ANTENATAL CARE SERVICE UTILISATION AND MATERNAL HEALTH OUTCOMES AMONG WOMEN OF REROductive AGE (15-49) AT KASANJE HC III, WAKISO DISTRICT, UGANDA

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2024/FEB/MPH/M235720/WKD

A DISSERTATION SUBMITTED TO THE SCHOOL OF SCIENCES AS PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER IN PUBLIC HEALTH OF NKUMBA UNIVERSITY

OCTOBER 2026

DECLARATION

I, Lily Batebe declare that this research dissertation titled "**Antenatal care service utilization and maternal health outcomes among women of reproductive age (15–49 years) at Kasanje HC III, Wakiso District,Uganda**", is my original work and has not been submitted for any academic award in any university or institution of higher learning.

Signature:.....

Date:...14th/October/2026.....

APPROVAL

This is to certify that this research dissertation titled "**Antenatal care service utilization and maternal health outcomes among women of reproductive age (15–49 years) at Kasanje HC III, Wakiso District,Uganda**" was carried out under my supervision and is submitted with my approval.

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Date:.....16/10/26.....

DEDICATION

I dedicate this dissertation to the family of Mr. and Mrs. Muwanguzi, my children and also to the family of Mr and Mrs. Katalihwa Cranmer. Thank you for your generous support and continuous guidance through out my education journey. I would not have made it without you.

ACKNOWLEDGEMENT

First and foremost, I would like to express my sincere gratitude to the Almighty God for the gift of life and also for the knowledge, wisdom and understanding, having reached this milestone of my career.

I acknowledge the profesional support and guidance of my supervisor Ms. Sharon Nakagiri. She always gave me feedback and direction from the start of the research proposal up the final write up of the research dissertaton. I also acknowledge all the lecturers of MPH class with whom I interacted with during the class sessions. The knowledge they shared has greatly improved me in the areas of public health promotion and creating awaresness in my various environments of life.

Further more, Iam grateful to all the respondents for having voluntarily committed their time to participate in the research study. Without their invaluable input,this research study would not have been completed.

Lastly, to my dear lovely husdand and children,thank you for all the love,care and support.You have always believed in me. Am forever indebted to you.

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ACRONYMS

ANC	Antenatal Care
FANC	Focused Antenatal Care
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
KHC III	Kasanje Health Centre III
MCH	Maternal and Child Health
MMR	Maternal Mortality Ratio
MOH	Ministry of Health
SDGs	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic and Health Survey
UN	United Nations
UNICEF	United Nations Children's Fund *(formerly United Nations International Children's Emergency Fund)*
WHO	World Health Organization

ABSTRACT

Antenatal care (ANC) is an essential component of maternal healthcare that promotes the health and well-being of mothers and their unborn babies through the timely identification,

prevention, and management of pregnancy-related complications. Despite improvements in maternal healthcare utilisation in Uganda, challenges such as delayed ANC initiation, inadequate completion of recommended contacts, limited accessibility and gaps in service quality continue to affect maternal health outcomes. This study assessed the relationship between antenatal care service utilisation and maternal health outcomes among women of reproductive age (15–49 years) at Kasanje Health Centre III (HC III), Wakiso District, Uganda. Specifically, the study examined knowledge and attitudes, accessibility, frequency and timing, and quality of ANC services received and maternal health outcomes.

The study employed a cross-sectional mixed-methods design with a sample size of 250 participants. Simple random sampling and convenience sampling techniques were used to select participants. Data were collected using structured questionnaires, focus group discussions (FGDs) and key informant interviews (KIIs). Quantitative data was analyzed using descriptive statistics, Pearson's correlation coefficient and regression analysis, while qualitative data was analyzed using Nvivo.

The findings revealed that there is a strong relationship between ANC service utilisation and maternal health outcomes. Although participants generally demonstrated good knowledge and positive attitudes towards ANC, gaps remained in early initiation and completion of the recommended ANC contacts. The frequency of ANC attendance showed that it was strongly associated with maternal health outcomes, followed by accessibility of ANC services, then knowledge and attitudes and lastly quality.

The study concludes that improving ANC utilisation is essential for achieving favorable maternal health outcomes The study recommends strengthening the implementation of the World Health Organization's recommended eight ANC contacts, enhancing follow-up mechanisms, promoting respectful maternity care, improving maternal health education, and encouraging male involvement to improve ANC utilisation and maternal health outcomes.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Antenatal care (ANC) is a critical service aimed at improving maternal and neonatal health by offering preventive, diagnostic and therapeutic care during pregnancy. Evidence shows that adequate ANC utilization is associated with reduced maternal and perinatal morbidity and mortality. However, utilization patterns and outcomes vary widely across regions, influenced by socio-demographic, economic, cultural and health system factors. Inadequate ANC utilization has been associated with increased maternal complications, adverse birth outcomes and maternal mortality.

This study assessed the relationship between antenatal care service utilization and maternal health outcomes among women (15–49 years) at Kasanje HC III, Wakiso District.The independent variable was antenatal care service utilization and the dependent variable was maternal health outcomes

This chapter presents the background of the study, the problem statement, the objectives of the study, research questions, hypotheses, justification, significance, the scope,conceptual framework and definition of key terms

1.1 Background

This subsection presents the background of the study that is sub divided into; historical, contextual, theoretical and conceptual bakground

1.1.1 Historical background

Antenatal care (ANC) is a critical component of maternal health services aimed at ensuring optimal health outcomes for both mother and child during pregnancy. Historically, organized antenatal care began in the early 20th century in Europe and North America as part of broader public health reforms designed to reduce maternal and infant mortality (World Health Organization (WHO) (2016). Over time, ANC evolved from a risk-based approach where care was primarily provided to women identified as high risk to a universal preventive model promoting routine monitoring, early detection of complications and health education for all pregnant women.

Globally, maternal mortality remains a significant public health concern. According to the WHO (2023), approximately 287,000 women died worldwide in 2020 due to preventable

causes related to pregnancy and childbirth, with Sub-Saharan Africa accounting for nearly 70% of these deaths. The global maternal mortality ratio (MMR) was estimated at 223 deaths per 100,000 live births, highlighting persistent inequities between high-income and low-income countries.

In response, global frameworks such as the United Nations Sustainable Development Goals (SDGs), particularly Goal 3.1, aim to reduce the global MMR to less than 70 per 100,000 live births by 2030. United Nations, (2015). ANC plays a pivotal role in achieving this target by facilitating early identification and management of pregnancy-related complications, promoting skilled birth attendance and providing preventive interventions such as tetanus toxoid immunization, malaria prophylaxis, iron and folic acid supplementation and HIV testing.

The WHO initially recommended a minimum of four focused antenatal visits (FANC model) but revised this in 2016 to recommend at least eight contacts to improve maternal and neonatal outcomes WHO (2016). Evidence shows that increased frequency and early initiation of ANC visits are associated with reduced perinatal mortality and improved maternal outcomes.

1.1.2 Contextual background

Global context

Maternal health, worldwide, particularly in low and middle-income countries is still a point of public health concern. Globally, maternal mortality declined by approximately 34% between 2000 and 2020, yet progress remains uneven (WHO, 2023). In addition, approximately 800 women die daily due to preventable pregnancy and childbirth complications, with about 99% of these deaths occurring in developing countries. (WHO, 2023). ANC services are among the most effective strategies for reducing maternal and neonatal morbidity and mortality by providing early detection, prevention and management of pregnancy-related complications.

Despite improvements in maternal health indicators globally, disparities persist. Utilization of ANC services varies significantly by region, socioeconomic status, education level and rural-urban residence UNICEF, (2022). While over 85% of pregnant women globally attend at

least one ANC visit, fewer complete the recommended eight contacts, particularly in low-income settings WHO, (2023). Barriers such as distance to health facilities, indirect costs, poor quality of health care systems, cultural beliefs, lack of knowledge about maternal health services and limited autonomy affect ANC. (Yoseph et al., 2025). These challenges contribute to poor maternal health outcomes, including maternal morbidity, adverse birth outcomes and maternal mortality.

Sub-Saharan African context

Sub-Saharan Africa bears the highest burden of maternal mortality globally. This accounts for nearly 70% of global maternal deaths, challenges in this region include limited health infrastructure, inadequate staffing, poverty, gender inequality and weak referral systems (Say et al., 2014) and low utilization of antenatal care (Lateef et al., 2024). Studies indicate that while many women attend at least one ANC visit, timely initiation during the first trimester and completion of recommended visits remain suboptimal (Tessema et al., (2021). Quality of care is also inconsistent, affecting the effectiveness of ANC services in improving maternal outcomes.

Ugandan context

In Uganda, maternal health remains a national priority. According to the Uganda Bureau of Statistics (UBOS, 2022), the maternal mortality ratio is estimated at 189 deaths per 100,000 live births. Although 97% of pregnant women attend at least one ANC visit, only about 60% initiate ANC in the first trimester which remains below the recommended standards for optimal maternal care and fewer complete the recommended number of visits. (UDHS, 2022).

Several factors influence antenatal care utilization among women in Uganda. These include women's knowledge and attitudes toward ANC services, accessibility of health facilities, cost of transport, availability of skilled healthcare workers and the quality of services provided at health facilities (Tumwizere et al., 2024).

Wakiso district, where Kasanje Health Centre III is located, presents unique peri-urban context maternal health challenges due to rapid urbanization, socio-economic disparities, population growth and pressure and health service demand, leading to inequalities in health

care access and utilisation. These challenges may influence ANC utilization and eventually maternal health outcomes, including maternal morbidity, adverse birth outcomes and mortality.

Therefore, understanding the relationship between ANC service utilization and maternal health outcomes in this setting is critical for identifying gaps in service utilization and for informing targeted maternal health interventions.

1.1.3 Theoretical background

This study was guided by the Health Belief Model (HBM) and Andersen's Behavioral Model of health services utilization.

The Health Belief Model suggests that an individual's health behavior is influenced by perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy (Rosenstock, 1974). In the context of ANC utilization, women are more likely to attend ANC services if they perceive pregnancy complications as serious, believe ANC attendance will reduce risks and encounter minimal barriers such as distance or cost.

Andersen's Behavioral Model emphasizes three categories influencing health service utilization: predisposing factors for example knowledge, attitude, age, education, enabling factors for example accessibility, income, availability of services and need factors for example perceived or evaluated health needs (Andersen, 1995). This model explains how knowledge and attitudes towards ANC, accessibility of services and perceived need for care influence frequency and timing of ANC visits.

Together, these theories provide a framework for understanding how individual beliefs and systemic factors interact to influence ANC utilization and maternal health outcomes.

1.1.4 Conceptual background

ANC service utilization refers to the extent to which a pregnant woman receives health services from trained health professionals during pregnancy to monitor the health of both the mother and the unborn baby and to prevent or manage complications before childbirth. ANC service utilization as the independent variable will further focus on; knowledge and attitudes

towards ANC, accessibility of ANC services, frequency and timing of ANC services, quality of ANC services received.

Maternal health outcomes refer to the results or effects of healthcare services on the health and well-being of a woman during pregnancy, childbirth and the period after delivery. Maternal health outcomes as the dependent variable will further look at maternal morbidity, maternal mortality and child birth outcomes.

Antenatal care utilization is influenced by several factors including women's knowledge and attitudes towards ANC, accessibility of services, frequency and timing of visits and the quality of care received. These factors affect whether women initiate ANC early and complete the recommended visits during pregnancy. For example, studies in Uganda have shown that knowledge of pregnancy danger signs significantly influences early ANC attendance and receipt of quality care.

Maternal health outcomes such as maternal morbidity, birth outcomes and maternal mortality are strongly linked to the utilization of ANC services. Women who attend the recommended number of ANC visits are more likely to deliver in health facilities and receive timely postnatal care, thereby reducing complications during pregnancy and childbirth.

1.2 Problem statement

Maternal health remains a major public health concern globally, particularly in low- and middle-income countries. Despite significant progress over the past two decades, preventable maternal deaths continue to occur at unacceptably high rates. According to the (WHO, 2023) approximately 287,000 women died worldwide in 2020 due to pregnancy and childbirth related complications, the majority of which were preventable through timely and adequate maternal health interventions such as antenatal care. Sub-Saharan Africa accounts for nearly 70% of these deaths, underscoring persistent inequities in access to and utilization of quality maternal healthcare services.

In Uganda, maternal health continues to pose significant challenges. The Uganda Bureau of Statistics (UBOS 2022) reported a maternal mortality ratio of 189 deaths per 100,000 live births, which is significantly higher than the global Sustainable Development Goal target of less than 70 deaths per 100,000 live births by 2030. 45% of these deaths mostly occur during

pregnancy and child birth. (UDHS, 2022). Although 97% of women attend at least one ANC visit only about 60% initiate care during the first trimester and far fewer complete the recommended number of visits. This gap between initial contact and adequate utilization suggests that mere availability of services does not guarantee optimal maternal health outcomes. (UNICEF, 2022)

Several factors have been associated with inadequate ANC utilization, including limited knowledge about ANC benefits, negative attitudes toward facility-based care, long distances to health facilities, transportation costs, poor service quality, long waiting times and shortages of essential supplies and skilled personnel (Say et al., 2014; Tessema et al., 2021). These barriers affect not only the frequency and timing of ANC attendance but also the quality of care received, which ultimately influences maternal health outcomes such as anemia, pre-eclampsia, hemorrhage, low birth weight, preterm birth and maternal mortality. (Muhirwe & Aagard, 2023)

In Wakiso district, health facilities such as Kasanje Health Centre III serve large rural populations with diverse socio-economic backgrounds, yet challenges such as limited resources, accessibility barriers and variations in service quality persist. These challenges may lead to poor maternal health outcomes, including complications during pregnancy, adverse birth outcomes, and maternal deaths.

Despite national-level data on ANC coverage and maternal mortality, there is limited context-specific evidence examining how different dimensions of ANC utilization such as knowledge and attitudes, accessibility, frequency and timing and quality affect maternal health outcomes at lower-level health facilities such as Kasanje Health Centre III. Without context-specific evidence, interventions may fail to address the underlying determinants affecting ANC utilization and maternal outcomes in this locality, thus creating gaps for the targeted interventions.

This study therefore sought to bridge this gap by assessing the relationship between antenatal care service utilization and maternal health outcomes among women of reproductive age at Kasanje Health Centre III, Wakiso district.

1.3 Objectives of the study

This section presents the general objective and the specific objectives of the study.

1.3.1 General objective

The research study aimed;

To assess the relationship between antenatal care service utilization and maternal health outcomes among women (15–49 years) at Kasanje HC III, Wakiso District.

1.3.2 Specific objectives

The specific objectives of the study were;

1) To determine the relationship between knowledge and attitudes towards ANC and maternal health outcomes.
2) To examine the relationship between accessibility of ANC services and maternal health outcomes.
3) To assess the relationship between frequency and timing of ANC services and maternal health outcomes.
4) To study the relationship between quality of ANC services received and maternal health outcomes.

1.4 Research questions

1) What is the relationship between knowledge and attitudes towards ANC and maternal health outcomes?
2) What is the relationship between accessibility of ANC services and maternal health outcomes?
3) What is the relationship between frequency and timing of ANC services and maternal health outcomes?
4) What is the relationship between quality of ANC services received and maternal health outcomes?

1.5 Hypothesis

Ho: There is no relationship between knowledge and attitudes towards ANC and maternal health outcomes.

Ho. There is no relationship between accessibility of ANC services and maternal health outcomes.

Ho. There is no relationship between frequency and timing of ANC services and maternal health outcomes.

Ho. There is no relationship between quality of ANC services received and maternal health outcomes.

1.6 Justification of the study

In Uganda, maternal health remains a priority under the Ministry of Health strategic plans. Although progress has been made in improving ANC attendance, challenges such as late initiation of ANC, fewer than the recommended visits, limited knowledge, accessibility barriers, and variations in service quality continue to affect maternal health outcomes. Wakiso District, which is one of the most densely populated districts in Uganda, presents unique challenges due to disparities in healthcare access.

Kasanje Health Centre III serves a large catchment population of women of reproductive age. Despite the availability of ANC services at this facility, maternal complications such as anemia, hypertensive disorders, infections and adverse birth outcomes are still reported. However, limited documented evidence exists regarding how ANC utilization patterns (knowledge, accessibility, timing, frequency and quality) influence maternal health outcomes in this specific setting, thus a reason for this study.

1.7 Significance of the study

The findings of this study would be significant to several stakeholders:

Ministry of Health and policy makers. The study will provide evidence-based data that can inform maternal health policies, resource allocation and strategies aimed at improving ANC service utilization and maternal health outcomes in Wakiso District and Uganda at large.

Health facility management (Kasanje Health Centre III). The results would help the health facility identify gaps in ANC service delivery, including accessibility, quality of care and client education. This will support improvements in service planning, staffing and maternal health interventions.

Healthcare providers-The study would enhance healthcare workers' understanding of how knowledge, attitudes and service quality influence maternal outcomes, encouraging client-centered care and improved counseling during ANC visits.

Women of reproductive age. The research would highlight barriers and facilitators to effective ANC utilization, potentially leading to improved health education programs that empower women to seek timely and adequate care.

Researchers and academicians. The study would add to the existing body of knowledge on maternal health and ANC utilization in Uganda and serve as reference material for future studies in similar settings.

1.8 Scope of the study

1.8.1 Content scope

The study focused on ANC service utilization as the independent variable basically looking at: knowledge and attitudes towards ANC services, accessibility of ANC services, frequency and timing of ANC visits, quality of ANC services received.

The study also focused on maternal health outcomes (pregnancy complications, birth outcomes, maternal morbidity) as the dependent variable

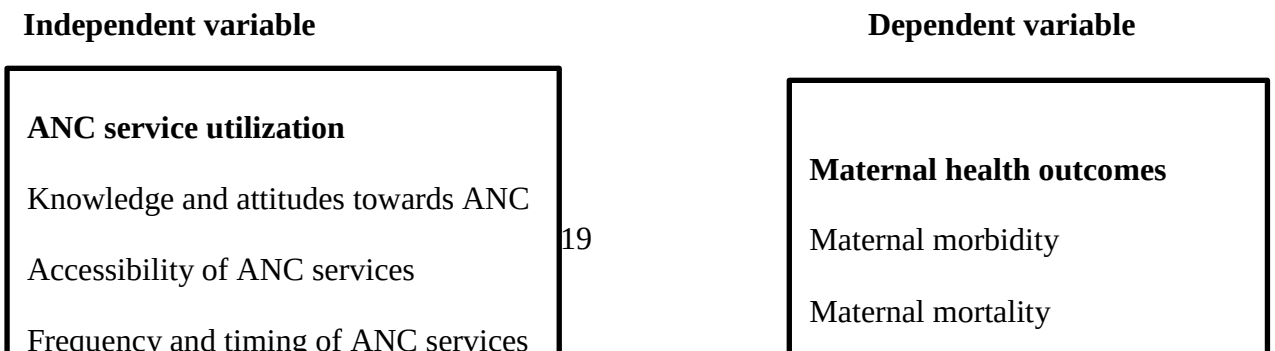
1.8.2 Geographical scope

The study was conducted at Kasanje Health Centre III located in Wakiso District, Uganda. The facility serves women from surrounding communities within the district.

1.8.3 Time scope

The study focused on maternal health experiences from women who were accessing antenantal and postnatal care services at the facility, from June to July 2026.

1.9 Conceptual framework



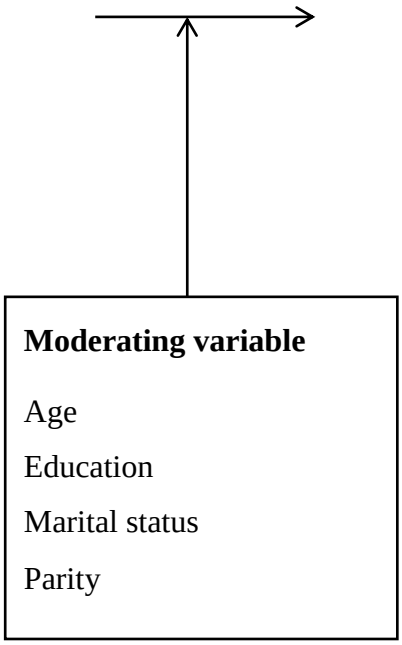


Figure 1: Conceptual framework (Data Source; The Researcher, 2026)

The conceptual framework indicates that maternal health outcomes are influenced by the knowledge, attitudes, accessibility, frequency, timing and quality of ANC services utilized and the moderating variables are age, education, marital status and parity.

The conceptual framework for this study illustrates the relationship between independent variable which is ANC utilization and dependent variable which is maternal health outcomes.

Independent variables (ANC utilization)

Knowledge and attitude toward ANC-refers to women's awareness of ANC benefits, recommended visit schedules, danger signs in pregnancy and their perceptions or beliefs about the importance of ANC.

Accessibility of ANC services- Includes distance to the health facility, transportation availability, cost of services, waiting time and availability of healthcare providers and supplies.

Frequency and timing of ANC visits- Refers to the number of ANC visits attended and whether initiation occurred within the first trimester as recommended by WHO guidelines.

Quality of ANC received- Encompasses availability of essential services (blood pressure monitoring, laboratory tests, counseling and supplementation), provider competence, respectful maternity care and continuity of services.

Dependent variable

Maternal health outcomes-These include pregnancy-related complications for example anemia, pre-eclampsia, hemorrhage), birth outcomes (for example low birth weight, preterm birth) and maternal mortality.

Moderating variables are; age, education, marital status and parity

Relationship among variables

The framework assumes that adequate knowledge and positive attitudes, improved accessibility, timely and frequent visits combined with high-quality services, contribute to improved maternal health outcomes.

