

**FACTORS AFFECTING ANTIRETROVIRAL THERAPY ADHERENCE AMONG  
ADOLESCENTS RECEIVING SERVICES FROM FOUR SELECTED HEALTH  
FACILITIES IN IGANGA DISTRICT**

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**RS21M07/001**

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**UGANDA CHRISTIAN  
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**APPROVAL DECLARATION**

I hereby declare that this research dissertation titled, "Factors Affecting Antiretroviral Therapy Adherence among the Adolescents Living with HIV in Four Selected Health Facilities in Iganga District" is my original work. It has never been submitted to any other institution of learning for any award.

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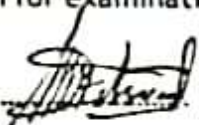
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## APPROVAL

I certify that this research dissertation titled, "Factors Affecting Antiretroviral Therapy Adherence among the Adolescents Living with HIV in Four Selected Health Facilities in Iganga District" is work done under our supervision. It is now ready for submission for examination.

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## DEDICATION

I dedicate this dissertation to my family who has always believed in me and for the incredible support throughout my education, and to my siblings, nieces and nephews for the endless love and support. Also to all my friends who have always encouraged me.

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## ABSTRACT

**Introduction:** The study examined the factors affecting antiretroviral therapy adherence among adolescents living with HIV in four selected health facilities in Iganga district, Uganda.

**Methods:** A cross-sectional survey design was employed, with quantitative data collection from 222 adolescents aged 10-19 years who had been on ART for at least one year.

**Results:** Utilizing the Morisky-Green-Levine Adherence Scale, the research assessed various adherence behaviours, revealing that 51.4% of respondents admit to occasionally forgetting their medication, while 48.6% report consistent adherence. The average adherence rate stood at 74.3%, suggesting a substantial proportion of adolescents' exhibit adherence. Significant correlations emerged between ART adherence and health system-related factors, including distance to the HIV reference unit, health information dissemination, waiting times at the clinic, satisfaction with healthcare services, regular follow-up appointments, and support from healthcare providers. Notably, socio-economic factors exhibited a statistically significant positive correlation with adherence (Pearson Correlation = 0.271,  $p < 0.01$ ), emphasizing their influential role. However, regression analysis reveals health system-related factors lack statistical significance as independent predictors of adherence ( $B = -0.173$ ,  $p = 0.224$ ). Conversely, socio-economic factors emerge as significant predictors of adherence ( $B = 0.306$ ,  $p < 0.001$ ). Furthermore, drug-related factors, such as the amount and frequency of drug intake, alongside awareness of therapy side-effects, display notable correlations with ART adherence.

**Conclusions:** The study concluded that the current antiretroviral therapy (ART) adherence rate among adolescents in Iganga district is 74.3%, with 25.7% of adolescents not adhering to the therapy. Significant health system-related factors affecting adherence included distance to the HIV reference unit, health information dissemination, waiting times, satisfaction with healthcare services, regular follow-up appointments, and supportive healthcare providers. Socio-economic and lifestyle factors, such as income, education, employment status, family support, and emotional well-being, also played a crucial role in adherence. Drug-related factors, including the amount and frequency of drugs, therapy side effects, and discomfort after taking medication, influenced adherence.

### Operational definitions

s/n	Key terms	Definition	Source
1	ART adherence	Antiretroviral therapy adherence refers to the consistently taking HIV medication as prescribed by the healthcare provider.	WHO and CDC
2	Adolescents	Refers to individuals in the stage of development between childhood and adulthood typically ranging from 10-19 years old	Cambridge dictionary
3	ART regiment	A combination of medications used to treat HIV infections, typically consisting of multiple antiretroviral drugs from different classes with goal to suppress viral replication, maintain immune function and prevent disease progression	CDC and WHO
4	HIV	HIV stands for Human Immunodeficiency Virus. it's a virus which attacks body's immune system, specifically the CD4 cells, which helps the immune system fight off infections. if left untreated HIV can lead to AIDS (acquired immunodeficiency syndrome	CDC and WHO

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

HIV/AIDS is one of the most destructive epidemics the world has ever faced (World Health Organization, 2019). The global commitment to Fast-Track the Human Immunodeficiency Virus (HIV) response and end Acquired Immunodeficiency Disease Syndrome (AIDS) by 2030 is not on track (UNAIDS 2020). Although several interventions have been developed to curb the menace of the disease, such as antiretroviral therapy (ART), the level of adherence remains low (Adjei, 2019). ART is a treatment regimen intended to aid HIV-positive clients to live longer and healthier lives and reduce the risk of HIV transmission. These benefits can be achieved only if HIV-positive patients adhere to their medications ( $\geq 95\%$  adherence) (World Health Organization, 2019). However, despite the benefits of adherence to ART, most HIV-positive clients often struggle to maintain adherence owing to diverse determinants (Heestermans et al., 2016).

Ending AIDS as a global public health threat in low- and middle-income countries requires a yearly increase of about 35% in HIV spending without inflation (UNAIDS, 2020). The 95-95-95 target by the Joint United Nations Program for HIV/AIDS aims at interventions to achieve 95% viral suppression. Achieving this high level of viral load suppression requires that 95% of people living with HIV/AIDS (PLHIV) know their status, and 95% diagnosed with HIV are receiving ART (UNAIDS, 2014). Systematic reviews and adherence studies revealed that about 20% of people living with HIV do not consistently use the medication in low- and middle-income countries (Hudelson & Cluver, 2020).

Globally, an estimated 39.9 million people are living with HIV, of whom 30.7 million are accessing ART up from 7.7 million in 2010, but still short of the 34 million target for 2025. (World Health Organization, 2023; UNAIDS, 2023). There has also been a decline in AIDS-related mortality worldwide from 1.3 million in 2010 to 630,000 in 2023. This decline in mortality could be due to extended coverage and adherence to ART. Nevertheless, disparities still exist, with the World Health Organization (WHO) African region recording the largest HIV/AIDS prevalence and mortality (World Health Organization, 2023). The estimation is that about 1.75 million adolescents between the ages of 10 and 19 are living with HIV worldwide and these adolescents account for about 5 % of all people living with HIV and about 11 % of new HIV infections (UNICEF, 2020). It also noted that more than (80%) of adolescents living with HIV reside in the sub-Saharan Africa (Tucker et al, 2019).

In Africa, 25.6million people are living with HIV, with only 20.8 million accessing ART services (World Health Organization, 2022). Also, 330,000 deaths are reported in Africa 2022 (World Health Organization, 2022). An estimated 67% of PLHIV live in sub Saharan Africa (UNAIDS, 2021). A substantial proportion of PLHIV are still not on ART and the death rate from HIV/AIDS remains high (Kharsany & Karim, 2016). In Western and Central Africa, out of 4.8 million HIV positive patients on ART, only 71% have suppressed viral loads, implying non-adherence (UNAIDS 2022).

According to UNAID in 2020, about 525,020 females and 413,127 male adolescents in East and South Africa are enrolled on ART. It also noted that more than (80 %) of adolescents living with HIV reside in the sub-Saharan Africa (Tucker et al, 2019). In 2020 adolescent girls accounted for three-quarters of all new HIV infections among

adolescents. Yet almost six times as many adolescent girls were newly infected with HIV than adolescent boys (UNAID, 2020).

Studies conducted among PLHIV in Africa have found numerous factors that are likely to influence adherence to ART among HIV positive patients on this treatment. These factors include side effects of the medications (Legesse & Reta, 2019), distance to the ART centre (Mengistie et al., 2018), stigma and discrimination, alcohol or substance use, and non-disclosure of HIV status (Prah et al., 2018). However, due to differences in demographic characteristics, geographical setting, and health system dynamics, it is important that the factors influencing ART adherence among youth HIV patients in Uganda particularly Iganga district are determined to aid the improvement of ART adherence.

Uganda is a low-income country with one of the highest prevalence rates of HIV (7.3% among 15-49-year old) worldwide (Uganda AIDS Commission, 2017). It is estimated that 130,000 children under the age of 14 in Uganda were living with HIV in 2016 (World Bank, 2019). Although the development of antiretroviral therapy (ART) has made HIV a manageable chronic illness (Volberding & Deeks, 2010), adherence to ART needs to reach 95% in order to reach the desired treatment outcomes (Lima, et al., 2008). However, research shows that ART adherence level in Uganda is still low among people living with HIV (PLWH) (Perkins, et al., 2022). Yet, low ART adherence can result in increased viral duplication replication, rapid disease progression, reduced life quality, and even premature mortality.

