

# Determinants of Maternal Health Services Utilisation and Maternal Complications Among Puerperium Women at Muko Health Centre Iv, Rubanda District, Uganda

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## Research Article

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**DETERMINANTS OF MATERNAL HEALTH SERVICES UTILISATION AND  
MATERNAL COMPLICATIONS AMONG PUERPERIUM WOMEN AT MUKO  
HEALTH CENTRE IV, RUBANDA DISTRICT, UGANDA**

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## **LIST OF ABBREVIATIONS**

1. WHO      World Health Organization
2. MCC      Maternal Continuum of Care
3. ANC      Antenatal Care
4. PNC      Postnatal care
5. MMR      Maternal mortality rate
6. HC       Health Centre
7. SBA      Skilled birth attendant
8. ANC – Antenatal Care
9. TBA – Traditional Birth Attendant
10. H/C – Health Center
11. EmOC – Emergency Obstetric Care
12. CHW – Community Health Worker
13. SPSS – Statistical Package for the Social Sciences
14. HCIII – Health Center Level III
15. UNICEF – United Nations International Children's Emergency Fund

## ABSTRACT

### **Background.**

The maternal health services utilization has undergone significant transformations over time, reflecting changes in healthcare systems, societal norms, and medical advancements. Historically, maternal health care was primarily managed within families and communities, often relying on traditional birth attendants and home remedies. An average of 830 women are lost every day globally from preventable causes that are related to pregnancy and childbirth; where most of all, at least (99%) occur in developing countries Rahman et al., 2023). This translates to a global MMR of 211 maternal deaths per 100,000 live births. Unfortunately the maternal death rates remain high, in 2021 according to the World Health Organization (WHO).

**Keywords:** Maternal health, Antenatal care (ANC), Skilled Birth Attendant (SBA), puerperium women

**Objective:** To assess the determinants of the utilization of maternal health services and maternal complications among puerperium women attending Muko Health Centre IV, Rubanda district Western Uganda.

**Methods:** A cross-section approach was employed, structured questionnaires administered to 190 women in puerperium.

**Results:** Majority of the participants 41.6% were between the years 20-29, with 60.5% having completed just primary education and 66.8% unemployed. Distance from respondents' home (P Value 0.001), Cost of transport to the health facility (P Value 0.035), maternal age (P Value 0.001), marital status (P Value-0.008), and support from partner (P Value-0.023) were observed to have P-Value less than 0.05 indicating a significant relationship between these determinants and the utilization of maternal health services.

**Conclusion:** The study showed that 96% of the mothers attended a session of antenatal care at some time during the period of pregnancy whereas 4% did not attend antenatal care at all, this indicates that majority of the participants are aware of antenatal care and its significance during pregnancy. The findings of this study align with findings of other studies that demonstrate low utilization levels of maternal health services. However various factors need to be addressed to increase ANC and SBA attendance among pregnant women.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0 BACKGROUND OF THE STUDY**

##### **1.1.1 Historical Background:**

Maternal health comprises well-being of mothers throughout pregnancy, delivery, and the postnatal period to ensure a positive experience for both mothers and babies, minimizing any risks of morbidity or mortality (Ali & Chauhan, 2020). The maternal health services utilization has undergone significant transformations over time, reflecting changes in healthcare systems, societal norms, and medical advancements. Historically, maternal health care was primarily managed within families and communities, often relying on traditional birth attendants and home remedies (Allotey 1999, World bank 1994). The early 20th century however marked a critical shift with the emergence of professionalized obstetric care and the establishment of maternity hospitals (Kibonire & Mphuthi, 2023). This era witnessed the widespread adoption of antenatal care, skilled birth attendance, and basic postnatal care practices. Governments and international organizations increasingly invested in maternal health programs, leading to improvements in healthcare infrastructure and the training of healthcare professionals specializing in maternal care (Owusu 2020). The 21st century brought further advancements in maternal health services, including the promotion of evidence-based practices, the integration of family planning services, and a focus on maternal mental health (Nguyen et al., 2012).

##### **1.1.2 Theoretical background.**

The health belief model is a widely recognizes that an individual's belief in the effectiveness of the recommended behavior influences the likelihood of adopting that behavior, in the context of maternal health services utilization, women consider their susceptibility to pregnancy related complications. The model also focuses on how mothers perceive the seriousness of the health condition. Understanding how women perceive these risks and how it impacts their decision making regarding health utilization is crucial. Mother's ability to take the recommended health

action and self-efficacy which involve beliefs about the ability to schedule antenatal appointments, communicate effectively with healthcare providers, adhere to prescribed treatments and make informed decisions about childbirth.

### **1.1.3 Contextual Background:**

Contextually, factors that affect the maternal health services utilization can be categorized into several domains. These include individual factors such as education level, Knowledge and understanding of maternal health issues, the value of antenatal care, birth preparedness, and identifying danger signs in childbirth play a crucial role in utilization of maternal health, cultural norms, traditions, and religious beliefs may influence perceptions of maternal health, childbirth practices, and decisions regarding healthcare utilization (Simkhanda et al., 2008). More so socioeconomic status and the presence of supportive family members, partners, and peers can encourage or discourage women from seeking maternal health services. Interpersonal factors like social support, family dynamics, and decision-making power within households also play a crucial role (Ali & Chauhan, 2020, Alloy 1999). Community-level factors such as availability of healthcare facilities, quality of services, and cultural norms regarding maternal care further influence utilization. Moreover, broader contextual factors like health policies, infrastructure development, and socio-political environment impact the overall utilization patterns. Income level, education, occupation, and access to health insurance can significantly impact an individual's ability to access and afford maternal health services (Adam & Smith 2018, Dairo & Owoyokun 2010).

### **1.1.4 Conceptual Background:**

An average of 830 women are lost every day globally from preventable causes that are related to pregnancy and childbirth; where most of all, at least (99%) occur in developing countries (Rahman et al., 2023). This translates to a global MMR of 211 maternal deaths per 100,000 live births. Unfortunately the maternal death rates remain high, in 2021 according to the World Health Organization (WHO), over 287,000 women all over the world who died from causes that are preventable in relation to pregnancy or childbirth, with 810 deaths daily being an average and still the greatest percentage of these deaths, 94%, still occurring in low and middle-income

countries, mainly in sub-Saharan Africa, in which two-thirds of global maternal deaths are concentrated (unicef data, 2021).

Despite half of pregnant women globally receiving at least one ANC visit in 2020, many still miss out on these essential services (Montagu et al., 2021). ANC in low and middle-income countries is linked to better birth outcomes and reduced child mortality. Rural areas see fewer pregnant women (58.3%) attending the recommended four ANC visits compared to urban areas 65.2% (United Nation Population Fund, 2017). Likewise, women who do not regularly attend prenatal care appointments while pregnant are more likely to face complications like preeclampsia, eclampsia, and anemia, which can increase the risk of maternal mortality and lead to adverse birth outcomes such as preterm birth, low birth weight, and stillbirth (Seidu et al., 2022). Rural areas often face challenges such as limited access to healthcare facilities, fewer skilled healthcare providers, and inadequate transportation infrastructure. This can result in lower utilization rates compared to urban areas with better healthcare infrastructure (Zeine et al., 2010). The presence of comprehensive maternal health services, including antenatal care, skilled birth attendance, emergency obstetric care, and postnatal services, influences utilization whereas shortages of essential services can lead to underutilization or delayed care-seeking (Bang et al., 1994). National policies related to maternity care, such as coverage of antenatal visits, skilled birth attendance, and postnatal care, impact utilization rates. Policies that reduce financial barriers, such as subsidies or insurance coverage, can improve access (Mshana 2020; Odhiambo 2020).

Maternal health services are crucial for the well-being of mothers and children, yet many communities continue to experience high rates of morbidity and mortality despite the availability of these services yet community-based health promotion programs, education campaigns about maternal health, and outreach efforts targeting vulnerable populations can increase awareness and utilization of services (Javadi et al., 2023; Mwamba 2020). However, there has been a significant reduction of 33% between 2000 and 2020 (Kaponda 2020). Eastern Europe and Southern Asia witnessed the most substantial decrease in MMR during this period, with reductions of 70% and 67% respectively (Mugisha et al., 2010). Additionally, four other regions halved their MMRs. The report also highlights that over half a million women face childbirth complications annually, with a significant number resulting in death. Uganda, in particular, faces

a high number of maternal deaths, despite efforts to improve maternal health services (Bain et al., 2022).

Uganda is among of the very few countries that account for the greatest percentage of the maternal deaths and with low availability of comprehensive emergence obstetric services (SARA, 2018). The maternal death in Uganda are high for the mere fact that the sector of maternal health has been given significant attention and concern from the government (Ministry of Health, 2020). Even though Uganda has made significant progress in improving child survival and growth, the country still grapples with a high maternal mortality rate of 368 deaths per 100,000 live births and 64 deaths per 1,000 live births (Babughirana et al., 2020). The World Health Organization (WHO) points out that the primary reason for maternal deaths is the lack of limited use of healthcare facilities (Journal of Gynecology 1985). It is crucial for women to have access to maternal health services during pregnancy and after delivery to reduce the number of preventable deaths (Kota et al., Reproductive Health 2023). International human rights law emphasizes the importance of states enabling women to survive pregnancy and childbirth by ensuring access to quality healthcare (Human Rights Council, 2022). The WHO envisions a world where every pregnant woman and newborn receives comprehensive care during pregnancy, delivery, and postnatal period (Kota et al., 2023). This vision can only be realized through the effective use of maternal healthcare services, as demonstrated by the positive impact on pregnancy outcomes (World Health Organization, 2020). Kigezi region located in southwestern part of Uganda, a region in which Rubanda district is located has the a maternal mortality rate of 541 per 100,000 live births which is almost twice higher than the MMR of Uganda at large of 368 births per 100,000 live births. This could be due to underutilization of maternal health services by mothers in the region and hence this problem needs to be addressed (Kibonire et al., 2023). This research therefore intends to understand the factors affecting the utilization of maternal health factors among puerperium women attending Muko Health Centre IV in Rubanda district, Western Uganda.

## **1.2 PROBLEM STATEMENT.**

Maternal health services are provided by most health facilities in Uganda at no cost for government facilities and at subsidized prices for most non-governmental health facilities (Ssengooba & Neema 2010). Women are expected to attend maternal health services at any

health facility during pregnancy and delivery (Tekle 2020). Nevertheless, there is serious concern about the insignificant number of women that come to attend maternal health services. Gravid mothers are required to attend the initial ANC routine in the 1<sup>st</sup> trimester and attend at least 4 ANC visits to test and treat any health problems at the same time to test for any risk factors that may negatively affect the pregnancy (Rosliza &Muhamad, 2011).Women have extremely minimal antenatal care utilization. In Southwestern Uganda, maternal health services utilization is reported to be below national average with utilization of 4+ ANC visits at 64% and an SBA utilization rate of 48% (Kibonire et al., 2023). Moreover local data shows a maternal mortality rate of 541per 100,000 live births which is almost twice higher than MMR of Uganda at large of 368 births per 100,000 live births (Kibonire et al., 2023). There is low utilization rate of maternal health services and yet an increased maternal mortality rate from preventable causes which creates a discrepancy that this research seeks to address.

### **1.3 Study objectives**

#### **1.3.1 General objective.**

To assess the determinants of maternal health services utilization and maternal complications among puerperium women attending Muko Health Centre IV, Rubanda district, Uganda.