Conversely, poor knowledge, negative attitudes, limited accessibility, inadequate frequency and poor quality of care may lead to adverse maternal outcomes

1.10 Definition of key terms

Antenatal care refers to the health services that a pregnant woman receives from trained health professionals during pregnancy to monitor the health of both the mother and the unborn baby and to prevent or manage complications before childbirth.

Postnatal care refers to the critical physical,emotional and medical support provided to a mother and her new born during the first six weeks after child birth.

Maternal health outcomes refer to the results or effects of healthcare services on the health and well-being of a woman during pregnancy, childbirth and the period after delivery.

Maternal morbidity refers to any illness, injury or health complication that a woman experiences during pregnancy, childbirth or within the postpartum period.

Childbirth outcomes refer to the health results for both the mother and the newborn after delivery, such as safe delivery, birth weight, survival of the mother and baby and absence of complications.

Maternal mortality refers to the death of a woman during pregnancy, childbirth or within 42 days after the end of pregnancy due to causes related to or worsened by the pregnancy or its management.

ANC service utilization refers to the extent to which pregnant women use available healthcare services such as attending antenatal visits, receiving skilled birth care or accessing postnatal services.

Reproductive-age women refers to women who are biologically capable of becoming pregnant, typically defined in research and public health as women aged 15–49 years.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Antenatal care service utilization plays a fundamental role in improving maternal health outcomes and provides a platform for delivering preventive, promotive and curative services to pregnant women. This chapter reviews key theories and existing literature related to antenatal care utilization and maternal health outcomes. It encompasses multiple dimensions including knowledge and attitudes, accessibility, frequency and timing of visits, and quality of care received. These factors interact to influence maternal morbidity, birth outcomes and mortality.

This chapter will review the key theories, empirical literature relevant to the research and then the summery of the literature.

2.1 Theoretical review

2.1.1 Health Belief Model (HBM)

Rosenstock developed the Health Belief Model (HBM) in the 1950s and Becker and associates later extended it to explain health-seeking behavior based on personal perceptions and beliefs. (Rosenstock, 1974; Rosenstock, Strecher, & Becker, 1988). The model explains these cores; perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, self-efficacy.

Health Belief Model application to ANC utilization

Early ANC initiation is more common in women who believe that they are susceptible to pregnancy problems; those that are aware of severe consequences such as hemorrhage or eclampsia often regularly attend ANC. The women with perceived benefits for example safe delivery, having a healthy baby usually complete all the recommended visits. Women with perceived barriers for example distance, cost, long waiting times reduce the frequency of ANC attendance. Health education messages and community outreach act as cues to action while self-efficacy influences consistent attendance of ANC appointments.

Thus, HBM explains how maternal knowledge and attitudes shape frequency and timing of ANC visits, ultimately influencing maternal health outcomes.

2.1.2 Andersen's Behavioral Model of health services use

Andersen (1968; revised 1995) developed a framework explaining health service utilization through three categories of factors; predisposing factors for example age, education, parity, beliefs, culture, enabling factors for example income, distance to the facility, availability of services and need factors for example perceived or evaluated illness.

Application to ANC utilization and maternal health outcomes

The predisposing characteristics such as maternal education influence awareness and use of ANC, the enabling resources such as transport, cost and facility readiness determine whether women access services. The perceived needs for example experiencing pregnancy complications may prompt late or emergency attendance.

Andersen's model demonstrates that service utilization is not determined solely by knowledge but also by structural and economic conditions, which ultimately affect maternal health outcomes.

Theoretical perspectives provide a strong foundation for examining antenatal care utilization and maternal health outcomes. The Health Belief Model explains individual knowledge and attitudes while Andersen's Behavioral Model addresses structural and enabling factors.

2.2 Review of empirical studies related to the objectives

ANC services offer possibilities for early identification and handling of pregnancy-related issues, health education and readiness for childbirth. Antenatal care service utilization encompasses several dimensions, including knowledge and attitudes toward ANC, accessibility of services, frequency and timing of visits and quality of care received. These dimensions collectively influence the maternal health outcomes as elaborated below.

This section presents relevant literature on the study variables. The review was thematically done according to the study objectives.

2.2.1 Knowledge and attitude towards ANC

Knowledge and attitudes toward ANC services are key determinants of ANC utilization. Knowledge about ANC includes awareness of its importance, recommended timing, number of visits, danger signs during pregnancy and available services.

According to (Bhutada et al., 2024), studies consistently show that women with higher levels of education and awareness are more likely to initiate ANC early and attend the recommended number of visits. (Okello et al., 2022) add that women with adequate knowledge about ANC are more likely to attend the recommended visits. Education enhances women's autonomy, decision-making capacity and understanding of the benefits of preventive healthcare, thereby positively influencing health-seeking behavior.(Amwonya et al., 2022) further add.

(UDHS, 2022), in Uganda, misconceptions and cultural beliefs contribute to delayed ANC attendance. (Bhutada et al., 2024) add that research in sub-Saharan Africa indicates that knowledge of pregnancy danger signs significantly increases the likelihood of skilled maternal care utilization Women who understand complications such as hemorrhage, hypertension and anemia are more proactive in seeking preventive services.The World Health Organization emphasizes health education during ANC as a key strategy to empower women to make informed decisions about pregnancy and childbirth.(WHO 2022)

Attitudes refer to personal beliefs, perceptions and feelings about ANC services. Positive attitudes such as believing that ANC ensures safe delivery promote regular attendance. Conversely, negative perceptions of healthcare providers, fear of mistreatment or cultural misconceptions may discourage attendance (Afulani et al., 2017).

According to (Bhutada et al., 2024), negative social or cultural beliefs, misconceptions about pregnancy and low perceived need for care contribute to delayed initiation and underutilization of ANC services. Qualitative findings further reveal that fear of mistreatment, lack of partner support and previous negative healthcare experiences shape attitudes toward ANC attendance.

In some communities, pregnancy is viewed as a natural condition not requiring medical supervision unless complications arise. Such beliefs delay early initiation of ANC. Overall, knowledge and attitude significantly determine health-seeking behavior and directly influence the timing and frequency of ANC visits. (Tumwizere et al., 2024).

2.2.2 Accessibility of Antenatal care services

Accessibility of ANC services is another critical factor influencing utilization. Accessibility refers to the ease with which women can obtain ANC services. It includes geographical, financial accessibility of the available health care services.

Geographical accessibility. According to (UDHS, 2022).The physical distance to health facilities and transportation challenges significantly affect ANC utilization. Women living in rural areas are less likely to attend four or more ANC visits compared to urban residents.(Lateef et al., 2024) add that long travel distances increase indirect costs and time burdens. In Uganda, financial constraints and lack of transportation are major barriers to accessing antenatal care services. (Atuhaire et al., 2023) further add that, infrastructural challenges such as poor road networks and limited health facility distribution in peri-urban and rural areas like Wakiso district may further constrain access, thereby influencing ANC utilization patterns.

In Uganda, disparities in access persist along socioeconomic and geographic lines, with women in rural areas and lower wealth sources significantly less likely to utilize maternal health services compared to their urban and wealthier counterparts (Atuhaire et al., 2023). For example, women from the richest households are up to four times more likely to receive a comprehensive package of maternal health services than those from the poorest households.

Financial accessibility. (Lateef et al., 2024), say that although many countries like Uganda have policies promoting free maternal services, hidden costs such as transportation, cost of some health services for example scans or some laboratory tests, informal payments and opportunity costs may limit utilization. 30% of Ugandan women cite distance and associated transport costs as a major barrier UDHS, (2022). Accessibility challenges are evident in rural areas of Wakiso district mostly Kasanje.

Availability of accessible health services. Facility readiness, including availability of skilled staff, drugs, diagnostic equipment and consistent operating hours affects service utilization. According to the World Health Organization (2016), health system strengthening is essential to improve maternal outcomes.

Andersen’s Behavioral Model of Health services use explains that enabling factors such as income, health insurance and facility availability determine service utilization (Andersen, 1995).

UDHS, (2022).Limited accessibility often results in delayed booking, irregular attendance or complete non-utilization of ANC services.

2.2.3 Frequency and timing of ANC visits

The frequency and timing of ANC visits are essential indicators of adequate utilization and are strongly associated with improved maternal and neonatal outcomes.

Throughout history, the Focused Antenatal Care (FANC) model suggested a minimum of four visits. The timely utilization of ANC plays a role in promoting the use of health facility deliveries and postnatal care services (Atuhaire et al., 2020). Despite Uganda incorporating the FANC approach into its healthcare system in 2003, recent findings show that only 48% of expectant mothers were able to attend at least four ANC visits during their pregnancy, with the first visit ideally taking place in the first trimester. This highlights the acknowledged necessity for enhancements in the quality of ANC services provided by WHO (2016).

Uganda's Ministry of Health adjusted its guidelines to align with the latest global recommendations from the World Health Organization (WHO), which emphasize a comprehensive approach to caring for pregnant women. This includes eight consultations, deliveries at healthcare facilities and treatment by trained medical staff. The purpose of this update is to enhance the standards and availability of antenatal care services in Uganda. (Muwema et al., 2022, MOH, 2016).

Low birth weight, premature birth and maternal difficulties are among the negative outcomes that women who attend less than te recommended appointments are more likey to experience ,accrording to research(UDHS, 2022). Regular attendance improves; monitoring of fetal growth, detection of pregnancy complications and provision of preventive interventions for example tetanus toxoid, iron supplementation. (WHO, 2016)

Accrding to (Adedokun & Yaya, 2020). Early initiation of ANC preferably within the first trimester is associated with improved maternal and neonatal outcomes. Early booking allows for timely screening for infections, anemia, hypertension and other complications

However, in many low-resource settings like Kasanje town council, in Wakiso district of Uganda, evidence indicates that women initiate ANC during the second or third trimester due to lack of awareness, cultural beliefs, financial constraints among other challenges. (Bhutada et al., 2024).

(UBOS, 2022). Late initiation is common with only 29% of Ugandan women starting ANC in the first trimester and 60% of women start ANC in the second trimester Late initiation increases risks of complications.

Late initiation and inadequate frequency of visits limit opportunities for screening, health education and preventive interventions such as immunization and nutritional supplementation, thereby increasing the risk of adverse maternal and birth outcomes. (Adedokun & Yaya, 2020).

2.2.4 Quality of ANC received.

Quality of ANC services is increasingly recognized as a determinant of both service utilization and maternal health outcomes. (UBOS, 2022).

According to (Muhirwe & Aagard, 2023).Quality of care refers to the degree to which health services increase the likelihood of desired health outcomes and are consistent with professional standards. This includes structural and process quality.

This includes availability of trained and skilled health care personnel, medical equipment and supplies, adherence to clinical guidelines, laboratory services and essential drugs. Poor infrastructure limits effective service delivery. Quality of care affects both ANC utilization and maternal outcomes. Poor structural service quality discourages repeat visits and the reverse is true.(Okello et al., 2022).

(Bbaale, 2011; Akeju et al., 2022). Process quality involves provider-client interactions, comprehensive examinations, counseling and quality of health education, screening tests and provision of respectful and patient centered maternity care.

Studies in Uganda have shown that women who receive high-quality ANC services are significantly more likely to complete the recommended number of visits and to utilize

subsequent maternal health services such as postnatal care, immunization, family planning etc. (Towongo et al., 2024).

(Bbaale, 2011; Akeju et al., 2022), say that high quality ANC services encourage women to return for subsequent visits and adhere to recommended schedules. Conversely, poor quality of care, including negative attitudes of healthcare workers, lack of privacy and insufficient medical supplies, can discourage women from utilizing services. (Afulani et al., 2017). Studies have demonstrated that women who receive comprehensive ANC services including blood pressure monitoring, laboratory testing, counseling and preventive treatments are more likely to complete the recommended number of visits. In contrast, gaps in service delivery reduce the perceived value of ANC and contribute to low utilization rates. Therefore, improving the quality of ANC services is essential for enhancing both utilization and maternal health outcomes.

2.2.5 Maternal health outcomes

Maternal health outcomes refer to the health status of women during pregnancy, childbirth and the postpartum period. These include maternal morbidity, birth outcomes and maternal mortality

According to (UBOS & MOH, 2022), maternal morbidity includes complications such as anemia, infections, hypertension and hemorrhage during pregnancy or childbirth. In Uganda, anemia accounts for (25%), infections (15%), hypertensive disorders (10%)

Birth outcomes refer to the health status of new born at birth, including; birth weight, preterm birth, stillbirth, neonatal survival. In Uganda, low birth weight accounts for (12%), preterm births (10%), still birth (5%) (UBOS & MOH, 2022).

Maternal mortality refers to the death of a woman during pregnancy or within 42 days after childbirth due to reasons related to pregnancy. The Uganda Bureau of Statistics (UBOS 2022) reports a maternal mortality ratio of 189 deaths per 100,000 live births, exceeding the global target set by the Ministry of Health in 2022 of less than 70 deaths per 100,000 live births by 2030.

According to (Say et al., 2014).Evidence shows that women who attend four or more ANC visits are more likely to deliver in health facilities and receive postnatal care, which significantly improves maternal and newborn health outcomes.

Maternal health outcomes, the dependent variable in this study, are influenced by the level and quality of ANC utilization. Maternal morbidity, which includes complications such as hemorrhage, infections, hypertensive disorders, and obstructed labor, remains prevalent in settings with inadequate ANC utilization. Effective ANC provides an opportunity for early detection and management of these conditions, thereby reducing morbidity. Additionally, ANC utilization is closely linked to birth outcomes, including birth weight, preterm delivery and neonatal survival. Adequate ANC attendance has been associated with improved birth outcomes through interventions such as nutritional counseling, infection prevention and monitoring of fetal development.

Maternal mortality represents the most severe outcome of poor maternal health and is strongly associated with inadequate utilization of maternal health services. Evidence suggests that increased utilization of ANC, skilled birth attendance and postnatal care significantly reduces the risk of maternal death (Atuhaire et al., 2023). However, persistent inequalities in service utilization, particularly among disadvantaged populations, continue to drive high mortality rates in Uganda. Furthermore, non-institutional deliveries, which still account for approximately 25% of births in Uganda, are associated with higher risks of complications and maternal death (Towongo et al., 2025).

2.2.6 Gaps in existing Literature

Facility-level evidence gap. Existing research on antenatal care utilization in Uganda has largely relied on national surveys, particularly the Uganda Demographic and Health Surveys, which provide important population-level evidence but offer limited information about individual health facilities. Such studies may not adequately capture facility-specific differences in staffing, availability of medicines and equipment, waiting time, counselling, provider-client interactions and other aspects of service delivery (Bbaale, 2011; Akeju et al., 2022). There is limited published evidence specifically examining ANC utilization and maternal health outcomes at Kasanje Health Centre III in Wakiso District.. A facility-based study at Kasanje Health Centre III is therefore necessary to generate context-specific evidence on the factors influencing ANC utilization and maternal outcomes.

Quality-versus-quantity gap. Previous studies have often measured ANC utilization in terms of number of visits and timing of the first visit, with less emphasis on the quality and content of care received during those visits**.** However, attending the recommended number of ANC visits does not necessarily mean that women receive comprehensive and appropriate care. Essential components such as physical examination, laboratory testing, counselling, health education, risk assessment, medicines and follow-up may be inadequately provided (Nabunya et al., 2023). Therefore, focusing only on the number of visits may overestimate the effectiveness of ANC services. There is consequently a need to assess both the quantity and quality of ANC services received by women at Kasanje Health Centre III .

Integrated-variable analysis gap. Existing studies have examined several determinants of ANC utilization, including maternal knowledge, accessibility, timing of ANC initiation and frequency of visits. However, these factors have often been investigated separately limiting understanding of how they interact to influence maternal health outcomes (Akeju et al., 2022; Bbaale, 2011). For instance, adequate knowledge may encourage ANC attendance, but poor accessibility, delayed initiation or inadequate service quality may still negatively affect maternal outcomes. Similarly, physical access to a facility may not guarantee effective utilization when women lack information or receive poor-quality services.This study therefore seeks to address this gap by examining these variables collectively at Kasanje Health Centre III.

2.3 Summary of literature

In summary, the literature demonstrated that antenatal care service utilization is a multifaceted construct influenced by individual, socio-cultural and health system factors. Knowledge and attitudes, accessibility, frequency and timing of visits and quality of services all play critical roles in shaping utilization patterns. These factors in turn, have significant implications for maternal health outcomes, including morbidity, birth outcomes and mortality. Despite progress in improving maternal health indicators, substantial gaps remain in achieving equitable and adequate ANC utilization in Uganda. Addressing these gaps requires a comprehensive approach that integrates community education, health system strengthening and targeted interventions to improve access and quality of care, particularly in underserved areas such as Wakiso District, Kasanje town council

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes the methodology that was used to assess antenatal care service utilization and maternal health outcomes among women of reproductive age (15–49 years) at Kasanje HC III in Wakiso District.

This section focused on the study design, study area, study population, sample size determination, sampling technique, data collection methods and instruments, validity and reliability of research instruments, data management and analysis, ethical considerations and finally the limitations of the study.

3.1 Study design

The study employed the cross sectional study design using mixed method approach. The cross-sectional design was appropriate because it allowed the researcher to collect data from participants at a single point in time and analyze relationships between variables; that is the independent variables (knowledge and attitude, accessibility, frequency and timing, quality) and maternal health outcomes as the dependent variable.(maternal morbidity, birth outcomes and maternal mortality.

3.2 Study area

This study was conducted at Kasanje Health Centre III, located in Kasanje Sub-county, Wakiso District, in the central region of Uganda. Kasanje HC III is a government health facility that provides a range of primary healthcare services, including antenatal care (ANC), postnatal care (PNC), immunization, family planning, HIV/AIDS services, outpatient care, and maternity services.

The health facility serves a predominantly rural and peri-urban population from Kasanje Sub-county and neighboring communities. It receives a significant number of women between the ages 15-49 seeking antenatal and maternal healthcare services, making it an suitable environment for evaluating the use of antenatal care service utilization and the outcomes of maternal health outcomes.

Kasanje HC III was selected as the study area because it provides accessible maternal health services to a large population of women and offers an appropriate environment for obtaining information on antenatal care utilization and its relationship with maternal health outcomes.

3.3 Study population

The study population comprised of 667 women of reproductive age (15–49 years) which was the average estimated number of women attending ANC and PNC at this facility in two months as per the DHIS2 data base. The inclusion criteria was women residing in the catchment area of Kasanje Health Centre III, who have attended ANC or are attending ANC at this facility and or have given birth within the last 12 months and/or have delivered at the facility within the last 12 months and provided informed consent were eligible to participate in the study.

3.4 Sample size determination

The sample size was determined using Taro Yamane's formula

$$n = \frac{N}{1+N(e^2)}$$

Where:

N=Population size=667

n=sample size

e=margin of error at 0.05(5%)

The calculation

$$n = \frac{667}{1+667(0.05^2)}$$

therefore (0.05^2) =0.0025

and 667x0.0025=1.6675

$$n = \frac{667}{1+1.6675}$$

$$n = \frac{667}{2.6675}$$

n=250.05

Therefore the sample size = 250 respondents

3.5 Sampling techniques

3.5.1 Simple random sampling method

simple random sampling was used to select study participants from the target population of women of reproductive age (15–49 years) attending antenatal and postnatal services at Kasanje HC III. A sampling frame was first prepared using the antenatal care register and clinic attendance register, where all eligible women were assigned unique identification numbers.

Each eligible woman had an equal and independent chance of being selected, ensuring that the sample is representative of the target population. Women who met the inclusion criteria and provided informed consent took part in the research study. If a selected participant declined to participate or didnot not meet the eligibility criteria upon verification, another participant was selected randomly from the remaining eligible population.

3.5.2 Convenience sampling method

Convenience sampling was used to recruit study participants from women of reproductive age (15–49 years) who attended antenatal care and postnatal care services at Kasanje HC III during the data collection period. Eligible women who were available at the health facility and met the inclusion criteria were approached by the researcher and invited to participate in the research study.

The researcher explained the purpose of the study, obtained informed consent and then administered the questionnaire to women who voluntarily agreed to participate. Recruitment would continue each clinic day until the required sample size was reached. Women who declined to participate or did not meet the eligibility criteria were not included in the study.Convenience sampling was appropriate for this study because it allowed the researcher to collect data from readily available participants within the limited time and resources available.

3.6 Data collection methods

This study employed a mixed-method approach, combining both quantitative and qualitative methods to obtain a comprehensive understanding of the relationship between antenatal care service utilization and maternal health outcomes

Using mixed methods allowed triangulation, enhancing the validity of findings and ensuring that both numerical trends and experiential perspectives are captured (Creswell & Plano Clark, 2018).

3.6.1. Questionnaire method

Data was collected using a structured questionnaire developed by the researcher based on the study objectives and relevant literature on antenatal care service utilization and maternal health outcomes. It was administered face-to-face by the researcher or trained research assistants to women of reproductive age (15–49 years) attending antenatal and postnatal care services at Kasanje HC III.

3.6.2. Interview method

The interview method was used to collect qualitative data from selected key informants who were knowledgeable about antenatal care service delivery and maternal health at Kasanje HC III. These included the in-charge of the maternity unit, midwives and nurses.

These interviews provide in-depth qualitative insights and contextual explanations that complement questionnaire findings (Patton, 2015).

A semi-structured interview guide was used to ensure consistency while allowing respondents to provide detailed information. The interviews focused on issues such as the knowledge and attitudes towards ANC, accessibility of ANC services, frequency and timing of ANC services, quality of ANC services received and maternal health outcomes.

The interviews were conducted face-to-face at a time and place convenient for the respondents. With the respondents' consent, the interviews were audio-recorded and detailed notes were taken to ensure that all relevant information was captured accurately. Each interview lasted approximately 20–35 minutes.

