilk) were conducted separately for male and female respondents to determine whether the key variables were normally distributed within the genders. Staff Adequacy Composite: No significant difference in the Shapiro-Wilk test was found for males ($p = .062$, $p > .05$), suggesting that the data does not deviate significantly from normality. The Shapiro-Wilk test for females was significant ($p = .010$, $p < .05$), indicating slight non-normality. Staff Motivation: For males, both tests were not significant (K-S $p = .066$; S-W $p = .088$), consistent with normal distribution. For females, both tests were statistically significant ($p < .001$), indicating a deviation from normality. Staff Training: Both

tests were highly significant ($p < .001$), indicating significant departures from normality of this variable across genders for both males and females. Maternal Health Outcomes: Similar to Staff Adequacy: normal for males (S-W $p = .062$) but a small deviation for females (S-W $p = .010$).

Figure 4: Normality Test Result for Staff Adequacy



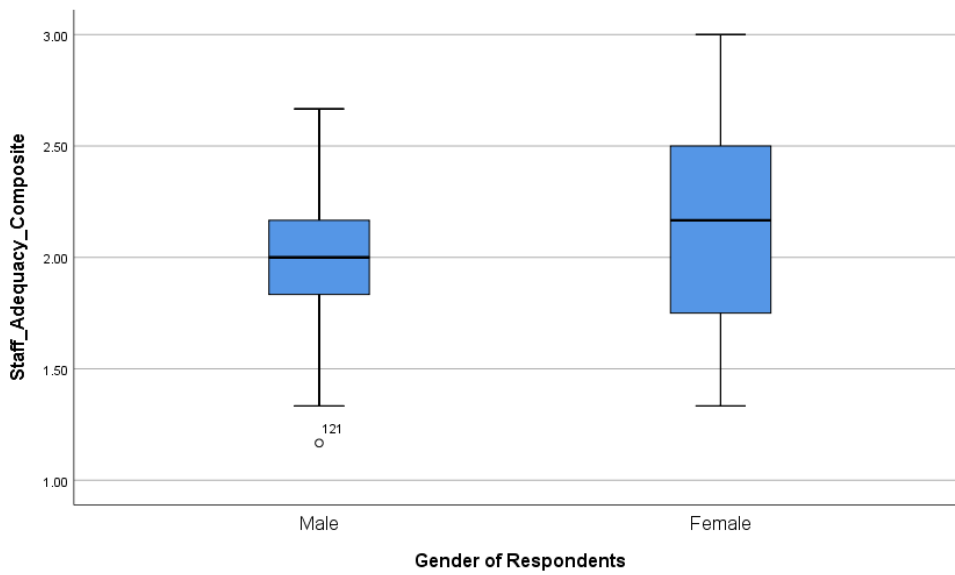
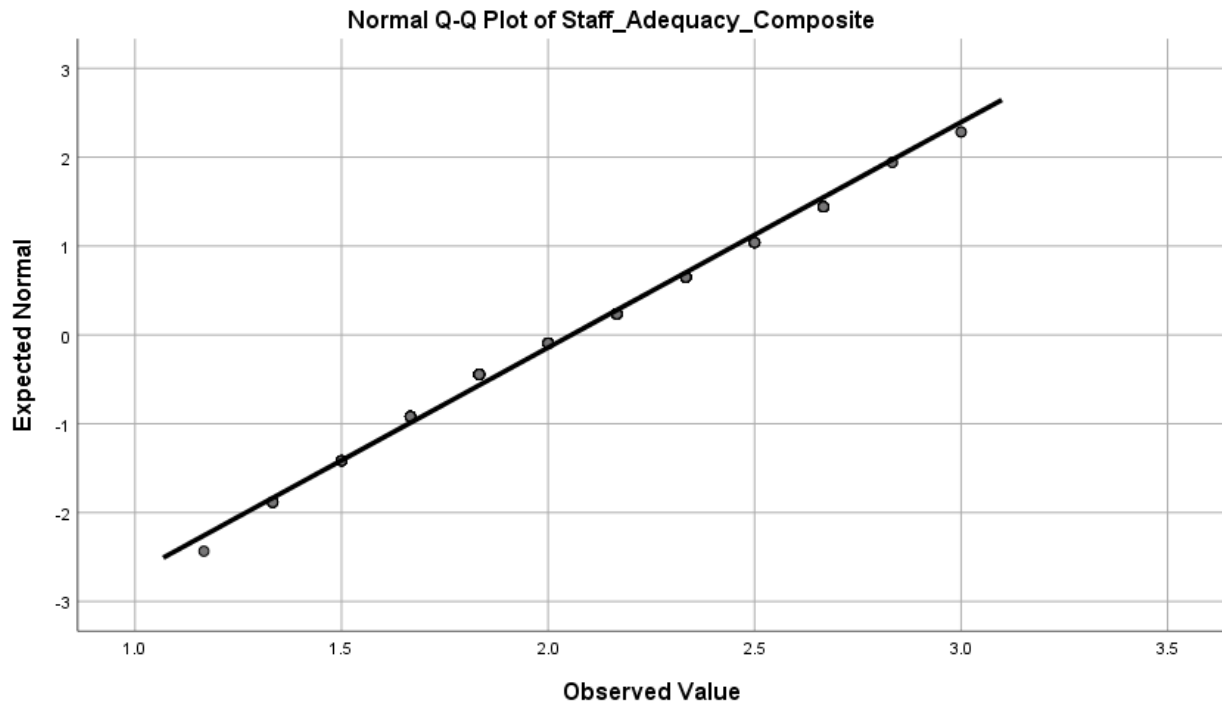