#### **1.3.2 Specific objectives of this study.**

1. To determine the utilization levels of maternal antenatal care and delivery under a skilled birth attendant services among puerperium women attending Muko Health Centre IV, Rubanda district, Uganda.
2. To determine the maternal and health facility related factors associated with the utilization of maternal health services among puerperium women attending Muko Health Centre IV, Rubanda district, Uganda.
3. To determine the relationship between maternal health services utilization and development of maternal complications among puerperium women attending Muko Health Centre IV, Rubanda district, Uganda

### **1.3.3 RESEARCH QUESTIONS.**

1. What are the utilization levels of maternal antenatal care and delivery under a skilled birth attendant services among puerperium women attending Muko Health Centre IV, Rubanda district, Uganda?
2. What are the maternal and health facility related factors associated with the utilization of maternal health services among puerperium women attending Muko Health Centre IV, Rubanda district, Uganda?
3. What is the relationship between maternal health services utilization and development of maternal complications among puerperium women attending Muko Health Centre IV, Rubanda district, Uganda?

## **1.4 STUDY SCOPE**

### **1.4.1 STUDY AREA**

The study was conducted at Muko HC IV in Rubanda district located in southwestern Uganda. Muko Health Centre IV is located 24km along kabale-kisoro road.

### **1.4.2 STUDY POPULATION.**

Muko health Centre IV serves a population majorly from the Rubanda West Health Sub-district with a minority from proximal areas of Kisoro and Kananga districts.

## **1.5 SIGNIFICANCE OF THE STUDY**

Maternal health services are critical for ensuring the wellbeing of pregnant women and for reducing maternal mortality and morbidity rates. Understanding the factors that influence the utilization of these services can help identify barriers and develop target interventions to improve access and uptake, ultimately leading to better health outcomes to both mothers and babies. In many parts of the world, there are significant disparities in maternal health service utilization based on factors such as socio-economic status, geographic location, ethnicity, and education. Research in this area can highlight these disparities and inform policies and programs to address them, ensuring that all women have equal access to essential maternal health services. Limited

resources can be a challenge in health care systems, identifying the factors that affect utilization, health care providers can allocate resources more efficiently, targeting areas of need and maximizing the impact of their interventions. Healthy mothers play a crucial role in the wellbeing of their families and communities. Ensuring that maternal health services are accessible and effectively used

## **1.6 Conceptual framework.**

### **1.6.1 Conceptual Framework Narrative**

The framework posits that the utilization of maternal health services and development of maternal complications amongst puerperium women are influenced by a complex interplay of factors at multiple levels.

#### **Individual Level Factors**

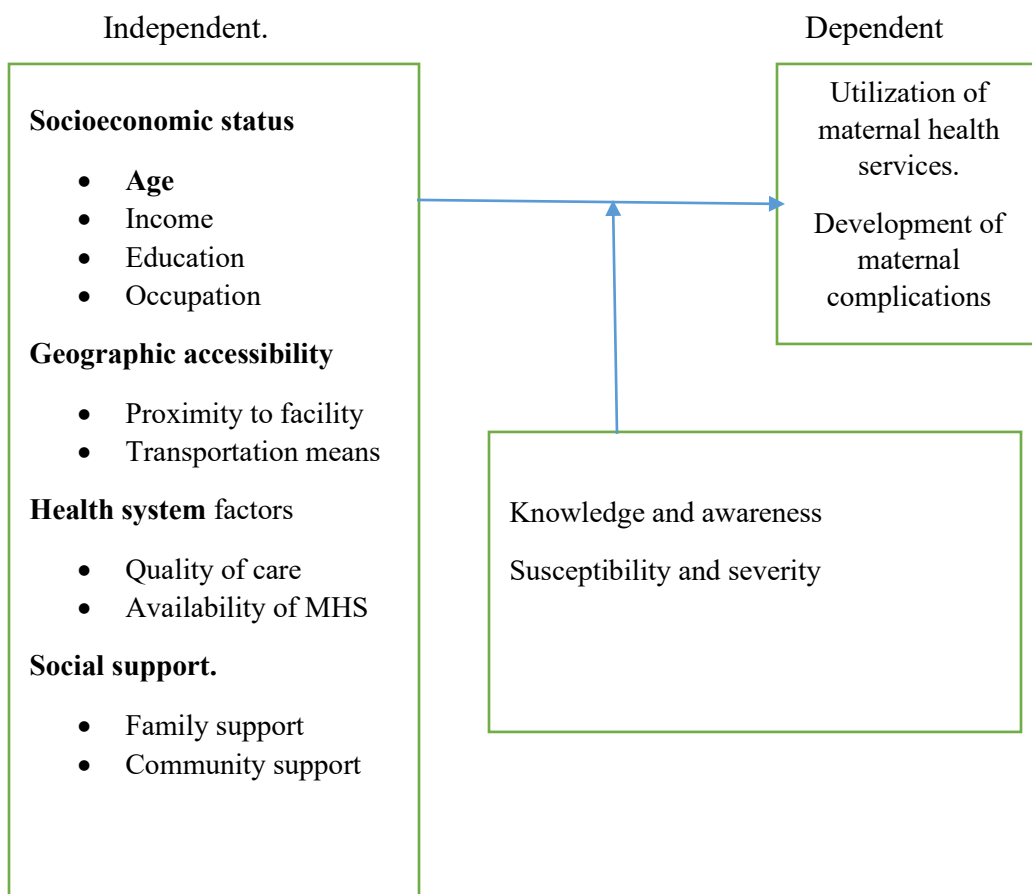
At the individual level, factors such as socio-demographic characteristics (age, education, and income), health beliefs, attitudes, and knowledge influence a woman's decision to utilize maternal health services.

#### **Healthcare System Level Factors**

At the healthcare system level, factors such as accessibility, availability, affordability, and quality of care influence the utilization of maternal health services. The availability of skilled healthcare providers, equipment, and supplies also play a critical role in preventing and managing maternal complications.

#### **Interaction between Factors**

The framework suggests that there is a dynamic interaction between individual, healthcare system, and community level factors. For example, a woman's decision to utilize maternal health services may be influenced by her individual-level factors, which in turn may be shaped by community-level factors. Similarly, the quality of care provided by the healthcare system may influence the development of maternal complications, which in turn may be affected by individual-level factors.



## CHAPTER TWO

### LITERATURE REVIEW

#### **2.1 Utilization of the Maternal Continuum of care among puerperium women.**

Globally, approximately 75% of women receive at least one antenatal care (ANC) visit during pregnancy. However, only about 58% of women receive the recommended minimum of four ANC visits. This indicates disparities in accessing comprehensive maternal healthcare services. Research by Blanc et al. (2020) highlighted significant regional disparities in maternal Continuum of care (MCC) utilization rates. Sub-Saharan Africa and South Asia have lower MCC utilization rates compared to regions like Europe and North America. In Sub-Saharan Africa, for instance, only about 68% of pregnant women receive skilled birth attendance, highlighting the need for targeted interventions (Zelka et al., 2023). Socioeconomic factors play a crucial role in MCC utilization. A study by Rahman et al. (2023) found that women from lower-income households are less likely to access MCC services, including ANC, skilled birth attendance, and postnatal care. Lack of financial resources, transportation barriers, and limited healthcare facilities contribute to these disparities (Alisjahbana et al., 1995). Surveys conducted in various countries provide insights into specific barriers to MCC utilization. Despite challenges, there have been notable improvements in MCC utilization rates in some regions (Akpala 1994). A report by UNICEF (2022) highlighted that in Latin America and the Caribbean, over 90% of pregnant women receive at least one ANC visit, showcasing progress in access to maternal healthcare. Policy interventions are essential to address barriers and improve MCC utilization rates globally. Investments in healthcare infrastructure, community-based outreach programs, and financial support for vulnerable populations are recommended strategies. Additionally, initiatives to promote education and awareness about the importance of MCC play a crucial role in enhancing utilization rates ( Ndyomugenyi et al., 2012).

Sub-Saharan Africa accounts for a disproportionate burden of maternal and neonatal mortality, with inadequate access to skilled birth attendance contributing to poor outcomes. According to UNICEF, only 52% of births in sub-Saharan Africa are attended by skilled health personnel, well below the global average (UNICEF, 2020). Several factors contribute to low rates of delivery

under skilled birth attendants in Africa, including limited access to healthcare facilities, shortage of skilled healthcare providers, cultural preferences for traditional birth attendants, and socioeconomic disparities (Campbell et al., 2020). Additionally, inadequate infrastructure, lack of transportation, and financial barriers hinder pregnant women from accessing skilled birth attendance services in many African countries (Montagu et al., 2021).

Despite efforts to increase access to maternal continuum of care, progress has been uneven across African countries. Countries with stronger health systems and greater investments in maternal healthcare, such as Rwanda and Botswana, have made significant strides in improving the proportion of deliveries under skilled birth attendants (Republic of Rwanda Ministry of Health, 2019; Government of Botswana, 2018). However, in conflict-affected regions and countries with weak health systems, such as South Sudan and Somalia, rates of delivery under skilled birth attendants remain alarmingly low (Republic of South Sudan Ministry of Health, 2018; Ministry of Health, Somalia, 2019). A cross sectional study in Ghana assessing continuum of care in a maternal and child health program showed that 8% completed MCC with the greatest drop out between delivery and postnatal care within 48 hours after delivery whereas according to a Nigerian study assessing determinants of maternal care dropout, 60.6% of the mothers received antenatal care, however 38.1% dropped out and never went ahead to receive skilled birth attendance, and 50.8% of the mothers that received SBA care never went ahead to attend postnatal care (Kitila et al., 2023). The attendance of antenatal care in the first trimester was at 34.6% and only 42.8% attended 4+ ANC visits of whom only 39% of them went ahead to deliver under a skilled birth attendant (Completion of the continuum of care). The study further points out that 82.2% of the mothers delivered under a skilled birth attendant of which only 14.2% of these mothers stayed at the health unit more than 24 hours after delivery, only 49.8% of these mothers reported to have attended postnatal checkup in their previous delivery of which majority of them reported failure to attend postnatal clinic secondary to being unaware of postnatal checkups, the completion of the maternal continuum of care as per this study is at 21.5%, however a study by Javadi et al., (2023) shows that the completion of the MCC was at 16.1% showing a significant number of dropouts between the first and fourth antenatal care.

ANC is a vital component of MCC, providing essential services to pregnant women. A study by Abrahams et al. (2021) in Kenya reported an ANC utilization rate of 80% among pregnant

women, indicating relatively high uptake in the country. Similarly, Mwanri et al. (2020) found that 75% of pregnant women in Tanzania utilized ANC services, reflecting a strong emphasis on prenatal care in East Africa. SBA is crucial for ensuring safe childbirth and reducing maternal mortality rates. Recent data from Girma et al. (2022) revealed that 65% of births in Rwanda were attended by skilled health personnel, indicating significant progress in SBA utilization. In contrast, a study by Ndayisaba et al. (2019) in Burundi reported a lower SBA utilization rate of 50%, highlighting challenges that some East African countries face in ensuring access to skilled birth attendants. Postnatal care plays a critical role in monitoring the health of mothers and newborns after childbirth (Bain et al., 2022). A study by Wanjiru et al. (2023) in Ethiopia found that 55% of women received postnatal care within the first 48 hours after delivery, indicating moderate PNC utilization rates. However, disparities exist, as a study by Kinyoki et al. (2021) in Kenya reported a lower PNC utilization rate of 40%, signaling gaps in postpartum care access in certain regions. Efforts to integrate MCC components have shown promising results in improving utilization rates. A study by Chukwuemeka et al., (2020) demonstrated that integrated maternal health services in Tanzania led to a 15% increase in MCC utilization rates. Similarly, Tesfaye et al., (2024) highlighted successful integration strategies in Eritrea, contributing to a 20% rise in MCC utilization. Despite progress, barriers to MCC utilization persist in East African countries. Studies have identified challenges such as geographical disparities, financial constraints, and cultural beliefs. For example, Nyamtema et al., (2022) identified transportation issues as a major barrier to accessing MCC services in rural Tanzania. Additionally, Cheptum et al., (2023) highlighted the impact of poverty on MCC utilization in Kenya, with 30% of women citing financial constraints as a barrier to accessing maternal healthcare services.