Participation was voluntary and informed consent was obtained before the interviews began. Confidentiality and anonymity was maintained throughout the study by ensuring that participants' identities were not disclosed in the research report. The information obtained from the interviews complemented the quantitative findings and provided a deeper understanding of antenatal care service utilization and maternal health outcomes at Kasanje HC III.

3.6.3. Focus Group Discussion (FGD) method

Four Focus Group Discussions (FGDs) were used to collect qualitative data to complement the information obtained through the questionnaires. The discussions provided a deeper understanding of women's experiences, perceptions and attitudes regarding antenatal care service utilization and maternal health outcomes at Kasanje HC III.

Participants were purposively selected from women of reproductive age (15–49 years) who had attended antenatal or post natal care services at Kasanje HC III and were willing to participate. Each focus group comprised of eight participants to encourage active participation and meaningful interaction. The moderator, who was the researcher guided the discussion using a semi-structured FGD guide based on the study objectives.

With participants' consent, the discussions were audio-recorded and detailed notes were also taken to ensure that all key information is captured.

Participation was voluntary and informed consent was obtained before each discussion. Confidentiality and privacy were maintained throughout the data collection process and

participants were encouraged to express their views freely without fear of discrimination or prejudice.

3.7 Data collection instruments

To effectively assess the relationship between antenatal care service utilization and maternal health outcomes, this study employed corresponding data collection instruments. Each instrument aligned with a particular research method. This was to ensure clarity, accuracy and detailed capturing of both quantitative and qualitative information.

3.7.1. Questionnaire

The primary data collection instrument for this study was a structured questionnaire. A questionnaire is a research instrument consisting of a series of carefully designed questions used to collect standardized information from respondents. It was suitable for this study because it enabled the researcher to gather data from a relatively large number of women of reproductive age (15–49 years) in a consistent, efficient and cost-effective manner.

The questionnaire was administered to women aged 15–49 years seeking maternal health services at Kasanje HC III. It consisted of closed-ended questions.

The questionnaire was divided into sections consisting; section A: socio-demographic characteristics, section B: knowledge and attitudes toward ANC, section C: accessibility of ANC services, section D:frequency and timing of ANC services,section E:Quality of ANC services received, section F:maternal health outcomes.

The questionnaire was pre-tested among a small group of women with characteristics similar to the study population at Buyege health centre III. This pre-test helped identify ambiguous or unclear questions, assess the time required to complete the questionnaire and improve its reliability and validity before actual data collection.

The use of a structured questionnaire was appropriate for this study because it provided standardized data that was easily coded, entered into statistical software and analyzed to determine the relationship between antenatal care service utilization and maternal health outcomes among women of reproductive age (15–49 years) attending Kasanje HC III in Wakiso District.

3.7.2 Interview guide

An interview guide was used as a qualitative data collection instrument to obtain in-depth information on antenatal care (ANC) service utilization and maternal health outcomes among women of reproductive age (15–49 years) at Kasanje HC III, Wakiso District. The interview guide consisted of a set of open-ended questions designed to facilitate face-to-face interviews while allowing respondents to freely express their experiences, perceptions and opinions regarding antenatal care services.

The interview guide was appropriate for this study because it enabled the researcher to explore issues that may not have been adequately captured through a structured questionnaire. It also provided an opportunity to probe for clarification, obtain detailed responses and understand the contextual factors influencing ANC service utilization and maternal health outcomes.

The interview guide targeted selected respondents, including key informants such as the in charge-ANC/maternity section, midwives,nurses involved in antenatal care services at Kasanje HC III and responses were recorded through note-taking, with audio recording used only after obtaining informed consent.

The interview guide was pre-tested with midwives from Buyege H/C III, who had characteristics similar to the study population to ensure that the questions were clear, relevant and capable of generating the required information. Feedback from the pre-test was used to refine the guide before the actual data collection.

Using an interview guide enabled the researcher to collect rich qualitative data that complemented the quantitative findings obtained through the questionnaire. This approach provided a deeper understanding of the factors influencing antenatal care service utilization and how these factors relate to maternal health outcomes among women of reproductive age (15–49 years) attending Kasanje HC III in Wakiso District.

3.7.3. FGD guide

A Focus Group Discussion (FGD) guide was used as a qualitative data collection guide to gather in-depth information from women of reproductive age (15–49 years) regarding their experiences, perceptions and opinions about antenatal care (ANC) service utilization and maternal health outcomes at Kasanje HC III in Wakiso District.The FGD checklist was used in the following ways:

Guiding the discussion: The checklist provided a structured sequence of open-ended questions and discussion prompts to ensure that all key topics related to ANC utilization and maternal health outcomes are covered while enabling particpants to freely share their opinions

Exploring experiences with ANC services: Participants were encouraged to discuss their experiences attending antenatal care, perceived benefits of ANC, knowledge of pregnancy danger signs, sources of knowledge about ANC, the timing of the first ANC visit, the number of visits attended, the quality of care received, interactions with healthcare providers and satisfaction with services.

Identifying barriers and facilitators:The checklist included prompts to explore factors influencing ANC utilization, such as distance to the health facility, transport costs, waiting time, availability of health workers, family support, financial constraints and knowledge about ANC services.

Understanding maternal health outcomes**:** Participants discussed how ANC attendance influenced their pregnancy and childbirth experiences, including prevention and management of pregnancy complications, birth preparedness, skilled delivery and postnatal health.

Capturing community perceptions:The checklist encouraged discussion on community attitudes toward antenatal care, traditional practices, decision-making within households and perceptions of the quality and accessibility of services at Kasanje HC III.

Generating recommendations:Participants were asked to suggest practical ways of improving ANC service utilization and maternal health outcomes at Kasanje HC III, providing insights that can inform policy and service improvement.

Administration of the FGD

Each FGD consisted of approximately 8 women of reproductive age (15–49 years) with similar characteristics to promote open discussion. Discussions were moderated by the researcher (or a trained research assistant) using the checklist. Each session lasted approximately 30–40 minutes and was conducted in a quiet location to ensure confidentiality.

With the consent of the participants, conversations were recorded using audio devices and thorough written observations were made to document gestures and how the group interacted.The information collected was transcribed, translated where necessary and analyzed thematically to identify recurring themes and patterns related to ANC utilization and maternal health outcomes.

Using an FGD checklist enabled the researcher to obtain rich, detailed qualitative data that complemented quantitative findings by providing a deeper understanding of the relationship between antenatal care service utilization and maternal health outcomes among women of reproductive age from Kasanje HC III.

3.8 Data quality

3.8.1 Validity

Validity refers to the ability of the research instrument to measure what it is intended to measure. Amin (2005) To ensure validity, content validity was used by the researcher. The questionnaire was reviewed by research supervisor and maternal health experts/workers at the facility, then the corrections were made based on their recommendations. Content validity index was used to compute the validity for each item in the instrument

$$\textbf{CVI} = \frac{\text{Number of items declared valid}}{\text{Total number of items in the instrument}}$$

$$= \frac{38}{48}$$

$$= 0.79$$

Note: if the CVI is 0.7 and above, the instrument can then be considered valid (Amin, 2004)

3.8.2 Reliability

Reliability refers to the ability of the research instrument to collect the same data consistency under the same conditions. (Amin, 2004). Reliability was ensured by pilot testing the research instrument using the test- re test method. A pilot test of the instruments was conducted among women attending ANC services at nearby health facility, Buyege Health Centre III in Wakiso District.

3.9 Procedure for data collection

After the successful defense of the research proposal, the researcher obtained an authorization letter from Nkumba University to officially conduct the research and collect data in the field. All data collection instruments were accompanied by a cover letter explaining the purpose of the research study, assuring respondents of confidentiality and providing the researcher's contact information for any clarifications.

On line google forms questionnaires were researcher administered to the selected participants and upon completion, each questionnaire was assigned a unique identification code to ensure proper organization and tracking. The quantitative data obtained was then entered and analyzed using SPSS version 25, enabling descriptive statistical analysis to assess the relationship between antenatal care service utilization and maternal health outcomes.

For qualitative data, the researcher transcribed the FGDs and interviews promptly after each session to preserve accuracy and context. The transcripts were carefully reviewed to ensure completeness and to correct any inconsistencies before analysis.

This approach ensured that both quantitative and qualitative data was systematically collected, accurately processed and ready for rigorous analysis, providing reliable insights of antenatal care service utilization and maternal health outcomes.

3.10 Data analysis

3.10.1 Quantitative data analysis

Data was analyzed using descriptive statistics, including frequencies, percentages, mean and standard deviations. Pearson's correlation coefficient and regression were used to determine

the relationship between antenatal care service utilization and maternal health outcomes and an interpretation of the research data provided after.

3.10.2 Qualitative data analysis

Qualitative data was analyzed using content analysis. The information was organized into thematic areas based on the study objectives and presented in narrative form reflecting the respondents' views. Conclusions and interpretations were drawn regarding the relationships between antenatal care service utilization and maternal health outcomes.

3.11 Ethical considerations

Ethical approval for this study was obtained from the Nkumba University School of Sciences (SCOS) Research Committee. In addition, administrative clearance to conduct the study was obtained from the management of Kasanje Health Centre III before the commencement of data collection.

Participation in the study was voluntary and written informed consent was obtained from all participants before their involvement. Participants were informed about the purpose of the study, the procedures involved, their right to decline participation or withdraw from the study at any time without any consequences and the measures taken to ensure confidentiality. To protect participants' privacy, no personal identifiers were collected and all information obtained was treated with strict confidentiality and used solely for research purposes. For participants below 18 years, assent and guardian consent was obtained. Data was securely stored and accessed only by the research team.

3.12 Limitations of the study

The study encountered several limitations. First, since it employed a cross-sectional study design, it collected data at a single point in time, limiting the ability to establish causal relationships between antenatal care service utilization and maternal health outcomes.

Second, the study relied on self-reported information from participants, which might have been affected by recall bias or social desirability bias.

Third, the study was conducted only at Kasanje Health Centre III in Wakiso District. Therefore, the findings may not be generalizable to women attending other health facilities or living in different geographical settings.

Finally, time and financial constraints limited the sample size and the duration of data collection, which could affect the breadth of information obtained. Despite these limitations, appropriate measures such as careful planning and supervision, using standardized data collection tools, assuring participants of confidentiality and training research assistants, were implemented to enhance the validity and reliability of the study findings.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.0 Introduction

This chapter presents the findings of the study on antenatal care service utilization and maternal health outcomes among women of reproductive age (15–49 years) attending Kasanje Health Centre III in Wakiso District. The chapter presents respondents' socio-demographic characteristics, findings according to the study objectives and analysis of the relationship between antenatal care service utilization and maternal health outcomes. Data was collected from 250 respondents and analyzed using descriptive statistics. Frequencies, percentages and pearson correlations and regression were used to summarize and interpret the findings.

4.1 Response rate

The study targeted a total of 250 respondents who included health workers and other selected participants relevant to the study objectives. Data was collected using a mixed-methods approach comprising questionnaires**,** focus group discussions (FGDs) and key informant interviews with health workers. All 250 questionnaires administered through on line google forms were successfully completed. In addition, all planned FGDs were conducted and all selected health workers participated in the interviews, resulting in an overall response rate of 100%**.**

4.2 Socio-demographic characteristics of the respondents

This section presents the general background information of the respondents who filled the questionnaires. This includes; age group, marital status, level of education,occupation and parity

Table 4.1: Socio-demographic characteristics of respondents (N = 250)

Variable	Category	Frequency (n)	Percent (%)
Age group (years)	15–19	28	11.2
	20–24	133	53.2
	25–29	45	18.0
	30–34	28	11.2
	35–39	13	5.2
	40–44	3	1.2
	45–49	0	0
	Total	**250**	**100.0**
Marital status	Single	22	8.8
	Married	200	80.0
	Cohabiting	28	11.2
	Total	**250**	**100.0**
Level of education	No formal education	3	1.2
	Primary	117	46.8
	Secondary	92	36.8
	Tertiary	28	11.2
	Vocational	10	4.0
	Total	**250**	**100.0**
Occupation	Farming	143	57.2
	Household work	16	6.4
	Business	75	30.0
	Casual labour	4	1.6
	Salaried work	11	4.4
	None	1	0.4
	Total	**250**	**100.0**
Parity (Number of children)	1	70	28.0
	2–3	108	43.2
	4–5	52	20.8
	More than 5	20	8.0
	Total	**250**	**100.0**

Source: Field data (2026)

4.2.1 Interpretation of Socio-demographic characteristics of the respondents

A total of 250 women of reproductive age (15–49 years) participated in the study.

Age group of respondents

The findings indicated that the majority of respondents were 20–24 years old (53.2%, n = 133), followed by those aged 25–29 years (18.0%, n = 45). Respondents aged 15–19 years and 30–34 years each accounted for 11.2% (n = 28) of the study population. Women aged 35–39 years constituted 5.2% (n = 13), while only 1.2% (n = 3) were aged 40–44 years.

These findings show that the study population was predominantly composed of young adult women, particularly those aged 20–24 years, who are within the peak reproductive age. This suggests that the findings on antenatal care (ANC) utilization largely reflect the experiences and maternal health outcomes of younger women, who generally account for a substantial proportion of pregnancies.

Marital status

Regarding marital status, the majority of respondents were married (80.0%, n = 200). Respondents who were cohabiting represented 11.2% (n = 28), while single women accounted for 8.8% (n = 22).

The high proportion of married women indicates that most participants were likely to have stable family support during pregnancy, which may positively influence ANC utilization and maternal health service uptake. However, unmarried and cohabiting women may experience different social and economic circumstances that could affect their access to maternal healthcare services.

Level of education

Almost half of the respondents had attained primary education (46.8%, n = 117), while 36.8% (n = 92) had completed secondary education. Respondents with tertiary education constituted 11.2% (n = 28), whereas 4.0% (n = 10) had vocational training. Only 1.2% (n = 3) reported having no formal education.

These findings indicated that the majority of women had attained at least primary education, suggesting a relatively literate study population. This had important implications because lower education levels influenced health-seeking behaviors, knowledge about safe childbirth and decision-making related to neonatal care.

Occupation

More than half of the respondents were engaged in farming (57.2%, n = 143)**,** making it the predominant occupation. This was followed by business (30.0%, n = 75) and household work (6.4%, n = 16)**.** A small proportion were involved in salaried employment (4.4%, n = 11)**,** casual labour (1.6%, n = 4)**,** while only 0.4% (n = 1) reported having no occupation.

The predominance of farming suggests that the study population largely consisted of women from rural or agrarian communities. Farming households often experience seasonal income fluctuations and geographical barriers that may influence timely access to ANC services. Women engaged in formal employment may have relatively greater financial capacity to access healthcare services than those relying on subsistence farming.

Number of children (Parity)

The largest proportion of respondents had 2–3 children (43.2%, n = 108)**.** This was followed by women with one child (28.0%, n = 70) and those with 4–5 children (20.8%, n = 52)**.** Respondents with more than five children accounted for 8.0% (n = 20)**.**

These findings indicate that most respondents had previous pregnancy experience, with over two-thirds having at least two children. Previous childbirth experience may influence ANC utilization either positively, through increased awareness of maternal healthcare services, or negatively if women perceive themselves as experienced and therefore less likely to require regular ANC attendance. Women with higher parity may also face competing family responsibilities that could limit their ability to attend the recommended number of ANC visits

4.3 Descriptive statistics

4.3.1 knowledge and attitudes towards ANC

Table 4.2: Knowledge and attitudes towards ANC among women of reproductive age (15–49) (N = 250)

Variable	Response	Frequency (n)	Percent (%)	Mean	Std. Deviation
Have you heard about antenatal care (ANC)?	Yes	250	100.0	1.00	0.000
Do you believe attending ANC is important?	Yes	248	99.2	1.01	0.089
	No	2	0.8		
What is the recommended number of ANC visits during pregnancy?	1–3	104	41.6	2.03	1.000
	4–7	52	20.8		
	8 or more	77	30.8		
	Don't know	17	6.8		
ANC helps in preventing pregnancy complications.	Neutral	2	0.8	4.83	0.399
	Agree	39	15.6		
	Strongly agree	209	83.6		
When should a pregnant woman start ANC visits?	First trimester	145	58.0	1.63	0.831
	Second trimester	56	22.4		
	Third trimester	45	18.0		
	Don’t know	4	1.6		
Attending ANC is necessary even if there are no complications.	True	238	95.2	1.05	0.214
	False	12	4.8		
Have you heard about danger signs during pregnancy?	Yes	241	96.4	1.04	0.187
	No	9	3.6		
	Average			1.80	0.40

Source: Field data (2026)

Heard about Antenatal Care (ANC)

All respondents (250, 100%) reported that they had heard about antenatal care (ANC). The mean score was 1.00 with a standard deviation (SD) of 0.000**,** indicating complete uniformity in responses, with all respondents reporting awareness of ANC. This demonstrates universal awareness of ANC among women of reproductive age in the study population and suggests that information on ANC has effectively reached the respondents through healthcare providers, community health workers, health education, mass media, or other information channels.

Belief that attending ANC is important

Nearly all respondents, 248 (99.2%), believed that attending ANC is important, while only 2 (0.8%) did not. The mean score was 1.01 (SD = 0.089)**,** indicating very little variation in responses and a highly consistent positive attitude towards the importance of ANC. The finding demonstrates that women generally recognize ANC as an essential component of pregnancy care and maternal health.

Knowledge of the recommended number of ANC visits

Regarding the recommended number of ANC visits during pregnancy, 104 (41.6%) respondents indicated that 1–3 visits were recommended, 52 (20.8%) reported 4–7 visits, 77 (30.8%) identified 8 or more visits, while 17 (6.8%) did not know. The mean response was 2.03 (SD = 1.000)**,** indicating some variation in respondents' knowledge regarding the recommended number of ANC contacts. Although awareness of ANC was universal, knowledge of the recommended number of contacts was relatively limited. Only 30.8% correctly identified 8 or more contacts, as recommended under the current WHO ANC model, while a larger proportion underestimated the required number. This highlights the need for strengthened health education on the recommended frequency of ANC attendance.

ANC helps prevent pregnancy complications

The majority of respondents, 209 (83.6%), strongly agreed that ANC helps prevent pregnancy complications, while 39 (15.6%) agreed and only 2 (0.8%) were neutral. The mean score was 4.83 (SD = 0.399)**,** indicating a very high level of agreement and minimal variation in responses. Overall, 99.2% of respondents either agreed or strongly agreed that ANC helps prevent pregnancy complications. This demonstrates a strong understanding of the preventive role of ANC in identifying risks early, promoting healthy pregnancies, and preventing or reducing potential pregnancy-related complications.

Appropriate time to begin ANC

Concerning the appropriate time to begin ANC visits, 145 (58.0%) respondents correctly identified the first trimester, while 56 (22.4%) selected the second trimester, 45 (18.0%) selected the third trimester, and 4 (1.6%) did not know. The mean score was 1.63 (SD = 0.831)**,** indicating moderate variation in responses concerning the appropriate time to initiate ANC. Although more than half of the respondents correctly identified the first trimester, a considerable proportion believed that ANC should commence during the second or third trimester. This indicates that knowledge regarding the recommended timing of ANC initiation was not universal and highlights the need for further education emphasizing early initiation of ANC.

ANC is necessary even without complications

A total of 238 (95.2%) respondents indicated that ANC is necessary even when there are no pregnancy complications, while 12 (4.8%) disagreed. The mean score was 1.05 (SD = 0.214)**,**

indicating very little variation in responses and a strong consensus among respondents. The finding demonstrates that most respondents understood that ANC is a routine and preventive component of pregnancy care and is not required only when complications arise. This reflects a generally good understanding of the importance of regular ANC for monitoring maternal and fetal wellbeing and identifying potential risks early.

Awareness of pregnancy danger signs

Most respondents, 241 (96.4%), reported that they had heard about danger signs during pregnancy, whereas 9 (3.6%) had not. The mean score was 1.04 (SD = 0.187)**,** indicating a high degree of consistency in responses and a generally high level of awareness. This finding suggests that information concerning pregnancy danger signs has reached the vast majority of women in the study population. Awareness of pregnancy danger signs is important because it can promote timely healthcare-seeking when warning symptoms occur. However, the 3.6% who had not heard about pregnancy danger signs indicates that continued maternal health education is necessary to ensure comprehensive awareness.