Figure 5: Normality Test Result for Staff Motivation

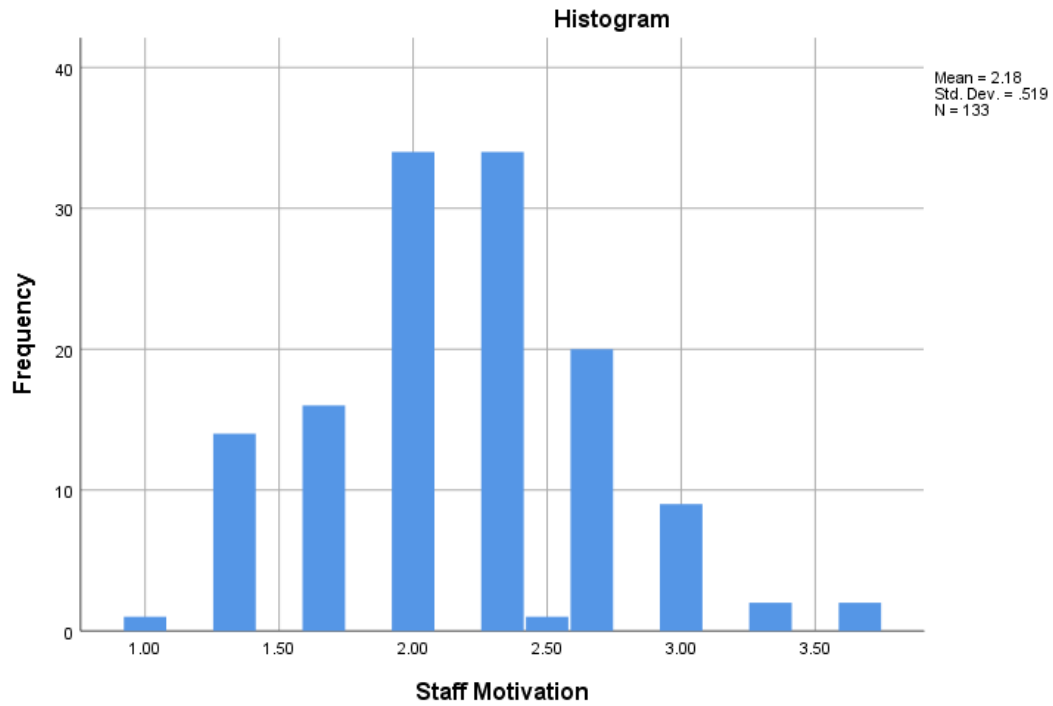


Figure 6: Normality Test Result for Staff Training

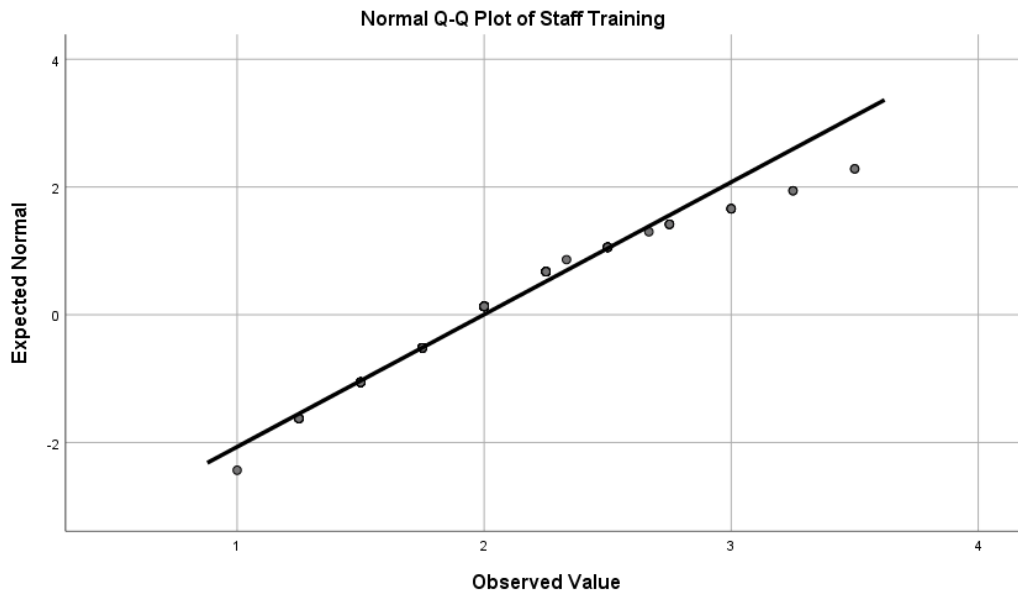
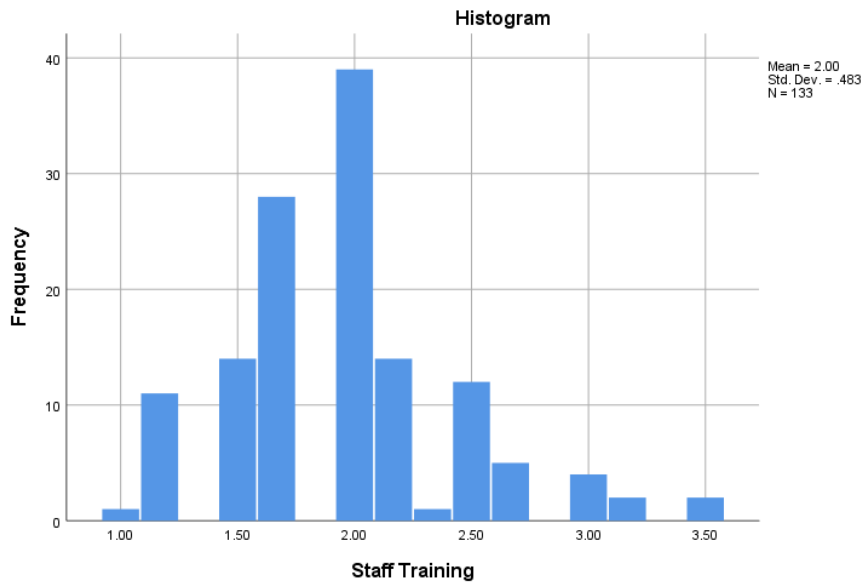
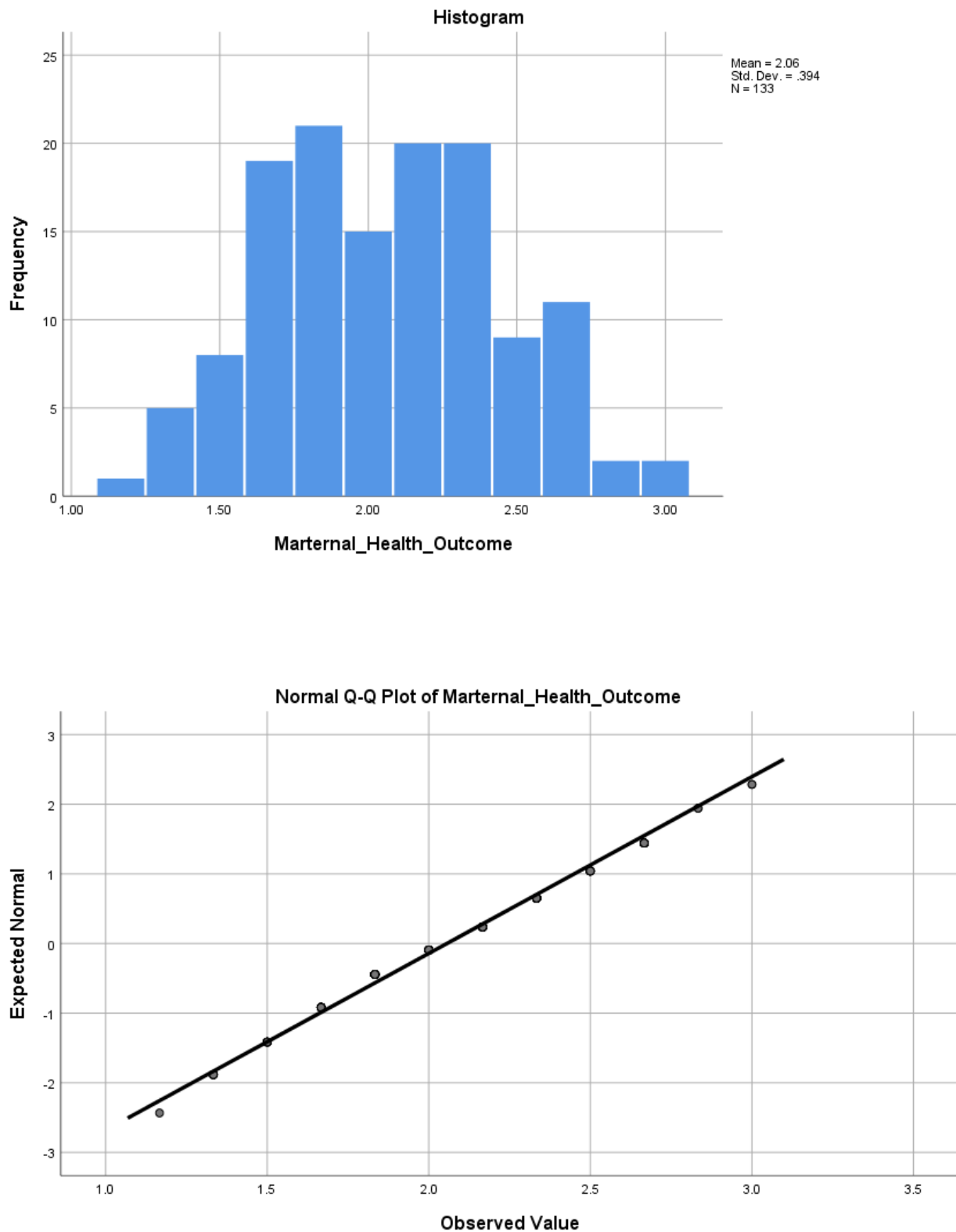
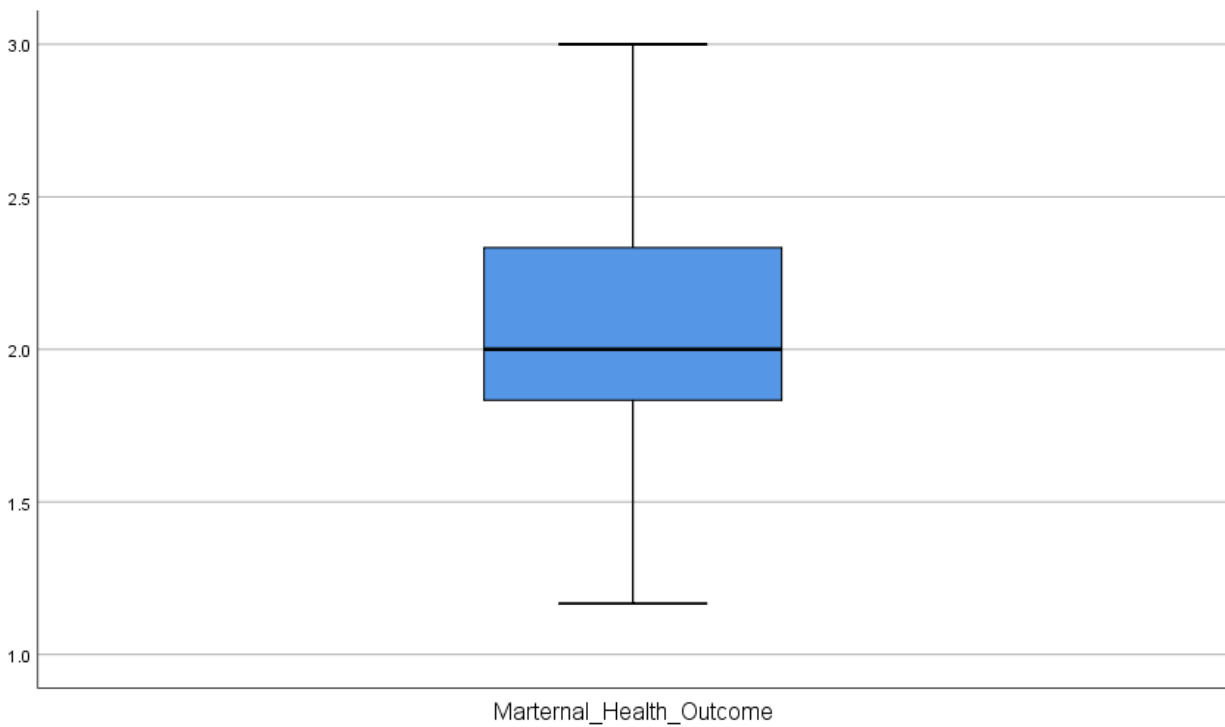
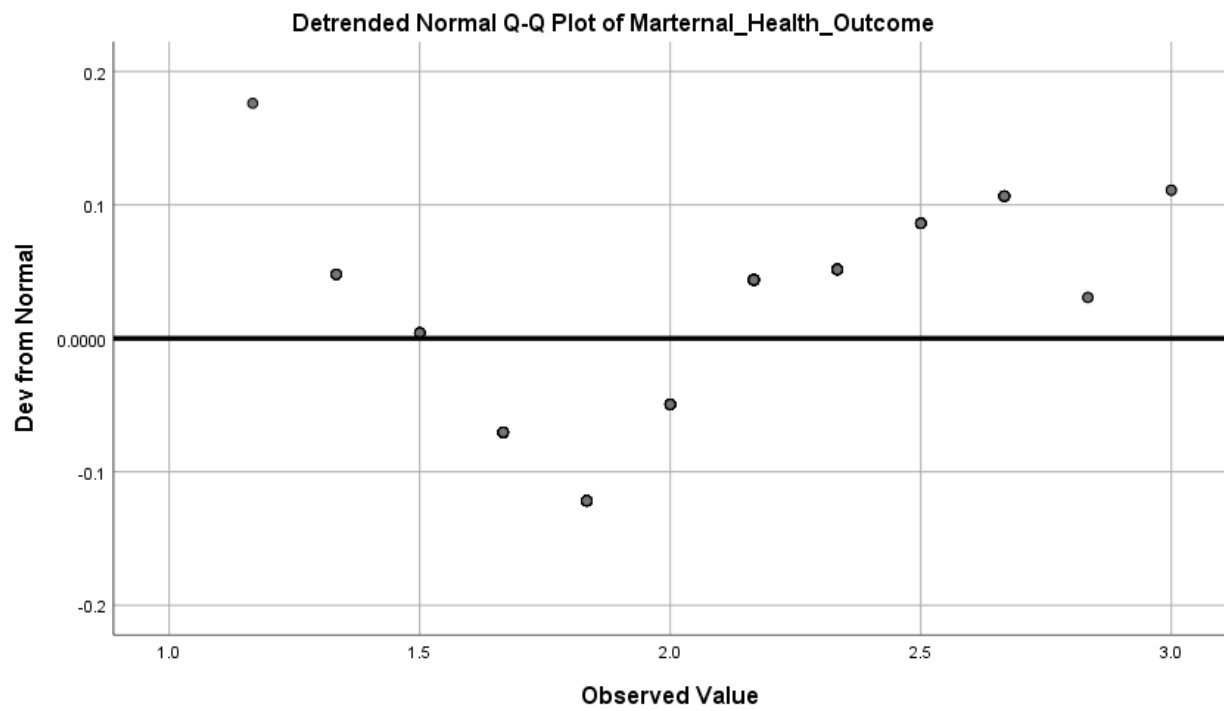