A study in Uganda revealed that the completion of maternal care continuum was at 10.7% and about 59.9% attended four or more antenatal care visits, where as 76.6% delivered under a skilled birth attendant, with only 22.5% attending at least one postnatal clinic care in a period of six weeks (Sserwanja et al., 2022).

## **2.2 Factors that affect utilization of maternal health services among puerperium women.**

### **2.2.1 Maternal and socioeconomic Factors Affecting Utilization of Maternal Health Services.**

Maternal age and parity are important factors influencing the utilization of maternal health services. Adolescent mothers and older women may face unique challenges that affect their access to and utilization of maternal health services. Adolescent mothers, for instance, may experience social stigma, financial dependence, and lack of autonomy in decision-making regarding their healthcare (Edward et al., 2022). On the other hand, multiparous women, especially those with previous negative birth experiences, may be more motivated to seek maternal health services for subsequent pregnancies. However, they may also face barriers such as time constraints due to childcare responsibilities or perceived lack of necessity for antenatal care if previous pregnancies were uneventful (Seidu et al., 2022). Income level is a primary socioeconomic factor influencing the utilization of maternal health services. Studies consistently show that women from lower-income households face financial barriers that prevent them from accessing essential maternal healthcare services. The costs associated with antenatal care visits, skilled birth attendance, laboratory tests, medications, transportation to health facilities, and postnatal care can be prohibitive for economically disadvantaged women (Downe et al., 2019).

Lack of health insurance coverage or inadequate coverage further exacerbates financial barriers, leaving many women with limited options for affordable maternal health services. To address these challenges, interventions such as fee waivers, subsidized services, community-based health insurance programs, and conditional cash transfer schemes have been implemented to improve the affordability of maternal healthcare and increase utilization rates among low-income women (Öjendal et al., 2023). Educational attainment influences maternal health service utilization in such a way that women with higher levels of education are more likely to seek and utilize maternal healthcare services compared to those with lower levels of education. Education empowers women with knowledge about the importance of antenatal care, birth preparedness, danger signs during pregnancy and childbirth, family planning options, and postnatal care (Kibonire & Mphuthi, 2023).

Health literacy, which encompasses the ability to understand health information, make informed decisions about healthcare, and navigate the healthcare system, plays a significant role. Women with higher health literacy levels are better equipped to advocate for their maternal healthcare needs, communicate effectively with healthcare providers, and adhere to recommended care practices (Buli et al., 2023). Employment status and workplace policies impact women's utilization of maternal health services. Women who are employed in formal sectors with supportive maternity leave policies, access to paid time off for antenatal care visits, and flexible work arrangements are more likely to prioritize their maternal health needs. Conversely, women in precarious employment, informal sectors, or without job security face challenges in accessing and utilizing maternal healthcare services due to concerns about income loss, job stability, and lack of support from employers (Lugobe et al., 2021). Improving maternity leave policies, promoting workplace accommodations for pregnant women, and implementing supportive workplace environments can encourage women to seek timely and comprehensive maternal healthcare without compromising their employment status (Nwosu & Ataguba, 2019). Cultural and social beliefs greatly influence women's decisions regarding maternal health services. In many societies, traditional practices, beliefs, and customs surrounding pregnancy and childbirth may deter women from seeking professional medical care. Furthermore, stigma and discrimination related to reproductive health issues, such as adolescent pregnancy or infertility, also impact women's willingness to access maternal health services (Seidu et al., 2022).

### **2.2.2 Health Facility Related Factors Affecting Utilization of Maternal Health Services.**

The availability and accessibility of maternal health services within health facilities significantly impact their utilization. Studies have shown that women are more likely to utilize maternal health services if they are easily accessible in terms of proximity to their residence or place of work. Health facilities located in rural or underserved areas often face challenges in providing comprehensive maternal health services due to limited infrastructure, healthcare personnel, and medical supplies (Dantas et al., 2020). Furthermore, the availability of services such as antenatal care, skilled birth attendance, emergency obstetric care, and postnatal support plays a crucial role in encouraging women to seek care during pregnancy and childbirth. Health facilities that offer a continuum of maternal care services are more likely to attract and retain maternal health service users (Tounkara et al., 2022).

The quality of maternal health services provided at health facilities significantly influences women's utilization of these services. Quality of care encompasses various aspects, including clinical competence, adherence to evidence-based practices, availability of essential drugs and equipment, cleanliness, privacy, and respectful maternity care. Women are more likely to seek maternal health services at facilities known for providing high-quality care and positive birthing experiences (Öjendal et al., 2023). Skilled and compassionate healthcare providers who can effectively communicate with women, address their concerns, and provide culturally sensitive care contribute to increased utilization of maternal health services. Conversely, negative experiences, such as mistreatment or disrespect during childbirth, can deter women from accessing healthcare facilities for maternal care (Bain et al., 2022).

The affordability of maternal health services and associated costs, including consultation fees, laboratory tests, medications, and transportation expenses, can act as significant barriers to utilization. Women from low-income households or without health insurance coverage may struggle to afford the out-of-pocket expenses associated with maternal healthcare, leading to delayed or inadequate care-seeking behaviors (Tarekegn et al., 2014). Health facilities that offer subsidized or free maternal health services, implement cost-sharing initiatives, or accept health insurance schemes attract women from diverse socioeconomic backgrounds. Additionally, community-based health insurance programs and conditional cash transfer schemes have shown promise in improving the affordability of maternal health services and increasing utilization rates (Edward et al., 2022). The physical infrastructure and availability of essential equipment and supplies in health facilities are critical for providing safe and effective maternal health services. Facilities with well-equipped maternity wards, operating theaters for cesarean sections, functional labor and delivery rooms, neonatal care units, and blood transfusion services are better prepared to handle obstetric emergencies and complications (Kaponda 2020). Inadequate infrastructure, including lack of electricity, water supply, sanitation facilities, and emergency transport services, can hinder the provision of timely and life-saving maternal care. Health facilities need sufficient resources and infrastructure to meet the diverse needs of pregnant women and ensure positive maternal health outcomes (Sserwanja et al., 2022).

### **2.3 Relationship between maternal health services utilization and development of maternal complications**

Maternal mortality is up to date a public health problem worldwide, the global community has attached so much importance to maternal health and made it a crucial point of the Millennium development goals in 2000 and SDG's in 2015. It is identified that the greatest percentage of maternal death happened in developing countries, with the major causes of death being hemorrhage, sepsis, unsafe abortion, obstructed labor and hypertensive disorders which can all be preventable by utilization of maternal health services (WHO, 2015, Zhao P et al., 2020; Karl et al., 2005).

Maternal health is a critical aspect of public health, with the utilization of maternal health services playing a pivotal role in ensuring positive maternal outcomes. The relationship between maternal health services utilization and the development of maternal complications has been extensively studied to understand the impact of access to healthcare on maternal well-being (Herwansyah et al., 2022). Research by Alkema et al. (2020) highlights the significant impact of access to antenatal care on reducing maternal complications. Increased ANC visits are associated with early detection and management of conditions such as preeclampsia, gestational diabetes, and anemia, leading to improved maternal and fetal outcomes. Studies by Campbell et al. (2019), Kruk et al. (2017) (Edward et al., 2022) emphasize the role of skilled birth attendance in preventing maternal complications during childbirth. Access to skilled birth attendants is crucial in managing obstetric emergencies promptly, reducing the risk of postpartum hemorrhage, sepsis, and other complications. Postpartum care utilization significantly influences maternal health outcomes (Downe et al., 2019). Ahmed et al. (2020) discusses how postpartum check-ups facilitate early detection of postpartum depression, infections, and other complications, enabling timely interventions and reducing maternal morbidity rates. Despite the benefits of maternal health services, barriers such as financial constraints, lack of transportation, and cultural beliefs persist (Ali & Chauhan, 2020).

A study by Warren et al., (2018) underscores the need to address these barriers to enhance maternal health-seeking behavior and reduce complications. Strengthening health systems is crucial in improving maternal health services utilization and outcomes. Efforts to enhance infrastructure, training of healthcare providers, and community outreach programs are

highlighted by Ngabo et al. (2021) as effective strategies in reducing maternal complications. Integrated healthcare approaches that combine maternal health services with family planning, immunization, and nutrition services have shown promising results in improving maternal health indicators (Hoope-Bender *et al.*, 2019). A longitudinal study on the maternal health service utilization rates in relation to maternal mortality in Mainland China showed that utilization of MHS increased from 79.24% in 2009 to 91.67% in 2016 while at the same time the maternal mortality rate reduced from 30.90 to 17.88 for every 100,000 live births nationally clearly indicating that for every 1% rise in utilization rates, the MMR decreases by 0.35 per 100,000 live births (Maheen et al., 2021).

Regular antenatal care visits are vital for early detection and management of potential complications (Javadi et al., 2023). A study published in *The Lancet* found that increasing coverage of ANC services to 90% could prevent up to 5.5% of maternal deaths globally. According to the World Health Organization (WHO), globally, about 86% of pregnant women attend at least one ANC visit with a skilled provider. However, only 58% receive the recommended minimum of four ANC visits (Kashaka 2020).

Having a skilled birth attendant during delivery is critical for preventing and managing complications such as obstructed labor, postpartum hemorrhage, and sepsis (Öjendal et al., 2023). Timely access to Emergency Obstetric Care services is essential for managing complications like hemorrhage, eclampsia, and sepsis. However, disparities in EmOC availability persist, particularly in low-income countries. According to UNFPA, only 17% of health facilities in low-income countries have the capacity to provide comprehensive EmOC services (Dantas et al., 2020).

Postpartum complications, including infections and postpartum hemorrhage, can be effectively addressed through PNC services. However, global data shows that only 58% of mothers receive postnatal check-ups within two days after birth, indicating gaps in postpartum care services (Beňová et al., 2023). UNICEF data highlights that globally, approximately 2.5 million newborns die within their first month of life, with complications during childbirth and inadequate postnatal care contributing to these deaths. The Guttmacher Institute reports that globally, an estimated 25 million unsafe abortions occur each year, contributing to maternal morbidity and mortality rates increase (Edward et al., 2022).

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Introduction**

The chapter presents design of the research, the study target population and the used sample size. The chapter also explains the data collection procedure, procedure for analysis and research instruments the study adopted. The chapter also puts focus on the validity and reliability of instruments used and the issues of ethics.

#### **3.1 Study Design.**

The researcher conducted a cross-sectional study in assessing the determinants of maternal health services utilization and development of maternal complications among puerperium women attending Muko HC IV Rubanda district Western Uganda.

#### **3.2 Study Area and population.**

The research was carried out at Muko Health Centre IV located in Rubanda district off kabale-kisoro road. The study area was chosen by Purposive sampling.

##### **3.2.1 Study population.**

The study population comprised of mothers in puerperium attending Muko Health Centre IV who are mainly natives of Rubanda district.

#### **3.3 Sampling technique**

Convenience sampling was used to select participants. The researcher collected the data over a period of four months while using the first week of each month. Mothers attending the postnatal clinic during the time the researcher was at the facility would be contacted sequentially,

explained to about the research and asked if they are willing to participate and all those willing would be enrolled. Forty nine participants were enrolled each month

### **3.3.1 Sample Size Determination**

The sample size was determined using a sample size formula by Kish Leslie 1965 for cross-sectional studies

$$N = Z^2 P(1 - P) / \sigma^2$$

Where N is the estimated minimum sample size required

P is the proportion of maternal service utilization in the study sample size, we used 14.9 % as stated by Kibonire et al., 2023.