Qualitative Analysis: Focus Group Discussion

Table 4.3: Summary of findings from the Focus Group Discussions (FGDs) on knowledge & attitudes

Main Theme	Sub-theme	Quote from FGD Participants
Perceived Benefits of ANC	Maternal and fetal health monitoring	*"ANC helped us know whether our babies were growing well."* — FGD 2
	Early detection and management of pregnancy complications	*"Because of ANC, the blood pressure problem was detected early."* — FGD 3
	Health education and counselling	*"The nurses taught me what foods to eat during pregnancy."* — FGD 1
	Preventive interventions, including iron/folic acid, immunization and preventive medications	*"ANC helped us learn what we should do to protect ourselves and our babies during pregnancy."* — FGD participant
	Birth preparedness and delivery planning	*"ANC prepared me for childbirth and what to expect."* — FGD 1
	Knowledge and awareness of pregnancy care	*"ANC classes opened our eyes to many things we did not know."* — FGD 2
	Psychosocial support and reassurance	*"ANC gave us confidence because we knew professionals were following the pregnancy."* — FGD 1
	Reduction of pregnancy-related risks	*"Many problems can be prevented if women attend ANC early."* — FGD 4
Knowledge of Pregnancy Danger Signs	Vaginal bleeding recognized as an emergency	*"When a pregnant woman starts bleeding, she should go to the health facility immediately."* — FGD 1
	Severe headache and blurred vision	*"Severe headache and problems with vision can show that something is wrong during*

		pregnancy." — FGD participant
	Severe abdominal pain	*"Severe abdominal pain during pregnancy is a sign that a woman should seek medical attention."* — FGD participant
	Swollen feet or body swelling	*"Swelling during pregnancy can be a sign that something is not right."* — FGD participant
	Reduced fetal movement	*"If the baby stops moving, I know I must seek help quickly."* — FGD 2
	Convulsions	*"Convulsions during pregnancy are an emergency and require immediate treatment."* — FGD participant
	Persistent fever and severe weakness	*"Persistent fever and severe weakness should not be ignored during pregnancy."* — FGD participant
Sources of Knowledge about ANC	ANC health education	*"The first place we learned about danger signs was during ANC."* — FGD 3
	Health workers and midwives	*"The health workers explained the danger signs and what we should do when they occur."* — FGD participant
	Experienced mothers and family members	*"Older mothers and family members also shared their experiences with us."* — FGD participant
	Community health workers	*"Community health workers also gave us information about pregnancy care."* — FGD participant
	Radio health programmes	*"We also hear information about pregnancy and health on the radio."* — FGD participant
	Traditional birth attendants	*"Traditional birth attendants also provide advice to women about pregnancy."* — FGD participant

Source: Field data (2026)

Interpretation of the findings

The FGDs demonstrated that participants possessed a good level of knowledge regarding the benefits of antenatal care (ANC). The four discussion groups identified maternal and fetal health monitoring**,** early detection and management of pregnancy complications**,** health education and counselling**,** preventive interventions**,** birth preparedness and improved knowledge of pregnancy care as key benefits of attending ANC. Participants emphasized that ANC enabled health workers to monitor both maternal and fetal wellbeing and identify complications before they became severe. Participants from FGD 2 explained, *"ANC helped us know whether our babies were growing well,"* while respondents from FGD 3 noted, *"Because of ANC, the blood pressure problem was detected early."* Participants from FGD 1 also appreciated the health education received during ANC, with one mother stating, *"The nurses taught me what foods to eat during pregnancy,"* and another adding, *"ANC prepared me for childbirth and what to expect."*

Half of the FGDs further highlighted the psychosocial benefits of ANC, indicating that regular contact with healthcare providers increased mothers' confidence and reduced anxiety during pregnancy. As participants from FGD 1 remarked, *"ANC gave us confidence because we knew professionals were following the pregnancy."* Similarly, some participants recognized that early ANC attendance reduces pregnancy-related risks, with respondents from FGD 4 observing that *"Many problems can be prevented if women attend ANC early."*

Regarding knowledge of pregnancy danger signs, the findings showed that participants were generally aware of common obstetric emergencies, although knowledge varied across specific conditions. Vaginal bleeding was the most frequently identified danger sign, mentioned in three of the four FGDs. Participants consistently regarded it as an emergency requiring immediate medical attention, with participants from FGD 1 stating, *"When a pregnant woman starts bleeding, she should go to the health facility immediately."* Other commonly recognized danger signs included severe headache and blurred vision, severe abdominal pain, swollen feet or body swelling and reduced fetal movement. Participants from FGD 2 explained, *"If the baby stops moving, I know I must seek help quickly."* However, differing views regarding whether body swelling is always a danger sign suggest that some misconceptions remain.

The discussions also revealed that ANC health education was the primary source of knowledge**,** with all four FGDs identifying ANC clinics as the main avenue through which women learned about pregnancy care and danger signs. Participants consistently credited health workers for providing reliable information. Respondents from FGD 3 noted, *"The first place we learned about danger signs was during ANC,"* while other respodents from FGD 2 explained, *"ANC classes opened our eyes to many things we did not know."* Although family members, community health workers, radio programmes and traditional birth attendants were also mentioned as sources of information, participants generally regarded healthcare providers as the most credible source. Overall, the findings suggest that ANC services play a critical role in improving women's knowledge of pregnancy, enhancing awareness of danger signs, promoting birth preparedness and encouraging timely utilization of maternal health services.

4.3.2 Accessibility and availability of ANC services

Table 4.4: Accessibility and availability of Antenatal care services among women of reproductive age (15–49 Years) (N = 250)

Variable	Response	Frequency (n)	Percent (%)	Mean	Std. Deviation
Distance from home to ANC facility/hospital	Less than 1 km	22	8.8	2.56	0.904
	1–2 km	110	44.0		
	3–4 km	79	31.6		
	5–10 km	34	13.6		
	More than 10 km	5	2.0		
Main means of transport to ANC facility/hospital	Walking	65	26.0	2.58	1.100
	Bicycle	13	5.2		
	Motorcycle	151	60.4		
	Private car	7	2.8		
	Public means (e.g., taxi)	12	4.8		
	Water transport	2	0.8		
Availability of means of transport when needed	Yes	222	88.8	1.11	0.316
	No	28	11.2		
Time taken to reach the hospital	<15 minutes	80	32.0	2.03	0.894
	15–30 minutes	99	39.6		
	30–60 minutes	55	22.0		
	>1 hour	16	6.4		
Average waiting time at the hospital	<1 hour	58	23.2	2.26	0.957
	1–3 hours	101	40.4		
	3–5 hours	59	23.6		
	>5 hours	32	12.8		
Availability of ANC services when visiting the hospital	Yes	215	86.0	1.14	0.348
	No	35	14.0		
Costs incurred when accessing ANC services	Yes	225	90.0	1.10	0.301
	No	25	10.0		
Affordability of ANC service costs	Yes	175	70.0	1.30	0.459
	No	75	30.0		
Average across accessibility indicators	—	—	—	1.76	0.66
Total	—	250	100.0		

Source: Field data (2026)

Interpretation of accessibility and availability of antenatal care services

Distance from home to ANC facility/hospital

The findings indicate that most respondents lived relatively close to the ANC facility. The largest proportion, 110 (44.0%), lived 1–2 km from the facility, followed by 79 (31.6%) who lived 3–4 km away. A further 22 (8.8%) lived less than 1 km away, while 34 (13.6%) lived 5–10 km away and only 5 (2.0%) lived more than 10 km from the facility. The mean distance category was 2.56 (SD = 0.904)**,** indicating moderate variation in the distance respondents travelled to access ANC. Overall, the findings suggest that geographical distance was not a

major barrier for most women, although those travelling longer distances may face greater challenges in attending ANC regularly.

One respondent, a mother of two who was expecting her third child, explained, *"I can easily access antenatal care services because the health centre is located about 3 km from home."* In contrast, another FGD participant who travelled a longer distance stated, *"I move more than 5 kms each time I am to attend antenatal care. I have to limit the number of times I go to the health centre because it's a tiresome journey for me, and by the time I reach, the line is too long, which means I have to sit for around 1–2 hours before I am examined, then wait for another 1–2 hours at the lab or pharmacy."* These accounts illustrate how distance can interact with waiting time to influence women's experiences of accessing ANC.

Main means of transport to the ANC facility/hospital

Motorcycles were the predominant means of transport, used by 151 (60.4%) respondents, followed by walking at 65 (26.0%). Smaller proportions used bicycles (5.2%), public transport such as taxis (4.8%), private cars (2.8%), and water transport (0.8%). The mean for the main means of transport was 2.58 (SD = 1.100)**,** indicating relatively greater variation in the means of transport used by respondents compared with some of the other accessibility indicators. The predominance of motorcycles suggests that they provide a convenient and accessible means of reaching ANC facilities, particularly for women who live beyond walking distance and in areas where public transport may be limited.

Availability of transport when needed

Most respondents, 222 (88.8%), reported that their means of transport was readily available when needed, while 28 (11.2%) reported that transport was not readily available. The mean was 1.11 (SD = 0.316)**,** indicating little variation in responses and a high level of consistency regarding transport availability. The findings suggest that transport availability was generally favourable and did not constitute a major barrier to ANC access for most women. Nevertheless, the proportion experiencing transport challenges remains important because lack of readily available transport may contribute to delays or missed ANC appointments, particularly in emergencies.

Time taken to reach the hospital

Regarding travel time, 80 (32.0%) respondents reached the hospital in less than 15 minutes, while 99 (39.6%) required 15–30 minutes. A further 55 (22.0%) took 30–60 minutes, whereas 16 (6.4%) required more than one hour. The mean travel-time category was 2.03 (SD = 0.894)**,** indicating moderate variation in the time taken to reach the facility. Overall, 71.6% of respondents reached the hospital within 30 minutes, suggesting relatively good physical accessibility to ANC services for the majority. However, women who required more than 30 minutes, particularly those travelling for more than one hour, may experience greater transportation and time-related barriers.

Average waiting time at the hospital

Waiting time was identified as a more significant accessibility challenge. While 58 (23.2%) respondents waited less than one hour, 101 (40.4%) waited between one and three hours, 59 (23.6%) waited three to five hours, and 32 (12.8%) waited more than five hours. The mean waiting-time category was 2.26 (SD = 0.957)**,** indicating moderate variability in the amount of time women spent waiting for ANC services. Overall, 76.8% of respondents waited at least one hour, and 36.4% waited more than three hours. These findings suggest that although most women could physically reach ANC facilities, service utilization was affected by prolonged waiting times. Long waiting periods may be associated with high patient volumes, inadequate staffing, limited service points, or inefficiencies in the organization of ANC services.

The experiences reported by participants support this finding. One FGD participant explained that after travelling more than 5 km, she could spend *"around 1–2 hours before I am examined, then wait for another 1–2 hours at the lab or pharmacy."* This illustrates how the total time spent at the facility may extend considerably beyond the initial clinical consultation.

Availability of ANC services when visiting the hospital

Most respondents, 215 (86.0%), reported that ANC services were readily available when they visited the hospital, while 35 (14.0%) reported that the services were not always available. The mean was 1.14 (SD = 0.348)**,** indicating limited variation in responses and generally high availability of ANC services. The findings suggest that most facilities were able to provide

ANC services consistently, although service interruptions affected a notable minority of women.

Health workers attributed the generally high level of service availability to routine ANC clinic scheduling, the presence of trained maternal health personnel, and support from government and partner programmes. However, they acknowledged that occasional interruptions occurred because of shortages of essential medicines and supplies, laboratory reagent stock-outs, staff shortages, high patient volumes, temporary equipment breakdowns, staff being away for training, public holidays, and unexpected emergencies. These factors may explain why some women reported that ANC services were unavailable despite the overall availability of maternal healthcare services.

Costs incurred when accessing ANC services

A substantial majority of respondents, 225 (90.0%), reported incurring costs when accessing ANC services, while only 25 (10.0%) reported that they did not incur costs. The mean was 1.10 (SD = 0.301)**,** indicating very little variation in responses and showing that incurring some form of cost was common among respondents.

Although ANC consultations may be provided free of charge at public health facilities, women reported several indirect and out-of-pocket expenses, including transportation, laboratory investigations, medications, food and other necessities during prolonged visits. Respondents explained that *"while consultation services were free, they often had to pay for transport to and from the health facility, purchase drugs that were unavailable at the facility and meet the costs of recommended laboratory investigations that could not be provided free of charge."* Some women also indicated that long waiting times increased expenditure on food and other necessities.

Health workers similarly acknowledged that although ANC services were offered free of charge, stock-outs of essential medicines, reagents and laboratory supplies sometimes required clients to obtain services from private pharmacies or laboratories at their own expense. Transportation costs were also identified as an important burden, particularly for women travelling from remote or hard-to-reach communities. These findings demonstrate that the nominal availability of free ANC does not necessarily mean that accessing the complete package of ANC services is cost-free.

Affordability of costs for accessing ANC services

Regarding affordability, 175 (70.0%) respondents considered the costs associated with accessing ANC services affordable, while 75 (30.0%) considered them unaffordable. The mean was 1.30 (SD = 0.459)**,** indicating some variation in respondents' perceptions of affordability. Although the majority considered the costs manageable, nearly one-third experienced financial difficulties associated with accessing ANC.

Respondents who considered the costs affordable explained that ANC consultations at public health facilities were generally free and that indirect expenses, particularly transportation and occasional medication purchases, were manageable within their household resources. Some women also reported receiving financial support from spouses, relatives or community programmes, which helped reduce the financial burden.

In contrast, respondents who considered the costs unaffordable identified transportation expenses, long travel distances, purchasing medicines that were unavailable at the facility, and payment for laboratory investigations as major financial challenges. For women from low-income households, these expenses could contribute to delayed or missed ANC visits.

From the health workers' perspective, the core ANC services were generally accessible because they were provided free of charge under government policy. However, they acknowledged that indirect costs remained a barrier for some women, particularly those from economically disadvantaged households and remote communities. Transport expenses, medicine stock-outs requiring purchases from private pharmacies, and referrals for investigations outside the facility increased the overall cost of ANC. Health workers noted that these financial constraints could affect women's ability to adhere to the recommended ANC schedule.

Overall, the findings show that the average mean across the eight accessibility indicators was 1.76, with an average standard deviation of 0.66**.** This suggests that accessibility of ANC services was generally favourable, although important barriers remained. Most women lived within a relatively short distance of the ANC facility, had access to transport when needed, could reach the facility within 30 minutes, and reported that ANC services were generally available. However**,** long waiting times and the financial costs associated with accessing ANC services emerged as important challenges**.**

In particular, the fact that 90.0% of respondents incurred some form of cost despite the availability of free ANC consultations highlights the importance of considering indirect costs when assessing access to maternal healthcare. Similarly, the substantial proportion experiencing long waiting times indicates that physical proximity to a facility does not necessarily guarantee convenient or efficient access. Therefore, improving ANC accessibility requires not only maintaining geographical and service availability but also addressing waiting times, medicine and laboratory stock-outs, transport costs, and other indirect financial barriers that may discourage timely and regular ANC attendance.

Qualitative Analysis: Focus Group Discussions

Table 4.5: Summary of findings from the Focus Group Discussions (FGDs) on accessibility and availability of antenatal care services

Main Theme	Sub-theme (Codes)	Illustrative Quote
Distance to Health Facility	Long distance to Kasanje Health Centre III	*"Some women walk for more than an hour to reach the health centre."* — FGD participant
	Distance becomes more difficult during advanced pregnancy	*"The burden of travelling increases as pregnancy progresses."* — FGD participant
	Long travel time discourages ANC attendance	*"Some women postpone visits because the journey is too tiring."* — FGD participant
	Long distance contributes to missed ANC appointments	*"Sometimes women miss their appointments because the health centre is far."* — FGD participant
	Distance delays early ANC initiation	*"Some women delay starting ANC because of the distance they have to travel."* — FGD participant
	Women living closer attend ANC more regularly	*"Women who live near the health centre can come more regularly for ANC."* — FGD participant
	Better proximity would improve ANC attendance	*"If the health centre were closer, more women would attend regularly."* — FGD participant
Transportation and Cost Barriers	Walking as a means of transport	*"Most times they walk because they cannot afford transport every month."* — FGD 3
	Motorcycle taxis (boda-bodas)	*"Many women depend on boda-bodas when they have money for transport."* — FGD participant
	Public taxis/minibuses	*"Some women use taxis, especially when they are travelling from far."* — FGD participant
	Private/family vehicles	*"Those who have family members with vehicles can get to the health centre more easily."* — FGD participant
	Bicycle transport	*"Some women use bicycles when there is no other transport available."* — FGD participant
	Community emergency vehicles	*"Community transport can help women who need to reach the facility urgently."* — FGD participant
	Lack of transport limits ANC attendance	*"Even when they want to attend ANC, transport money is sometimes unavailable."* — FGD 4
	High transport costs	*"Transport costs make it difficult for some women to attend ANC regularly."* — FGD participant

	High transport costs despite free ANC services	*"Even when ANC is free, we still have to pay for transport."* — FGD participant
	Unpredictable transport fares	*"Sometimes the transport fare changes, and you may not have enough money."* — FGD participant
	Transport availability influences ANC attendance	*"When transport is available, it is easier for women to keep their ANC appointments."* — FGD participant
Road and Physical Accessibility Challenges	Poor road conditions	*"The roads are very poor, making it difficult to reach the health centre."* — FGD participant
	Rainy season worsens accessibility	*"During the rainy season, reaching the health centre becomes very difficult."* — FGD 2
	Seasonal flooding and muddy roads	*"The road becomes almost impassable whenever it rains."* — FGD 1
	Limited transport services in remote areas	*"In some areas, transport is difficult to find because they are far from the main road."* — FGD participant
	Physical exhaustion from walking	*"Walking for a long distance when pregnant is very tiring."* — FGD participant
	Fear of motorcycle accidents	*"Women sometimes fear using motorcycles because of accidents on the rough roads."* — FGD participant
	Discomfort riding during late pregnancy	*"Riding on a motorcycle becomes uncomfortable when the pregnancy is advanced."* — FGD participant
Emergency Transport Challenges	Lack of emergency transport	*"There is no reliable transport when a woman needs to go to the health centre urgently."* — FGD participant
	Delays during labour or emergencies	*"Reaching the health facility quickly can save both mother and baby."* — FGD participant
	Lack of transport at night	*"When labour starts at night, getting a boda-boda becomes very difficult."* — FGD 1/2
Community and Household Support	Family and community support	*"Family members can help women with transport when they need to attend ANC."* — FGD participant
	Household responsibilities compete with ANC attendance	*"Sometimes household responsibilities make it difficult for women to leave home for ANC."* — FGD participant
	Family support helps overcome distance barriers	*"When family members provide transport or money, it becomes easier to attend ANC."* — FGD participant
	Determination motivates ANC attendance despite barriers	*"Even when the journey is difficult, some women are determined to attend ANC."* — FGD participant
Perceived Effects on Maternal Health	Easy access improves maternal health outcomes	*"When women can easily reach the health centre, they are more likely to attend ANC and receive care early."* — FGD participant
	Distance affects access to emergency obstetric care	*"When there is an emergency, a long distance can delay reaching the health facility."* — FGD participant

Source: Field data (2026)

Interpretation of the findings

The focus group discussions revealed that distance and transportation barriers were the most significant challenges affecting access to antenatal care (ANC) services. All four FGDs (100%) reported that many women travel long distances to reach Kasanje Health Centre III, with participants explaining that *"Some women walk for more than an hour to reach the health centre."* Participants further noted that "*the burden of travelling increases as*

pregnancy progresses and long travel times discourage women from attending scheduled ANC visits. one participant affirmed that, *"Some women postpone visits because the journey is too tiring."* The discussions also indicated that long distances contributed to missed ANC appointments and delayed initiation of ANC, while women living closer to the health facility were perceived to attend services more consistently. Several participants believed that *"If the health centre were closer, more women would attend regularly."*

Transportation was another major determinant of accessibility. Walking, motorcycle, taxis (boda-bodas) and public taxis were identified in all four FGDs (100%) as the principal means of reaching health facilities. However, participants consistently emphasized that lack of transport and transport costs limited ANC attendance. Participants FGD 3 explained, *"Most times they walk because they cannot afford transport every month,"* while those from FGD 4 added that, *"Even when they want to attend ANC, transport money is sometimes unavailable."* Although ANC services were considered free, participants stressed that transport expenses remained a substantial barrier to regular attendance. The availability of transport was also viewed as an important factor influencing whether pregnant women could keep their ANC appointments.

The discussions further highlighted the influence of poor road infrastructure on access to maternal healthcare. Three of the four FGDs (75%) reported that poor road conditions made travel difficult, particularly for women in advanced pregnancy. Participants explained that accessibility worsened during the rainy season because roads became muddy and nearly impassable. Participants from FGD 1 remarked, *"The road becomes almost impassable whenever it rains,"* while those from FGD 2 and 4 also noted that, *"During the rainy season, reaching the health centre becomes very difficult."* Women also described the physical burden of walking long distances during pregnancy and expressed concerns about the safety and discomfort associated with travelling by motorcycle on rough roads.

Emergency transport challenges also emerged during the discussions. Half of the FGDs (50%) reported that the lack of reliable emergency transport delayed access to skilled care during labour or pregnancy-related complications. Participants from FGD 1 and 2 emphasized that "*obtaining transport at night was particularly difficult*," the respondents added that, *"When labour starts at night, getting a boda-boda becomes very difficult."* Others stressed the importance of timely transportation by noting that *"reaching the health facility quickly can save both mother and baby."*

Finally, although family and community support were mentioned as helping some women overcome transport and distance barriers, participants generally agreed that improving physical access to health facilities would enhance ANC utilization and maternal health outcomes. Overall, the findings suggest that long distances, transport costs, inadequate transport availability, poor road infrastructure and emergency transport constraints remain major barriers to accessing ANC services, underscoring the need for interventions that improve geographical and financial access to maternal healthcare services.

4.3.3 Frequency and timing of ANC services

Table 4.6: Frequency and timing of ANC visits among women of reproductive age (15–49 years) (N = 250)

Variable	Response	Frequency (n)	Percent (%)	Mean	Std. Deviation
Attendance of ANC during last pregnancy	Yes	240	96.0	1.04	0.196
	No	10	4.0		
Number of ANC visits attended	1–3 visits	142	56.8	1.55	0.699
	4–7 visits	78	31.2		
	8 or more visits	30	12.0		
Timing of first ANC visit	First trimester	115	46.0	1.76	0.794
	Second trimester	79	31.6		
	Third trimester	56	22.4		
Average across ANC utilization indicators	—	—	—	1.45	0.56

Source: Field data (2026)

Interpretation of Findings

Attendance of ANC during the last pregnancy

The findings in Table 4.6 show that ANC utilization during the last pregnancy was very high among the respondents. Out of the 250 women**,** 240 (96.0%) reported attending ANC, while only 10 (4.0%) did not attend. The variable had a mean of 1.04 and a standard deviation of 0.196, indicating very little variation in responses. This high level of attendance suggests that ANC services were widely utilized and that most women recognized the importance of

seeking antenatal care during pregnancy. However, attendance at least once does not necessarily indicate adequate or timely utilization of ANC throughout pregnancy.