Figure 7: Normality Test Result for Maternal Health Outcome





4.4 Key Findings

4.4.1 Objective One: Staff Adequacy and Maternal Health Outcomes

4.4.2.1 Descriptive Statistics for Staff Adequacy

This included data analysis from the respondents' perceptions on a 5-point Likert scale, with higher scores corresponding to stronger agreement with the statements, to measure the influence of healthcare staff adequacy in maternal health, as well as to get a clear image of the staffing challenges that bedevil the district's healthcare system. The mean, SD, minimum and maximum values were obtained and the table below shows the results.

Table 5: Staff Adequacy and Maternal Health Outcomes responses

Variable Description	N	Mean	Std. Deviation
There are enough healthcare staff available.	136	3.33	1.217
The limited number of staff contributes to complications.	136	2.15	1.325
Staff adequacy has a direct impact on improving outcomes.	136	1.82	0.759
Staff shortages result in delays in critical services.	136	1.44	0.581
Increased staff would significantly improve outcomes.	136	1.63	0.719
Patient-doctor ratio relates to health outcomes.	136	1.91	0.755
Overall Staff Adequacy (Composite)	136	2.05	0.396

Source: Primary Data

From Table 4.4 above, the composite variable for Staff Adequacy and health outcome clearly showed a mean score of 2.06 (SD = 0.40) on a 5-point scale, indicating generally low levels of perceived staff adequacy among respondents.