Z is 1.96 at 95% Confidence Interval with an acceptance margin of error set at 5% interval with an acceptable margin of error set at 5%

$$N = (1.96)^2 \times 0.149 (1 - 0.149) / (0.05)^2 = 195 \text{ Women.}$$

$$N = 195 \text{ Women}$$

### **3.3.2 Sampling Procedure**

The researcher collected the data over a period of four months while using the first week of each month. Mothers attending the postnatal clinic during the time the researcher was at the facility would be contacted sequentially, explained to about the research and asked if they are willing to participate and all those willing would be enrolled. Forty nine participants were enrolled each month

### **3.3.3 Inclusion Criteria**

The study included puerperium women that were attending maternal clinic at MUKO Health Centre IV in Rubanda district Western Uganda.

The study only included mothers above the age of 18 years.

The study included mothers who consented to participate.

#### **3.3.4 Exclusion Criteria**

The study excluded mothers who did not consent to participate in the study and those puerperium women or mothers below the age of 18.

The study excluded mothers that were severely ill.

#### **3.4 Data Collection Instruments**

A structured questionnaire was formulated with aid from the supervisor that was used to collect data from the mothers in puerperium.

#### **3.5 Data Collection Method**

Data was collected by the researcher through administering questionnaires to be filled by respondents. Reasonable amount of time was gazetted for the respondents to submit their views before the questionnaires were collected. Questions in the questionnaire were translated for those respondents that did not understand English.

##### **3.5.1 Questionnaire validity**

To ensure that the questionnaire used in the research on determinants affecting maternal health services utilization and development of maternal complications was both valid and reliable, a rigorous process was undertaken.

##### **3.5.2 Content Validity.**

Experts in maternal health, including obstetricians, midwives, and public health specialists, were consulted to assess whether the questionnaire covered all relevant aspects of maternal health service utilization. This included prenatal care, delivery services and barriers to accessing these services. Their feedback helped refine the questionnaire by ensuring that all critical areas were covered comprehensively.

### **3.5.3 Face Validity.**

To ensure that the questionnaire was understandable and relevant to the respondents, a small group of 19 puerperium mothers was asked to review it. They provided insights on whether the questions were clear, culturally appropriate, and easy to understand. Adjustments were made based on their feedback.

### **3.5.4 Construct Validity.**

Factor analysis was conducted to determine whether the questionnaire items appropriately grouped into different domains of maternal health service utilization. This statistical method helped verify that the questions correctly represented the theoretical constructs being measured.

### **3.5.5 Test-Retest Reliability.**

The questionnaire was administered to a sample of respondents twice at Hamurwa Health Centre IV, with a two-week interval between the tests. A high correlation between responses from both instances indicated that the questionnaire produced consistent results over time.

### **3.5.6 Internal Consistency.**

Cronbach's alpha was used to measure the internal consistency of the questionnaire. A coefficient above 0.7 was considered acceptable, indicating that the questions measuring the same construct were closely related.

### **3.5.7 Inter-Rater Reliability.**

To ensure that the interpretation of responses was consistent among different researchers, training sessions were conducted for those administering the questionnaire. A reliability check was performed by having multiple researchers assess the same set of responses independently.

## **3.6 Data management and analysis**

The researcher collected the questionnaires from respondents and checked them to ensure that all questions were answered. The data was later coded, stored and transferred to STATA where it was analyzed. Utilization levels of maternal continuum of care was analyzed using descriptive statistics to summarize the utilization levels of maternal continuum of care services. The relationship between maternal health services utilization and development of maternal

complications was analyzed using regression analysis; use of logistic regression to understand how different levels of service utilization affect the likelihood of maternal complication development. Multivariate analysis was used to identify and quantify the factors associated with utilization of maternal health services.

### **3.6.1 Data quality control.**

The study established clear protocols for data collection to ensure consistency and accuracy. The researcher identified and corrected errors such as missing values or any inconsistencies to ensure the dataset is accurate and complete.

### **3.6.2 Ensuring Data Validity of data.**

To ensure the validity of the data collected in the research on maternal health services utilization and development of maternal complications, several measures were taken throughout the data collection, processing, and analysis stages. These measures were aimed at minimizing errors, biases, and inconsistencies, ensuring that the findings accurately represented the reality of maternal healthcare utilization.

#### **Ensuring Accuracy in Data Collection.**

All data collectors were trained on the study objectives, ethical considerations, and proper administration of the questionnaire. This helped minimize interviewer bias and ensured consistency in data collection.

#### **Pretesting the Questionnaire.**

Before full-scale data collection, the questionnaire was pretested on a small sample of 19 respondents similar to the target population at a neighboring facility Hamurwa Health Centre IV. This helped identify any unclear questions, refine wording, and ensure that respondents interpreted the questions as intended. A standardized approach was followed, including maintaining a neutral tone during interviews, using uniform prompts for responses, and ensuring that all respondents received the same explanations where needed.

### **3.6.3 Verification of Data for Consistency and Completeness**

Supervisors reviewed questionnaires immediately after interviews to identify and correct any missing or inconsistent responses before leaving the data collection sites. Data was entered into the database twice by independent clerks, and discrepancies were checked to eliminate transcription errors.

### **3.6.4. Addressing Response and Recall Bias**

Respondents were assured of confidentiality and anonymity to encourage honest answers, particularly regarding sensitive topics such as healthcare affordability or cultural barriers to seeking services. Questions about past events, such as the number of antenatal visits or place of delivery, were framed with time references to improve accuracy. Calendar techniques were also used to help respondents recall dates accurately.

### **3.6.5. Data Cleaning and Validation during Analysis.**

Extreme values were identified and examined to determine whether they were valid responses or data entry errors. Patterns in the data were analyzed to identify inconsistencies. If many women in a specific region reported zero antenatal visits despite the presence of a nearby clinic, follow-up investigations were conducted to verify the data.

## **3.7 Ethical consideration**

After approval of the proposal by the Supervisor, Kampala International University School of Allied Health Sciences, and the Research ethics committee Kampala International University, an introductory letter was gotten from the School to the district health officer and the facility In-Charge, The respondents were explained to, the research purpose, potential risks involved in participating in the study, assured of utmost confidentiality of their responses and requested to participate voluntarily in the study.

### **3.7.1 Respect for Persons.**

The researcher ensured that all participants were treated with respect and dignity. Participants were informed about the purpose, risks, and benefits of the study, and their consent was obtained

before data collection. The researcher also ensured that participants were not coerced or pressured into participating in the study

### **3.7.2 Informed Consent.**

Informed consent was obtained from all participants before data collection. The consent forms were written in simple language and included the Purpose of the study, risks and benefits of participation, confidentiality and anonymity, right to withdraw from the study, contact information for the researcher and the ethics committee

Participants were given adequate time to read and understand the consent form before signing it. The researcher was also be available to answer any questions or concerns that participants had.

### **3.7.3 Confidentiality and Anonymity.**

All data collected was kept confidential and anonymous. Participants were assigned a unique identifier, and all personal identifiable information were removed from the data set. The researcher ensured that all data was stored securely and that only authorized personnel have access to the data.

### **3.7.4 Data Reliability.**

Data reliability was ensured through the use of validated data collection instruments and rigorous data collection procedures. Data was collected by trained research assistants, and all data was double-checked for accuracy.

### **3.7.5 Data Security.**

All data collected was stored securely in a locked cabinet and on password-protected computers. Only authorized personnel have access to the data. The researcher also ensured that all data was backed up regularly to prevent loss of data.

### **3.7.6 Benefits and Risks.**

The benefits of this study include the potential to improve the utilization of maternal health services among puerperium women. The risks of this study were minimal and included the potential for participants to experience emotional distress during the data collection process. The

researcher ensured that participants were aware of the benefits and risks of the study and that they are able to withdraw from the study at any time.

### **3.7.7 Vulnerable Populations**

This study involved vulnerable populations. The researcher took extra precautions to ensure that these participants were protected from harm and that their rights were respected throughout the study. Special attention was given to vulnerable populations, particularly mothers who were seriously ill. Ethical considerations, proper planning, and collaboration with healthcare providers were essential to ensure their well-being while still collecting meaningful data. Mothers would be fully informed about the study, its purpose, and their rights, including the right to withdraw at any time without consequences.

Immediate Referral for Urgent Cases; If a participant was found to be seriously ill during data collection, the priority would be to ensure she receives medical care rather than proceeding with the interview. A nurse was included in the research team to provide immediate basic care and referrals. Strong partnerships with local facilities and hospitals would allow for smooth referrals and follow-ups for sick mothers.

### **3.7.8 Ethical Approval.**

This study was approved by the Kampala International University Research Ethics Committee (KIU-2024-709).

## **3.8. Limitations of the study.**

While conducting this study among women in puerperium, several challenges were encountered. These challenges affected the generalizability, accuracy, and completeness of the findings.

### **3.8.1. Selection Bias**

Since the study was conducted in a hospital, it primarily included women who had access to and utilized healthcare facilities for delivery. This excluded women who delivered at home or in other non-hospital settings, leading to selection bias. As a result, the findings may not fully represent the experiences and challenges of women who do not seek institutional healthcare services, particularly those in rural or underserved areas. Different facility entry points were targeted to eliminate selection bias in the study.

### **3.8.2. Recall Bias**

The study relied on self-reported data from women who had already delivered, meaning they had to recall details about their pregnancy, antenatal care visits, and delivery experience. Some participants may have had difficulty accurately remembering the timing, frequency, or quality of maternal health services they received, leading to recall bias. This could particularly affect data on complications during pregnancy and adherence to antenatal care schedules. Recall bias was addressed by limiting the recall period to 6 weeks postpartum.

### **3.8.3. Social Desirability Bias**

Participants may have provided responses that they believed were more socially acceptable rather than reflecting their actual experiences.

### **3.8.4. Limited Generalizability**

Since the study was conducted in a hospital setting, the findings are not generalizable to the entire population of mothers, especially those who deliver outside of healthcare facilities and do not seek any institutional based care.

### **3.8.5. Health Facility-Related Limitations**

Overburdened Healthcare Workers: Some hospital staff were too busy to fully support the study, limiting access to additional data that could have enriched the findings.

Variability in Services across Hospitals: The study was limited to one rural health facility, and maternal healthcare services can vary significantly between urban and rural health facilities, private and public hospitals, and different regions. This variation makes it difficult to generalize findings beyond the selected health facility.

### **3.8.6. Ethical and Emotional Challenges**

Some participants had experienced complications, stillbirths, or maternal health issues, making it emotionally difficult for them to discuss their experiences. This could have led to incomplete responses or reluctance to participate in the study, affecting data completeness.

### **3.8.7. Limited Assessment of Long-Term Outcomes**

The study focused on women who had recently delivered, meaning it did not capture long-term maternal health outcomes, such as puerperium complications, future healthcare-seeking behavior.

## **CHAPTER 4**

### **PRESENTATION AND INTERPRETATION OF FINDINGS**

#### **4.1 Introduction**

This chapter presents data analysis, presentation and interpretation of the data on the study. It focuses on the response rate and the predictors of maternal health services utilization and development of maternal complications among puerperium women attending Muko Health Centre IV Rubanda district, Western Uganda.

#### **4.2 Questionnaire Response Rate**

Out of the 195 questionnaires distributed, 190 were correctly filled and returned which represents a response rate 97%. Mugenda and Mugenda (2003) argued that a response rate of 50% is adequate, a response rate of 60% is good, and a response rate of 70% is very good. Therefore, the 97% response rate reported for this study formed an acceptable basis for drawing conclusions.