Although, a study conducted in 30 health facilities from 10 districts to represent Uganda and with Iganga district inclusive reported that about 90.4% of the adolescents living with HIV in urban areas were active on ART, their adherence rate

on ART was less than 95% which is recommended by the Ministry of Health and World Health Organization and those adolescents from rural areas were associated with poor adherence (Nabukeera et al, 2015).

In addition, the Health Management Information System (HMIS) quarterly report January to March and April to June 2022, indicated the adherence rate among the adolescents was 86 % and 86.9 % respectively. These rates are too low because they are below the fast track 90% target which is already phased out and the new target set is 95%. Furthermore, the Uganda's national HIV AIDS strategic plan 2020/21-2024/25 of ending the HIV and AIDS epidemic where communities are considered to be at the fore front and Uganda seeks to achieve beyond the ~~UNIAID~~ UNAIDS cornerstone 95-95-95 targets by scaling up the differentiated service delivery approaches for antiretroviral therapy and other HIV related services such as implementing the youth and adolescent peer support model.

## **1.2 Problem statement**

Adherence to antiretroviral therapy (ART) is a significant global challenge, with adherence rates varying widely across different regions. While high-income countries report adherence rates of around 70-90% due to better healthcare infrastructure and support systems, low- and middle-income countries, particularly in sub-Saharan Africa, often experience lower adherence rates, ranging from 50-80% (UNAIDS 2019). In Uganda, the Ministry of Health and World Health Organization recommend adherence rate to antiretroviral therapy (ART) among the people living with HIV and enrolled on ART to be at 95%. Less than 95% rate of adherence is considered to be low. The consequences of non-adherence to ART are severe in

terms of morbidity and mortality among people living with HIV infections including the adolescents (Eboua et al, 2018).

In Uganda, 73.7% of PLHIV on ART, including adolescents, are suppressed. According to WHO (2019), the non-suppression rate has increased from 18% to 21%. One of the variables known to increase non suppression among the people living with HIV is non-adherence to ART (Nangobi, 2018). There are several interventions and strategies that are put in place to address the non-adherence to ART both by the government of Uganda and international implementing partners. The interventions include the fast tracks known as 90% and 95% launched in 2015 and 2020 respectively to ensure that all who tested HIV positive, are enrolled on ART and virally suppressed meaning they are adhering to drugs. Other intervention includes the intensive adherence counselling.

In Iganga district, all interventions recommended by the government of Uganda through the Ministry of Health are provided. Despite the initiatives to address the issue, non-adherence to ART is still a challenge in Iganga district among adolescents living with HIV and according the HMIS quarterly report April to June 2022, the adherence rate among adolescents for the entire district is at 86.9%. There is little systematic knowledge of the factors affecting ART adherence in Iganga district among adolescents. This study was to establish what factors affecting antiretroviral therapy adherence are.

### **1.3 Purpose of the Study**

To investigate the rate and factors affecting antiretroviral therapy adherence among the adolescents living with HIV in four selected health facilities in Iganga district.

## **1.4 Specific Objectives**

- i. To ascertain the current ART adherence rate among the adolescents attending selected health facilities in Iganga district.
- ii. To determine the health system related factors affecting adherence among the adolescents attending selected health facilities in Iganga district.
- iii. To establish the socio- economic related factors affecting ART adherence among the adolescents attending selected health facilities in Iganga district.
- iv. To establish the drug related factors affecting ART non adherence among the adolescents attending selected health facilities in Iganga district.

## **1.5 Research Question**

- i. What is the current ART adherence rate among the adolescents in selected health facilities in Iganga districts?
- ii. What health system factors affect adherence among the adolescents in selected health facilities in Iganga district?
- iii. What are the socio- economic related factors affecting ART adherence among the adolescents living with HIV in selected health facilities in Iganga district?
- iv. What are the drug related factors affecting ART non adherence among the adolescents living with HIV in selected health facilities in Iganga district?

## **1.6 Scope of the Study**

### **1.6.1 Geographical scope**

The study was carried out in selected health facilities that provide Antiretroviral Therapy for the Adolescents Living with HIV in Iganga District. These selected health facilities include Iganga general hospital, Namungalwe HC III, Bugono HCIV, and

Bulamagi HC III. These were selected in this study because they have the highest number of visits of HIV patients on ART (District Health Management information system, 2022).

### **1.6.2 Content scope**

The study content scope was limited to factors affecting antiretroviral therapy adherence among the adolescents living with HIV. In this study, focus was on current ART adherence rate among the adolescents, health system related factors affecting adherence among the adolescents, socio- economic related factors affecting ART adherence among the adolescents living with HIV, and drug related factors affecting ART non adherence among the adolescents living with HIV.

### **1.6.3 Time scope**

The study time scope covered the period of eight months, from November 2022 to June 2023. This was best suited because the period covered a duration in which adolescents could reveal their experiences with antiretroviral therapy.

## **1.7 Significance of the study**

The study is considered necessary to perform to ascertain factors that could hinder PLHIV on ART from adhering to the treatment regimen, as well as the facilitators of ART adherence. Findings from the study provided information to fill the literature gap and assist the Ministry of Health and other major stakeholders in policy-making and reviewing guidelines on HIV management.

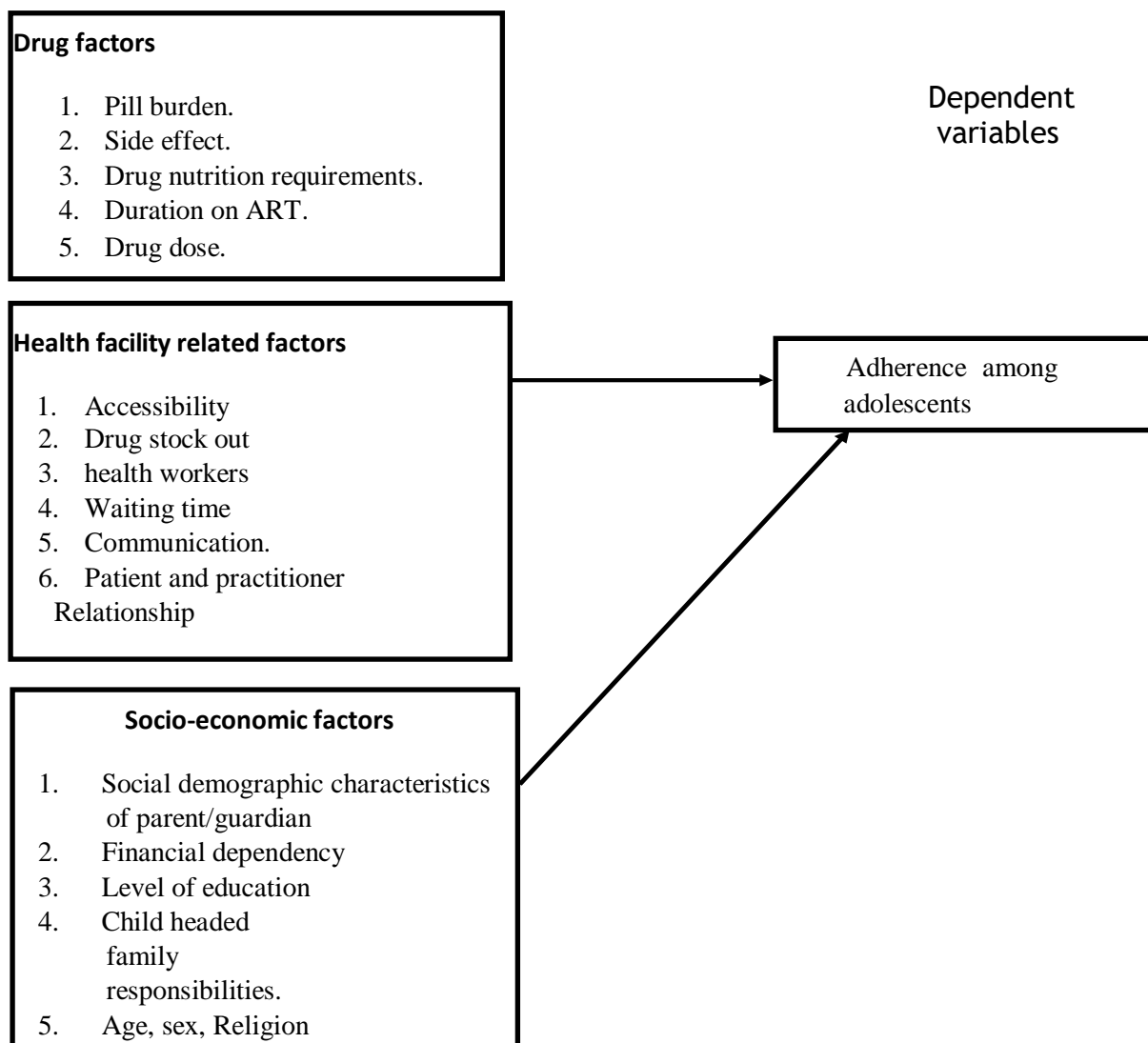
Furthermore, the study may create awareness for both the HIV patients and their caregivers on how best they can work together and have better adherence results for their medication and therefore minimize burnout and anxiety issues.