4.4.2.2 Correlations Analysis:

Table 6: Staff Adequacy and Maternal Health Outcomes Correlation

Item		Staff Adequacy	Maternal Health Outcomes
Staff Adequacy	Pearson Correlation	1	.034
	Sig. (2-tailed)		.696
	N	135	134
Maternal Health Outcomes	Pearson Correlation	.034	1
	Sig. (2-tailed)	.696	
	N	134	136

Source: Primary Data

Table 7: Regression Analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.034 ^a	.001	-.006	.45472
a. Predictors: (Constant), Staff Adequacy				

A non-significant model was produced for regression analysis of the impact of healthcare staff adequacy on maternal health outcomes. From the above, you would have expected a negligible, statistically insignificant positive relationship ($R = 0.034$, $p > 0.05$) where staff adequacy explains only 0.1% of the variance in maternal health outcomes ($R^2 = 0.001$). The adjusted R-square coefficient of -0.006 further supports that staff adequacy is not a meaningful predictor of maternal health outcomes in Terego District.

Table 8: Hypothesis Testing

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.032	1	.032	.153	.696 ^b
	Residual	27.294	132	.207		
	Total	27.325	133			
a. Dependent Variable: Maternal health Outcomes						
b. Predictors: (Constant), Staff Adquacy						

ANOVA result shows a non-significant model ($F(1, 132) = 0.153$, $p = 0.696$). Staff adequacy accounts for a negligible proportion of the variance in maternal health outcomes ($R^2 = 0.001$), suggesting little predictive power. So the hypothesis is rejected. The implication is that, within this study, the mere adequacy of staffing is not a strong contributing factor to the achievement of favorable maternal health outcomes in Terego District.

4.4.3 Objective Two: Staff Motivation and Maternal Health Outcomes

While this section of the study found that staff adequacy was not a significant predictor of maternal health outcomes, the second objective of the study is to investigate the influence of healthcare staff motivation. In cases where just having staff there is not enough, the question of their motivation, morale, and commitment becomes paramount. This section provides an integrated analysis of both quantitative data and qualitative insights to determine whether staff motivation levels represent a key lever to improve maternal health outcomes in the Terego District, potentially compensating for numerical staffing shortfalls.

4.4.3.1 Descriptive Statistics for Staff Motivation

The perceived levels of staff motivation were assessed using a 5-point Likert scale (1=Strongly Agree to 5=Strongly Disagree). The results, presented in Table 4.4.2.1, reveal a complex picture of staff motivation, characterised by a strong belief in the importance of motivation alongside a clear recognition of deficiencies in current support systems.

Table 9: Descriptive Statistics for Staff Motivation Variables

Item	Statement	Mean	Std. Deviation	Interpretation
M1	Motivated staff provide quality services.	1.51	0.71	Very High Agreement
M2	Adequate incentives would improve outcomes.	1.85	0.76	High Agreement
M3	Staff are highly motivated.	3.53	1.17	Disagreement
M4	Staff morale impacts service quality.	1.84	0.76	High Agreement
M5	Staff feel adequately supported.	3.21	1.10	Disagreement
M6	Motivation programs reduce complications.	1.76	1.02	High Agreement

Source: Primary data

From the above table, it was generally agreed that motivation is a major ingredient of quality of care. This is reflected in the high agreement among staff that motivated staff produce high quality services (M1, M=1.51), that morale matters (M4, M=1.84), and that motivation programs will help reduce complications (M6, M=1.76). And while being able to describe the importance of this, the survey subjects had directly complained that their current environment was lacking motivation and support. They disagreed with the statement “staff are highly motivated” (M3, M=3.53) and “feel adequately supported” (M5, M=3.21). This suggests that there may be an obvious perceived missing piece to the current motivational picture. This is followed by very high agreement that “adequate incentives and support would improve outcomes” (M2, M=1.85), confirming a common view that targeted interventions that positively impact motivation might directly and positively affect maternal health outcomes. Overall, the descriptive statistics serve as indicator of a workforce that is well aware of the impact of motivation, but are now working in settings where they feel under-supported and demotivated, representing a large opportunity for enhancement through targeted motivational support.

4.4.3.2 Correlation Analysis for Staff Motivation

A Pearson correlation analysis was conducted to examine the relationship between staff motivation and maternal health outcomes. The results are shown in the table below:

Table 10: Correlation Analysis for Staff Motivation

Correlations			
		Staff Motivation	Maternal Health Outcomes
Staff Motivation	Pearson Correlation	1	.333**
	Sig. (2-tailed)		.000
	N	136	136
Maternal Health Outcomes	Pearson Correlation	.333**	1
	Sig. (2-tailed)	.000	
	N	136	136
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Primary data**Table 11: Regression Analysis for Staff Motivation**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.333 ^a	.111	.104	.43184
a. Predictors: (Constant), Staff Motivation				

Source: Primary data

The regression model summary demonstrates that staff motivation is a positive and significant predictor of maternal health outcomes. The model shows an R value of .333, reflecting a moderate positive correlation between the variables. An R Square of .111 shows that staff motivation explains 11.1% of the variation in maternal health outcomes in Terego District. The Adjusted R Square of .104 indicates that about 10.4% of the variation results from staff motivation, after controlling for sample size and predictors. The Standard Error of Estimate, at .432, implies that the model's predictions of maternal health outcomes typically differ from the actual values by about 0.432 points.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.111	1	3.111	16.681	.000 ^b
	Residual	24.989	134	.186		
	Total	28.100	135			
a. Dependent Variable: Maternal health Outcomes						
b. Predictors: (Constant), Staff Motivation						

Source: Primary data

The ANOVA results of the regression model that predicts Maternal Health Outcomes from Staff Motivation are provided as the ANOVA table. The analysis confirms that the regression is significant ($F(1, 134) = 16.681, p < .001$). The F-statistic of 16.681 with a p-value of .000 is well below the standard alpha level of 0.05; this means that staff motivation is associated with maternal health outcomes and not chance.

4.4.3.4 Hypothesis Analysis for Staff Motivation

Well supported is the hypothesis that healthcare staff motivation has significant effects on maternal health in Terego District. Based on both quantitative and qualitative findings, this result is solidly confirmed. Staff motivation is statistically significant positively correlated with maternal health outcomes (quantitative analysis). The regression model confirms that staff motivation explains a significant amount (11.1%) of the variance in maternal health ($R^2 = .111, p < .001$) whereas the model as a whole was highly statistically significant ($F(1, 134) = 16.681, p < .001$). The use of qualitative evidence offers valuable context regarding the nature of this relationship. Healthcare workers explained explicitly how motivation affects either service quality or patient outcomes: in addition to some positive motivators (allowances, housing, recognition) they identify demotivating factors (for example lack of promotion, low salaries) that impact their performance and commitment towards maternal healthcare. These findings converge to the conclusion that staff motivation is the fundamental determining factor of maternal health status in Terego District, which corroborates research's second hypothesis.

4.4.4 Staff Training and Maternal Health Outcomes

4.4.4.1 Descriptive Statistics for Staff Training

The perceived levels of staff training and its impact were assessed using a 5-point Likert scale (1=Strongly Agree to 5=Strongly Disagree). The results, presented in Table 4.X, reveal a workforce that strongly believes in the power of training but reports significant gaps in their current skills and preparation.