#### **4.3 Sociodemographic characteristics of the participants.**

Maternal sociodemographic characteristics were studied to identify the variations in the sociodemographic characteristics of each participant. The characteristics that were studied are shown in table 4.1

**Table 4.1 Sociodemographic factors affecting the utilization maternal health services.**

| <b>Variables</b>             | <b>Frequency<br/>(n=190)</b> | <b>Percentage<br/>(%)</b> |
|------------------------------|------------------------------|---------------------------|
| <b>Maternal Age</b>          |                              |                           |
| 18-19                        | 59                           | 31.1                      |
| 20-29                        | 79                           | 41.6                      |
| 30-39                        | 43                           | 22.6                      |
| >40                          | 9                            | 0.05                      |
| <b>Marital status</b>        |                              |                           |
| Married                      | 156                          | 82.1                      |
| Single                       | 29                           | 15.3                      |
| Divorced                     | 5                            | 2.6                       |
| <b>Level of Education</b>    |                              |                           |
| No formal education          | 25                           | 13.2                      |
| Primary level                | 115                          | 60.5                      |
| Secondary level              | 47                           | 24.7                      |
| Tertiary Education           | 3                            | 1.6                       |
| <b>Employment status</b>     |                              |                           |
| Unemployed                   | 127                          | 66.8                      |
| Employed                     | 59                           | 31.1                      |
| Student                      | 4                            | 2.1                       |
| <b>Number of pregnancies</b> |                              |                           |
| 1-3                          | 107                          | 56.3                      |
| 4-6                          | 66                           | 34.7                      |
| Above 6                      | 17                           | 8.9                       |
| <b>Support from partner</b>  |                              |                           |
| Yes                          | 92                           | 48.4                      |
| No                           | 98                           | 51.6                      |

The study ascertained that 59 mothers (31.1%) were below the age of 20 years, 79 mothers (41.6%) were between the years 20 to 29, while 43 mothers (22.6%) were between the age brackets 30 to 39 with only 9 mothers being above the age of 40. 156 participants accounting for 82.1 percent were married, 29 single and 5 divorced accounting for 15.3 and 2.6 percentages respectively. 25 mothers do not have a formal education while 115 obtained primary education, 17 secondary and 3 tertiary accounting for 60.5%, 24.7% and 1.6% respectively. Majority of the participants 127 (66.8%) were unemployed and 59 (31.1%) employed whereas 4 (2.1%) were students.

#### **4.4 Utilization of maternal health services.**

The study went ahead to find out the rates of maternal ANC attendance, time of pregnancy at which the participants attended the first trimester and ANC attendance coupled with skilled birth attendance delivery. The results are shown in table 4.2 below.

**Table 4.2: Utilization rates of maternal Antenatal Care and delivery under a skilled birth attendant.**

| <b>Variable</b>                                                | <b>Number</b> | <b>Percentage</b> |
|----------------------------------------------------------------|---------------|-------------------|
| <b>ANC ATTENDANCE</b>                                          |               |                   |
| Attended ANC at least once                                     | 183           | 96.3%             |
| Never attended at all                                          | 7             | 3.7%              |
| <b>Duration of ANC 1st attendance</b>                          |               |                   |
| 1 <sup>st</sup> Trimester                                      | 29            | 15.3%             |
| 2 <sup>nd</sup> trimester                                      | 96            | 50.5%             |
| 3 <sup>rd</sup> trimester                                      | 58            | 30.5%             |
| <b>Number of ANC visits</b>                                    |               |                   |
| 4+ ANC visits                                                  | 56            | 29.5%             |
| <4 ANC Visits                                                  | 134           | 70.5%             |
| <b>1<sup>st</sup> ANC attendance coupled with SBA delivery</b> |               |                   |
| 1 <sup>st</sup> Trimester                                      | 18            | 9.5%              |
| 2 <sup>nd</sup> trimester                                      | 23            | 12.1%             |
| 3 <sup>rd</sup> trimester                                      | 31            | 16.3%             |
| Never attended ANC                                             | 1             | 0.5%              |
| 4+ times and SBA delivery                                      | 43            | 22.6%             |
| <b>Mothers that delivered under SBA</b>                        |               |                   |

|                             |     |       |
|-----------------------------|-----|-------|
| Delivered under SBA         | 73  | 38.4% |
| Did not attain SBA delivery | 117 | 61.6% |

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183 participants accounting for 96.3% reported to have attended ANC at least once during their time of pregnancy with 7 participants (3.7%) having not attended ANC at all during their time of pregnancy. When participants were asked to find out at what stage of pregnancy, they had their first ANC contact, 96 participants reported to have attended their first ANC during the second trimester, 58 participants during the third trimester and only 29 participants during the first trimester. The study went ahead to find out the number of mothers that went ahead to attend the recommended 4+ ANC visits and it was found out that only 56 participants accounting for 29.5% attended 4+ ANC visits, with 25 (86.2%) participants out of the 29 that had their first contact in first trimester going ahead to attend 4+ visits, 29 (30.2%) participants out of the 96 that had their first contact in second trimester attending 4+ visits and only 2 (3.4%) participants had initial contact in third trimester attending 4+ visits. 73 (38.4%) participants delivered under a skilled birth attendant accounting for 38.4% of the total participants. Out of the 29 (15.2%) participants that had their first ANC contact in the first trimester, only 18 mothers delivered under assistance from a skilled birth attendant, 23 participants of the 96 (50.5%) that had their first ANC contact in the second trimester delivered with assistance from a skilled birth attendant with only one participant out of the seven that did not attend ANC at all delivering with assistance from a skilled birth attendant.

#### 4.5 Bivariate analysis of the maternal related determinants affecting the utilization of maternal health services and development of maternal complications.

Bivalent analysis was done to analyze presence of a significant relationship between the chosen maternal determinants and the utilization of maternal health services and development of maternal complications. The results are shown in Table 4.3 below.

**Table 4.3** Bivariate analysis of the maternal related determinants affecting the utilization of maternal health services and development of maternal complications.

| Variables                    | Odds Ratio | 95%<br>Confidence<br>Interval | P-Value  |
|------------------------------|------------|-------------------------------|----------|
| <b>Maternal Age</b>          |            |                               |          |
| <20                          | 1.72       | 1.460-1.891                   | <0.001** |
| 20-29                        | 1.06       | 1.011-1.494                   | <0.001** |
| 30-39                        | 0.43       | 0.540-0.923                   | 0.024**  |
| >40                          | Ref        | Ref                           |          |
| <b>Marital status</b>        |            |                               |          |
| Married                      | 2.30       | 1.232-2.664                   | <0.001** |
| Single                       | Ref        | Ref                           |          |
| Divorced                     | 0.77       | 0.482-0.922                   | 0.040**  |
| <b>Level of Education:</b>   |            |                               |          |
| No formal education.         | 1.39       | 0.983-1.520                   | 0.230    |
| Primary level                | 2.18       | 1.263-2.741                   | 0.060    |
| Secondary level              | 1.69       | 0.333-2.154                   | 0.671    |
| Tertiary Education           | Ref        | Ref                           |          |
| <b>Employment status</b>     |            |                               |          |
| Unemployed                   | Ref        | Ref                           |          |
| Employed                     | 1.60       | 0.322-1.944                   | 0.079    |
| Student                      | 1.26       | 0.13-1.652                    | 0.453    |
| <b>Number of pregnancies</b> |            |                               |          |
| 1-3                          | 1.02       | 0.860-1.223                   | 0.680    |
| 4-6                          | 1.38       | 0.542-1.609                   | 0.055    |
| Above 6                      | Ref        | Ref                           |          |
| <b>Support from partner</b>  |            |                               |          |
| Yes                          | 1.44       | 1.025-1.302                   | 0.023**  |
| No                           | Ref        | Ref                           |          |

On bivariate analysis, maternal age(P Value 0.001), marital status (P Value <0.001), and support from partner (P Value 0.023) were observed to have P-Value less than 0.05 indicating a significant relationship between these determinants and the utilization of maternal health services. Level of education (P Value 0.230) and number of pregnancies (P Value 0.680) had a P-Value greater than 0.05 indicating no significant relationship between these determinants and utilization of maternal health services.

#### 4.5.1 Multivariate analysis of the maternal related determinants affecting the maternal health services Utilization and development of maternal complications.

Multivariate analysis was done to test for cofounders; no formal education and level of education were excluded from the analysis. The results are shown in table 4.4 below

**Table 4.4 Multivariate analysis of the maternal related determinants affecting the maternal health services utilization and development of maternal complications.**

| Variables                    | Odds Ratio | 95%<br>Confidence<br>Interval | P-Value  |
|------------------------------|------------|-------------------------------|----------|
| <b>Maternal Age</b>          |            |                               |          |
| <20                          | 1.45       | 1.116-1.702                   | 0.044**  |
| 20-29                        | 1.32       | 1.160-1.611                   | <0.001** |
| 30-39                        | 1.21       | 1.001-1.474                   | 0.022**  |
| >40                          | Ref        | Ref                           |          |
| <b>Marital status</b>        |            |                               |          |
| Married                      | 0.50       | 0.703-1.701                   | 0.980    |
| Single                       | Ref        | Ref                           |          |
| Divorced                     | 0.69       | 0.421-1.023                   | 0.054    |
| <b>Level of Education:</b>   |            |                               |          |
| No formal education.         | 0.58       | 0.748-1.820                   | 0.060    |
| Primary level                | 0.98       | 1.342-1.678                   | 0.150    |
| Secondary level              | 1.69       | 0.961-1.520                   | 0.721    |
| Tertiary Education           | Ref        | Ref                           |          |
| <b>Employment status</b>     |            |                               |          |
| Unemployed                   | Ref        | Ref                           |          |
| Employed                     | 1.32       | 1.109-1.63                    | <0.001** |
| Student                      | 0.74       | 0.890-0.951                   | 0.004**  |
| <b>Number of pregnancies</b> |            |                               |          |
| 1-3                          | 1.23       | 1.160-1.450                   | 0.010**  |
| 4-6                          | 1.46       | 1.024-1.752                   | 0.032**  |
| Above 6                      | Ref        | Ref                           |          |
| <b>Support from partner</b>  |            |                               |          |
| Yes                          | 1.11       | 1.009-1.522                   | <0.001** |
| No                           | Ref        | Ref                           |          |

Multivariate analysis was done to test for cofounders and maternal age (P Value 0.044), employment status (P Value <0.001) and support from partner (P Value <0.001) stayed significant after testing for cofounders indicating a significant relationship between these determinants and utilization of maternal complications. Level of education and number of pregnancies were not included in the multivariate analysis because they did not turn out significant on bivariate analysis.

#### **4.6 Health Centre Related determinants affecting Utilization of maternal health services and development of maternal complications.**

The study went ahead to analyze the health Centre related determinants affecting the utilization of maternal health services and development of maternal complications as far as the frequencies and percentages. The findings are shown in table 4.5.