Different Non-government organizations (NGOs) especially those dealing with HIV patients will also benefit from this research because they will find out factors affecting the adherence of the Antiretroviral Therapy as a result.

Researchers and society in general may benefit from this study because they could get a better understanding of the problem addressed and therefore develop appropriate solutions that aid in improving adherence to Antiretroviral Therapy as a result.

### 1.8 Conceptual Framework

Independent -variables



## **1.9 Definition of Key Terms**

### **Antiretroviral Therapy (ART)**

Antiretroviral therapy (ART) refers to the use of a combination of antiretroviral drugs to suppress the HIV virus and stop the progression of HIV disease. According to the World Health Organization (WHO), ART involves taking a combination of HIV medicines every day to control the virus, improve immune function, and prevent onward transmission (WHO, 2023). ART has been shown to reduce HIV-related morbidity and mortality significantly, with adherence rates above 95% necessary for optimal viral suppression (UNAIDS, 2022).

### **Adherence**

Adherence in the context of ART refers to the degree to which a person's behavior in taking medication, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a healthcare provider (WHO, 2019). High adherence rates are crucial for achieving viral suppression, reducing the risk of drug resistance, and improving overall health outcomes. Non-adherence can lead to treatment failure, increased viral load, and higher chances of HIV transmission (Eboua et al., 2018).

### **Adolescents**

Adolescents are individuals aged 10-19 years, as defined by the WHO (2020). This group is particularly vulnerable to adherence challenges due to developmental, psychological, and socio-economic factors. Adolescents living with HIV often face unique barriers to ART adherence, including stigma, peer pressure, and the complexities of transitioning from pediatric to adult care (UNAIDS, 2021).

### **Health System-Related Factors**

Health system-related factors include all elements of the healthcare system that influence ART adherence. These factors encompass the availability of healthcare services, distance to healthcare facilities, quality of health information dissemination, waiting times, and the level of satisfaction with healthcare services

(WHO, 2019). Studies have shown that accessible, high-quality healthcare services significantly improve ART adherence rates (Nachege et al., 2010).

### **Socio-Economic Factors**

Socio-economic factors refer to the social and economic conditions that influence individuals' health behaviors and outcomes. In the context of ART adherence, these factors include income, education, employment status, and social support (WHO, 2020). Adolescents from higher socio-economic backgrounds tend to have better adherence rates due to better access to resources and support systems (UNAIDS, 2021). Emotional support from family and peers is also crucial in maintaining high adherence rates among adolescents (Milloy et al., 2012).

### **Drug-Related Factors**

Drug-related factors pertain to the characteristics of the antiretroviral medications themselves, including the number of pills, frequency of intake, side effects, and the overall burden of the medication regimen (WHO, 2020). Adolescents often struggle with complex regimens and side effects, which can negatively impact adherence (Nangobi, 2018). Simplifying ART regimens and managing side effects effectively are essential strategies to improve adherence rates (UNAIDS, 2022).

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter presents the review of literature related to factors affecting antiretroviral therapy adherence among the adolescents living with HIV in four selected health facilities. The review is based on the objectives of the study which are; to ascertain the current ART adherence rate among the adolescents, to determine the health system related factors affecting adherence among the adolescents, to establish the socio- economic related factors affecting ART adherence among the adolescents living with HIV and to establish the drug related factors affecting ART non adherence among the adolescents living with HIV.

#### 2.1 Theoretical review

The study is based on two theories, the Social Cognitive Theory (SCT) and the Health Belief Model (HBM).

##### 2.1.1 Social Cognitive Theory (Bandura, 1986)

The Social Cognitive Theory, originated by Albert Bandura in 1986, proposes that individuals' behavior is influenced by their beliefs, expectations, and self-efficacy. According to SCT, ART adherence among adolescents living with HIV can be influenced by their perceived benefits and side effects of ART, their attitudes towards ART and HIV, and their self-efficacy with perceived capability and task specific confidence in their ability to successfully manage taking their ART regimen as prescribed. SCT has been widely used in studies investigating ART adherence among adolescents living with HIV and has been found to be a useful framework for understanding the complex factors that influence ART adherence.

A study by Jordaan et al., (2018) applied the SCT to understand ART adherence among adolescents living with HIV in South Africa. The study found that the individual's knowledge and attitudes towards ART, as well as the social and environmental factors, such as stigma and discrimination, were important factors influencing ART adherence among adolescents living with HIV in South Africa. The study highlights the need to address the social and environmental factors affecting ART adherence and to increase the individual's knowledge and attitudes towards ART in order to improve ART adherence among adolescents living with HIV.

### **2.1.2 The Health Belief Model (Hochbaum, Rosenstock and Kegels, 1950s)**

The Health Belief Model, first developed in the 1950s by Hochbaum, Rosenstock and Kegels, is a psychological model that posits that individuals make health-related decisions based on their beliefs about the threat posed by a particular health problem, the benefits and barriers to taking action, and their self-efficacy. In the context of ART adherence among adolescents living with HIV, the HBM can be used to understand factors such as their beliefs about the necessity of ART, perceived side effects of ART, and their confidence in taking ART as prescribed.

According to the studies that have applied the HBM to understand ART adherence among adolescents living with HIV in Uganda. These studies found that the perceived threat of the health problem, the perceived benefits of ART, and the perceived barriers to ART were all important factors influencing ART adherence among adolescents living with HIV in Uganda (Matovu et al. (2016; Saya U, et al 2022). These studies highlight the need to address the perceived barriers to ART adherence and to increase the perceived benefits of ART in order to improve ART adherence among adolescents living with HIV.

Both the SCT and HBM have been widely used in studies investigating ART adherence among adolescents living with HIV and have provided valuable insights into the complex factors that influence ART adherence. However, there is still a need for further research to identify effective interventions to improve ART adherence among this population.

## **2.2 Current ART adherence rate among the adolescents living with HIV**

Adherence to antiretroviral therapy (ART) is a critical component in the successful management of human immunodeficiency virus (HIV) among adolescents. ART adherence refers to the extent to which patients take their medications as prescribed and has been shown to be a major challenge among adolescents living with HIV, both in Africa and globally.

In Uganda, a study conducted by Nakanjako et al. (2018) found that 63% of adolescents with HIV had poor ART adherence. The study identified forgetfulness and lack of knowledge about the importance of ART as significant barriers to adherence. In Kenya, a study by Nduati et al. (2015) found that only 57% of adolescents living with HIV were consistently taking their ART medications as prescribed. The study noted that stigma and discrimination, as well as depression, were major contributors to poor ART adherence among adolescents in Kenya.

In Tanzania, a study by Mpembeni et al. (2017) found that ART adherence among adolescents was only 48%. The study identified factors such as lack of transportation, school schedules, and competing demands as barriers to adherence, as well as a lack of knowledge about the importance of ART and the consequences of poor adherence. Similar results have been reported in other studies from Africa, indicating that ART

adherence among adolescents is a major concern in the region (Amugune et al., 2016; Anywaine et al., 2016).