Number of ANC visits attended

Although overall ANC attendance was high, the number of visits attended varied considerably among respondents. More than half, 142 (56.8%)**,** reported attending only 1–3 ANC visits**,** while 78 (31.2%) attended 4–7 visits**.** Only 30 (12.0%) reported attending 8 or more visits. The mean score was 1.55 (SD = 0.699)**,** indicating moderate variation in the number of visits attended.

These findings suggest that while most women initiated ANC at some point during pregnancy, many did not maintain frequent contact with ANC services. The fact that only 12.0% attended eight or more visits indicates a gap in continuity of ANC attendance. This may limit opportunities for repeated monitoring of maternal and fetal health, provision of preventive interventions, health education, birth preparedness and early identification of complications.

Participants attributed inadequate frequency of ANC attendance to several barriers. Some women explained that *"transport costs, competing household and work responsibilities, long waiting times at the facility and other indirect costs incurred limited their ability to attend all the recommended visits."* Others indicated that they considered a few ANC visits sufficient when the pregnancy appeared to be progressing normally. These responses suggest that both socioeconomic constraints and perceptions about the need for repeated ANC contacts influenced the frequency of service utilization.

Timing of the first ANC visit

The findings further indicate that the timing of ANC initiation varied among respondents. 115 (46.0%) women initiated ANC during the first trimester**,** 79 (31.6%) started during the second trimester, while 56 (22.4%) first attended ANC during the third trimester**.** The mean score was 1.76 (SD = 0.794**)**, demonstrating moderate variation in the timing of ANC initiation.

Although the first trimester was the most commonly reported period for the first ANC visit, fewer than half of the respondents initiated care during this period. More than half **(**54.0%**)** commenced ANC during the second or third trimester. This indicates that delayed initiation

of ANC remained a concern in the study population. Late initiation may reduce opportunities for early screening, identification of pregnancy-related risks, preventive treatment, health education, nutritional counselling and birth preparedness.

The findings therefore emphasize the importance of strengthening community-based sensitization on the benefits of early ANC initiation. Women should be encouraged to seek care as soon as pregnancy is recognized rather than waiting until symptoms or complications develop.

Overall frequency and timing of ANC utilization

Across the ANC utilization indicators, the average mean was 1.45 with a standard deviation of 0.56**.** Overall, the findings demonstrate a mixed pattern of ANC utilization. On the one hand, 96.0% (240**)** of respondents attended ANC during their last pregnancy, indicating very high initial utilization. On the other hand, the frequency and timing of attendance were less optimal, with 56.8% (142) attending only 1–3 visits and 54.0% (135) initiating ANC during the second or third trimester.

The findings therefore suggest that the principal challenge was not simply encouraging women to attend ANC, but ensuring early initiation and continued attendance throughout pregnancy**.** The mean and standard deviation values further demonstrate that responses were relatively consistent for whether women attended ANC **(**M = 1.04, SD = 0.196**),** but there was greater variation in the number and timing of visits (M = 1.55, SD = 0.699 and M = 1.76, SD = 0.794, respectively).

Overall, these results indicate the need for interventions that move beyond promoting initial ANC attendance to improving timeliness, continuity and adequacy of ANC utilization. Such interventions should address transport and financial barriers, reduce waiting times at health facilities, strengthen community sensitization, and emphasize the importance of maintaining regular ANC contacts even when pregnancy appears uncomplicated.

Qualitative Analysis: Focus Group Discussions

Table 4.7: Summary of Focus Group Discussions on frequency and timing of Antenatal Care attendance (n = 4 FGDs)

Main Theme	Sub-theme (Codes)	Illustrative Quotes
Timing of First ANC Attendance	Early ANC initiation commonly occurs around 3–5 months of pregnancy	"Most of us come when pregnancy is about three months."
	Late ANC initiation among some women	"Some women come when the pregnancies are already big."
	First-time mothers tend to initiate ANC earlier	"If it is your first baby, you come early because you are scared."
Knowledge and Awareness	Health education promotes early ANC booking	"Health education encourages early booking."
	Limited knowledge contributes to delayed ANC initiation	"If you don't know, you just stay at home until it grows."
	Younger mothers may delay ANC because of limited experience or knowledge	"Some young mothers do not know when they are supposed to start."
Socioeconomic Barriers	Financial constraints and transport costs delay ANC attendance	"Without money, you cannot rush to hospital."
	Transport costs interfere with regular ANC attendance	"Sometimes you plan to go back, but there is no transport money."
	Distance to the health facility affects attendance	"When the health centre is far, it becomes difficult to keep going back."
	Lack of partner support affects ANC attendance	"When your husband does not help with transport, it becomes difficult to go."
Psychosocial and Cultural Influences	Waiting to confirm pregnancy before booking	"Some women first wait until they are sure that they are pregnant."
	Fear of tests or judgment discourages early attendance	"Some women fear being tested or being judged at the health centre."
	Personal attitude and discipline influence ANC attendance	"Some people know they should go, but they do not make it a priority."
Completion of Recommended ANC Visits	Most women attend only a few ANC visits	"Most of us go two or three times, not all visits."
	Few women complete all recommended ANC visits	"Only few women manage to attend every visit."
	Some women attend ANC only when they feel unwell	"Some women come to ANC when they are sick, not for routine checking."
Financial and Economic Barriers	Transport costs limit completion of ANC visits	"Sometimes you plan to go back, but there is no transport money."
	Poverty limits continued ANC attendance	"When there is no money at home, ANC becomes difficult to continue."
	Lack of husband/partner financial support	"If your husband does not provide the money, you may miss the appointment."
Health System and Time-related Barriers	Long waiting times discourage return visits	"The waiting time alone can discourage you from returning."
	Missed follow-up appointments	"Sometimes you miss the date and then keep postponing the next visit."
	Work and income-generating activities interfere with ANC attendance	"When you have work to do, sometimes you choose work instead of going to ANC."
Behavioural Factors Influencing ANC Attendance	Health education encourages continued ANC attendance	"When health workers explain why you should come back, you are encouraged to continue."
	Low prioritization of ANC	"Some women do not see ANC as important when they are feeling well."
	Personal motivation and discipline	"You have to decide for yourself to keep going for ANC."

Source: Field data (2026)

Interpretation of the findings

The FGDs indicate that the timing of ANC initiation and the completion of recommended ANC visits remain suboptimal among many pregnant women. Participants consistently reported that most women begin ANC between three and five months of pregnancy**,** while late initiation between five and seven months was also common. Most of the participants explained, *"Most of us come when pregnancy is about three months,"* whereas others elaborated that, *"Some women come when the pregnancies are already big."* First-time mothers were perceived to seek ANC earlier because of anxiety and uncertainty about pregnancy, with one participant remarking, *"If it is your first baby, you come early because you are scared."*

The discussions further revealed that knowledge and awareness influence the timing of ANC attendance**.** Participants acknowledged that health education provided during ANC and community sensitization encouraged women to book early. As one participant stated, *"Health education encourages early booking."* However, limited knowledge about the importance of early ANC and misconceptions among younger mothers contributed to delayed attendance. One respondent noted, *"If you don't know, you just stay at home until it grows."*

Socioeconomic barriers emerged as one of the most important factors affecting both the timing and frequency of ANC attendance. Financial constraints, particularly transport costs, were mentioned in all FGDs as a major reason for delayed initiation and failure to complete scheduled visits. Participants explained, *"Without money, you cannot rush to hospital,"* while another added, *"Sometimes you plan to go back, but there is no transport money."* Distance to health facilities and limited financial support from partners further reduced the likelihood of timely and regular ANC attendance.

Regarding the frequency of ANC visits**,** participants reported that most pregnant women attended only two or three ANC visits**,** with relatively few completing all the recommended visits. As one participant stated, *"Most of us go two or three times, not all visits,"* while another observed, *"Only few women manage to attend every visit."* Some women reported attending ANC only when they experienced illness or pregnancy-related complications, suggesting that preventive ANC was not consistently prioritized.

The FGDs also identified health system and behavioural factors that affected continued ANC attendance. Long waiting times at health facilities, missed follow-up appointments and competing work or income-generating activities discouraged women from returning for subsequent visits. Most participants noted that *"The waiting time alone can discourage you from returning,"* while others explained that work commitments often took precedence over scheduled appointments. Although health education was recognized as encouraging continued attendance, some participants believed that personal attitudes and low prioritization of ANC also contributed to poor adherence to recommended visit schedules.

Overall, the findings suggest that financial hardship, transport costs, delayed ANC initiation, incomplete attendance, health system inefficiencies, and limited awareness collectively reduce the frequency and timeliness of ANC utilization**.** Strengthening community health education, reducing financial and transport barriers, promoting male partner involvement, and improving the efficiency of ANC services may enhance both early initiation and completion of the recommended ANC schedule.

4.3.4 Quality of ANC services received

Table 4.8: Quality of Antenatal Care services among women of reproductive age (15–49 years) (N = 250)

Variable	Response	Frequency (n)	Percent (%)	Mean	Std. Deviation
Health workers treated me with respect while attending ANC	Strongly disagree	4	1.6	4.69	0.727
	Disagree	4	1.6		
	Neutral	3	1.2		
	Agree	44	17.6		
	Strongly agree	195	78.0		
Waiting time during ANC visits was reasonable	Strongly disagree	17	6.8	4.23	1.233
	Disagree	20	8.0		
	Neutral	5	2.0		
	Agree	54	21.6		
	Strongly agree	154	61.6		
Received adequate health education during ANC visits	Yes	217	86.8	1.13	0.339
	No	33	13.2		
Health education received was satisfactory, detailed and sufficient	Strongly disagree	5	2.0	4.55	0.883
	Disagree	4	1.6		
	Neutral	24	9.6		
	Agree	33	13.2		
	Strongly agree	184	73.6		
Health worker/doctor explained	Yes	239	95.6	1.04	0.206

pregnancy danger signs	No	11	4.4		
Prescribed drugs were available at the hospital	Always	103	41.2	1.64	0.585
	Sometimes	133	53.2		
	Never	14	5.6		
Laboratory tests carried out during most recent ANC visit	Yes	245	98.0	1.02	0.140
	No	5	2.0		
Health workers treat patients with respect	Strongly disagree	3	1.2	4.66	0.786
	Disagree	9	3.6		
	Neutral	4	1.6		
	Agree	37	14.8		
	Strongly agree	197	78.8		
Health workers are friendly and approachable	Strongly disagree	3	1.2	4.61	0.830
	Disagree	11	4.4		
	Neutral	5	2.0		
	Agree	43	17.2		
	Strongly agree	188	75.2		
Comfortable discussing concerns with doctor/health workers	Strongly disagree	6	2.4	4.54	0.936
	Disagree	13	5.2		
	Neutral	3	1.2		
	Agree	46	18.4		
	Strongly agree	182	72.8		
Average across service quality indicators	—	—	—	3.21	0.67

Source: Field data (2026)

Interpretation of the Findings

Health workers treated women with respect during ANC visits

The findings demonstrate a very high level of perceived respectful treatment among women attending ANC. 195 (78.0%) respondents strongly agreed that health workers treated them with respect, while 44 (17.6%) agreed. Only 4 (1.6%) strongly disagreed, 4 (1.6%) disagreed and 3 (1.2%) were neutral. The variable recorded a mean of 4.69 (SD = 0.727)**,** indicating that responses were strongly concentrated toward positive perceptions. These findings suggest that respectful treatment was a major strength of ANC service delivery and that most women experienced positive provider–client interactions.

Waiting time during ANC visits was reasonable

Most respondents perceived the waiting time during ANC visits as reasonable. 154 (61.6%) strongly agreed and 54 (21.6%) agreed that waiting time was reasonable. However**,** 17 (6.8%)

strongly disagreed and 20 (8.0%) disagreed, while 5 (2.0%) remained neutral. The indicator had a mean of 4.23 (SD = 1.233)**.** The relatively larger standard deviation indicates greater variation in women's experiences of waiting time compared with several other service-quality indicators. Overall, waiting time was acceptable to most women, although delays remained a concern for a minority of clients.

Receipt of adequate health education during ANC visits

A large majority of respondents, 217 (86.8%)**,** reported receiving adequate health education during ANC visits, while 33 (13.2%) reported that they did not. The variable recorded a mean of 1.13 (SD = 0.339) based on the binary coding used in the analysis. The findings demonstrate that ANC provided an important platform for delivering maternal health information to most women. Nevertheless, the proportion who did not receive adequate health education indicates a need to ensure that health education is provided consistently to all ANC clients.

Satisfaction with the health education received

The quality and adequacy of health education were also positively rated. 184 (73.6%) respondents strongly agreed that the health education received was satisfactory, detailed and sufficient, while 33 (13.2%) agreed. 24 (9.6%) were neutral, 4 (1.6%) disagreed and 5 (2.0%) strongly disagreed. The variable had a mean of 4.55 (SD = 0.883)**.** These findings indicate a high level of satisfaction with the content and adequacy of health education provided during ANC, although the neutral and negative responses suggest that improvements in the consistency and depth of health education may still be required.

Explanation of pregnancy danger signs by health workers

Almost all respondents reported receiving information about pregnancy danger signs. Specifically, 239 (95.6%) indicated that a health worker or doctor had explained the danger signs to them, while 11 (4.4%) reported that they had not received such information. The indicator recorded a mean of 1.04 (SD = 0.206) based on the binary coding. The very small standard deviation indicates that responses were highly concentrated around the reported outcome. This finding demonstrates that health workers were largely providing essential

information on danger signs such as bleeding, high blood pressure and infection, which is important for promoting timely care-seeking when complications arise.

Availability of prescribed drugs at the hospital

The availability of prescribed medicines was less consistent than other components of ANC quality. Only 103 (41.2%) respondents reported that prescribed drugs were always available, while 133 (53.2%) indicated that drugs were sometimes available and 14 (5.6%) reported that they were never available. The variable had a mean of 1.64 (SD = 0.585)**.** These findings suggest that intermittent availability of prescribed medicines was an important weakness in ANC service provision. Occasional medicine shortages may require women to purchase medicines elsewhere, potentially increasing the financial burden associated with accessing ANC services.

Laboratory tests conducted during the most recent ANC visit

Laboratory testing was widely available among the respondents**.** 245 (98.0%) women reported undergoing laboratory tests during their most recent ANC visit, while only 5 (2.0%) reported that they had not. The indicator recorded a mean of 1.02 (SD = 0.140) based on the binary coding. The very small standard deviation reflects the strong concentration of responses around the reported outcome. The findings indicate that laboratory investigations constituted a well-established component of ANC services among the women surveyed.

Health workers treated patients with respect

The second measure of respectful care similarly revealed very positive perceptions. 197 (78.8%) respondents strongly agreed that health workers treated patients with respect, while 37 (14.8%) agreed. 4 (1.6%) were neutral, 9 (3.6%) disagreed and 3 (1.2%) strongly disagreed. The variable recorded a mean of 4.66 (SD = 0.786)**.** These results reinforce the finding that respectful treatment was a strong feature of ANC service delivery and that most women viewed interactions with health workers positively.

Health workers were friendly and approachable

Most respondents perceived health workers as friendly and approachable. 188 (75.2%) strongly agreed and 43 (17.2%) agreed with this statement. In comparison, 11 (4.4%)

disagreed**,** 3 (1.2%) strongly disagreed and 5 (2.0%) were neutral. The mean score was 4.61 (SD = 0.830)**.** These findings suggest that the interpersonal environment within ANC services was generally supportive and welcoming. Friendly and approachable health workers may also facilitate greater trust and make women more willing to communicate their health concerns.

Comfort discussing concerns with doctors and health workers

The findings indicate that most women felt comfortable discussing their concerns with healthcare providers. 182 (72.8%) respondents strongly agreed and 46 (18.4%) agreed that they felt comfortable discussing their concerns. Meanwhile, 13 (5.2%) disagreed, 6 (2.4%) strongly disagreed and 3 (1.2%) were neutral. The indicator had a mean of 4.54 (SD = 0.936)**.** Although the mean indicates generally strong agreement, the relatively larger standard deviation shows some variation in women's experiences. Overall, the findings suggest that most women considered ANC providers sufficiently approachable to facilitate open communication about pregnancy-related concerns.

Overall quality of ANC services

Across the service-quality indicators, the average mean was 3.21 (SD = 0.67)**.** Overall, the findings indicate that women generally perceived the quality of ANC services positively. The strongest aspects were respectful treatment of women (M = 4.69, SD = 0.727)**,** respectful treatment of patients (M = 4.66, SD = 0.786)**,** friendliness and approachability of health workers (M = 4.61, SD = 0.830), and comfort discussing concerns with healthcare providers (M = 4.54, SD = 0.936). Health education was also favourably rated, with 86.8% (217) reporting that they received adequate health education and 73.6% (184) strongly agreeing that the education was satisfactory, detailed and sufficient **(**M = 4.55, SD = 0.883**).**

The technical components of ANC were also generally well provided. Nearly all respondents, 95.6% (239)**,** reported receiving explanations about pregnancy danger signs **(**M = 1.04, SD = 0.206), while 98.0% (245) underwent laboratory tests during their most recent ANC visit (M **=** 1.02, SD = 0.140). However, medicine availability and waiting time emerged as areas requiring greater attention. Only 41.2% (103) reported that prescribed medicines were always available, while 53.2% (133) reported that medicines were only sometimes available (M **=** 1.64, SD = 0.585). Similarly, although 83.2% (208) either agreed or strongly agreed that

waiting time was reasonable, 14.8% (37) disagreed or strongly disagreed, with a relatively high standard deviation of 1.233**.**

Taken together, the overall mean of 3.21 (SD = 0.67) suggests generally favourable perceptions of ANC service quality. The findings particularly highlight the importance of respectful provider behaviour, effective communication, health education, laboratory services and supportive provider–client relationships**.** At the same time, strengthening the consistent availability of prescribed medicines and reducing variability in waiting times could further improve women's experiences of ANC services.

From the health workers' perspective, respectful, friendly and approachable care was considered an essential component of quality ANC. They explained that treating pregnant women with dignity, maintaining confidentiality and communicating politely helps build trust and encourages continued ANC attendance. Health workers further noted that creating a supportive environment enables women to openly discuss pregnancy-related concerns, facilitating early identification of complications, appropriate counselling and improved maternal and fetal health outcomes.

Qualitative Analysis: Focus Group Discussions

Table 4.9: Summary of Focus Group Discussions on Quality of Antenatal Care (ANC) services (n = 4 FGDs)

Main theme	Sub-theme (codes)	Illustrative quote
Availability of laboratory tests	HIV testing routinely conducted	*"HIV test is done for everyone."*
	Blood tests, including haemoglobin and blood grouping, commonly performed	*"They take blood almost every visit."*
	Urine testing routinely performed	*"They also check our urine when we come for ANC."*
	Some essential tests unavailable or referred elsewhere	*"Some tests are done here, others you are sent outside."*
Quality and efficiency of laboratory services	Long waiting time for laboratory tests and results	*"We spend the whole day waiting for results."*
	Delayed results requiring return visits	*"Sometimes they tell you to return another day for the results."*
	Equipment or machine breakdowns affecting services	*"When the machine is not working, you have to wait or go somewhere*

		else."
Women's satisfaction with laboratory services	Dissatisfaction due to delays and unavailable tests	*"We know the tests, but the service is slow."*
	Satisfaction because essential tests are provided	*"At least the important tests are done when we come for ANC."*
	Mixed perceptions regarding improvement in laboratory services	*"Things have improved, but not all women get all the tests on time."*
Positive health worker attitudes and behaviours	Respectful and kind treatment of pregnant women	*"When the nurse talks to you politely, you feel comfortable coming back."*
	Health workers provide useful ANC information and education	*"They teach us many things that help us protect our babies."*
	Health workers are supportive and approachable	*"You can ask the health worker questions when you do not understand something."*
Influence of health worker attitudes on ANC attendance	Respectful care encourages return visits and completion of ANC	*"Respectful care encourages women to complete all ANC visits."*
	Positive interactions increase confidence and trust	*"When they treat us well and explain things clearly, we trust them more."*
	Negative experiences discourage ANC attendance	*"Some mothers stop coming because they fear being embarrassed."*
Challenges affecting health worker interactions	Workload and high patient numbers affect provider behaviour	*"Sometimes they are overwhelmed by many patients and become impatient."*
	Occasional rude or unfriendly responses	*"Sometimes the health workers speak harshly when they are tired."*
	Strict communication interpreted differently by mothers	*"Sometimes they speak firmly because they want mothers to follow the advice, but some women feel offended."*
Role of health workers in promoting ANC utilization	Encouragement motivates continued ANC attendance	*"I attended all my visits because the midwife encouraged me and answered my questions."*
	Good treatment promotes positive recommendations among women	*"When women are treated well, they tell other mothers to come for ANC."*

Source: Field data (2026)

Interpretation of Findings

The findings indicate that the quality of antenatal care (ANC) services was shaped by both the availability of essential laboratory investigations and the attitudes and practices of health workers. Participants reported that HIV testing, blood investigations such as haemoglobin and blood grouping, and urine testing were routinely provided during ANC visits. This suggests that important diagnostic services were generally integrated into maternal healthcare. One participant explained, *"HIV test is done for everyone,"* while another noted, *"They take blood almost every visit."* However, participants also reported that some essential investigations were not always available at the health facility, requiring women to seek services elsewhere. As one participant stated, *"Some tests are done here, others you are sent outside."*

Participants further highlighted challenges concerning the efficiency of laboratory services. Prolonged waiting times for laboratory tests and results were frequently mentioned as a major concern. Some women reported spending considerable time at the facility while waiting for results, while others were required to return on another day when results were delayed. Participants described situations where they *"spent the whole day waiting for results"* or had to *"return another day for results."* Equipment or machine breakdowns were also identified as factors that disrupted the timely provision of laboratory services. These challenges suggest that although laboratory investigations were generally available, delays reduced the efficiency and convenience of ANC service delivery.