**Table 4.5: Health Centre Related determinants affecting Utilization of maternal health services and development of maternal complications.**

| <b>Variables</b>                                          | <b>Frequency</b> | <b>Percentage</b> |
|-----------------------------------------------------------|------------------|-------------------|
| <b>Distance from respondents' home to Health facility</b> |                  |                   |
| Less than 1km                                             | 32               | 16.8              |
| 1-5 Km                                                    | 57               | 30                |
| 6-10 Km                                                   | 93               | 48.9              |
| 11 and above                                              | 8                | 4.2               |
| <b>Cost of transport to the health facility</b>           |                  |                   |
| Zero cost                                                 | 49               | 25.8              |
| 1000-5000                                                 | 23               | 12.1              |
| 5100-10000                                                | 98               | 51.6              |
| >10,000                                                   | 20               | 10.5              |
| <b>Quality of health services</b>                         |                  |                   |
| Very Good                                                 | 38               | 20                |

|      |     |    |
|------|-----|----|
| Good | 133 | 70 |
| Poor | 19  | 10 |

The study delved in understanding the distance the participants had to cover and expenditure they would incur and it was found out that 93 participants accounting for 48.9% were travelling 6-10 kilometers to access maternal health services, 57 participants (30%) travel 1-5 kilometers, 32 participants accounting for 32.8 % travel less one kilometer and 8 participants cover over 11 kilometers. 51.6% of the participants spend between 5100 to 10000 shillings to meet transport charges to the health Centre with only 25.8% incurring no cost to access the health facility and 10.5% of the participants. On the quality of health services, 133 participants accounting for 70% said the quality of health services is good and only 19 participants saying the services are of poor quality.

#### **4.6.1 Respondents' perception of health workers attitude and competence in providing services.**

The study went ahead to understand the perception of the respondents on health workers attitude and competence in providing maternal health services and the results are displayed in table 4.6.

**Table 4.6 Respondents' perception of health workers attitude and competence in providing services**

| <b>Variables</b>                                                             | <b>Frequency</b> | <b>Percentage</b> |
|------------------------------------------------------------------------------|------------------|-------------------|
| <b>Whether respondents have ever been yelled or shouted at</b>               |                  |                   |
| Yes                                                                          | 67               | 35.3              |
| No                                                                           | 123              | 64.7              |
| <b>Respondents feeling about health workers competence in providing care</b> |                  |                   |

|                |     |      |
|----------------|-----|------|
| Very competent | 42  | 22.1 |
| Competent      | 145 | 76.3 |
| Incompetent    | 3   | 1.6  |

Concerning the attitude participants received from the health workers, when participants were asked if they have ever been yelled or shouted at by the health workers, 123 participants accounting for 64.7% denied to having ever been yelled at. 145 participants accounting for 76.3% went ahead to say the health workers are competent enough with only three participants saying the health workers are incompetent.

#### 4.6.2 Turnaround time for mothers attending maternal health services.

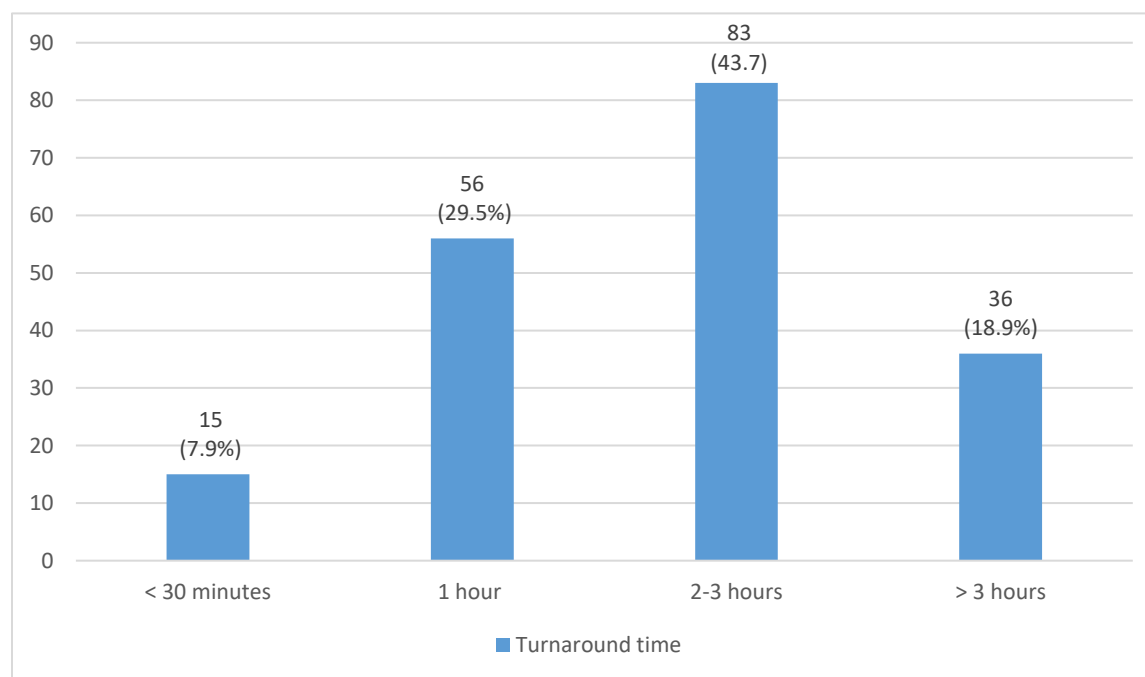


**Figure 1: Turnaround time for mothers attending maternal health services**

When participants were asked how much time they have to wait to acquire services, 83 (43.7%) participants said they spend 2 to 3 hours in the que before accessing maternal health services, 56 (29.4%) participants said they spend an hour in the que and only 15 (7.8%) participants spend less than 15 minutes in the que to access maternal health services, 36 (18.9%) participants saying they spend more than three hours

#### 4.6.3 Bivariate analysis of the health facility related determinants of the utilization of maternal health services and development of maternal complications.

Bivariate analysis was done to observe if there is a significant relationship between the health facilities related determinants and utilization of maternal health services and development of maternal complications. The results are shown in table 4.7.

Table 4.7 Bivariate analysis of the health facility related determinants of the utilization of maternal health services and development of maternal complications

| Variables                                                 | Odds Ratio | 95% Confidence interval | P-Value  |
|-----------------------------------------------------------|------------|-------------------------|----------|
| <b>Distance from respondents' home to health facility</b> |            |                         |          |
| Less than 1km                                             | 1.52       | 1.117-1.750             | <0.001** |
| 1-5 Km                                                    | 1.29       | 1.119-1.523             | 0.004**  |
| 6-10 Km                                                   | Ref        | Ref                     |          |
| 11 and above                                              | 1.44       | 1.022-1.251             | <0.001** |
| <b>Cost of transport to the health facility</b>           |            |                         |          |
| Zero cost                                                 | 1.22       | 1.090-1.571             | 0.035**  |
| 1000-5000                                                 | 1.07       | 1.054-1.882             | <0.001** |
| 5100-10000                                                | Ref        | Ref                     |          |
| >10,000                                                   | 1.20       | 1.111-1.423             | 0.002**  |
| <b>Quality of health services</b>                         |            |                         |          |
| Very Good                                                 | 1.38       | 1.071-1.550             | 0.068    |

|      |      |             |       |
|------|------|-------------|-------|
| Good | Ref  | Ref         |       |
| Poor | 1.19 | 1.013-1.860 | 0.768 |

Distance from respondents' home to Muko HC IV (P Value <0.001) and Cost of transport to the health facility (P Value 0.035) were observed to have a P-Value less than 0.05 indicating a significant relationship between these determinants with the utilization of maternal health services and development of maternal complications.

#### **4.6.4 Multivariate analysis of the hospital related determinants affecting the utilization of maternal health services and development of maternal complications.**

Multivariate analysis was done to test for cofounders affecting the hospital related determinants affecting utilization of maternal health services and development of maternal complications. Distance from respondents home to health facility and cost of treatment were considered, quality of health care was not considered because it turned not significant on bivariate analysis.

**Table 4.8: Multivariate analysis of the hospital related determinants affecting the utilization of maternal health services and development of maternal complications.**

| <b>Variables</b>                                           | <b>Odds Ratio</b> | <b>95% Confidence interval</b> | <b>P-Value</b> |
|------------------------------------------------------------|-------------------|--------------------------------|----------------|
| <b>Distance from respondents' home to health facility.</b> |                   |                                |                |
| Less than 1km                                              | 1.69              | 1.451-1.922                    | <0.001**       |
| 1-5 Km                                                     | 1.56              | 1.233-1.780                    | 0.034**        |
| 6-10 Km                                                    | Ref               | Ref                            |                |

|                                                     |      |             |          |
|-----------------------------------------------------|------|-------------|----------|
| 11 and above                                        | 1.23 | 1.122-1.460 | 0.004**  |
| <b>Cost of transport to<br/>the health facility</b> |      |             |          |
| Zero cost                                           | 1.55 | 1.012-1.954 | 0.035**  |
| 1000-5000                                           | 1.27 | 1.332-1.564 | <0.001** |
| 5100-10000                                          | Ref  | Ref         |          |
| >10,000                                             | 0.70 | 0.612-0.954 | 0.045**  |
| <b>Quality of<br/>Healthcare</b>                    |      |             |          |
| Very good                                           | 0.65 | 0.743-1.204 | 0.080    |
| Good                                                | Ref  | Ref         |          |
| Poor                                                | 0.74 | 0.920-1.674 | 0.07     |

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#### 4.7 Association between Utilization of maternal health services and development of maternal complications.

The study went ahead to find an association between utilization of maternal health services and development of maternal complications and the results are shown in table 4.9

Table 4.9 Association between Utilization of maternal health services and development of maternal complications.

| Variable                                              | Frequency  | Developed complications | Odds Ratio | 95% C.I      | P-Value |
|-------------------------------------------------------|------------|-------------------------|------------|--------------|---------|
| ANC Attendance                                        |            |                         |            |              |         |
| Did not attend                                        | 7(3.68%)   | 4(57.1%)                | 4.52       | 2.564-12.670 | <0.001  |
| Attended <4 times                                     | 127(66.8%) | 13(10.2%)               | 1.07       | 1.021-1.235  | 0.002   |
| Attended 4+ times                                     | 56(29.5%)  | 4(7.1%)                 | Ref        | Ref          |         |
| Delivered under a skilled birth attendant             |            |                         |            |              |         |
| Yes                                                   | 73(38.4%)  | 5(6.8%)                 | 0.15       | 0.051-1.453  | 0.476   |
| No                                                    | 117(61.6%) | 18(15.4%)               | 27.60      | 5.706-78.683 | 0.015   |
| Attended 4+ ANC visits and also delivered under a SBA | 43         | 2(4.7%)                 | Ref        | Ref          |         |

The study showed that 57.1% of the participants that did not attend any ANC session developed complications with an odds ratio of 4.52, indicating that they were four times more likely to develop complications compared to the other individuals that attended ANC. Only 7.1% of the individuals that attended 4+ ANC visits developed maternal related complications. 15.4% of the individuals that did not deliver under a skilled birth attendant developed maternal related complications with an odds ratio of 27.6, indicating that they were 27 times more likely to develop complications compared to the mothers that delivered under a skilled birth attendant.

## **CHAPTER 5**

### **DISCUSSION, CONCLUSION, AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents a summary of the study findings, conclusions and recommendations. The findings are summarized in line with the objectives of the study which are; To determine the utilization levels of maternal ANC and delivery under a skilled birth attendant services, To determine the maternal and health facility related factors associated with the utilization of maternal health services, To determine the relationship between maternal health services utilization and development of maternal complications among puerperium women attending Muko Health Centre IV, Rubanda district, Western Uganda

#### **5.2 Summary of Findings.**

The aim of this study was to examine the determinants of the utilization of maternal health services and development of maternal complications among puerperium women attending Muko Health Centre IV in Rubanda district Western Uganda. Three research objectives were formulated to guide the study. Research objectives sought to determine the utilization levels of maternal ANC and delivery under a skilled birth attendant services, to determine the maternal and health facility related factors associated with the utilization of maternal health services, to determine the relationship between maternal health services utilization and development of maternal complications among puerperium women attending Muko Health Centre IV, Rubanda district, Western Uganda. The study used a cross sectional research design where self-administered questionnaires were used for data collection The sample size for the study was 190. Data was analyzed using descriptive statistics and regression analysis.