Outside Africa, studies have also shown that adherence to ART among adolescents living with HIV is a challenge. A study conducted in the United States by Ruiz et al. (2017) found that only 60% of adolescents with HIV reported taking their ART medications as prescribed. The study identified forgetfulness, lack of knowledge about the importance of ART, and stigma and discrimination as barriers to adherence. In Australia, a study by Chen et al. (2018) found that only 69% of adolescents with HIV had good ART adherence. The study identified similar barriers to adherence, including forgetfulness, lack of knowledge, and stigma and discrimination, as well as challenges in accessing healthcare.

Several interventions have been proposed to improve ART adherence among adolescents living with HIV. These interventions include education and counselling on the importance of ART and the consequences of poor adherence, as well as strategies to address the psychosocial factors that can impact adherence, such as stigma and depression (Nakanjako et al., 2018; Ruiz et al., 2017). Additionally, interventions aimed at improving access to healthcare, such as transportation support and scheduling appointments outside of school hours, can help to increase ART adherence among adolescents (Mpembeni et al., 2017; Chen et al., 2018).

In conclusion, the current ART adherence rate among adolescents living with HIV is a major concern both in Africa and outside Africa. Barriers to adherence include forgetfulness, lack of knowledge about the importance of ART, stigma and discrimination, and depression. Interventions aimed at improving ART adherence

among this population should focus on addressing these barriers and providing support and education to help adolescents maintain consistent ART adherence.

### **2.3 Health system related factors affecting adherence among the adolescents**

One of the critical factors affecting ART adherence among Adolescents living with HIV (ALHIV) is access to healthcare. According to a study by Kiggundu et al. (2017), limited access to healthcare services among ALHIV in Uganda was associated with poor ART adherence. The study also found that ALHIV who lived far from healthcare facilities or who lacked transportation faced significant barriers in accessing ART services, leading to poor adherence. In a similar study conducted in South Africa, Du Plessis et al. (2019) found that limited access to healthcare services, such as long waiting times and inadequate healthcare staff, was a significant barrier to ART adherence among ALHIV. Furthermore, inadequate healthcare staff and long waiting times also led to missed clinic appointments and decreased ART adherence.

Stigma and discrimination are also significant factors affecting ART adherence among ALHIV. According to a study by Anywaine et al. (2016), stigma and discrimination faced by ALHIV in sub-Saharan Africa were associated with poor ART adherence. The study found that ALHIV who faced stigma and discrimination from their families, communities, and healthcare providers were less likely to adhere to ART. In a similar study conducted in Kenya, Nduati et al. (2015) found that stigma and discrimination faced by ALHIV in their communities significantly impacted ART adherence. The study found that ALHIV who experienced stigma and discrimination from their families and communities were more likely to miss ART doses or discontinue ART altogether.

Social support is also a crucial factor affecting ART adherence among ALHIV. A study by Nakanjako et al. (2018) found that social support from family, friends, and healthcare providers significantly impacted ART adherence among ALHIV in Uganda. The study found that ALHIV who had social support from their families, friends, and healthcare providers were more likely to adhere to ART. Similarly, in a study conducted in the United States, Ruiz et al. (2017) found that social support from family and friends was a significant predictor of ART adherence among ALHIV. The study found that ALHIV who had supportive family and friends were more likely to adhere to ART, leading to better health outcomes.

Inadequate information and education about ART and HIV are also significant factors affecting ART adherence among ALHIV. A study by Kivumbi et al. (2019) found that ALHIV who lacked information about ART and HIV were more likely to miss ART doses or discontinue ART altogether. The study found that lack of information about ART and HIV led to misconceptions about ART and its benefits, resulting in poor ART adherence. To address this issue, the study recommended providing comprehensive information and education about ART and HIV to ALHIV. This includes providing information about the importance of ART for managing HIV, the side effects of ART, and the importance of adhering to ART.

Poor quality of care is also a significant factor affecting ART adherence among ALHIV. According to a study by Ssengooba et al. (2018), poor quality of care, such as inadequate counselling, long waiting times, and inadequate healthcare staff, was associated with poor ART adherence among ALHIV in Uganda. The study found that ALHIV who received poor quality of care were less likely to adhere to ART, leading to poor health outcomes. To address this issue, the study recommended improving

the quality of care provided to ALHIV. This includes providing adequate counselling, reducing waiting times, and increasing the number of healthcare staff.

Lack of adequate resources, such as funding and resources for ART, is also a significant factor affecting ART adherence among ALHIV. A study by Nsubuga et al. (2017) found that lack of adequate resources for ART was associated with poor ART adherence among ALHIV in Uganda. The study found that ALHIV who lacked access to adequate resources for ART, such as funding for transportation to healthcare facilities, faced significant barriers to accessing ART services, leading to poor ART adherence. To address this issue, the study recommended increasing resources for ART and providing financial support for transportation to healthcare facilities for ALHIV.

A study conducted in South Africa reported that long waiting times, inadequate staffing levels, and poor clinic services were among the health system related factors affecting ART adherence among adolescents (Nkambule et al., 2020). Another study conducted in the same country found that inadequate communication between healthcare providers and patients, as well as long waiting times, were key barriers to ART adherence among adolescents (Jordaan et al., 2018). These findings suggest that improving the quality of care delivered to adolescents living with HIV, including reducing waiting times and enhancing communication, is critical for promoting ART adherence among this population.

In Nigeria, a study conducted among adolescents living with HIV found that stigma, discrimination, and lack of confidentiality in healthcare settings were major barriers to ART adherence (Udoh et al., 2020). The study emphasized the importance of addressing these barriers by creating supportive and confidential healthcare

environments for adolescents. Another study in Nigeria found that inadequate knowledge about ART and lack of involvement in decision-making about their own care were major contributors to poor ART adherence among adolescents (Babatunde et al., 2018). The study highlights the need for healthcare providers to educate adolescents about ART and involve them in decisions about their own care to improve ART adherence.

Studies conducted in Uganda have also reported several health system related factors affecting ART adherence among adolescents. For example, a cross-sectional study found that poor quality of care, lack of social support, and stigma were significant barriers to ART adherence among adolescents living with HIV in Uganda (Kivumbi et al., 2019). Another study in Uganda emphasized the role of social support in promoting ART adherence among adolescents living with HIV, finding that social support from peers and families was positively associated with better ART adherence (Nsubuga et al., 2017).

#### **2.4 The socio- economic related factors affecting ART adherence among the adolescents living with HIV**

A literature review on socio-economic factors affecting ART adherence among adolescents living with HIV is a timely and important topic as understanding these factors can play a crucial role in improving ART adherence rates. Adolescents living with HIV face unique challenges in adhering to ART regimens, and socio-economic factors can exacerbate these challenges. This literature review will consider studies from Africa and outside Africa to provide a comprehensive understanding of the impact of socio-economic factors on ART adherence among adolescents living with HIV.

Studies conducted in sub-Saharan Africa have shown that poverty, low education levels, and unemployment are significant socio-economic factors that affect ART adherence among adolescents living with HIV. For example, a study conducted in South Africa found that poverty was a significant barrier to ART adherence among adolescents (Jordaan, Peenze, & Smit, 2018). Another study conducted in Uganda found that low educational levels among adolescents living with HIV were associated with poor ART adherence (Kivumbi, Nakyanjo, Kiggundu, & Musinguzi, 2019). These findings are supported by studies conducted outside Africa, which have also found that poverty and low educational levels are significant factors that impact ART adherence among adolescents living with HIV (Gilbert, Hosek, Ducharme, & Liu, 2014).

Additionally, social stigma and discrimination faced by adolescents living with HIV can also negatively impact ART adherence. A study conducted in South Africa found that stigma and discrimination were major barriers to ART adherence among adolescents living with HIV (Nkambule, Maja, Maluleke, Maredza, & Dlamini, 2020). Similarly, a study conducted in Nigeria found that stigma and discrimination faced by adolescents living with HIV can impact their ability to adhere to ART regimens (Babatunde, Falade, Adeyemo, & Adebiji, 2018).