Table 12: Descriptive Statistics for Staff Training Variables

Item	Statement	Mean	Std. Deviation	Interpretation
T1	Regular training enhances ability to address issues.	1.55	0.64	Very High Agreement
T2	Staff have necessary skills to manage complications.	3.18	1.15	Disagreement
T3	Inadequate training negatively affects outcomes.	1.80	0.97	High Agreement
T4	Enhanced training would improve service quality.	1.44	0.57	Very High Agreement
T5	Ongoing training is crucial for improving outcomes.	1.99	0.95	High Agreement

Source Primary Data

The data, as shown in the table above, presents a compelling narrative about the central role of training:

Large agreement on the value of training: Respondents overwhelmingly agreed that training was beneficial. They overwhelmingly agreed that regular training improves skills (T1, M=1.55), that a lack of training has negative consequences (T3, M=1.80) and most emphatically that improved training would increase service quality (T4, M=1.44). Critical Self-Identified Skill Gaps: Respondents acknowledged its value but claimed that they were lacking skills at the time of this survey. They disagreed with the statement that they had "the necessary skills and training to manage maternal health complications effectively" (T2, M=3.18). Clearly this indicates a

mismatch between what their self-perceived competences are and what they demand must be done. A clear desire for sustained development for which "ongoing training... is crucial" (T5, M=1.99) indicates that it is considered a prerequisite for good health outcomes, not a series or separate one-off workshops. The descriptive statistics provide a picture of a health care workforce that is acutely aware of the critical importance of training but feels under-equipped to effectively manage maternal health complications, and emphasizes the need for improved, ongoing skill development programs.

4.4.4.2 Correlation Analysis for Staff Training

A Pearson correlation analysis was conducted to examine the relationship between staff training and maternal health outcomes, and the result is shown below:

Table 13: Correlation Analysis for Staff Training

Correlations			
		Staff Training	Maternal health Outcomes
Staff Training	Pearson Correlation	1	.400**
	Sig. (2-tailed)		.000
	N	134	134
Maternal health Outcomes	Pearson Correlation	.400**	1
	Sig. (2-tailed)	.000	
	N	134	136
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Primary data

4.4.4.3 Regression Analysis for Staff Training

The regression analysis confirms staff training as a statistically significant and substantively important predictor of maternal health outcomes in Terego District.

Table 14: Regression Analysis for Staff Training

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.400 ^a	.160	.153	.42243
a. Predictors: (Constant), Staff Training				

Source: Primary Data

The regression model demonstrates strong predictive power, with staff training explaining 16.0% of the variance in maternal health outcomes ($R^2 = .160$). The adjusted R^2 value of .153 confirms the model's robustness, indicating that approximately 15.3% of the variance is uniquely attributable to staff training after accounting for sample characteristics.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.480	1	4.480	25.105	.000 ^b
	Residual	23.555	132	.178		
	Total	28.035	133			
a. Dependent Variable: Maternal health Outcomes						
b. Predictors: (Constant), Staff Training						

The overall regression model is highly statistically significant ($F(1, 132) = 25.105$, $p < .001$), confirming that staff training provides a significantly better prediction of maternal health outcomes than a model with no predictors. These results strongly support staff training as the most influential staffing factor examined in this study. The model indicates that investments in healthcare worker training are likely to yield substantial improvements in maternal health outcomes, with training alone accounting for a meaningful portion of outcome variability in Terego District's healthcare system.

4.4.4.4 Hypothesis Analysis for Staff Training

It is well supported as a hypothesis that staff skills and training of healthcare workers have a significant effect on maternal health outcome in Terego district. This inference is supported by strong quantitative evidence. Staff training is the best predictor across the seven staffing factors

examined, accounting for a significant 16.0% of the variance in maternal health outcomes ($R^2 = .160$, $p < .001$). The regression model is consistent with a robust, highly significant positive relationship ($\beta = .400$, $p < .001$); the overall model is very significant ($F(1, 132) = 25.105$, $p < .001$).

4.5 Qualitative Findings

The present analysis: a section analysing qualitative data from semi-structured interviews with healthcare workers and stakeholders in Terego District. Beyond the numbers, it provides valuable contextual insights on experiences, perceptions and mechanisms that illuminate and underlie why staffing factors drive maternal health outcomes, including both lived experiences and perceived effects. The results are organised according to themes that are related to the three aims of the study and relate to: staff adequacy, motivation for staff members and staff training. These themes and sub-themes demonstrate the multi-faceted human side of healthcare provision, offering a compelling narrative support for the statistical relationships described before and pointing to systemic issues that quantitative data might overlook.

Theme 1: Healthcare Staff Adequacy

Interviews gave context for these statistical results, exposing deep staffing challenges in the organization. The interview results were arranged in the following thematic areas with their sub-themes:

Sub-theme 1.1: Critical Shortage of Skilled Staff. Respondents reported a severe shortage of personnel, which fundamentally undermines the healthcare system's capacity. As one participant starkly illustrated, "In most health centres, we have only one or two midwives handling all maternal cases, which is far below what is needed." This chronic understaffing was identified as a primary constraint on service delivery.

Sub-theme 1.2: Staffing Levels and Quality and Timeliness of Service. This shortage was a direct cause of worse quality patient care and reduced health. Inadequate staffing "creates dangerous delays," participants explained, "When staffing levels are adequate, it gives mothers timely attention, but when they are not, it often leads to complications." This theme highlights a clear trajectory from staff deficiency to elevated maternal risk.

Sub-theme 1.3: External interventions and unstable staffing solutions. The data also indicated a dependence on temporary and intermittent management of the chronic staffing shortfall.

“Sometimes NGOs do offer temporary staff or volunteers, however, government recruitment is still slow in the long-term,” wrote one respondent. “This underscores a systemic breakdown in sustainable human resource planning and the failure to develop a sustainable workforce that relies on external and highly evanescent aid. The quantitative findings are affirmed by qualitative evidence that motivation plays a key role in establishing a correlation between the well-being of staff and the survival of patients. The analysis revealed three main dimensions of motivation which are outlined in the themes below:

Theme 2: Motivation of the Healthcare Staff.

Sub-theme 2.1: Incentives and Recognition as Drivers of Motivation:

Aspects as material and psychological incentives, as identified by participants, were considered as the base. As one participant stated, “Staff’s motivation becomes stronger when they are included in pay packages, housed, or even have a positive impression because of the praise of their manager.” This makes clear both economic and non-economic recognition are important levers.

Sub-theme 2.2: The influence of motivation on maternal care and outcomes: The link between motivation and saving maternal life was clearly drawn. A healthcare worker claimed that, “I have witnessed dedicated staff go the extra mile when they feel they are supported, which lowers maternal deaths.” This gives direct evidence of the causal link between support and a reduction in mortality.

Sub-theme 2.3: Inadequacy of motivation due to promotion or lack thereof and low remuneration. Systemic barriers that actively sabotage the morale were also revealed in the data, as indicated in a comment of one of the respondents in the below sentence; “When you have a lack of advancement and your salary is low you don’t want to give your best to health care workers.” It points to underlying structural flaws in career progression and pay that inhibit performance and loyalty.

Theme 3: Staff Training. Interview data also generated compelling evidence for the role of staff training as a key mechanism that has a direct impact on maternal survival and quality of care. Three elements of this relationship emerged from the thematic analysis:

Theme 3: Healthcare Staff Training and Skills.

Sub-theme 3.1: The Need for Ongoing Training: Participants stressed continued training due to the need of life-saving complications. As one respondent noted, “Frequent retraining gives us more

tools to deal with things like postpartum hemorrhage." It underscores a direct relationship between skill currency and emergency obstetric care.

Sub-theme 3.2: Impact of Skilled Staff on Clinical Outcomes: Respondents provided concrete examples of how expertise translates into saved lives. The statement, "Well-trained midwives have managed complicated deliveries which might have ended in failure," is direct evidence of the fact which links training and the control of maternal fatalities.