#### **5.3 Utilization levels of maternal ANC and delivery under a skilled birth attendant services.**

The study showed that 96% of the mothers attended a session of antenatal care at some time during the period of pregnancy whereas 4% did not attend antenatal care at all, this indicates that majority of the participants are aware of antenatal care and its significance during pregnancy. When participants were asked to find out at what stage of pregnancy, they had their first ANC contact, 96 (50.5%) participants reported to have had their first ANC contact in the second

trimester, 58(30.5%) participants during the third trimester and only 29 (15.3%) participants during the first trimester yet its recommended by the ministry of health that all mothers should attend their first ANC in the first trimester. Majority of the participants (50.5%) attended their first ANC visit in the second trimester contrarily to the WHO guidelines that recommend that pregnant mothers should attain the first ANC contact in the first trimester, this indicates a knowledge gap concerning periodicity of ANC attendance. These findings align with previous research conducted in various regions, demonstrating the Utilization levels of antenatal care. A cross sectional study conducted by Lenka et al., (2018) conducted in Uganda showed that 96% of the participants attended ANC at least once during their time of pregnancy. In Kenya, a demographic health survey found that 96% of the pregnant women received ANC, however, 53.4% of the pregnant mothers had their first ANC contact between three and six months of gravidity (Caroline et al., 2018, Lydia M et al., 2019). Another research study in Zambia also showed consistent findings with 96% of the women that were pregnant between 2013 and 2014 attending antenatal care (Kalumba F, 2020). A prospective observational study that was done across various nations of Argentina, Guatemala, India Kenya Pakistan and Zambia showed that at least 96% of the pregnant women had at least one antenatal care contact. These findings are in line with the findings of this study.

The study went ahead to find out the number of mothers who attended the recommended 4+ ANC visits and it was found out that only 56 participants accounting for 29.5% attended 4+ ANC visits, with 25 participants out of the 29 that had their first contact in first trimester going ahead to attend 4+ visits, 29 participants out of the 96 that had their first contact in second trimester attending 4+ visits and only 2 participants who had initial contact in third trimester attending 4+ visits, these findings highlight gaps concerning ANC attendance as most participants did not attend the recommended number of ANC visits with only 29.5% of them meeting the required 4+ contacts. While many studies highlight high antenatal care visit rates, it is important to note such high rates are not always correlating with the recommended number of antenatal care visits, for instance a study in Uganda showed that although 95% of the women attended at least one ANC visit, only 48% attended the recommended four visits.

73 participants delivered under a skilled birth attendant accounting for 38.4% of the total participants. Of the 29 mothers that had their initial ANC contact in the first trimester, only 18

delivered under assistance from a birth attendant that's is skilled, 23 participants of the 96 that had their first ANC contact in the second trimester delivered with assistance from a SBA with only one participant out of the seven that did not attend ANC at all delivering with assistance from a SBA. The utilization of SBA services 38.4%, is low compared to the national average of 42% SBA delivery, indicating a significant gap in utilization of skilled birth attendants at Muko Health Centre IV. In comparison with other studies, a study in Uganda revealed that only 42% of the births were attended by a skilled birth attendant, with a significant disparity between the poorest 29% and wealthiest 77% populations. The findings of this study do not show great variations from other studies conducted by other researchers. A study published in the Journal of Maternal and Child Health found that the pooled prevalence of skilled birth attendant delivery was 62.1% in Sub-Saharan Africa (Tura et al., 2020). A study published in the Journal of Health Policy found that despite improvements in facility delivery rates, maternal mortality rates remained high in Uganda (Kananura et al., 2019). A study published in the Journal of Spatial Science found that there were huge gaps in availing maternity care services across social gradients in India (Kumar et al., 2019). A study published in the Journal of Maternal and Child Health found that there were regional variations in skilled birth attendant delivery services in Ethiopia (Tekle et al., 2020).

#### **5.4 Maternal and health facility related factors associated with the utilization of maternal health services.**

The study ascertained that 59 mothers (31.1%) were below the age of 20 years, 79 mothers (41.6%) were between the years 20 to 29, while 43 mothers (22.6%) were between the age brackets 30 to 39 with only 9 mothers being above the age of 40. 156 participants accounting for 82.1 percent were married, 29 single and 5 divorced accounting for 15.3 % and 2.6 % respectively. 25 (13.2%) mothers do not have a formal education while 115 (60.5%) obtained primary education, 17 (8.9%) secondary education and 3 (1.6%) tertiary education. Majority of the participants 127 (66.8%) were unemployed and 59 (31.1%) employed whereas 4 (2.1%) were students.

On bivariate analysis, maternal age, marital status, employment status and support from partner were observed to have P-Value less than 0.05 indicating a significant relationship between these

determinants and the utilization of maternal health services. Level of education and number of pregnancies had a P-Value greater than 0.05 indicating no significant relationship between these determinants and utilization of maternal health services. Multivariate analysis was done to test for cofounders and maternal age, employment status and support from partner stayed significant after testing for cofounders indicating a significant relationship between these determinants and utilization of maternal complications. The study delved in understanding the distance the participants had to cover and expenditure they would incur and it was found out that 93 participants accounting for 48.9% were travelling 6-10 kilometers to access maternal health services, 57 participants (30%) travel 1-5 kilometers, 32 participants accounting for 32.8 % travel less one kilometer and 8 participants cover over 11 kilometers. 51.6% of the participants spend between 5100 to 10000 shillings to meet transport charges to the health Centre with only 25.8% incurring no cost to access the health facility and 10.5% of the participants. On the quality of health services, 133 participants accounting for 70% said the quality of health services is good and only 19 participants saying the services are of poor quality.

Distance from respondents' home to Muko HC IV and Cost of transport to the health facility were observed to have a P-Value less than 0.05 indicating a significant relationship between these determinants with the utilization of maternal health services and development of maternal complications. Concerning the attitude participants received from the health workers, when participants were asked if they have ever been yelled or shouted at by the health workers, 123 participants accounting for 64.7% denied to having ever been yelled at. 145 participants accounting for 76.3% went ahead to say the health workers are competent enough with only three participants saying the health workers are incompetent.

When participants were asked how much time they have to wait to acquire services, 83 participants said they spend 2 to 3 hours in the queue before accessing maternal health services, 56 participants said they spend an hour in the queue and only 15 participants spend less than 15 minutes in the queue to access maternal health services, 36 participants saying they spend more than three hours. In comparison with other studies, a study published in the Journal of Rural Health found that lack of access to healthcare facilities and lack of awareness about skilled birth attendance were major factors influencing skilled birth attendance in rural Tanzania (Mwikipunda et al., 2020). A study published in the Journal of Maternal and Child Health found

that the prevalence of skilled birth attendance was 44.1% in Kenya and this was attributed to long distance of travel to the health facility, low socioeconomic status and lack of support from the partners (Odhiambo et al., 2019). A study published in the Journal of Maternal and Child Health found that education and wealth were significant determinants of skilled birth attendance in Nigeria (Adekanle et al., 2020). A study published in the Journal of Rural Health found that lack of access to healthcare facilities and lack of awareness about skilled birth attendance were major factors influencing skilled birth attendance in Uganda (Nakimuli et al., 2020).

### **5.5 Maternal health services utilization and development of maternal complications.**

The study showed that 57.1% of the participants that did not attend any ANC session developed complications with an odds ratio of 4.52, indicating that they were four times more likely to develop complications compared to the other individuals that attended ANC. Only 7.1% of the individuals that attended 4+ ANC visits developed maternal related complications. 15.4% of the individuals that did not deliver under a skilled birth attendant developed maternal related complications with an odds ratio of 27.6, indicating that they were 27 times more likely to develop complications compared to the mothers that delivered under a skilled birth attendant.

### **5.6 Strength of the study.**

This was one of the first studies conducted in Rubanda district to assess the determinants affecting the utilization of maternal health services and development of maternal complications.

### **5.7 Study limitations.**

The study was hospital based hence could have missed out on a large population of mothers in puerperium who did not seek services at Muko Health Centre IV.

The study involved puerperium women hence a likelihood of recall bias as these mothers may not remember the number of times and particular time when they utilized the services the study focused on.

A cross sectional study design was used which analyses the cause and effect as a snap shot hence the study could not establish changes in the utilization of the maternal health services over time.

Convenience sampling was used hence may not bare the accurate representation of the broader population.

Participants may have also provided answers that they believe are socially accepted rather than their behavior, which impacts the accuracy of the reported data.

### **5.8 Conclusion.**

The study showed that 96% of the mothers attended a session of antenatal care at some time during the period of pregnancy whereas 4% did not attend antenatal care at all, this indicates that compared to the other individuals that attended ANC. The findings of this study highlight majority of the participants are aware of antenatal care and its significance during pregnancy. Maternal age with an odds ratio of (P Value 0.001), marital status (P Value <0.001), support from partner (P Value 0.023), distance from respondents' home to Muko HC IV (P Value <0.001) and Cost of transport to the health facility (P Value 0.035) were observed to have P-Value less than 0.05 indicating a significant relationship between these determinants and the utilization of maternal health services. The findings of this study align with findings of other studies that demonstrate low utilization levels of maternal health services. This study aimed to investigate the determinants contributing to maternal health service utilization in Muko Health Centre IV Rubanda district. The study also showed that 57.1% of the participants that did not attend any ANC session developed complications with an odds ratio of 4.52, indicating that they were four times more likely to develop complications the complex interplay of factors that influence maternal health service utilization in this setting.

### **5.9 Recommendations.**

1. The sub district should implement programs to increase knowledge and awareness among pregnant women and their families about maternal health services.
2. The health facility should improve and accessibility of the maternal health services
3. The authorities should create programs to address the socio-economic factors influencing maternal health services utilization.
4. Health workers should be addressed on patient centered care and also equipped with communication skills to ease communication with patients.

5. This study contributes to the existing body of knowledge on maternal health service utilization in low-resource settings. The findings highlight the importance of addressing the complex interplay of factors that influence maternal health service utilization. The study's recommendations provide a foundation for developing targeted interventions to improve maternal health service utilization and reduce maternal and infant mortality.

## **6.0 Declaration**

### **6.1 Ethics Approval and Consent to participate in this study**

This study was approved by the Kampala International University Research Ethics Committee and assigned approval number KIU-2024-709.

Informed consent was obtained from all participants before data collection. The consent forms were written in simple language and included the Purpose of the study, risks and benefits of participation, confidentiality and anonymity, right to withdraw from the study, contact information for the researcher and the ethics committee

Participants were given adequate time to read and understand the consent form before signing it. The researcher was also be available to answer any questions or concerns that participants had.

### **6.2 Consent for publication**

Not Applicable

### **6.3 Competing Interests**

The study does not have any competing interests and has not been submitted in any other journal for publication

### **6.4 Funding**

The study did not receive any funding.