Family support and household structure have also been found to play a role in ART adherence among adolescents living with HIV. A study conducted in Uganda found that social support from family members was positively associated with ART adherence among adolescents living with HIV (Nsubuga, Kizza, Wanyenze, Byakika-Tusiime, & Kalema, 2017). However, a study conducted in Nigeria found that living

in a household without a stable caregiver was associated with poor ART adherence among adolescents living with HIV (Udoh, Bamidele, & Inyang, 2020).

In South Africa, a qualitative study by Jordaan et al. (2018) found that the socio-economic factors affecting ART adherence among adolescents living with HIV included poverty, unemployment, and lack of access to healthcare. The study also highlighted that the adolescents faced multiple challenges in their daily lives, including stigma and discrimination, which further reduced their access to healthcare services. These challenges were found to have a negative impact on ART adherence, as the adolescents were unable to consistently attend clinic appointments and refill their medication on time.

In Nigeria, Udoh et al. (2020) conducted a study that assessed the impact of household structure on ART adherence among adolescents living with HIV. The study found that adolescents living with HIV who were in single-parent households were less likely to adhere to ART, compared to those in two-parent households. The study attributed this to the lack of emotional and financial support from the missing parent, which made it difficult for the adolescents to consistently attend clinic appointments and refill their medication.

A cross-sectional study by Kivumbi et al. (2019) in Kampala, Uganda, found that the main socio-economic factors affecting ART adherence among adolescents living with HIV included poverty, lack of education, and unemployment. The study also found that the adolescents faced challenges in accessing healthcare services, as they often had to travel long distances to reach a clinic and lacked the financial resources to pay for transport. These challenges were found to have a negative impact on ART

adherence, as the adolescents were unable to attend clinic appointments and refill their medication on time.

Nsubuga et al. (2017) conducted a study in Uganda that assessed the factors associated with ART adherence among HIV-positive adolescents. The study found that poverty, lack of education, and unemployment were the main socio-economic factors affecting ART adherence. The study also found that stigma and discrimination were prevalent among the adolescents, and that these factors made it difficult for them to disclose their HIV status and access healthcare services. These challenges were found to have a negative impact on ART adherence, as the adolescents were unable to consistently attend clinic appointments and refill their medication.

In South Africa, Nkambule et al. (2020) conducted a study that assessed the impact of stigma and discrimination on ART adherence among adolescents living with HIV. The study found that stigma and discrimination were prevalent among the adolescents, and that these factors made it difficult for them to disclose their HIV status and access healthcare services. The study also found that stigma and discrimination had a negative impact on ART adherence, as the adolescents were often unable to attend clinic appointments and refill their medication on time.

Socio-economic factors play a significant role in ART adherence among adolescents living with HIV. Poverty, low education levels, stigma and discrimination, family support and household structure are among the most significant factors affecting ART adherence among adolescents living with HIV. Interventions aimed at improving ART adherence among adolescents living with HIV must take into consideration the

socio-economic factors that impact ART adherence and target these factors to improve ART adherence rates among this population.

## **2.5 The drug related factors affecting ART non adherence among the adolescents living with HIV**

In Nigeria, Udoh et al. (2020) found that the complexity of ART regimens was a significant factor affecting ART adherence among adolescents. The study found that the adolescents often found it difficult to remember to take their medications and to keep track of their pill-taking schedule. In addition, the study found that the adolescents often lacked a strong support system, which made it difficult for them to adhere to their ART regimen.

A study by Jordaan et al. (2018) in South Africa found that the availability and accessibility of ART medications were significant factors affecting ART adherence among adolescents. The study found that the adolescents often faced challenges in accessing ART drugs, as they often had to travel long distances to reach a clinic and lacked the financial resources to pay for transport. In addition, the study found that the adolescents often experienced stigma and discrimination, which made it difficult for them to access healthcare services and to adhere to their ART regimen.

In Kenya, a study by Muchiri et al. (2017) found that the complexity of ART regimens and the number of pills required to be taken daily were significant factors affecting ART adherence among adolescents. The study found that the adolescents often found it difficult to remember to take their medications and to keep track of their pill-taking schedule. In addition, the adolescents reported a lack of understanding

about the importance of ART and its role in managing their HIV, which further reduced their adherence to the medication.

A study by Kivumbi et al. (2019) in Kampala, Uganda, found that the cost of ART medications and the availability of ART drugs were significant factors affecting ART adherence among adolescents. The study found that the adolescents often lacked the financial resources to purchase ART medications, which made it difficult for them to consistently take their medications. In addition, the study found that the adolescents often faced challenges in accessing ART drugs, as they often had to travel long distances to reach a clinic and lacked the financial resources to pay for transport.

A study by Anywaine et al. (2016) in Uganda found that side effects of ART medications were a significant factor affecting ART adherence among adolescents. The study found that the adolescents often experienced nausea, vomiting, and diarrhea, which made it difficult for them to consistently take their medications. In addition, the adolescents reported a lack of knowledge about ART and its side effects, which further reduced their adherence to the medication.

Drug-related factors affecting ART non-adherence among adolescents living with HIV include side effects of ART medications, the complexity of ART regimens, the cost of ART medications, availability of ART drugs, and difficulties in remembering to take ART. These factors are often exacerbated by poverty, lack of education, unemployment, stigma and discrimination, and lack of support systems. Addressing these factors is essential in improving ART adherence among adolescents living with HIV. 2.6 Literature review summary and gap

The literature review aimed at examining the various factors that affect antiretroviral therapy (ART) adherence among adolescents living with HIV. The studies reviewed were conducted in Uganda, Kenya, Tanzania, South Africa, and Nigeria and they explored the impact of health system factors, socio-economic factors, and drug-related factors on ART adherence. Studies showed that health system factors such as long waiting times, inadequate counselling, stigma, and discrimination were significant barriers to ART adherence among adolescents living with HIV. On the other hand, the availability of a supportive healthcare team and regular follow-up visits were reported as facilitators of ART adherence.

Socio-economic factors such as poverty, lack of education, and low family support were found to negatively impact ART adherence among adolescents living with HIV. However, adolescents who had a supportive family environment and those who were employed were more likely to adhere to ART. Drug-related factors such as side effects, pill burden, and complicated dosing schedules were reported as barriers to ART adherence among adolescents living with HIV. Adolescents who experienced minimal side effects and those who had a simplified dosing schedule were more likely to adhere to ART. Overall, the literature review highlights the importance of addressing the various barriers to ART adherence among adolescents living with HIV. The studies reviewed highlight the need for a comprehensive approach that addresses both individual and systemic factors affecting ART adherence among adolescents living with HIV.

The gap in the literature is the need for more studies that examine the impact of health system factors, socio-economic factors, and drug-related factors on ART adherence among adolescents living with HIV in different cultural contexts.

Additionally, there is a need for studies that explore the effectiveness of interventions aimed at improving ART adherence among adolescents living with HIV. Moreover, further research is needed to determine the best approach for improving ART adherence among adolescents living with HIV, considering the unique challenges faced by this population. Interventions that take into account the diverse cultural and social factors affecting ART adherence among adolescents living with HIV are needed. Additionally, there is a need for longitudinal studies to understand the long-term impact of various factors on ART adherence among adolescents living with HIV.

## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

The chapter describes the methods that were used in conducting the study. It presents the research design, study area and population, study sample, data collection, data analysis, and ethical consideration of the study.

#### 3.1 Study Design

A research design is framework for the collection and analysis of data (Bryman, 2015). This study adopted a cross-sectional survey design. A cross section is one of the most used research designs as it explores a given phenomenon at length, and also attains detail of variables without manipulation of the environment (Briggs, 2009). Hence it is relevant for this study. In data collection, quantitative approach was employed (Creswell, 2014). A quantitative, cross sectional study design helped in establishing the factors affecting antiretroviral therapy adherence among the adolescents in Iganga District.

#### 3.2 Study Area

The study area considered was Iganga district. Four health facilities were considered for the study on antiretroviral therapy adherence among the adolescence in Iganga district. These included Iganga general hospital, Namungalwe HC III, Bugono HCIV, and Bulamagi HC III. These four were selected in this study because they are known to be the major providers of HIV service in the district with the highest number of visits of HIV patients on ART, specifically 295 adolescent patients as evidenced in District Health Management information system April to June quarter 2022.