Sub-theme 3.3: Gaps in Specific skills and training needs. The findings showed specific unmet training needs at a high-risk situation. That call for "more training in neonatal resuscitation and handling high-risk pregnancies in rural facilities" identifies critical skill deficiencies that have rendered the capacity to respond to what are the greatest disparities to occur between vulnerable maternal and neonatal cases.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter draws together the discoveries of Chapter Four, giving an in-depth conversation, conclusions, and prescriptions. The dialogue is framed around the study aims and references recent work (the literature as at least 2020 or later) to provide a contextual account of the findings. The chapter ends with implications for future studies.

5.2 Summary of Findings

Objective 1: How is sufficient health care staff related to maternal health outcomes in Terego District? No significant association between staffing adequacy and maternal health outcomes was found in the statistical analysis ($r = 0.034$, $p = 0.696$). The qualitative findings indicated that staff shortages are widespread and severe across health facilities in Terego (i.e., one or two midwives per centre). However, the absence of differences among facilities on staffing levels (all facilities are understaffed) means that adequacy alone may not explain variation in outcomes. Service delays owing to understaffing were common, but there was no significant statistical explanation given the widespread and uniform nature of this issue in Terego. Staff adequacy is an essential, but not sufficient, condition for improving maternal health outcomes in Terego. As the district falls below a certain point of staffing, simply adding people on staff, without tackling systemic problems (e.g., motivation, training levels, support) would simply not do justice to this.

Objective 2: The influence of healthcare staff motivation on improving maternal health outcomes in Terego District.

A statistically significant positive relationship was found between staff motivation and maternal health outcomes ($r = 0.333$, $p < 0.001$).

Motivation accounted for 11.1% of the variance in maternal health outcomes.

Qualitative data highlighted that motivated staff “go the extra mile,” leading to timelier care and reduced maternal deaths.

Key demotivators identified included low salaries, lack of promotion, inadequate housing, and poor transport support.

Incentives and recognition were seen as critical for boosting morale and performance.

Staff motivation is a pivotal mediating factor that significantly influences maternal health

outcomes. Addressing motivational factors is essential for improving service quality and reducing maternal mortality.

Objective 3: The impact of healthcare workers' skills on enhancing maternal health outcomes in Terego District.

Staff training and skills were the strongest predictor of maternal health outcomes ($r = 0.400$, $p < 0.001$). Training accounted for 16.0% of the variance in outcomes the highest among all staffing factors examined. According to the data, staff competence and patient survival can be directly correlated with regular, hands-on training (e.g., in emergency obstetric care, neonatal resuscitation). Skills gaps identified included management of high-risk pregnancies and neonatal resuscitation, especially in rural settings. Staff were found to feel under-equipped to manage maternal emergencies despite recognising the value of training. Investment in continuous, competency-based training is the most impactful staffing strategy for improving maternal health outcomes in Terego District.

5.2 Discussion of Findings

5.2.1 Effect of Healthcare Staff Adequacy on Maternal Health Outcomes

Results: In the Terego area, there was no significant statistical relationship between staff adequacy and maternal health outcomes ($r = 0.034$, $p = 0.696$). Qualitative data indicated blanket shortages across all facilities. Contradiction from the Dominant Theory: This outcome presents a stark contrast to both the prevailing literature and health systems theory (e.g., WHO, 2020; Pillai et al., 2019), which argue that adequate staffing is a baseline requirement for quality maternal care and lower maternal mortality. The Health Systems Theory model used in the study specifically relates the availability of human resources to positive health effects. The finding is not in itself an indication of a lack of staffing capacity, but demonstrates a threshold effect commonly observed in severely resource-limited settings. When there are uniform and severe shortages, as in Terego, differences in "adequacy" are insufficient to be commensurate with differences in outcomes. This is consistent with more recent fine details from (Nwosu et al., 2021; Masiira et al., 2021) that under widespread deficit, staff adequacy has little impact without parallel improvements in skill, motivation and systems support. The study therefore adds an important qualification to the literature: staffing adequacy should however be a necessary condition but not a sufficient one and its impact may be attenuated below a critical minimum threshold. Qualitative data helped to clarify

the operational implications of these staffing dilemmas. As one participant suggested, “When proper staffing levels are met, mothers receive timely care, but when not, sometimes delays cause complications.” Another participant pointed out that structural barriers exist in overcoming these weaknesses: “Nongovernmental bodies offer temporary staff or volunteer positions at times, but long-term recruitment of government personnel is slow.” These sentiments are consistent with recent research conducted by Mutebi et al. (2023), a finding that well supported but relatively small teams achieve better outcomes than well-staffed but demotivated facilities. Taken together, these results suggest that effective staffing interventions must combine quantifiable targets with qualitative reinforcement to have an impact on maternal health outcomes.

5.2.2 Influence of Healthcare Staff Motivation on Maternal Health Outcomes

Results: A significant, positive, and moderate relationship was found between staff motivation and maternal outcomes, accounting for 11.1% of variance ($r = 0.333$, $p < 0.001$). **Strong Evidence to Theoretical and Empirical Literature:** Strong empirical evidence is provided for this finding. It supports the Health Systems Theory, which focuses on quality of human resource more than just a number. It is congruent with research (e.g., Kruk et al., 2020; Brito et al., 2020) identifying motivation as a key factor in quality of service and patient outcomes in resource poor settings. **Alignment of Mechanism:** Qualitative evidence was indicative of “how” motivated staff “go the extra mile” (see Sacks et al., 2020 for detailed, structured link with the literature of organisational behavior and health worker functioning). The de-motivators highlighted (low pay, lack of promotion, poor housing) represent traditional well-established factors in health workforce literature in Africa (Mirembe et al., 2021). **Adds Context-Specific Evidence:** Corroborating global and regional trends, the study also provides specific, local evidence from a new, underserved Ugandan district (Terego). It shows that even in the presence of serious staff shortages differences in motivation within the existing workforce provide observable, significant differences in maternal survival, providing a lever for intervening in the face of slow recruitment.

5.2.3 Effect of Healthcare Workers' Skills and Training on Maternal Health Outcomes

Staff training and skills were the strongest predictor of maternal health outcomes ($r = 0.400$, $p < 0.001$), explaining 16.0% of the variance. **Strong Validation of One of the Most Urgent Global Practices:** This finding provides strong, empirical evidence in support of one of the most highlighted interventions in maternal and child health across the globe, skilled birth attendance and competency-based training. It provides important empirical evidence of the association

between health worker competency and lower maternal mortality (Hatt et al., 2021; WHO, 2020). Echoes the Success of Some Interventions: The reported effectiveness of emergency obstetric training (e.g., to manage postpartum hemorrhage) is reminiscent of recognized effects experienced by others, for example, Training in Emergency Obstetric and Newborn Care (EmONC) in Uganda and a similar program (Nsubuga et al., 2021; Ssebunya et al., 2021). Illustrates Staggered Needs and Highlights Priorities: The qualitative identification of particular skill gaps (such as neonatal resuscitation and high-risk pregnancy management) corroborates experiences from training needs assessments in other rural African settings. It supports the continued emphasis that agencies such as WHO and the Lancet Global Health Commission (2021) are on focusing on these high-yield competencies. Indicates Hierarchy of Importance the study has shown a stronger (statistical) relationship with outcomes in this context than adequacy and motivation, suggesting that training may inform a more strategic allocation of scarce resources in this context. This is in line with the literature of “task-shifting” and competency-based training as low cost strategies in resource-limited systems, in which addressing skills of the workforce can be more efficient than prioritizing recruitment or salary hikes.