Satisfaction with laboratory services was therefore mixed. Some participants appreciated the availability of essential investigations and considered the services useful, while others expressed dissatisfaction because of delays and the unavailability of certain tests. Participants acknowledged that laboratory services had improved but noted that not all women were able to obtain all required investigations promptly. One participant remarked, *"We know the tests, but service is slow,"* while another observed, *"Not all women get all tests on time."* These experiences indicate that improving the timeliness, reliability and completeness of laboratory services could enhance women's overall satisfaction with ANC.

Beyond laboratory services, participants emphasized that health worker attitudes and interpersonal relationships were important components of ANC quality. Respectful and kind treatment of pregnant women was repeatedly highlighted, alongside the provision of useful

health information and education and the availability of supportive and approachable health workers. Women explained that respectful communication made them feel comfortable and encouraged them to return for subsequent ANC visits. Participants from FGD 4 stated, *"When the nurse talks to you politely, you feel comfortable coming back,"* while participants from FGD 3 noted, *"They teach us many things that help us protect our babies."* These accounts demonstrate that respectful communication and effective health education contributed to positive experiences of ANC.

The discussions further demonstrated that health worker attitudes influenced women's willingness to continue attending ANC. Participants associated respectful care with increased motivation to return for scheduled visits and complete ANC. Positive interactions were perceived to strengthen women's confidence and trust in healthcare providers, whereas negative experiences could discourage continued attendance. Participants reported that *"Respectful care encourages women to complete all ANC visits,"* and emphasized that clear communication from health workers strengthened their confidence in managing pregnancy and seeking appropriate care.

Participants also identified challenges affecting interactions between women and health workers. High workloads and large numbers of patients were perceived to sometimes affect the behaviour of health workers, resulting in impatience or less friendly interactions. Some women also reported occasional rude or unfriendly responses. Participants explained, *"Sometimes they are overwhelmed by many patients and become impatient,"* while others noted that *"Some mothers stop coming because they fear being embarrassed."* These experiences suggest that staffing levels, workload management and continued emphasis on respectful maternity care are important for maintaining positive provider-client relationships.

The supportive role of health workers in promoting ANC utilization was also emphasized. Encouragement from health workers was reported to motivate women to continue attending ANC, while positive treatment encouraged women to recommend the facility to other pregnant women. One participant explained, *"I attended all my visits because the midwife encouraged me and answered my questions."* This illustrates how supportive communication, counselling and responsiveness to women's concerns can reinforce continued engagement with ANC services.

Overall, the findings demonstrate that the perceived quality of ANC services depended on both the technical and interpersonal dimensions of care. While essential laboratory investigations were generally available, delays, incomplete availability of some tests and equipment-related challenges affected women's experiences. At the same time, respectful, friendly, supportive and informative interactions with health workers enhanced women's confidence and willingness to continue attending ANC. Strengthening laboratory capacity, reducing waiting times, ensuring consistent availability of diagnostic services, managing health worker workloads and promoting respectful communication would therefore contribute to improved quality, satisfaction and continued utilization of ANC services.

4.3.5: Maternal health outcomes among women of reproductive age

Table 4.10: Maternal health outcomes among women of reproductive age (15–49 Years) (N = 250)

Variable	Response	Frequency (n)	Percent (%)	Mean	Std. Deviation
Experienced complications during pregnancy	Yes	143	57.2	1.43	0.496
	No	107	42.8		
Experienced illness after delivery	Yes	116	46.4	1.54	0.500
	No	134	53.6		
Accessed timely care during labour and delivery	Yes	222	88.8	1.11	0.316
	No	28	11.2		
Had a safe delivery	Yes	229	91.6	1.08	0.278
	No	21	8.4		
ANC attendance reduced risks of serious health problems during pregnancy	Disagree	1	0.4	4.78	0.467
	Neutral	3	1.2		
	Agree	45	18.0		
	Strongly agree	201	80.4		
Outcome of last pregnancy	Live birth	234	93.6	1.20	0.826
	Preterm birth	3	1.2		
	Low birth weight	2	0.8		
	Stillbirth	1	0.4		
	Miscarriage	10	4.0		
Birth weight of baby in last pregnancy	Don't know	12	4.8	3.11	1.008
	<2.5 kg	60	24.0		
	2.5–3.0 kg	84	33.6		
	3.1–4.0 kg	76	30.4		
	>4 kg	18	7.2		
Baby born preterm (<37 weeks)	Yes	23	9.2	1.91	0.290
	No	227	90.8		
Experienced life-threatening condition during pregnancy or delivery	Yes	118	47.2	1.53	0.500
	No	132	52.8		

Referred to another facility for emergency care	Yes	56	22.4	1.91	0.595
	No	160	64.0		
	Not applicable	34	13.6		
Average across maternal and pregnancy outcome indicators	—	—	—	2.26	0.53

Source: Field data (2026)

Interpretation of the findings

Experienced complications during pregnancy

More than half of the respondents, 143 (57.2%)**,** reported experiencing complications during pregnancy, while 107 (42.8%) did not. The variable had a mean of 1.43 and standard deviation of 0.496, based on the numerical coding used in the analysis. This indicates a considerable burden of pregnancy-related complications among the women surveyed and highlights the importance of regular ANC monitoring, early identification of risk factors and timely management of complications.

Experienced illness after delivery

Of the 250 respondents, 116 (46.4%) reported experiencing an illness after delivery, whereas 134 (53.6%) did not. The mean was 1.54 with a standard deviation of 0.500. Although more than half of the women reported no postpartum illness, the proportion experiencing illness remains substantial, emphasizing the importance of continued maternal health care and monitoring during the postnatal period.

Accessed timely care during labour and delivery

The majority of respondents, 222 (88.8%)**,** reported accessing timely care during labour and delivery, compared with 28 (11.2%) who did not. The indicator recorded a mean of 1.11 and standard deviation of 0.316, indicating relatively low variability in responses. These findings suggest that most women were able to obtain care in a timely manner during childbirth, although a minority experienced delays that could increase the risk of adverse maternal and neonatal outcomes.

Had a safe delivery

A large majority of respondents, 229 (91.6%)**,** reported having a safe delivery, while 21 (8.4%) reported that their delivery was not safe. The variable had a mean of 1.08 and standard deviation of 0.278. The high proportion of safe deliveries and relatively small standard deviation indicate that responses were strongly concentrated around the positive outcome. Overall, the findings suggest generally favourable delivery outcomes among the respondents.

ANC attendance reduced risks of serious health problems during pregnancy

Respondents demonstrated strong confidence in the protective value of ANC. Only 1 (0.4%) disagreed that ANC attendance reduced the risk of serious health problems, while 3 (1.2%) were neutral. In contrast, 45 (18.0%) agreed and 201 (80.4%) strongly agreed. The indicator had a mean of 4.78 and standard deviation of 0.467, representing the highest mean among the maternal health outcome indicators. This finding demonstrates a strong perception among women that ANC contributes to the prevention and reduction of serious pregnancy-related health problems through screening, monitoring, health education and early intervention.

Outcome of the last pregnancy

The predominant outcome of the last pregnancy was a live birth, reported by 234 (93.6%) respondents. Other reported outcomes included miscarriage among 10 (4.0%)**,** preterm birth among 3 (1.2%)**,** low birth weight among 2 (0.8%), and stillbirth among 1 (0.4%)**.** The variable had a mean of 1.20 and standard deviation of 0.826. These findings indicate generally favourable pregnancy outcomes, as most women reported live births. However, the occurrence of miscarriage, preterm birth, low birth weight and stillbirth demonstrates that adverse maternal and neonatal outcomes remained present among a proportion of respondents.

Birth weight of the baby from the last pregnancy

Regarding birth weight, 12 (4.8%) respondents did not know the birth weight of their baby. A total of 60 (24.0%) reported a birth weight below 2.5 kg, 84 (33.6%) reported 2.5–3.0 kg, 76 (30.4%) reported 3.1–4.0 kg, and 18 (7.2%) reported a birth weight above 4 kg. The variable recorded a mean of 3.11 and standard deviation of 1.008. The findings show considerable

variation in birth weight, with most babies falling within the 2.5–4.0 kg ranges. However, the proportion weighing below 2.5 kg is notable and suggests that low birth weight remains an important maternal and neonatal health concern.

Baby born preterm (<37 weeks)

Most respondents, 227 (90.8%)**,** reported that their babies were not born preterm, while 23 (9.2%) reported a birth before 37 weeks of gestation. The variable had a mean of 1.91 and standard deviation of 0.290. The findings indicate that most pregnancies resulted in term births, although the occurrence of preterm delivery among some respondents highlights the continued need for early ANC, regular pregnancy monitoring and prompt management of maternal and obstetric risk factors.

Experienced a life-threatening condition during pregnancy or delivery

Nearly half of the respondents, 118 (47.2%)**,** reported experiencing a life-threatening condition during pregnancy or delivery, while 132 (52.8%) did not. The indicator recorded a mean of 1.53 and standard deviation of 0.500. The findings reveal a substantial occurrence of serious maternal health conditions and underscore the importance of early detection, appropriate clinical management and timely referral of women experiencing pregnancy or delivery complications.

Referred to another facility for emergency care

Regarding emergency referral, 56 (22.4%) respondents reported being referred to another health facility, while 160 (64.0%) were not referred. A further 34 (13.6%) indicated that referral was not applicable. The variable had a mean of 1.91 and standard deviation of 0.595. The findings demonstrate that referral services were necessary for a notable proportion of women who required emergency or higher-level care. This highlights the importance of maintaining an effective referral system capable of ensuring rapid transfer and appropriate management of obstetric emergencies.

Overall maternal health outcomes

Across the maternal and pregnancy outcome indicators, the average mean was 2.26 with a standard deviation of 0.53. Overall, the findings present a combination of favourable and

concerning maternal health outcomes. Positive outcomes were reflected in the high proportions of women who accessed timely care during labour and delivery (222; 88.8%**),** reported safe deliveries (229; 91.6%**),** and had live births (234; 93.6%**).** Similarly, the strong perception that ANC reduced serious pregnancy-related health risks was demonstrated by the high proportion who agreed or strongly agreed (246; 98.4%**)** and the high mean score of 4.78 (SD = 0.467)**.**

Nevertheless, important maternal and neonatal health challenges remained. Pregnancy complications were reported by 143 (57.2%) women, postpartum illness by 116 (46.4%)**,** and life-threatening conditions during pregnancy or delivery by 118 (47.2%)**.** Furthermore, 60 (24.0%) babies had birth weights below 2.5 kg, while 23 (9.2%) were born preterm. Emergency referral was required by 56 (22.4%) respondents. These findings suggest that, despite generally favourable delivery and pregnancy outcomes, a substantial proportion of women continued to experience complications requiring strengthened prevention, monitoring and emergency response.

From the health workers' perspective, the pregnancy complications, postpartum illnesses and life-threatening conditions reported by some women were mainly associated with late initiation of ANC, incomplete attendance of recommended ANC contacts, pre-existing medical conditions, delays in seeking care and socioeconomic barriers. Health workers explained that *"timely access to skilled care during labour, regular monitoring throughout pregnancy and prompt management of complications contributed to the high proportion of safe deliveries, live births, and full-term pregnancies."*

Health workers further noted that *"ANC services, including health education, routine screening, early detection of risk factors, nutritional counselling, preventive treatments and timely referrals, played a vital role in reducing pregnancy-related risks and improving maternal and neonatal outcomes."* They also acknowledged that *"referrals to higher-level facilities were necessary for women with obstetric emergencies or complications requiring specialized care."* According to the health workers, adverse outcomes such as low birth weight, preterm birth, miscarriage and stillbirth may be associated with maternal illnesses, obstetric complications, inadequate ANC utilization and delayed access to emergency obstetric services.

Overall, the findings demonstrate the important contribution of ANC to maternal and neonatal health outcomes, as reflected by the high proportion of timely care, safe deliveries and live births, together with the very high mean score for the perceived risk-reduction benefits of ANC. However, the occurrence of pregnancy complications, postpartum illnesses, life-threatening conditions, low birth weight, preterm births and emergency referrals indicates the continued need to strengthen early ANC initiation, continuity of attendance, risk screening, health education, timely management of complications and emergency referral systems**.**

4.4 Correlations

4.4.1 Objective one: To determine the relationship between knowledge and attitudes towards ANC and maternal health outcomes.

The correlation analysis examined the relationship between women's knowledge of antenatal care (ANC) (Knowledge_Score) and maternal health outcomes.

Correlations

		Knowledge_Score	Maternal_Health_Outcomes
Knowledge_Score	Pearson Correlation	1	.307**
	Sig. (2-tailed)		.000
	N	250	250
Maternal_Health_Outcomes	Pearson Correlation	.307**	1
	Sig. (2-tailed)	.000	
	N	250	250

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation

The results indicate a positive correlation between knowledge of ANC and maternal health outcomes **(**r = 0.307**).**

The positive correlation means that women with higher levels of knowledge about ANC tended to experience better maternal health outcomes. The strength of the relationship is weak to moderate**,** suggesting that improved knowledge is associated with improved outcomes, although knowledge alone does not fully determine maternal health status.

The relationship is statistically significant ($p = 0.000$, $p < 0.01$)**,** indicating that the observed relationship is unlikely to have occurred by chance. Therefore, there is sufficient evidence to conclude that knowledge of ANC is significantly associated with maternal health outcomes among the respondents.

4.4.2 Objective 2: To examine the relationship between accessibility of ANC services and maternal health outcomes.

The correlation analysis examined the relationship between accessibility of antenatal care (ANC) services (Accessibility_Score) and maternal health outcomes among women of reproductive age.

Correlations

		Accessibility_Score	Maternal_Health_Outcomes
Accessibility_Score	Pearson Correlation	1	.338**
	Sig. (2-tailed)		.000
	N	250	250
Maternal_Health_Outcomes	Pearson Correlation	.338**	1
	Sig. (2-tailed)	.000	
	N	250	250

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation

The results show a positive correlation between accessibility of ANC services and maternal health outcomes ($r = 0.338$**).**

The positive correlation indicates that women who experienced better accessibility to ANC services tended to have better maternal health outcomes. The correlation strength is moderate, suggesting that improvements in access to ANC services are associated with improvements in maternal health outcomes, although accessibility alone does not fully determine maternal outcomes.

The relationship is statistically significant ($p = 0.000$, $p < 0.01$)**,** meaning that the observed association is unlikely to have occurred by chance. Therefore, there is sufficient statistical

evidence to conclude that accessibility of ANC services is significantly related to maternal health outcomes.

4.4.3 Objective 3: To assess the relationship between frequency and timing of ANC services and maternal health outcomes.

The correlation analysis examined the relationship between the frequency of ANC visits (Frequency_Score) and maternal health outcomes among women of reproductive age.

Correlations

		Frequency_Score	Maternal_Health_Outcomes
Frequency_Score	Pearson Correlation	1	.376**
	Sig. (2-tailed)		.000
	N	250	250
Maternal_Health_Outcomes	Pearson Correlation	.376**	1
	Sig. (2-tailed)	.000	
	N	250	250

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation

The results show a positive correlation between frequency of ANC attendance and maternal health outcomes **(**r = 0.376**).**

The positive correlation indicates that women who had higher ANC visit frequency tended to have better maternal health outcomes. The strength of the relationship is moderate**,** suggesting that increased attendance at ANC visits is associated with improvements in maternal health outcomes, although frequency of ANC visits alone does not completely determine outcomes.

The relationship is statistically significant (p = 0.000, p < 0.01)**,** meaning that the observed association is unlikely to have occurred by chance. Therefore, there is sufficient evidence to conclude that the frequency of ANC visits has a significant relationship with maternal health outcomes.

4.4.4 Objective 4: To study the relationship between quality of ANC services received and maternal health outcomes.

The correlation analysis examined the relationship between quality of ANC services (Quality_Score) and maternal health outcomes among women of reproductive age.

Correlations

		Quality_Score	Maternal_Health_Outcomes
Quality_Score	Pearson Correlation	1	.234**
	Sig. (2-tailed)		.000
	N	250	250
Maternal_Health_Outcomes	Pearson Correlation	.234**	1
	Sig. (2-tailed)	.000	
	N	250	250

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation

The results show that there was a positive correlation between quality of ANC services and maternal health outcomes ($r = 0.234$, $p < 0.01$). This indicates that improvements in the quality of antenatal care services are associated with improvements in maternal health outcomes. However, the strength of the relationship was weak, meaning that while better-quality ANC services tend to correspond with better maternal health outcomes, the relationship is not strong enough to suggest that ANC quality alone determines maternal health outcomes.

The significance value ($p = 0.000$) is less than the conventional significance level of 0.01, indicating that the observed relationship is statistically significant. Therefore, the relationship between ANC service quality and maternal health outcomes is unlikely to have occurred by chance.

Based on these findings, the null hypothesis stating that there is no significant relationship between quality of ANC services and maternal health outcomes is rejected. The study concludes that there is a statistically significant positive relationship between the quality of ANC services and maternal health outcomes among the respondents.

The weak correlation coefficient (r = 0.234) may imply that other factors beyond ANC service quality, such as maternal age, socioeconomic status, health-seeking behaviour, nutritional status, availability of emergency obstetric care and underlying health conditions, may also influence maternal health outcom. Therefore, improving ANC quality remains important but should be complemented by broader maternal healthcare interventions.

4.5 Regression analysis

Interpretation of regression analysis: Predictors of maternal health outcomes

A multiple linear regression analysis was conducted to examine how knowledge of ANC (Knowledge_Score), accessibility of ANC services (Accessibility_Score), frequency of ANC visits (Frequency_Score) and quality of ANC services (Quality_Score) predict maternal health outcomes among women of reproductive age (15–49 years).

The dependent variable was maternal health outcomes**,** while the independent variables were the four ANC-related factors

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.446[a]	.199	.186	.19197

a. Predictors: (Constant), Quality_Score, Frequency_Score, Accessibility_Score, Knowledge_Score

The model summary indicates a moderate positive relationship **(**R = 0.446**)** between the combined ANC-related predictors (knowledge, accessibility, frequency of ANC visits and quality of ANC services) and maternal health outcomes, suggesting that improvements in these ANC factors are generally associated with better maternal outcomes. The model explains 19.9% of the variation in maternal health outcomes (R^2 = 0.199**)**, meaning that the four predictors collectively contribute to explaining differences in maternal health outcomes, while the remaining 80.1% is influenced by other factors not included in the model, such as maternal characteristics, socioeconomic conditions, nutrition, previous pregnancy experiences, health-seeking behavior and availability of emergency obstetric services. After adjusting for the number of predictors, the model explains 18.6% of the variance (Adjusted R^2 = 0.186)**,** indicating that the model has a meaningful but limited explanatory capacity. The standard error of the estimate (0.19197) shows that the predicted maternal health outcome

scores are relatively close to the observed values, although some variability remains unexplained by the model. Overall, the findings demonstrate that ANC-related factors significantly contribute to maternal health outcomes but additional biological, social, economic and healthcare factors also play an important role.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.247	4	.562	15.244	.000[b]
	Residual	9.029	245	.037		
	Total	11.276	249			

a. Dependent Variable: Maternal_Health_Outcomes

b. Predictors: (Constant), Quality_Score, Frequency_Score, Accessibility_Score, Knowledge_Score

The ANOVA results show that the regression model is statistically significant **(**F = 15.244, p = 0.000**),** indicating that the combined predictors; knowledge of ANC, accessibility of ANC services, frequency of ANC visits and quality of ANC services significantly predict maternal health outcomes. This means that the model provides a better explanation of maternal health outcomes than a model without these predictors, confirming that ANC-related factors collectively influence maternal health outcomes among women of reproductive age.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.697	.223		7.614	.000
	Knowledge_Score	.073	.082	.066	.887	.376
	Accessibility_Score	.108	.037	.210	2.917	.004
	Frequency_Score	.179	.048	.265	3.753	.000
	Quality_Score	.018	.038	.035	.481	.631

a. Dependent Variable: Maternal_Health_Outcomes

Overall Interpretation

The regression results indicate that accessibility of ANC services and frequency of ANC attendance significantly predict maternal health outcomes, while knowledge of ANC services

and perceived quality of ANC services do not significantly predict maternal health outcomes in this model.

The regression equation can be expressed as: Maternal Health Outcomes = 1.697 + 0.073(Knowledge Score) + 0.108(Accessibility Score) + 0.179 (Frequency Score) + 0.018(Quality Score)

Interpretation of individual predictors

The knowledge score had a positive but statistically insignificant effect on maternal health outcomes **(**B = 0.073, β = 0.066, p = 0.376**).** This suggests that although increased maternal knowledge about ANC may be associated with slight improvements in health outcomes, the effect was not strong enough to be considered statistically meaningful. Therefore, knowledge alone may not directly influence maternal health outcomes without other supporting factors such as access to care and utilization of services.

Accessibility of ANC services had a positive and statistically significant effect on maternal health outcomes **(**B = 0.108, β = 0.210, p = 0.004**).** This means that a one-unit increase in accessibility to ANC services is associated with a 0.108-unit improvement in maternal health outcomes**,** holding other factors constant. The finding suggests that easier access to ANC services, including availability of services, reduced barriers and proximity to health facilities, contributes positively to maternal health.

Frequency of ANC attendance was the strongest predictor among the variables included in the model **(**B = 0.179, β = 0.265, p < 0.001**).** This indicates that women who attend ANC services more frequently are likely to experience better maternal health outcomes. A one-unit increase in ANC attendance frequency is associated with a 0.179-unit increase in maternal health outcomes**,** assuming other factors remain constant.