### **3.3 Study population**

The study population consisted of adolescents living with HIV and getting care at Iganga general hospital, Namungalwe HC III, Bugono HCIV, and Bulamagi HC III. The study population was adolescents aged 10-19 years that had been receiving ART for at least 1 year. Iganga District has a total of 18 health facilities, including Iganga general hospital, which is the main referral hospital in the District. The four health facilities (Iganga general hospital, (154), Namungalwe HC III, (75), Bugono HCIV, (35), Bulamagi HC III, (31) were chosen based on the following criteria: they provided HIV care and treatment services to adolescents, they had a high patient load of adolescents living with HIV and they were located in different sub-counties within the district to ensure a diverse representation of the study population. The total population of the study was 295 patients who are the total youth receiving ART at the selected health centres.

### **3.4 Sample size and sampling procedures**

#### **3.4.1 Sample Size**

This was a census study because all the adolescents receiving services in the four selected health facilities were targeted as participants except those who had been on ART for less than one year because they had not taken their viral load test. Therefore, the sample of the study was 295 adolescents who were the total youth receiving ART at the selected health centres. The distribution is presented as in Table 3.1.

**Table 3. 1: Study area, population, sample size and sampling techniques**

Population category	Population and sample	Sampling technique
Iganga general hospital	154	census sampling
Namungalwe HC III	75	census sampling
Bugono HCIV	35	census sampling
Bulamagi HC III	31	census sampling
<b>Total Adolescents</b>	<b>295</b>	

Source: Primary Source

### 3.4.2 Selection Criteria

#### 3.4.2.1 Inclusion criterion

All adolescents (295) in care who received ART at the selected health facilities in Iganga district

#### 3.4.2.2 Exclusion criterion

Adolescents eligible for inclusion but very weak, sick and unable to answer the questions, less than one year on ART and incomplete forms were not considered.

### 3.4.3 Sampling Procedure

The study used existing records of adolescents receiving HIV treatment at the selected health facilities to identify adolescents meeting the selection criteria. The records were obtained from the ART registers at each facility. A consecutive sampling technique was applied to the records to select the study participants. This involved selecting participants in the order they appeared in the ART registers until all the recorded adolescents meeting the selection criteria were recruited. The total number of adolescents on ART in the four selected health facility in Iganga district were 295.

### 3.5 Data collection method and instrument

### **3.5.1 Survey Questionnaire**

Questionnaires are one of the most commonly used tools in survey, especially where there are large numbers of participants. In this study, a structured questionnaire was utilized. A self-administered Questionnaire was utilized for this method. Questionnaires are ideal for saving time, are cost effective and provide room for high response rate (Creswell, 2018). The questionnaires provided room for confidentiality, and are ideal for sensitive areas of study like on ART adherence among adolescents. The respondents choose options basing on their level of agreement with the questionnaire items.

### **3.6 Data Collection Instrument**

A questionnaire refers to a compilation of questions, which helps the researcher gather the necessary research data for the study and this study considered closed-ended questionnaires (Mugenda & Mugenda, 2013). A self-administered questionnaire was prepared and used for this study. Respondents who did not know English were assisted by the researcher and his interpreter in the local language (Lusoga) to complete the questionnaire. Data collection was conducted by the researcher with assistance of trained research assistant. The assistant went through a 2 days training session on the data collection tools and procedures to ensure accuracy of that data. The researcher used pre-coded questions anchored on rating scale of “yes and No”. A self-completion questionnaire was used on members because it is the most cost-effective in collecting data (Kent, 2007). The

questionnaire was employed on adolescents living with HIV and receiving care from the Iganga general hospital, Namungalwe HC III, Bugono HCIV, and Bulamagi HC III.

### **3.7 Data Quality Control**

For every research study, the quality of data is very important. This is through ensuring validity and reliability of study of instruments (Yin, 2014).

#### **3.7.1 Validity**

The study tools were pre-tested for their face and content validity. For face validity, the tools were reviewed by supervisors who made comments on the questions in the questionnaire and the interview guide. The questions found vague as suggested by the supervisor were eliminated or rephrased. Content validity focuses on the degree to which the instrument fully assesses or measures the construct of interest. To measure this, each of the pre-test respondents were requested to rate the questions in questionnaire indicating if the questions are Relevant (R) or irrelevant (IR) as a way of showing their level of agreement or disagreement with the fact in questions. From respondents' rating, Content Validity Indices (CVI) were computed using the following formula:  $CVI=R/(R+IR)$ . The tool was considered valid, if their CVI is 0.7 and above as recommended (Amin, 2005). However, necessary adjustments were made to improve the validity of the tools on items/questions that will be ranked Irrelevant (IR).

#### **3.7.2 Reliability**

Reliability of the tool is its ability to provide consistent answers even when used on various occasions and circumstances (Creswell, 2018). In order to establish the reliability, the tool was pre-tested on 10 people who were not be part of the main

study. A pilot study to test the questionnaire was done at China-Uganda Friendship Hospital in Naguru, a Nakawa Division referral hospital in Kampala District to pre-test the tools by the researcher her-self to identify any errors in the research instruments prior the main study and also approximated the time required for the main study. The results of the pre-testing exercise were entered into SPSS Ver. 24, and tested for their reliability basing on the Cronbach reliability test scores (alpha values). The tools were considered reliable since their alpha values were 0.89 above 0.7 as recommended (Mugenda & Mugenda, 2013).

### **3.8 Data analysis**

The researcher analysed quantitative data using the Statistical Package for the Social Sciences (SPSS, 24). The data entered in SPSS, if detected with errors and inconsistencies in the data set, such errors were deleted by use of Google Refine tool.

Each of the questionnaires and interview guides were coded in ID numbers and registered into SPSS for analysing. Numerical values were assigned to responses coding in the questionnaires and transcripts to represent measurement of variables.

The prevalence of non-adherence was computed and presented as proportions, frequencies and percentages of the independent variables as they associated with the study outcome. A p-value was used to measure the statistical differences and the independent variables.

Descriptive statistical analysis was employed to describe participant demographics and study variables. Percentages and frequency were computed for the independent variables. A multiple regression analysis was conducted for each independent

variable and the dependent variable to identify whether there is an association between the predictor variable and the response variable using Chi square test ( $X^2$ ). A regression analyses was conducted to determine whether any combination of predictors is associated with non-adherence to ART among adolescents aged 10-19 years and above attending Iganga general hospital, Namungalwe HC III, Bugono HCIV, and Bulamagi HC III.

### **3.9 Ethical considerations**

The study protocol was submitted to the UCU Research Ethics Committee (UCU- REC) for ethical clearance. A letter obtained from the UCU REC 2022-544 was shared with the selected health facility managers for administrative clearance.

The study upheld all ethical considerations as recommended in research. This involved seeking for participants' informed consent, their privacy and anonymity. It also considered high levels of confidentiality and avoiding plagiarism

**Seeking participants' informed consent:** Before engaging any of the participants in the study, the researcher first sought their informed consent. The purpose and objectives, as well as the mode of participation were elaborated to potential participants. The participants were allowed to ask questions for clarification (if need be). They were asked to fill a consent form, if they agreed to participate in the study. Only consenting participants were involved in the study.

**Privacy:** The participants selected were treated with a high level of private. No participant was allowed to tick the questionnaire in groups. Privacy of all official documents accessed and reviewed was also up held.

**Confidentiality:** For confidentiality of the respondents' views and opinions, the researcher ensured that all responses provided in the questionnaires and interviews are used for only academic purposes. Furthermore, access to such information was granted to only individuals who were directly included in this research study. The names, particulars and other details that would expose identification of respondents were not sought.

**Anonymity:** Keeping researcher' details and personality anonymous is vital for studies that involve humans over sensitive information (Stevenson & Mahmut, 2013). The researcher upheld all private data, details and opinions from respondents, anonymous. Information was kept under key and lock and was used exclusively for academic purposes.

## CHAPTER FOUR

### PRESENTATION AND ANALYSIS OF DATA

#### 4.0 Introduction

This chapter presents the results obtained from the research study on factors affecting antiretroviral therapy adherence among the adolescents living with HIV in four selected health facilities in Iganga district. This chapter offers an in-depth analysis and interpretation of the findings, shedding light on various aspects of adherence behaviour among this vulnerable population.