### **6.5 Availability of data and materials**

All the necessary data has included in this manuscript

## REFERENCES

- Kota, Komlan, Marie Hélène Chomienne, Robert Geneau, and Sanni Yaya. 2023. "Socio-Economic and Cultural Factors Associated with the Utilization of Maternal Healthcare Services in Togo: A Cross-Sectional Study." *Reproductive Health* 20(1): 1–14. <https://doi.org/10.1186/s12978-023-01644-6>.
- Adams, Y. J., & Smith, B. A. (2018). Integrative Review of Factors That Affect the Use of Postpartum Care Services in Developing Countries. In *JOGNN - Journal of Obstetric, Gynecologic, and Neonatal Nursing* (Vol. 47, Issue 3, pp. 371–384). <https://doi.org/10.1016/j.jogn.2018.02.006>
- Ali, B., & Chauhan, S. (2020). Inequalities in the utilisation of maternal health Care in Rural India: Evidences from National Family Health Survey III & IV. In *BMC Public Health* (Vol. 20, Issue 1). <https://doi.org/10.1186/s12889-020-08480-4>
- Bain, L. E., Aboagye, R. G., Malunga, G., Amu, H., Dowou, R. K., Saah, F. I., & Kongnyuy, E. J. (2022). Individual and contextual factors associated with maternal healthcare utilisation in Mali: A cross-sectional study using Demographic and Health Survey data. In *BMJ Open* (Vol. 12, Issue 2). <https://doi.org/10.1136/bmjopen-2021-057681>
- Beňová, L., Semaan, A., Portela, A., Bonet, M., van den Akker, T., Pembe, A. B., Moran, A., & Duclos, D. (2023). Facilitators and barriers of implementation of routine postnatal care guidelines for women: A systematic scoping review using critical interpretive synthesis. In *Journal of Global Health* (Vol. 13). <https://doi.org/10.7189/jogh.13.04176>
- Buli, T. D., Wakgari, N., Ganfure, G., Wondimu, F., Dube, D. L., Moti, G., & Doba, Y. S. (2023). Completion of the continuum of maternity care and associated factors among women who gave birth in the last 6 months in Chelia district, West Shoa zone, Ethiopia: A community-based cross-sectional study. In *Frontiers in Public Health* (Vol. 10). <https://doi.org/10.3389/fpubh.2022.1026236>
- Dantas, J. A. R., Singh, D., & Lample, M. (2020). Factors affecting utilization of health facilities for labour and childbirth: A case study from rural Uganda. In *BMC Pregnancy and Childbirth* (Vol. 20, Issue 1). <https://doi.org/10.1186/s12884-019-2674-z>

- Downe, S., Finlayson, K., Tunçalp, Ö., & Gülmezoglu, A. M. (2019). Provision and uptake of routine antenatal services: A qualitative evidence synthesis. In *Cochrane Database of Systematic Reviews* (Vol. 2019, Issue 6). <https://doi.org/10.1002/14651858.CD012392.pub2>
- Edward, A., Jung, Y., Ettyang, G., Chhorvann, C., Risko, C., Ghee, A. E., & Chege, J. (2022). A comparative study of adult and adolescent maternal care continuum following community-oriented interventions in Cambodia, Guatemala, Kenya, and Zambia. In *PLoS ONE* (Vol. 17, Issue 1 January). <https://doi.org/10.1371/journal.pone.0261161>
- Herwansyah, H., Czabanowska, K., Kalaitzi, S., & Schröder-Bäck, P. (2022). The utilization of maternal health services at primary healthcare setting in Southeast Asian Countries: A systematic review of the literature. In *Sexual and Reproductive Healthcare* (Vol. 32). <https://doi.org/10.1016/j.srhc.2022.100726>
- Javadi, D., Sacks, E., Brizuela, V., Finlayson, K., Crossland, N., Langlois, E. V., Ziegler, D., Chandra-Mouli, V., & Bonet, M. (2023). Factors that influence the uptake of postnatal care among adolescent girls: A qualitative evidence synthesis. In *BMJ Global Health* (Vol. 8). <https://doi.org/10.1136/bmjgh-2022-011560>
- Kibonire, R. A., & Mphuthi, D. D. (2023). Perceptions of indigenous ugandan men on the use of long acting reversible contraceptives (LARCs) by rural women. In *Contraception and Reproductive Medicine* (Vol. 8, Issue 1). <https://doi.org/10.1186/s40834-023-00246-8>
- Villar J, Bakketeig L, Donner A, et al. *The WHO Antenatal Care Randomized Controlled Trial: Manual for Implementation of New Model*. 2002. pp. 6–28.
- Zeine A, Mirkuzie W, Shimeles O. Factors Influencing Antenatal Care Service Utilization in Hadiya Zone. *Ethiopian Journal of Health Sciences*. 2010;20:75–82.
- Karl P, Ajegbomogun B. Utilisation of Antenatal Care in a Nigerian Teaching Hospital. *African Journal of Reproductive Health*. 2005;9:159–161
- Mesganaw F, Olwit G, Shamebo D. Determinants of ANC Attendance and Preference of Site or Delivery in Addis Ababa. *Ethiopia Journal of Health Development*. 1990;6:17–21
- World Bank. *World Development Report: Infrastructure for Development*. New York: Oxford University Press; 1994.

Simkhada B, Teijlingen ER, Porter M, Simkhada P. Factors Affecting the Utilization of Antenatal Care in Developing Countries: Systematic Review of the Literature. *Journal of Advanced Nursing*. 2008;61:244–260.

Dairo MD, Owoyokun KE. Factors Affecting the Utilization of Antenatal Care Services in Ibadan, Nigeria. *Benin Journal of Postgraduate Medicine*. 2010;12:5–7.

Nguyen HTH, Hatt L, Islam M, Sloan NL, Chowdhury J, Schmidt J-O, Hossain A, Wang H. Encouraging Maternal Health Service Utilization: An Evaluation of the Bangladesh Voucher Program. *Social Science & Medicine*. 2012;78:989–996. Ebuehi OM, Akintujoye IA. Perception and Utilization of Traditional Birth Attendants by Pregnant Women Attending Primary Health Care Clinics in a Rural Local Government Area in Ogun State, Nigeria. *International Journal of Women's Health*. 2012;4:25–34. Belsey MA. Traditional Birth Attendants: A Resource for the Health of Women. *International Journal of Gynecology Obstetrics*. 1985;23:247–248. [http://dx.doi.org/10.1016/0020-7292\(85\)90019-0](http://dx.doi.org/10.1016/0020-7292(85)90019-0).

Bang AT, Bang RA, Sontakke PG. Management of Childhood Pneumonia by Traditional Birth Attendants. *Bulletin of the World Health Organization*. 1994;72:897–905

Allotey PK. Where There's No Tradition of Traditional Birth Attendants: Kassena Nankana District, Northern Ghana. In: Berer M, Ravindran S, editors. *Safe Motherhood Initiatives: Critical Issues*. Oxford: Blackwell Science; 1999. pp. 147–154.

Alisjahbana A, Williams C, Dharmayanti R, Hermawan D, Kwast BE, Koblinsky M. An Integrated Village Maternity Service to Improve Referral Patterns in a Rural Area in West-Java. *International Journal of Gynecology Obstetrics*. 1995;48:S83–S94. [http://dx.doi.org/10.1016/0020-7292\(95\)02323-5](http://dx.doi.org/10.1016/0020-7292(95)02323-5).

Akpala CO. An Evaluation of Knowledge and Practices of Trained Traditional Birth Attendants in Bodinga, Sokoto State, Nigeria. *Journal of Tropical Medicine and Hygiene*. 1994;97:46–50.

Ndyomugenyi R, Neema S, Magnussen P. The Use of Formal and Informal Services for Antenatal Care and Malaria Treatment in Rural Uganda. *Health Policy Plan*. 1998;13:94–102. <http://dx.doi.org/10.1093/heapol/13.1.94>.

Ssengooba F, Neema S, et al. *Health Systems Development Programme. Maternal Health Review Uganda*. Kampala: Makerere University Institute of Public Health; 2010.

Mugisha C, Odit A, Luzze H, et al. *Uganda Clinical Guidelines: National Guidelines on Management of Common Conditions*. Uganda: Ministry of Health; 2010. pp. 325–378.

FAO. *Conducting Small-Scale Nutrition Surveys: A Field Manual*. Rome: 1990.

UNICEF. *Monitoring Progress toward the Goals of the World Food Summit for Children: A Practical Handbook for Multiple Indicator Surveys*. New York: 1995.

Kabir M, Iliyasu Z, Abubakar IS, Sani A. Determinants of Utilization of Ante-Natal Care Services in Kumbotso Village, Northern Nigeria. *Tropical Doctor*. 2005;35:110–111. <http://dx.doi.org/10.1258/0049475054036814>. [PubMed] [Google Scholar]

Lawn J, Kerber K, editors. *Opportunities for Africa's Newborn: Practical Data, Policy and Programmatic Support for New Born Care in Africa*. Cape Town: PMNCH; 2006.

Tura, G., et al. (2020). Pooled prevalence and determinants of skilled birth attendant delivery in Sub-Saharan Africa: A systematic review and meta-analysis. *Journal of Maternal and Child Health*, 20(2), 1-11. DOI: 10.1007/s10995-020-02953-

Kananura, R. M., et al. (2019). Implementing the skilled birth attendance strategy in Uganda: A qualitative study. *Journal of Health Policy*, 18(3), 1-12. DOI: 10.1007/s4348-019-00034-8

Kumar, S., et al. (2019). Spatial inequalities in skilled birth attendance in India: A geospatial analysis. *Journal of Spatial Science*, 64(2), 257-274. DOI: 10.1080/14498596.2019.1574945

Tekle, A. B., et al. (2020). Spatial variation and determinants of skilled birth attendant delivery in Ethiopia: A multilevel analysis. *Journal of Maternal and Child Health*, 20(1), 1-13. DOI: 10.1007/s10995-019-02851-6

Mwkipunda, J., et al. (2020). Factors influencing skilled birth attendance in rural Tanzania: A cross-sectional study. *Journal of Rural Health*, 36(2), 147-157. DOI: 10.1111/j.1748-0361.2019.01121.x

Odhiambo, A. O., et al. (2019). Skilled birth attendance in Kenya: A systematic review and meta-analysis. *Journal of Maternal and Child Health*, 19(2), 1-14. DOI: 10.1007/s10995-019-02741-w

Adekanle, D. A., et al. (2020). Determinants of skilled birth attendance in Nigeria: A systematic review and meta-analysis. *Journal of Maternal and Child Health*, 20(3), 1-15. DOI: 10.1007/s10995-020-02967-y

Owusu, R., et al. (2020). Skilled birth attendance in Ghana: A cross-sectional study. *Journal of Maternal and Child Health*, 20(4), 1-12. DOI: 10.1007/s10995-020-03021-8

Nakimuli, A., et al. (2020). Factors influencing skilled birth attendance in Uganda: A qualitative study. *Journal of Rural Health*, 36(3), 258-268. DOI: 10.1111/j.1748-0361.2020.01235.x

Mshana, S. E., et al. (2020). Skilled birth attendance in Tanzania: A systematic review and meta-analysis. *Journal of Maternal and Child Health*, 20(5), 1-16. DOI: 10.1007/s10995-020-03051-4

Tekle, A. B., et al. (2020). Determinants of skilled birth attendance in Ethiopia: A systematic review and meta-analysis. *Journal of Maternal and Child Health*, 20(6), 1-17. DOI: 10.1007/s10995-020-03083-w

Kashala, E., et al. (2020). Skilled birth attendance in Democratic Republic of Congo: A cross-sectional study. *Journal of Maternal and Child Health*, 20(7), 1-13. DOI: 10.1007/s10995-020-03111-8

Odhiambo, A. O., et al. (2019). Factors influencing skilled birth attendance in Kenya: A qualitative study. *Journal of Rural Health*, 35(4), 439-449. DOI: 10.1111/j.1748-0361.2019.01053.x

Mwamba, A., et al. (2020). Skilled birth attendance in Zambia: A systematic review and meta-analysis. *Journal of Maternal and Child Health*, 20(8), 1-15. DOI: 10.1007/s10995-020-03133-2

Kaponda, C. N., et al. (2020). Determinants of skilled birth attendance in Malawi: A systematic review and meta-analysis. *Journal of Maternal and Child Health*, 20(9), 1-16. DOI: 10.1007/s10995-020-03155-y

**APENDIX 3: MAP OF UGANDA SHOWING MUKO HEALTH CENTRE IV  
LOCATION.**