The quality of ANC services showed a very small positive effect but was statistically insignificant **(**B = 0.018, β = 0.035, p = 0.631**).** This implies that, within this study model, perceived quality of ANC services did not significantly explain variations in maternal health outcomes. Although quality remains an important aspect of healthcare delivery, its influence may depend on other factors such as service utilization, availability of resources and continuity of care.

In conclusion, the regression findings demonstrate that frequency of ANC attendance and accessibility of ANC services are significant positive predictors of maternal health outcomes. Among these, frequency of ANC attendance has the greatest influence. Conversely, although knowledge and quality of ANC services have positive regression coefficients, their effects are not statistically significant **(**$p > 0.05$**).** Therefore, the study suggests that improving access to ANC services and encouraging regular ANC attendance may have a greater impact on maternal health outcomes than focusing solely on increasing knowledge or perceived service quality.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the discussion, conclusions and recommendations arising from the study titled "Antenatal care service utilization and maternal health outcomes among women of reproductive age (15–49 years) in Uganda." The findings are discussed according to the study objectives, with comparison to existing empirical evidence and theoretical expectations. The chapter highlights areas where the findings agree or differ from previous studies and identifies the new knowledge generated regarding the relationship between ANC utilization and maternal health outcomes. The chapter concludes with recommendations for policy, practice and future research.

5.1 Discussion of findings

5.1.1 Objective One: To determine the relationship between knowledge and attitudes towards ANC and maternal health outcomes.

The findings of this study indicated that women of reproductive age in the study area possess generally high levels of knowledge and positive attitudes towards antenatal care (ANC). Quantitative results revealed universal awareness of ANC (100%), with almost all respondents (99.2%) acknowledging the importance of attending ANC during pregnancy. In addition, 95.2% agreed that ANC is necessary even in the absence of pregnancy complications, while 96.4% had heard about pregnancy danger signs. However, despite this high level of awareness, only 30.8% correctly identified the current World Health Organization (WHO) recommendation of at least eight ANC contacts and only 58.0% correctly identified the first trimester as the appropriate time to initiate ANC. These findings were reinforced by the focus group discussions (FGDs), where participants demonstrated a good understanding of the benefits of ANC, including maternal and fetal monitoring, early detection of complications, health education, preventive interventions and birth preparedness. Participants also identified ANC clinics and healthcare providers as their principal sources of maternal health information.

The findings are consistent with Bhutada et al. (2024), who reported that knowledge of ANC significantly influences maternal healthcare utilization, particularly early initiation of care and completion of the recommended number of visits. Similar to the present study, Bhutada et al. found that women who understood the benefits of ANC and recognized pregnancy danger signs were more likely to appreciate the importance of maternal healthcare services. The qualitative findings strongly support this relationship, participants from FGD 2 explained, *"ANC helped us know whether our babies were growing well,"* while one respondent from FGD 3 clearly noted*"Because of ANC, my blood pressure problem was detected early."* These responses demonstrate that women perceive ANC as an essential preventive intervention rather than merely a treatment service, confirming the observations of Bhutada et al. (2024).

The findings further agree with Amwonya et al. (2022), who argued that health education enhances women's autonomy, decision-making capacity and understanding of preventive maternal healthcare. The FGDs revealed that ANC itself serves as the primary source of maternal health information with all discussion groups identifying ANC clinics as the main avenue through which women learn about pregnancy care and danger signs. Participants consistently acknowledged the role of healthcare providers in delivering reliable information. Respondents from FGD 3 noted, *"The first place we learned about danger signs was during ANC,"* while other respodents from FGD 2 explained *"ANC classes opened our eyes to many things we did not know."* These findings affirm the central role of health education in empowering women to make informed decisions regarding pregnancy care.

The findings are also consistent with the World Health Organization (WHO, 2022), which identifies health education during ANC as an essential strategy for improving maternal knowledge and promoting informed decision-making. The overwhelming majority of respondents (99.2%) believed that ANC is important, while 83.6% strongly agreed that ANC helps prevent pregnancy complications. Similarly, qualitative findings showed that women valued ANC for monitoring pregnancy, preventing complications, preparing for childbirth, and receiving nutritional counselling. Participants further indicated that ANC provided reassurance and increased confidence during pregnancy. Participants from FGD 1 stated, *"ANC gave us confidence because we knew professionals were following the pregnancy,"* illustrating the psychosocial benefits emphasized by the WHO (2022).

The study also supports evidence from the Uganda Demographic and Health Survey (UDHS, 2022) and Tumwizere et al. (2024), which reported that misconceptions and inadequate knowledge contribute to delayed initiation of ANC despite widespread awareness of maternal health services. In the present study, although 58.0% correctly identified the first trimester as the recommended time for initiating ANC, a considerable proportion believed ANC should begin during the second (22.4%) or third trimester (18.0%). These findings indicate that misconceptions regarding the timing of ANC initiation remain prevalent. This supports the observations of the UDHS (2022) that delayed initiation of ANC is partly attributable to incomplete knowledge of recommended maternal healthcare practices.

The findings further align with studies examining knowledge of pregnancy danger signs. Bhutada et al. (2024) observed that women who recognize obstetric danger signs are more likely to seek skilled maternal healthcare promptly. Similarly, the present study found that 96.4% of respondents had heard about pregnancy danger signs, while FGD participants correctly identified vaginal bleeding, severe headache, blurred vision, abdominal pain, reduced fetal movement, and body swelling as conditions requiring immediate medical attention. Participants from FGD 1 emphasized, *"When a pregnant woman starts bleeding, she should go to the health facility immediately,"*while participants from FGD 2 explained, *"If the baby stops moving, I know I must seek help quickly."* These findings suggest that maternal health education programmes have successfully improved awareness of obstetric emergencies within the study community.

The findings also provide partial support for Afulani et al. (2017), who argued that women's attitudes towards ANC are influenced by perceptions of healthcare providers, fear of mistreatment, partner support and previous healthcare experiences. In contrast to the negative attitudes reported by Afulani et al., the present study revealed overwhelmingly positive perceptions of ANC services. Women consistently expressed confidence in ANC and healthcare providers, emphasizing the benefits of counselling, reassurance, and professional monitoring. This difference may suggest improvements in the quality of maternal healthcare services, increased community trust in healthcare providers, or the effectiveness of maternal health promotion programmes within the study area.

An important new insight emerging from this study is the distinction between general awareness and comprehensive knowledge. Although awareness of ANC was universal and attitudes toward ANC were overwhelmingly positive, detailed knowledge of WHO

recommendations regarding the number of ANC contacts and the appropriate timing of ANC initiation remained incomplete. This finding suggests that existing maternal health programmes have been highly successful in promoting awareness and positive attitudes but have been less effective in communicating specific clinical recommendations. Future health education interventions should therefore place greater emphasis on translating general awareness into detailed understanding of recommended ANC schedules.

Another important contribution of this study is the identification of ANC clinics themselves as the primary source of maternal health knowledge. While previous studies have emphasized education, media campaigns, and community awareness (Amwonya et al., 2022; WHO, 2022), the present findings demonstrate that women acquire much of their maternal health knowledge after attending ANC rather than before initiating care. This suggests that community-based education strategies should be strengthened to ensure that women receive accurate information before pregnancy or during early pregnancy, thereby encouraging timely initiation of ANC.

Overall, the findings confirm existing empirical evidence that knowledge and positive attitudes are fundamental determinants of maternal healthcare utilization (Amwonya et al., 2022; Bhutada et al., 2024; Okello et al., 2022; WHO, 2022). However, the study also contributes new evidence by demonstrating that high awareness and favourable attitudes do not necessarily correspond with complete knowledge of recommended ANC guidelines. These findings underscore the need for maternal health programmes to move beyond awareness creation and focus on improving women's understanding of the timing, frequency, and preventive objectives of ANC in order to achieve optimal maternal and neonatal health outcomes.

5.1.2 Objective Two: To examine the relationship between accessibility of ANC services and maternal health outcomes.

The study examined the accessibility and availability of antenatal care (ANC) services among women of reproductive age. Overall, the findings indicate that while geographical access and service availability were relatively good for most respondents, important barriers related to transportation costs, waiting time, poor road infrastructure and emergency transport continue to hinder optimal ANC utilization. The quantitative and qualitative findings are largely

consistent with existing literature, while also providing context-specific insights into the realities experienced by women in peri-urban Uganda.

The study found that most respondents (75.6%) lived within four kilometres of an ANC facility and 71.6% reached the health facility within 30 minutes. These findings suggest relatively good geographical accessibility to ANC services. This is consistent with Andersen's (1995) Behavioral Model of Health Services Use, which identifies physical accessibility as an important enabling factor influencing healthcare utilization. Similarly, the World Health Organization (WHO, 2016) emphasizes that reducing geographical barriers improves maternal healthcare utilization and contributes to better pregnancy outcomes.

Transportation emerged as another important determinant of accessibility. Quantitative findings showed that motorcycles (60.4%) were the dominant means of transport, while 26.0% of respondents walked to health facilities. Additionally, 88.8% reported that transport was generally available when needed. Nevertheless, the qualitative findings demonstrated that transport costs remained a significant obstacle despite the availability of transport services. Participants from FGD 3 explained, *"Most times they walk because they cannot afford transport every month."* while those from FGD 4 added that, *"Even when they want to attend ANC, transport money is sometimes unavailable."*

These findings strongly support those of Lateef et al. (2024), who reported that financial constraints associated with transportation remain among the leading barriers to ANC utilization in Uganda even where maternal services are officially free. Similarly, the UDHS (2022) reported that approximately one-third of Ugandan women identify transport costs and distance as major obstacles to accessing maternal healthcare. The current study therefore reinforces existing evidence that financial accessibility extends beyond user fees and includes indirect costs such as transport, meals, and time away from household responsibilities.

The study further found that although 90.0% of respondents incurred costs while accessing ANC services, 70.0% considered these costs affordable. This finding extends current literature by suggesting that affordability is relative rather than absolute. While most women perceived the costs as manageable, almost one-third still regarded them as unaffordable, indicating socioeconomic disparities in access to maternal healthcare. Andersen (1995) argues that financial resources determine an individual's ability to translate healthcare needs into actual service utilization. Similarly, Atuhaire et al. (2023) observed that women from

wealthier households are significantly more likely to access comprehensive maternal healthcare than those from poorer households. The present study therefore confirms that indirect costs continue to disproportionately affect economically disadvantaged women.

Another important finding concerned waiting time at health facilities. Although ANC services were available for most respondents (86.0%), 40.4% waited between one and three hours, while another 36.4% waited more than three hours before receiving services. Long waiting times were echoed during the FGDs, where women described spending several hours moving between consultation rooms, laboratories, and pharmacies. One participant observed:*"By the time I reach, the line is too long, which means I have to sit for around one to two hours before I am examined, then wait for another one to two hours at the lab or pharmacy."*

This finding aligns with WHO (2016), which emphasizes that availability of services should encompass not only the existence of facilities but also adequate staffing, equipment and efficient service delivery. Although previous studies have mainly focused on geographical access (Lateef et al., 2024; UDHS, 2022), the present study highlights prolonged waiting time as an equally important barrier that may discourage regular ANC attendance despite physical proximity to health facilities. This represents an important contextual contribution to the literature.

Poor road infrastructure also emerged as a major accessibility challenge during the FGDs. Participants explained that muddy roads, seasonal flooding and poor road conditions made travelling particularly difficult during the rainy season. Women also reported discomfort and fear associated with riding motorcycles during advanced pregnancy. These findings are consistent with Atuhaire et al. (2023), who identified inadequate road infrastructure as a significant barrier to maternal healthcare utilization in peri-urban districts of Uganda. The current study further demonstrates that infrastructure challenges interact with transportation barriers, increasing travel time and physical exhaustion among pregnant women.

The study additionally identified emergency transportation as an overlooked aspect of accessibility. Participants reported difficulty obtaining transport during labour, particularly at night, delaying timely access to emergency obstetric care. Participants from FGD 1 and 2 emphasized that: *"When labour starts at night, getting a boda-boda becomes very difficult."*

This finding expands current literature, which primarily focuses on routine ANC attendance (Lateef et al., 2024; UDHS, 2022), by demonstrating that transportation challenges also compromise emergency maternal healthcare. The findings therefore suggest that improving emergency referral and transport systems should form part of broader maternal health interventions.

Another important insight generated by this study concerns the role of family and community support. Although mentioned less frequently, participants explained that support from spouses and family members often helped overcome transport and financial barriers to ANC attendance. This finding complements Andersen's (1995) Behavioral Model by illustrating that social support functions as an enabling factor that facilitates healthcare utilization. While previous studies have largely emphasized structural barriers (Atuhaire et al., 2023; Lateef et al., 2024), the current study suggests that household-level support mechanisms may mitigate some accessibility challenges.

Overall, the findings are highly consistent with previous empirical studies demonstrating that accessibility remains a multidimensional determinant of ANC utilization. The study confirms evidence from the UDHS (2022), Lateef et al. (2024), Atuhaire et al. (2023), WHO (2016), and Andersen (1995) that geographical distance, transportation, financial costs and health system factors significantly influence access to maternal healthcare.

5.1.3 Objective Three: To assess the relationship between frequency and timing of ANC services and maternal health outcomes.

The study examined the frequency and timing of antenatal care (ANC) utilization among women of reproductive age in Kasanje, Wakiso District. Overall, the findings indicate that while ANC attendance during pregnancy was remarkably high, the frequency of visits and timely initiation of ANC remained below the recommendations of the World Health Organization (WHO). Both the quantitative and qualitative findings are largely consistent with existing literature, while providing additional context-specific insights into the barriers that hinder optimal ANC utilization.

The study found that almost all respondents (96.0%) attended ANC during their last pregnancy, demonstrating a high level of acceptance and utilization of maternal healthcare services. This finding is consistent with the Uganda Demographic and Health Survey (UDHS,

2022), which reports increasing awareness and utilization of ANC services among Ugandan women. It also supports the assertion by Atuhaire et al. (2020) that ANC has become an integral entry point into the continuum of maternal healthcare, encouraging subsequent use of skilled delivery and postnatal care services. The high ANC attendance observed in this study further reflects the success of government and community maternal health promotion programmes aimed at increasing women's contact with health services during pregnancy.

However, despite the high proportion of women attending ANC at least once, the frequency of visits was considerably below the WHO recommendation of eight ANC contacts. More than half of the respondents (56.8%) attended only one to three visits, 31.2% attended four to seven visits and only 12.0% completed the recommended eight or more contacts. These findings are consistent with WHO (2016), which acknowledges that many low and middle income countries continue to struggle with implementation of the eight-contact ANC model despite adopting the revised guidelines.Further emphasizing that attending fewer than the recommended contacts reduces opportunities for fetal monitoring, early detection of pregnancy complications, nutritional counselling, immunization and preventive interventions such as iron supplementation and malaria prevention. WHO (2016)

The qualitative findings provide important explanations for the low completion of ANC visits. Across all four focus group discussions, participants reported that most women attended only two or three ANC visits, while relatively few completed the recommended schedule. Most of the participants explained: *"Most of us go two or three times, not all visits."* and added: *"Only few women manage to attend every visit."*late initiation between five and seven months was also common. Most of the participants explained, *"Most of us come when pregnancy is about three months,"* whereas others elaborated that, *"Some women come when the pregnancies are already big(late stages of pregnancy."* First-time mothers were perceived to seek ANC earlier because of anxiety and uncertainty about pregnancy, with one participant remarking, *"If it is your first baby, you come early because you are scared."*

These findings extend current literature by illustrating that incomplete ANC attendance is largely driven by practical barriers rather than unwillingness to utilize services. Financial constraints, transport costs, long waiting times, work responsibilities and competing household obligations were repeatedly cited as reasons why women discontinued ANC after the initial visits.

Regarding the timing of ANC initiation, the study found that only 46.0% of respondents began ANC during the first trimester, while more than half initiated care during the second (31.6%) or third trimester (22.4%). Although this indicates that early ANC initiation remains suboptimal, the findings compare favourably with national statistics. The UDHS (2022) reports that only about 29% of Ugandan women initiate ANC during the first trimester, with the majority beginning during the second trimester. Thus, the current study suggests relatively better early ANC uptake in Kasanje compared to the national average, although it still falls short of WHO recommendations that all pregnant women should begin ANC within the first trimester (WHO, 2016).

The study further found that knowledge and health education positively influenced the timing of ANC attendance. Participants acknowledged that health education received from healthcare workers encouraged women to initiate ANC earlier. As one participant explained: *"Health education encourages early booking."*Conversely, women with limited knowledge delayed seeking care. One respondent noted: *"If you don't know, you just stay at home until it grows."*

These findings are consistent with Bhutada et al. (2024), who reported that women's knowledge significantly influences both early ANC initiation and continued attendance throughout pregnancy. The findings also reinforce WHO (2016), which identifies health education during ANC as an essential strategy for promoting informed decision-making and improving maternal healthcare utilization.

Socioeconomic barriers emerged as one of the strongest determinants of both the timing and frequency of ANC attendance. Financial constraints, particularly transport costs, were identified in all focus groups as major barriers to completing recommended ANC visits. participants explained: *"Without money, you cannot rush to hospital."* while another added, *"Sometimes you plan to go back, but there is no transport money."*

These findings strongly support Bhutada et al. (2024) and the UDHS (2022), both of which identify poverty and transport costs as leading causes of delayed ANC initiation and inadequate attendance in Uganda. Although ANC services may be officially free, the study demonstrates that indirect costs continue to prevent women from utilizing services consistently. Financial accessibility extends beyond user fees to include transport expenses and opportunity costs associated with attending health facilities.

The study also identified male partner support as an important determinant of ANC utilization. Participants explained that limited financial support from husbands often delayed ANC attendance or prevented women from completing scheduled visits. Although male involvement has not been emphasized in much of the cited literature, this finding complements emerging evidence that partner support significantly influences maternal healthcare utilization by improving women's financial capacity, decision-making and emotional support during pregnancy.

Health system factors also influenced ANC attendance. Participants reported that long waiting times discouraged return visits, while missed appointments and competing work commitments reduced adherence to recommended schedules. Most participants noted that: *"The waiting time alone can discourage you from returning."*

This finding extends WHO (2016), which emphasizes that improving ANC utilization requires not only increasing service availability but also improving service quality and efficiency. The present study demonstrates that organizational barriers within health facilities may discourage continued attendance even among women who recognize the benefits of ANC.

Behavioral factors further emerged as contributors to inadequate ANC utilization. Participants explained that some women attended ANC only when they experienced illness or pregnancy-related complications, indicating that ANC was sometimes viewed as curative rather than preventive. Others attributed missed appointments to personal attitudes and low prioritization of maternal healthcare. These findings support Bhutada et al. (2024), who observed that misconceptions regarding the purpose of ANC continue to delay utilization in many low-resource settings.

Overall, the findings are largely consistent with previous empirical studies demonstrating that although ANC attendance is generally high, timely initiation and completion of the recommended schedule remain inadequate (WHO, 2016; UDHS, 2022; Bhutada et al., 2024; Adedokun & Yaya, 2020; Muwema et al., 2022).

5.1.4 Objective Four: To study the relationship between quality of ANC services received and maternal health outcomes.

The findings demonstrate that respondents generally perceived the quality of antenatal care (ANC) services positively. Most women reported respectful treatment by health workers, satisfactory health education, effective communication regarding pregnancy danger signs, and access to routine laboratory investigations. However, important service delivery challenges remained, particularly intermittent shortages of essential medicines and delays associated with laboratory services and waiting times. Overall, these findings are largely consistent with existing literature while providing additional contextual insights into the dimensions of ANC quality that most strongly influence women's experiences and continued utilization of maternal health services.

The study found that respectful maternity care was one of the strongest aspects of ANC service delivery. Nearly all respondents agreed that health workers treated them respectfully (96.0%), while similar proportions described health workers as friendly, approachable and supportive during ANC visits. These quantitative findings were reinforced by the focus group discussions (FGDs), where respectful treatment emerged as the most dominant qualitative theme. Women consistently explained that respectful communication, kindness and supportive interactions encouraged them to return for subsequent ANC visits and increased their confidence in the health system.

These findings are consistent with previous studies demonstrating that respectful provider-client relationships are fundamental determinants of maternal healthcare utilization. Afulani et al. (2017) reported that respectful maternity care significantly increases women's satisfaction with ANC services, improves trust in healthcare providers and promotes continued attendance throughout pregnancy. Similarly, Towongo et al. (2024) observed that Ugandan women who experience respectful, patient-centered care are more likely to complete recommended ANC schedules and subsequently utilize postnatal and child health services.

The findings further revealed that health education during ANC was highly satisfactory. Most respondents (86.8%) reported receiving adequate health education, while an equal proportion expressed satisfaction with the comprehensiveness of the information provided. In addition, 95.6% indicated that healthcare providers explained pregnancy danger signs during ANC visits. Qualitative findings corroborated these results, with participants consistently identifying health education as one of the greatest benefits of ANC attendance. Women

reported learning about nutrition, pregnancy monitoring, birth preparedness and danger signs, enabling them to make informed decisions throughout pregnancy.

These findings support the World Health Organization's (WHO, 2016; WHO, 2022) recommendation that health education should be an integral component of quality ANC because it empowers women to recognize complications early, adopt healthy pregnancy behaviours and seek timely care. Likewise, Okello et al. (2022) found that comprehensive counselling significantly improves maternal knowledge and encourages continued utilization of ANC services. The current findings therefore reinforce the importance of educational interventions within ANC programs. An important additional insight emerging from this study is that women perceived health education not merely as the transfer of information but also as an important source of reassurance, confidence and emotional support during pregnancy, emphasizing the psychosocial value of ANC counselling.