5.3 Conclusions

Based on the integrated analysis, the study concludes that:

5.3.1 Staff Adequacy and Maternal Health Outcome

Staff adequacy, while essential for a sustainable and functional health system, has its impact on maternal health outcomes in Terego District neutralised by the critical and uniform staff shortage. It is a necessary but insufficient condition for improvement. The non-significant effect ($p = 0.619$) indicates the importance of a novel approach towards rationalisation of current labour structure according to the optimal usage of human resources, including workload balancing and task-shifting and as recommended by the World Bank (2022).

5.3.2 Staff Motivation in relation to Maternal Health Outcomes.

Motivation amongst staff members is a central mediating factor for maternal health outcomes. To address demotivators, and to boost incentives, is a vital strategy to enhance service quality.

5.3.3 Staff Professional Development and Maternal Health Results.

Staff training is the strongest and most powerful factor. Only through continuous, hands-on and specialized skill development will we be able to meet the challenges of direct reduction in maternal

mortality and morbidity in Terego District, with investment in this process remaining the most effective way to ensure this outcome.

5.4 Recommendations.

Some practicable ideas are prescribed in order to apply these insights:

5.4.1 For Staff Adequacy

Conduct Strategic Task-Shifting: Promote for future hiring and also streamline employment of those existing staff formally, through training and authorisation of mid-level health workers to undertake those tasks, normally occupied by senior staff.

5.4.2 For Staff Encouragement

Build an Organized incentive programme: The District Health Office needs to institutionalize a combination of financial motivation (for example hardship allowances) and non-financial reward (e.g., ‘Midwife of the Year’ awards and awards of recognition by the public). Make housing conditions to have an improvement for its staff priority and to make timely promotions a priority.

5.4.3 For Staff Training

Scale-Up Competency-Based Training. Partner with NGOs and professional councils to run low-cost, high-frequency simulation training in emergency obstetric care (e.g., “Helping Mothers Survive”). Fill Targeted Skill Gaps: Develop and provide training modules to rural health workers in neonatal resuscitation and high-risk pregnancy management promptly.

5.5 Future Research Issues

Longitudinal Studies: To monitor the long-term effects of motivation and training interventions on maternal mortality rates.

Mediation Analysis: To examine the complex relationships relating adequacy, motivation, training among these factors and the extent of their interaction impacting on outcomes.

Gender Determinants to Understand: how the gender composition of the health workforce affects the team dynamics, motivation and patient outcomes in maternal care.

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APPENDICES

Appendix A: Table for Determining Sample Size for a Finite Population

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Appendix B: CONSENT FORM FOR PARTICIPANTS

TOPIC: HEALTH CARE STAFFING AND MATERNAL HEALTH OUTCOMES IN TEREKO DISTRICT, UGANDA

Introduction: I am Candia Morris, a researcher from Uganda Christian University. I am conducting a study entitled "Health Care Staffing and Maternal Health Outcomes in Tereko District, Uganda."

Purpose of the Study: The purpose of this study is to examine the relationship between healthcare staffing and maternal health outcomes in Tereko District.

Procedure of Study: You have been selected to participate in this study, and I would like to ask you a few questions regarding healthcare staffing and maternal health outcomes in Tereko District. Your responses will help in understanding how staffing influences maternal health and how improvements can be made.

If you decide to participate, we will conduct key informant interviews either in-person in a private room or via video conferencing software (e.g., Zoom). During the interviews, an audio recorder will be used to capture the data. You may choose not to answer any question you feel uncomfortable with or withdraw from the study at any time. The interview will last approximately 30-60 minutes and will be scheduled at a time convenient for you. Confidentiality: Your responses will be kept strictly confidential. Your answers will be recorded anonymously and stored securely, with no identifiable information linked to your responses. A unique participation number will replace your name in the data, and any identifying details will be kept confidential by the Principal Investigator. Your identity will not be disclosed in any publications related to this study.

Benefits and Risks/Discomforts: The findings of this study are expected to contribute to improving maternal health outcomes in Tereko District by identifying key staffing issues in healthcare that may affect maternal health. Participation will involve taking time to answer questions about your experiences and perspectives. You may choose to skip any question or discontinue participation at any time. No sensitive topics will be addressed, and the information shared will not be used in a way that could harm your reputation.

Alternatives: Your participation in this study is voluntary. You may choose not to participate or withdraw at any time. If you withdraw, your data will be excluded from the study up until the point of withdrawal. You may also refuse to answer any question or skip a question. Dissemination of

Results: After the study is completed, the findings will be shared with participants. Any new or relevant information affecting the study or participants' well-being will be made available.

Voluntary Consent: By signing this form, you acknowledge that you have been fully informed about the study, including the nature, purpose, risks, and benefits of participation. You understand that your participation is voluntary and that you have the right to withdraw at any time without negative consequences. Your identity will be kept confidential, and the information provided will be used solely for this research. If you have any questions about the study at any point, please feel free to contact me.

Contact Information: Candia Morris (0779236949) Consent Statement:

I, _____, have been fully informed about the study titled “Health Care Staffing and Maternal Health Outcomes in Terego District, Uganda.” I have been provided with a clear explanation of the study’s purpose, procedures, risks, and benefits. I understand that my participation is voluntary, and I have the right to withdraw from the study at any time without any negative consequences. Signature of Participant: _____

Date: _____

Signature of Researcher: _____

Date: _____

Appendix C: INTERVIEW GUIDES

1. Healthcare Staff Adequacy on Maternal Health Outcomes in Terego District

1. How do you assess the current staffing levels for maternal health services in Terego District?
2. How does the adequacy of healthcare staff affect maternal health outcomes in Terego District?
3. What strategies or measures are in place to address any staffing shortages in maternal health services?

2. Healthcare Staff Motivation on Improving Maternal Health Outcomes in Terego District

1. Do you think there are any specific incentives or programs in place to boost healthcare staff's motivation?
2. Can you share any instances where the motivation of healthcare staff significantly improved or hindered maternal health outcomes?
3. What measures do you think could be implemented to further improve the motivation of healthcare staff to enhance maternal health outcomes?

3. Healthcare Staff Training and Skills on Enhancing Maternal Health Outcomes in Terego District

1. In your experience, how does the training and skill development of healthcare staff influence maternal health outcomes in Terego District?
2. Can you provide examples where well-trained healthcare staff have positively impacted maternal health outcomes?
3. What additional training or skills development do you think is needed to further improve maternal health outcomes in the district?

Appendix D: QUESTIONNAIRE

Questionnaire for health workers and health unit management committees

Dear Respondent

My name is Candia Morris, a student of Uganda Christian University, School of Business, conducting research on “Health care staffing and maternal health outcomes in Terego district, Uganda”. The study is for academic purposes in the pursuit of the award of a Degree of Master of Business Administration from Uganda Christian University. The researcher requests you to respond to the questionnaire honestly and promise to treat your responses with the utmost confidentiality

INSTRUCTION: Tick the appropriate answer or fill in the space provided

Section A: Bio-data of Respondents

- 1.0 What is your gender? a) Male () b) Female ()
- 2.0 Indicate your age. a) Below 30 years () b) 31-40 years ()
 c) 41-50 years () d) Over 51 years ()
- 3.0 What is your highest qualification?
- a) Certificate holder () b) Diploma ()
- c) Graduate () d) Others () Specify -----
- 4.0 How long have you worked in health department
- a) 1-5 years () b) 6-10 years ()
- c) 11-15 years () d) 16years and above ()

Section B:

Please tick in the space provided. Choose that option is most applicable to you.

Note: Apply a tick where applicable using the following key.