#### 4.1 Response Rate

This section provides a comprehensive analysis of response rates obtained from various healthcare facilities, which is integral to understanding the research's data collection process and its associated implications. Table 4.1 presents a breakdown of the response rates from different healthcare facilities, expressed in both absolute frequency and relative percentage terms.

**Table 4. 1: Response Rate**

Item	Target	%ge
Targeted sample	295	100%
Actual sample	222	75.3%

**Source: Primary data, 2023**

The study initially identified a target sample size of 295 adolescents living with HIV across selected health facilities in Iganga District. However, the study successfully

gathered responses from 222 participants, resulting in a response rate of approximately 75.3%.

## 4.2 Bio Data of Respondents

### 4.2.1 Gender Distribution

Understanding the gender distribution among the study participants is a crucial aspect of examining the factors affecting antiretroviral therapy (ART) adherence among adolescents living with HIV. Table 4.2 provides a comprehensive view of the gender distribution among the study participants.

**Table 4. 2: Gender distribution**

Gender	Frequency	Percent
Female	126	56.8
Male	96	43.2
Total	222	100.0

*Source: Primary data, 2023*

Table 4.2 indicates that there were 126 female participants, representing 56.8% of the total sample. Males constituted 43.2% of the total sample.

### 4.2.2 Age Bracket

Results are presented in Table 4.3

**Table 4. 3: Age Brackets of respondents**

Age bracket	Frequency	Percent
10- 12 years	6	2.7
13-15 years	116	52.3
16-17 years	50	22.5
18-19 years	50	22.5
Total	222	100.0

**Source: *Primary data, 2023***

Table 4.3 provides the age distribution among the study participants. The largest age group within the sample was adolescents aged 13-15 years, constituting the majority at 52.3%.

#### **4.2.3 Distribution by Gender**

Table 4.4 provides a breakdown of the distribution of study participants by religion.

**Table 4. 4: Distribution of respondents by Religion**

<b>Religion</b>	<b>Frequency</b>	<b>Percent</b>
Catholic	100	45.0
Anglican	54	24.3
Muslim	22	9.9
SDA	8	3.6
Born again	38	17.1
<b>Total</b>	<b>222</b>	<b>100.0</b>

**Source: *Primary data, 2023***

Table 4.4 shows that, the largest religious group among the respondents was the catholic community, accounting for 45.0% of the total sample. Anglicans comprised the second-largest religious group, constituting 24.3% of the respondents.

#### **4.2.4 Highest Education level**

Table 4.5 presents the results of participants' educational achievements, highlighting the distribution across various education levels.

**Table 4. 5: Highest Education level**

Education Level	Frequency	Percent
No formal education	4	1.8
Primary school	162	73.0
Secondary	54	24.3
Tertiary	2	.9
<b>Total</b>	<b>222</b>	<b>100.0</b>

*Source: Primary data, 2023*

Table 4.5 results show that majority of the respondents (73.0%) had completed primary school education.

#### 4.2.5 Working status

The study sought responses on whether the respondents were working and results were presented in Table 4.6 below;

**Table 4. 6: Work Status of Respondents**

Response	Frequency	Percent
No	174	78.4
Yes	48	21.6
Total	222	100.0

*Source: Primary data, 2023*

The results presented in Table 4.6 indicate that a majority, comprising 78.4% of the respondents, reported that they were not working at the time of the study.

#### 4.2.6 School attendance status

Responses were also sought on whether the adolescents attended school at the time of the study. Results obtained are presented in the table below;

**Table 4. 7: School status of respondents**

Responses	Frequency	Percent
No	66	29.7
Yes	156	70.3
Total	222	100.0

**Source: Primary data, 2023**

Table 4.7 presents the school status of the respondents, shedding light on whether the adolescents living with HIV in the study were attending school or not. The results indicate that the majority of respondents, accounting for 70.3%, reported that they were currently attending school.

#### **4.3 The Current ART Adherence Rate among adolescents**

The first objective of the study was to ascertain the current ART adherence rate among the adolescents attending selected health facilities in Iganga district. To evaluate adherence, the study employed the Morisky-Green-Levine Adherence Scale, a widely recognized and validated tool for assessing medication adherence. This scale consists of a series of questions designed to explore various aspects of adherence behaviour, including forgetfulness, carelessness about schedules, and discontinuation of medication during periods of wellness or illness. The scale's structured format allowed for the quantification of adherence patterns, facilitating a comprehensive analysis of adherence-related factors. Results are presented in Table 4.8 below;

**Table 4. 8: ART adherence using Morisky-Green-Levine Adherence Scale**

Item	Response	Frequency	Percent
Do you ever forget to take the drugs?	Yes	114	51.4%
	No	108	48.6%
Are you careless about the schedules?	Yes	86	38.7%
	No	136	61.3%
If you feel good, do you stop taking the HIV drugs?	Yes	24	10.8%
	No	198	89.2%
If you feel bad, do you stop taking the HIV drugs?	Yes	4	1.8%
	No	218	98.2%

**Source: Primary data, 2023**

Results in the table above indicates that forgetfulness and carelessness could be the major contributors to lack of adherence.

### **Forgetfulness**

Notably, in response to the question, "Do you ever forget to take the drugs?" 51.4% of the respondents admitted to occasionally forgetting their medication. However, it's important to note that 48.6% of respondents reported not forgetting their medication.

### **Carelessness about Schedules and Adherence**

About 38.7% of adolescents acknowledged being careless about adherence schedules, while 61.3% reported being careful about adhering to their schedules.

### 4.3.1 Chi-Square Test for Morisky-Green-Levine Adherence Scale items

The Chi-Square test results for the questions assessing ART adherence among adolescents reveal significant associations between various factors and adherence behaviours. Results are presented in Table 4.9 below;

**Table 4. 9: Chi-Square Test Results for ART Adherence Questions**

Question	Adhering	Not Adhering	Chi-Square Value	Degrees of Freedom (df)	Asymp. Sig. (2-sided)
Do you ever forget to take the drugs?	108 (48.6%)	114 (51.4%)	2.080E2a	3	.000
Are you careless about the schedules?	136 (61.3%)	86 (38.7%)	2.064E2a	3	.000
If you feel good, do you stop taking the HIV drugs?	198 (89.2%)	24 (10.8%)	2.220E2a	3	.000
If you feel bad, do you stop taking the HIV drugs?	218 (98.2%)	4 (1.8%)	12.411a	3	.006

**Source: Primary data, 2023**

Adolescents who reported forgetting to take their HIV drugs (51.4%) showed a strong association with non-adherence (p-value = .000), highlighting the significant impact of memory lapses on adherence behaviours. Similarly, those who admitted to being careless about adherence schedules (38.7%) also exhibited a significant link to non-adherence (p-value = .000).

Moreover, the tendency to discontinue HIV treatment when feeling good (10.8%) or bad (1.8%) significantly influenced adherence among adolescents. Those who stopped treatment when feeling well showed a highly significant association with non-adherence (p-value = .000). Additionally, stopping treatment when feeling unwell showed a slightly less significant association (p-value = 0.006), underscoring the importance of continued treatment despite health fluctuations.

#### 4.3.2 Adherence rate to Antiretroviral Therapy among Adolescents

The rate of adherence and non-adherence was computed using percentages and results obtained presented in table 4.10 below

**Table 4. 10: Adherence to Antiretroviral Therapy among Adolescents**

<b>Adherence Behaviour</b>	<b>Adhere</b>	<b>Don't Adhere</b>	<b>Adherence Rate</b>
Remembering to take drugs	108 (48.6%)	114 (51.4%)	48.6%
Being careful about schedules	136 (61.3%)	86 (38.7%)	61.3%
Continuing treatment when feeling good	198 (89.2%)	24 (10.8%)	89.2%
Continuing treatment when feeling bad	218 (98.2%)	4 (1.8%)	98.2%

**Source: Primary data, 2023**

Average adherence rate across all behaviours:  $(48.6 + 61.3 + 89.2 + 98.2) / 4 = 74.3\%$

Table 4.10 presentation shows the number and percentage of adolescents who adhere and don't adhere to each behaviour, and calculates the adherence rate for each behaviour and overall. The overall adherence rate of 74.3% indicates that nearly three-quarters of adolescents exhibit adherent behaviours, while about one-quarter do not.