Another important finding was the widespread availability of routine laboratory investigations. Almost all respondents (98.0%) reported receiving laboratory tests during their most recent ANC visit, while FGDs confirmed that HIV testing, haemoglobin estimation, blood grouping and urine testing were routinely performed. These findings indicate relatively good compliance with recommended ANC screening guidelines and suggest that the health facility possesses adequate technical capacity to provide essential diagnostic services.

These findings align with WHO (2016) recommendations emphasizing routine laboratory investigations as an essential component of quality ANC. They are also consistent with Muhirwe and Aagard (2023), who argued that access to diagnostic services improves early identification and management of pregnancy complications, thereby enhancing maternal and neonatal outcomes. However, despite the high availability of laboratory testing, qualitative findings revealed significant concerns regarding prolonged waiting times, delayed release of results and occasional equipment breakdowns. These observations generate new insights beyond existing literature by illustrating that availability alone does not necessarily translate into efficient service delivery. Women valued laboratory services but expressed dissatisfaction with delays, indicating that improving operational efficiency is equally important as expanding diagnostic capacity.

The study also examined the availability of prescribed medicines during ANC. Although essential medicines were available for many women, only 41.2% reported that drugs were always available, while more than half (53.2%) indicated that medicines were sometimes not available. This suggests intermittent stock-outs of essential medications despite generally good service provision.

These findings are consistent with previous Ugandan studies indicating that shortages of medicines and medical supplies remain major barriers to quality maternal healthcare (Muhirwe & Aagard, 2023; Okello et al., 2022). Existing literature demonstrates that inadequate supplies reduce women's confidence in public health facilities and may discourage continued ANC utilization (Afulani et al., 2017). The current study therefore confirms that strengthening supply chain systems remains an important priority for improving ANC quality. However, an important contextual contribution of this study is that women generally remained satisfied with ANC despite intermittent medicine shortages, suggesting that positive interactions with healthcare providers may partially offset structural deficiencies in service delivery.

Regarding waiting time, the quantitative findings indicated that most respondents considered waiting times reasonable, although a notable minority experienced delays. Conversely, qualitative findings revealed that prolonged waiting for laboratory services and delayed test results were among the most frequently reported challenges. Some women reported spending the entire day at the health facility or returning on another day to obtain results.

This finding partially agrees with existing literature. Previous studies have shown that prolonged waiting times discourage women from attending subsequent ANC visits and reduce overall satisfaction with maternal healthcare services (Afulani et al., 2017; Towongo et al., 2024). The mixed findings observed in the current study suggest that although overall satisfaction with waiting time remains high, laboratory-specific delays continue to affect women's experiences. This provides an understanding that women distinguish between general clinic waiting times and delays associated with specific service components such as laboratory testing.

The qualitative findings further highlighted that heavy workloads and high patient volumes sometimes affected health worker behaviour. Although most women described providers positively, some participants reported occasional rude responses, impatience and reduced

communication during periods of high workload. Participants generally attributed these behaviours to staffing shortages rather than intentional disrespect.

These findings are consistent with Muhirwe and Aagard (2023), who observed that inadequate staffing and excessive workloads frequently compromise provider-client interactions despite healthcare workers' professional commitment. Similarly, Afulani et al. (2017) found that health worker burnout contributes to diminished interpersonal quality of care. The present study extends this literature by demonstrating that women themselves recognize workload pressures as an underlying cause of occasional negative interactions, suggesting that improving staffing levels may simultaneously enhance provider wellbeing and patient satisfaction.

Overall, the findings indicate that both structural quality (availability of laboratory services and medicines) and process quality (respectful care, communication, counselling and patient-provider relationships) jointly influence women's experiences of ANC. This observation strongly supports Donabedian's quality of care framework, which emphasizes that optimal health outcomes depend on both adequate health system resources and effective provider-client interactions (Muhirwe & Aagard, 2023). The findings further support Andersen's Behavioral Model, which posits that enabling health system factors influence healthcare utilization by shaping individuals' experiences and satisfaction with services (Andersen, 1995).

5.2 New knowledge generated from the study

This study generated several important insights that extend existing knowledge on antenatal care (ANC) utilization among women of reproductive age in Kasanje Town Council, Wakiso District, Uganda.

First, although awareness and positive attitudes towards ANC were almost universal, this knowledge did not translate into adequate utilization of ANC services. While all respondents had heard about ANC and almost all believed it was important, only a minority correctly identified the current World Health Organization (WHO) recommendation of at least eight ANC contacts, and only 12% completed the recommended number of visits. This demonstrates that general awareness alone is insufficient to ensure optimal ANC utilization. Instead, women require specific knowledge regarding the recommended timing and frequency of ANC attendance. This finding contributes new evidence that improving the

quality of maternal health education should emphasize practical information on ANC schedules rather than simply promoting ANC attendance.

Second, the study demonstrated that physical accessibility alone does not guarantee optimal utilization of ANC services. Although most women lived within relatively short distances of health facilities, had transport available, and reached facilities within 30 minutes, many still initiated ANC late and attended fewer than the recommended visits. The qualitative findings revealed that transport costs, long waiting times, indirect expenses, and competing household responsibilities remained significant barriers. This finding extends Andersen's Behavioral Model by illustrating that geographical accessibility must be complemented by financial accessibility and efficient service delivery before improvements in utilization can be realized.

Third, the study established that interpersonal quality of care has a stronger influence on continued ANC utilization than structural quality alone. Women consistently emphasized respectful treatment, supportive communication, and health education as the main reasons for returning for subsequent ANC visits, even when medicines were occasionally unavailable or laboratory services were delayed. This suggests that respectful maternity care can partially compensate for structural deficiencies within health facilities. The study therefore provides new evidence that strengthening provider-client relationships may be one of the most cost-effective strategies for improving ANC completion.

Fourth, the findings demonstrated that ANC utilization is influenced by multiple interacting factors rather than a single determinant. Women's knowledge, accessibility, affordability, quality of care, partner support, health system efficiency, and personal motivation collectively influenced both early initiation and completion of ANC visits. This confirms that interventions aimed at improving maternal health should adopt a comprehensive rather than a single-factor approach.

Finally, the study generated contextual evidence specific to Kasanje Town Council showing that despite relatively good availability of ANC services, utilization remains constrained by health system inefficiencies, indirect costs, delayed initiation and incomplete attendance. This local evidence provides policymakers with context-specific information for designing targeted maternal health interventions.

5.3 Conclusion

The study concludes that ANC utilization is significantly associated with maternal health outcomes among women of reproductive age in Uganda. Although knowledge and attitudes towards ANC were high, gaps remained in early ANC initiation and completion of recommended ANC contacts.

The study identified frequency of ANC visits as the strongest predictor of maternal health outcomes, followed by accessibility of ANC services. Women who attended ANC more frequently and experienced fewer barriers to accessing care were more likely to report favourable pregnancy outcomes. Although quality of ANC services was positively perceived, it did not independently predict maternal outcomes in this study.

Overall, the findings indicate that improving maternal health outcomes requires a comprehensive approach that increases ANC attendance, reduces financial and geographical barriers, strengthens health facility capacity and ensures consistent delivery of respectful and effective maternal healthcare services.

5.4 Limitations of the study

The study adopted a cross-sectional research design, whereby data was collected at a single point in time. Although the correlation and regression analyses demonstrated statistically significant relationships between ANC service utilisation and maternal health outcomes, the study design did not allow an assessment of changes or effects over an extended period. Longitudinal studies would therefore be more appropriate for examining the nature of this relationship over time.

The study predominantly relied on self-reported questionnaire data, which may have been subject to respondents' individual perceptions and ability to remember. Consequently, some participants may have underreported or overreported their experiences with ANC services. To mitigate this limitation, respondents were assured of the confidentiality and anonymity of the information provided, thereby encouraging accurate and honest responses.

The study was conducted exclusively at Kasanje Health Centre III within the specified study period. The characteristics and circumstances of this health facility may differ from those of other health centres, which may limit the applicability of the findings to other settings.

Therefore, caution should be exercised when generalising the study findings and conclusions beyond Kasanje Health Centre III

5.5 Recommendations

The following recommedndations were proposed based on the research study findings.

Ministry of Health and policymakers

The government should improve accessibility of ANC services by expanding maternal health services closer to communities, particularly in rural and underserved areas and the Ministry of Health should strengthen implementation of the WHO recommended eight ANC contacts by integrating ANC follow-up systems into existing maternal health programs.

Policies should address financial barriers associated with ANC attendance, including transport costs and other indirect expenses that limit service utilization.

Health facilities should be supported with adequate medicines, laboratory supplies and skilled healthcare providers to improve the effectiveness of ANC services.

Health facilities and healthcare providers

Health workers should encourage women to initiate ANC during the first trimester and complete the recommended number of visits.They should continue promoting respectful maternity care, effective communication and comprehensive health education.

Health facilities should strengthen systems for identifying and managing high-risk pregnancies through timely screening, referral and emergency preparedness.

Availability of essential medicines and supplies should be improved to ensure that women receive complete ANC services during each visit.

Community health programs

Education on the importance of early ANC initiation and completion of recommended ANC contacts should be intensified.

Male partners and community leaders should be engaged to promote supportive environments for maternal healthcare utilization. Community interventions should address barriers affecting ANC attendance, including transport challenges and lack of family support.

5.6 Areas for further research

The following areas for further research were proposed based on the research study findings and limitations.

A longitudinal study should be conducted to examine whether improvements in knowledge about the WHO eight-contact ANC model lead to increased completion of recommended ANC visits over time.

Future studies should investigate the influence of male partner involvement on early ANC initiation and completion of recommended visits, since qualitative findings indicated that partner support significantly affects ANC utilization.

Thirdly, further research should examine health workers' perspectives regarding the challenges affecting quality of ANC services, including workload, staffing shortages, medicine availability and laboratory service delays.

Qualitative studies should explore why women who possess adequate knowledge of ANC recommendations still delay initiation or fail to complete recommended visits despite positive attitudes toward maternal healthcare.

Finally, future studies should assess the cost-effectiveness of community outreach ANC services, transport voucher programmes and mobile maternal health clinics in improving ANC utilization among rural and peri-urban populations.

These recommendations and proposed research areas provide a practical framework for improving ANC utilization while contributing to the achievement of Uganda's maternal health goals and the Sustainable Development Goal 3 target of reducing maternal and neonatal morbidity and mortality.

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APPENDICES

APPENDIX I: Informed consent form

Title of study:Antenatal Care Service Utilization and Maternal Health Outcomes among women of reproductive age (15–49) at Kasanje Health Centre III, Wakiso district

You are invited to participate in this study. The purpose of this research is to assess antenatal care utilization and maternal health outcomes among women at Kasanje Health Centre III.

Your participation is voluntary. The information you provide will be kept confidential and used only for academic purposes.

If you agree to participate, please sign below.

Participant Signature: _____

Date: _____

Researcher Signature : _____

Date: _____

APPENDIX II: Assent form for participants aged 15–17 years

Study Title

Antenatal Care Service Utilization and Maternal Health Outcomes Among Women of Reproductive Age (15–49 Years) at Kasanje Health Centre III, Wakiso District

Information for Participants

Hello,

My name is Lily Batebe. I am conducting a research study about antenatal care services and maternal health among women of reproductive age attending Kasanje Health Centre III.

You are being invited to take part in this study because you meet the requirements for participation.

What will happen if you participate?

You will answer questions about antenatal care and maternal health. The interview will take about 20–30 minutes. You may refuse to answer any question you do not want to answer.

Are there any risks?

There are no major risks. Some questions may make you feel uncomfortable when remembering past experiences. If this happens, you may stop the interview at any time.

Are there any benefits?

You may not receive a direct benefit. However, your responses may help improve maternal healthcare services for women and girls in the future.

Will my information be kept private?

Yes.Your name will not appear on the questionnaire. Information you provide will be kept confidential. Only the research team will have access to the information.

Do I have to participate?

No.Participation is your choice. You can decide not to participate. You can stop participating at any time. Your decision will not affect the healthcare services you receive.

Assent Statement

I have read (or had read to me) the information above. I understand what the study is about and what I will be asked to do. I know that participation is voluntary and I can stop at any time. I agree to participate in this study.

Participant Name: _____

Signature/Thumbprint: _____

Date: _____

Researcher's Signature: _____

Date: _____

Witness Statement (if participant cannot read or write)

I confirm that the information in this assent form has been accurately explained to the participant and that she has voluntarily agreed to participate.

Witness Name: _____

Signature: _____

Date: _____

APPENDIX III: Data collection tools

1)Questionnaire

Dear respondent,

I am Lily Batebe, a student of Master's in Public Health at Nkumba University. I am conducting research titled "Antenatal care service utilization and maternal health outcomes among women of reproductive age (15–49) at Kasanje Health Centre III, Wakiso district". This questionnaire is intended to collect data regarding this research.

Instructions:

Please answer all questions honestly. Your responses will remain confidential.

SECTION A: Socio-demographic information

1. Age:

☐ 15–19 ☐ 20–24 ☐ 25–29 ☐ 30–34 ☐ 35–39 ☐ 40–44 ☐ 45–49

2. Marital status:

☐ Single ☐ Married ☐ Divorced ☐ Separated ☐ Widowed

☐ Co- habiting

3. Level of education:

☐ No formal education ☐ Primary ☐ Secondary ☐ Tertiary

4. Occupation: _____

☐ Farming ☐ Household work ☐ Business ☐ Casual labour

☐ Salaried work ☐ None

5. Number of children (Parity):

☐ 1 ☐ 2–3 ☐ 4–5 ☐ More than 5

SECTION B: Knowledge and attitudes towards ANC

6. Have you heard about antenatal care (ANC)?

☐ Yes ☐ No

7. Do you believe attending ANC is important?

☐ Yes ☐ No

8. What is the recommended number of ANC visits during pregnancy?

☐ 1–3 ☐ 4–7 ☐ 8 or more ☐ Don’t know

9. ANC helps in preventing pregnancy complications.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

10. When is the appropriate time for a pregnant woman to start ANC visits?

☐ First trimester ☐ Second trimester ☐ Third trimester ☐ Don’t know

11. Attending ANC is necessary even if there are no complications.

☐ True ☐ False

12. Have you heard about danger signs during pregnancy?

☐ Yes ☐ No

SECTION C: Accessibility of ANC services

13. What is the distance from your home to Kasanje Health Centre III?

☐ Less than a km ☐ 1-2km ☐ 3-4km ☐ 5–10 km ☐ More than 10 km

14. What is your main means of transport to Kasanje Health Centre III?

☐ Walking ☐ Bicycle ☐ Motorcycle ☐ Private car ☐ Water/boat

☐ Public transport(eg taxi) Water/boat ☐ Other

15. Is this means of transport readily available when needed?

☐ Yes ☐ No

16. How long does it take you to reach the Kasanje H/C III?

☐ <15 minutes ☐ 15-30 minutes ☐ 30–60 minutes ☐ >1 hour

17. What is the average waiting time while at Kasanje H/C III?

☐ <1 hour ☐ 1–3 hours ☐ 3–5 hours ☐ >5 hours

18. Are ANC services readily available when you visit Kasanje Health Centre III?

☐ Yes ☐ No

19. Do you incur any costs when accessing ANC services?

☐ Yes ☐ No

20. Are the costs of accessing ANC services affordable?

☐ Yes ☐ No

SECTION D: Frequency and timing of ANC visits

21. Did you attend ANC during your last pregnancy?

☐ Yes ☐ No

22. How many ANC visits did you attend?

☐ 1–3 ☐ 4–7 ☐ 8 or more

23. When did you start your first ANC visit?

☐ First trimester ☐ Second trimester ☐ Third trimester

SECTION E: Quality of ANC services received

24. Health workers treated you with respect while attending ANC.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

25. Waiting time during ANC visits was reasonable.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

26. Did you receive adequate health education during ANC visits?

☐ Yes ☐ No

27. The health education that I received was satisfactory, detailed and sufficient

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

28. Did any health worker/your doctor explain to you about pregnancy danger signs to watch out for during pregnancy? For example bleeding, high blood pressure, infection,

☐ Yes ☐ No

29. Were all prescribed drugs available at the Kasanje H/C III?

☐ Always ☐ Sometimes ☐ Never

30. Did you carry out any laboratory tests during your previous ANC visist?

☐ Yes ☐ No

31. Health workers treat patients with respect.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

32. Health workers are friendly and approachable.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

33. I feel comfortable discussing my concerns with the doctors/health workers.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

SECTION F: Maternal Health Outcomes

1)Maternal Morbidity

34. Did you experience any complications during pregnancy?

☐ Yes ☐ No

35. Did you experience any illness after delivery?

☐ Yes ☐ No

36. Did you access timely care during labor and delivery?

☐ Yes ☐ No

37. Did you have a safe delivery?

☐ Yes ☐ No

38. If yes do you agree that attending ANC contributed to having a safe delivery?

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

39. Do you agree that ANC attendance reduced your risks of getting serious health problems during pregnancy?

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

2) Birth Outcomes

40. Outcome of last pregnancy.

☐ Live birth ☐ Preterm birth ☐ low birth weight ☐ Stillbirth ☐ Miscarriage

41. Birth weight of baby of the last pregnancy.

☐ <2.5 kg ☐ 2.5-3.0 kg ☐ 3.1-4.0 kg ☐ >4 kg ☐ Don't know

42. Was the baby born preterm (<37 weeks)?

☐ Yes ☐ No

3. Maternal Mortality (Self reported proxy Indicators)

43. Did you experience any life-threatening condition during pregnancy or delivery?

☐ Yes ☐ No

44. Were you referred to another facility for emergency care?

☐ Yes ☐ No

Thank you for your responses

2) Interview guide (Health workers)

Dear participant, The purpose of this research is to assess antenatal care utilization and maternal health outcomes among women attending ANC at Kasanje Health Centre III.

Your participation is voluntary. The information you provide will be kept confidential and used only for academic purposes.

If you agree to participate, please sign below.

Participant Signature: _____

Date: _____

Researcher Signature and date: _____

Section 1: Knowledge and Attitudes

What do you understand about antenatal care services?

Why do some women delay or avoid ANC visits?

Do you feel women here are at risk of pregnancy complications? Why?

Section 2: Accessibility of ANC Services

What challenges do women face in accessing ANC services?

Are there any cultural or social barriers in this community?

What is your experience with waiting time at the facility?

Section 3: Frequency and timing

When do women usually begin ANC visits? Why?

How often do they attend ANC services?

What influences completion of recommended visits?

Section 4: Quality of services

How would you describe the quality of ANC services at Kasanje Health Centre III?

How does patient load affect quality?

Are there enough staff and supplies?

Section 5: Maternal health outcomes

What are the common pregnancy complications observed?

What factors contribute to poor birth outcomes?

Are medicines and tests readily available?

Section 6: Suggestions for improvement

What improvements would you recommend to increase antenatal care utilization at Kasanje HC III?

What suggestions do you have for improving maternal health outcomes among women in this community?

Thank you for your valuable time and contributions.

3) Focus Group Discussion (FGD) Checklist

Study Title: Antenatal Care Service Utilization and Maternal Health Outcomes among Women of Reproductive Age (15–49 Years) at Kasanje HC III in Wakiso District

Introduction

Good morning/afternoon. Thank you for agreeing to participate in this discussion. We are conducting a study to understand women's experiences with antenatal care services and maternal health outcomes at Kasanje HC III. There are no right or wrong answers. Your opinions and experiences are valuable. Everything shared will remain confidential and will only be used for research purposes. With your permission, the discussion will be audio-recorded.

Participant Information

Date: _____

Venue: _____

FGD Number: _____

Number of Participants: _____

Moderator: _____

Note Taker: _____

Participants: Mothers aged 15–49 years who have attended ANC services and/or recently delivered.

Knowledge and attitudes.

What benefits do women obtain from attending ANC services?

In your opinion, how does ANC help improve pregnancy outcomes?

What danger signs during pregnancy are women in this community aware of? How do women usually learn about these danger signs and how important is this?

In this community, what are some of the common sources of knowledge about ANC?

Accessibility and availability of ANC services

How far is Kasanje Health Centre III from where most women live?

How does distance affect attendance of ANC services?

What means of transport do pregnant women use to reach the health facility?

What transport challenges do pregnant women face?

In case of an emergency, how is transport means in this area?

In summery,how does accessibility and availability of ANC services affect maternal health?

Frequecty and timing

When do women in this community usually start ANC? Probe:First trimester, second trimester, third trimester

What factors influence the timing of the first ANC visit?

How many ANC visits do women usually complete during pregnancy?

What factors encourage women to attend all recommended ANC visits?

What prevents some women from completing the recommended visits?

Quality of ANC services

Are essential medicines usually available at the health facility? What happens when medicines are unavailable?

What laboratory tests are commonly performed during ANC visits? Are women satisfied with the laboratory services offered? Why?

How would you describe the behavior and attitude of health workers toward pregnant women?

How does the attitude of health workers affect ANC attendance?

What Challenges affect health worker interactions with mothers during anc visists

What do you think is the role of health workers in promoting ANC utilization?

We have come to the end of our discussion.Thank you for your valuable time and contributions. Your views will help us better understand how antenatal care services can be improved to promote better maternal health outcomes. All information shared will remain confidential.

APPENDIX IV: Work plan

Activity	Duration
Submission of draft 1 of proposal draft	March 2026
Submission of draft 2 of the proposal	April 2026
Final submission of draft 3 of the proposal	May 2026
Data Collection	June/July 2026
Data cleaning, analysis and dissertation complitation	August 2026
Submission of draft 1 of the dissertation report	September 2026
Defence and final submission of the dissertation report	October 2026