SA – Strongly, A- Agree, NS – Not Sure, D – Disagree, SD – Strongly Disagree

5. Effect of staff adequacy for maternal health outcomes in Terego District.

No. Qns	Questions	1 SA	2 A	3 NS	4 D	5 SD
1.	There are enough healthcare staff available to manage maternal health cases in Terego District effectively.					
2.	The limited number of healthcare staff in Terego District contributes to maternal health complications.					
3.	The adequacy of healthcare staff directly impacts maternal health outcomes in Terego District.					
4.	Healthcare staff shortages result in delays in providing critical maternal health services in Terego District					
5.	Increased healthcare staff in the Terego District would significantly improve maternal health outcomes.					
6.	The average patient-to-doctor ratio is associated with maternal health outcomes in Terego District.					

Section C

Note: Apply a tick where applicable using the following key.

SA – Strongly, A- Agree, NS – Not Sure, D – Disagree, SD – Strongly Disagree

6. Effect of Healthcare Staff Motivation on Improving Maternal Health

Outcomes in Terego District

No. Qns	Questions	1 SA	2 A	3 NS	4 D	5 SD
1.	Motivated healthcare staff are more likely to provide quality maternal healthcare services in Terego District					
2	Adequate incentives and support for healthcare staff would improve maternal health outcomes in Terego District					
3.	Healthcare staff in Terego District are highly motivated to deliver maternal healthcare services, resulting in improved outcomes.					
4.	Staff morale plays a significant role in the quality of maternal healthcare services in Terego District.					
5.	Healthcare staff in Terego District feel adequately supported in their work to improve maternal health outcomes					
6.	Motivation programs for healthcare staff would lead to a reduction in maternal health complications in Terego District					

Section D

Note: Apply a tick where applicable using the following key. SA – Strongly,

A- Agree, NS – Not Sure, D – Disagree, SD – Strongly Disagree

7. The effect of Healthcare Staff Training and Skills on Enhancing Maternal Health Outcomes in Terego District

No. Qns	Questions	1 SA	2 A	3 NS	4 D	5 SD
1.	Regular training of healthcare staff enhances their ability to address maternal health issues effectively in Terego District					
2	Healthcare staff in Terego District have the necessary skills and training to manage maternal health complications effectively.					
3.	Training programs for healthcare staff have led to improved maternal health outcomes in Terego District.					
4.	Inadequate training of healthcare staff negatively affects maternal health outcomes in Terego District					
5.	Enhanced healthcare staff training would significantly improve the quality of maternal healthcare services in Terego District.					
6.	Ongoing training and skill development programs are crucial for improving maternal health outcomes in Terego District.					

THANK YOU FOR YOUR PARTICIPATION

Appendix E: PROPOSED BUDGET.

S/NO	Particulars	Unit Cost Ugx	Quantity	Total Cost Ugx
001	Type setting and printing the Research proposal (6 copies)	1,000=	38 pgs@	228,000=
002	Travel to Terego to contact responsible persons i.e., DHO, CAO, Health workers and VHTs	100,000=		100,000=
003	Purchase of reams of printing papers	15,000=	2 reams	30,000=
004	Purchase of stapling machine & wires	15,000=	1	15,000=
005	Purchase of ruled papers	15,000=	1	15,000=
006	Typesetting and printing Questionnaires, interview guides & Focus Discussion guides.	3,000=	20 pgs	60,000=
007	Photocopying Questionnaires, and interview guides	100=	20pgs	2000=
008	Purchases of pens	500=	6	3000=
009	Transport to the district H/Qs (Terego) seeking for permission	20,000=		20,000=
010	Transport to 3 other schools sampled.	20,000=	3	60,000=
011	Meals to the Researcher.	20,000=	3	60,000=
012	Facilitation to meet District health team	50,000=	4	200,000=
013	Facilitations to health center management committee	30,000=	4	120,000=
014	Facilitation to VHTs	10,000=	128	1,280,000=
015	Printing the research report for preliminary analysis	1,500=	50pgs	75,000=
016	Analyzing, report writing & printing fair copy	1,500=	50pgs	75,000=
017	Taking report to supervisor for perusal correcting & approval by supervisor	100,000=	2 trips	200,000=
018	Processing fair/final copies of Report	1,500=	50 pages	75,000=
019	Submission of approved report	100,000=	2	200,000=
020	Final dissertation production			200,000=
021	Supplying copies to sampled health units and DHO Terego	150,000=		150,000=

022	SUB-TOTAL			2,966,000=
023	Miscellaneous Expenses	50% of total cost		2,482,000=
024	GRAND TOTAL			5,370,000=

Appendix F: Proposed Work plan

No	Activity	Time schedule
1.	Topic Submission and Approval	July, 2024
2.	Proposal writing	August 2024 - February, 2025
3.	Proposal submission (1 st draft)	Feb, 2025
4.	Proposal editing and Submission	Feb, 2024
5.	VIVA-Proposal	March, 2025
6.	Field work –data collection	March, 2025
7.	Dissertation/Report compilation	March, 2024
8.	Dissertation submission (1 st draft)	April, 2024
9.	Editing and re-submission of dissertation for marking	May, 2025
10.	Final copy submission	May, 2025
11.	Submission to External Examiners	May, 2025
12.	VIVA VOCA (Presentation)	May, 2025
13.	Final Submission	June, 2025

Appendix G: Signed Introductory Letter Data Collection



**UGANDA CHRISTIAN
UNIVERSITY**

A Centre of Excellence in the Heart of Africa

28th April 2025

To Whom It May Concern;

RE: MASTERS IN BUSINESS ADMINISTRATION (MBA)

Mr. Candia Morris , REG. M23M15/008 is a student at Uganda Christian University, pursuing a degree of Master's in Business Administration.

In partial fulfillment of the requirements for the award of the Master's degree, he is conducting a research study titled: **Health Care staffing and Maternal health outcomes in Terego District, Uganda**

This communication therefore serves to formally request you to allow him access any information in your custody/organisation, which is relevant to his research .

Thank you for your cooperation on this matter

Yours Sincerely,

Dr. Henry Mugisha

Head of Department, Postgraduate Studies

28 MAY 2025



Appendix H: Notification of Research Institutions Response

Uganda Christian University
P.O. Box 4, Mukono, Uganda
Email: registra@ucu.ac.ug
Date: 04/06/2025

The Chief Administrative Officer
Terego District Local Government
P.O. Box 1, Leju.



Dear Sir,

RE: NOTIFICATION OF RESEARCH INSTITUTIONS AND RESPONDENTS

Reference is made to the no-objection comment you kindly granted regarding my research study. I am a student of Uganda Christian University pursuing a Master's degree in Business Administration. I am currently conducting research titled: "Health Care Staffing and Maternal Health Outcomes in Terego District, Uganda."

This letter serves to formally inform your esteemed office of the institutions and categories of respondents that will be involved in the study. The research will cover both government and private health facilities within Terego District, specifically:

Oriajini Health Centre, Oninia Health Centre, Micu Health Centre, Ocodri Health Centre, Tuku Health Centre, Itia Health Centre, Oguwa Health Centre and Cilio Health Centre.

The categories of respondents will include: Members of the District Health Management Committee, Health Workers (both clinical and support staff) and Members of Health Unit Management Committees.

The purpose of this study is purely academic and all information collected will be treated with the highest level of confidentiality, and findings will be shared with your office upon completion of the study.

I kindly request continued cooperation and support in facilitating access to the mentioned institutions and respondents.

Yours faithfully,

Candia Morris

0779236949/0782894261
Reg. No: M23M15/008
Uganda Christian University