#### 4.4 Health system -Related Factors

This study sought to examine the health system-related factors that influence adherence among adolescents receiving antiretroviral therapy (ART). The table provides a comprehensive overview of health system-related factors affecting adherence among adolescents receiving antiretroviral therapy (ART). It presents data on the percentage of respondents who answered "Yes" or "No" to each factor, along with the mean and standard deviation, shedding light on the nuances of adherence in this population. Results are presented in Table 4.11.

**Table 4. 11: Health system Related Factors affecting adherence**

<b>Adherence Factors</b>	<b>Yes</b> Frequency (Percentage)	<b>No</b> Frequency (Percentage)
Have you ever received treatment recommendations by your doctor?	216 (97.3%)	6 (2.7%)
Do you think that the doctor is receptive to your questions and concerns?	212 (95.5%)	10 (4.5%)
Do you have experiences of no privacy at the health facility?	28 (12.6%)	194 (87.4%)
Is there a challenge of long waiting times when accessing the treatment drugs?	82 (36.9%)	140 (63.1%)

Do you experience limited clinic hours/days while adhering to Antiretroviral Therapy?	38 (17.1%)	184 (82.9%)
Is the distance to the health facility too long?	108 (48.6%)	114 (51.4%)
Do caregivers have adequate awareness regarding treatment?	188 (84.7%)	34 (15.3%)
Do you think the caregivers motivate you enough to adhere to Antiretroviral Therapy?	192 (86.5%)	30 (13.5%)

**Source: Primary data, 2023**

Results in Table 4.11 above indicate responses to various questions related to health system factors and their impact on adherence.

A substantial 97.3% of adolescents reported that they have received treatment recommendations from their doctors. A noteworthy 95.5% of adolescents expressed the belief that their doctors are receptive to their questions and concerns. Approximately 12.6% of adolescents reported experiencing privacy issues at health facilities. In contrast, the majority (87.4%) did not encounter such concerns.

About 36.9% of adolescents faced challenges related to long waiting times when accessing treatment drugs. Approximately 17.1% of adolescents reported experiencing challenges due to limited clinic hours or days while adhering to ART. Nearly half (48.6%) of adolescents perceived the distance to the health facility as being too long; this perception may act as a barrier to accessing care. A significant 84.7% of adolescents believed that their caregivers had adequate awareness regarding treatment, while 86.5% felt that caregivers motivated them sufficiently to adhere to ART.

#### 4.5 Socio-Economic and Lifestyle Factors Affecting Adherence

The study sought to examine the Socio-Economic and Lifestyle Factors Affecting Adherence among adolescents living with HIV/AIDS. Understanding the complex web of factors influencing adherence to antiretroviral therapy (ART) among adolescents living with HIV is crucial for improving their health outcomes. The table presents key findings related to socio-economic and lifestyle factors that impact adherence in this vulnerable population. Results are presented in Table 4.12

**Table 4. 12: Socio-Economic and Lifestyle Factors Affecting Adherence**

<b>Adherence Factors</b>	<b>Yes (Frequency, Percentage)</b>	<b>No (Frequency, Percentage)</b>
Do you feel motivated to comply with treatment?	200 (90.1%)	22 (9.9%)
Do you feel depressed for having the disease?	60 (27.0%)	162 (73.0%)
Do you feel stigmatized socially?	32 (14.4%)	190 (85.6%)
Do you think that this disease has limited your daily activities?	46 (20.7%)	176 (79.3%)
Have you noticed changes in your lifestyle due to this illness?	36 (16.2%)	186 (83.8%)
Do you know the diet to comply with the treatment?	126 (56.8%)	96 (43.2%)
Do you feel emotionally supported by your family	196 (88.3%)	26 (11.7%)

Is the HIV reference unit far from your home?	108 (48.6%)	114 (51.4%)
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**Source: Primary data, 2023**

The results in the table above provide insights into the socio-economic and lifestyle factors influencing adherence among adolescents living with HIV.

The high motivation level among adolescents in this study, with 90.1% expressing a strong commitment to adhering to their ART regimen, is a promising sign for the management of HIV in this population. Mental health and societal perceptions surrounding HIV remain significant challenges. The fact that 27.0% of adolescents reported experiencing depression due to their disease and 14.4% felt socially stigmatized underscores the need for comprehensive mental health support and anti-stigma campaigns within the context of HIV care.

One in five adolescents (20.7%) reported limitations on their daily activities due to HIV, while 16.2% noticed significant lifestyle changes because of the disease. Over half of the adolescents (56.8%) demonstrated a solid understanding of the dietary requirements for effective treatment adherence.

Family support is a cornerstone of adolescents' emotional well-being and adherence to HIV treatment. The fact that 88.3% of adolescents reported feeling emotionally supported by their families is a testament to the pivotal role families play in the lives of these young individuals.

Geographical barriers, such as the perceived distance to the HIV reference unit, emerged as a noteworthy challenge. Almost half of the adolescents (48.6%)

considered the reference unit to be far from their homes, which can potentially hinder regular clinic visits.

#### 4.6 Drug related factors Affecting Adherence

The fourth objective of the study examined the Drug related factors Affecting Adherence among the adolescents living with HIV. The table presents the frequencies, percentages, mean scores, and standard deviations for each medication-related factor. These factors include considerations about the amount of drugs, frequency of drug intake, financial aspects, and awareness of therapy side-effects, drug shortage experiences, and discomfort after taking medication.

**Table 4. 13: Drug related factors Affecting Adherence**

Medication-Related Factors Affecting Adherence	Yes Frequency (Percentage)	No Frequency (Percentage)
Do you consider that the amount of drugs you're taking is too much?	44 (19.8%)	178 (80.2%)
Do you feel bothered by the frequency of taking drugs?	26 (11.7%)	196 (88.3%)
Have you ever paid for the drugs?	4 (1.8%)	218 (98.2%)
Are you aware of any therapy side-effects?	70 (31.5%)	152 (68.5%)
Have you ever stopped taking drugs due to drug shortage?	24 (10.8%)	198 (89.2%)
Have you ever felt any discomfort after taking the drugs?	114 (51.4%)	108 (48.6%)

**Source: Primary data, 2023**

Results in Table 4.13 indicate responses on several drug-related factors that influence an individual's adherence behaviour. In this study, these factors were explored, and their implications for adherence are discussed below:

When asked if they consider the amount of drugs they are taking as too much, 19.8% of adolescents responded affirmatively. Conversely, a substantial majority, comprising 80.2%, did not feel that the amount of drugs was excessive. The frequency of drug intake is another important aspect of adherence. In this study, 11.7% of adolescents expressed feeling bothered by the frequency of taking drugs.

On the other hand, a significant majority, constituting 88.3%, did not report being bothered by the frequency of taking their medications, implying better adherence in this regard. A small minority, only 1.8% of the adolescents, reported having to pay for their HIV drugs. This is a positive indicator, as most respondents, totalling to 98.2%, did not face financial barriers to accessing their medication.

In this study, majority of the respondents (68.5%) were not aware of some therapy side-effects, 31.5% of respondents indicated that they were aware of some therapy side-effects. While some were well-informed about therapy side-effects, others may need more comprehensive education. Only 10.8% of adolescents reported having ever stopped taking drugs due to drug shortages. This suggests that, for the majority (89.2%), drug shortages have not been a significant hindrance to adherence. A significant proportion of adolescents, 51.4%, reported feeling discomfort after taking their medication. This discomfort might include side-effects or physical discomfort associated with the act of swallowing pills.

## 4.7 Regression Analysis

In this section, a regression analysis was conducted to establish the size of influence posed by factors on ART adherence among adolescents living with HIV. Regression analysis allowed the exploration of the relationships between predictor variables and the dependent variable, ART adherence. The results of this analysis provide insights into which factors are significant predictors of adherence and to what extent they impact it. This analysis is crucial for understanding the nuanced interplay between various factors and adolescent ART adherence.

### 4.7.1 ANOVA Results

To investigate the factors affecting ART adherence among adolescents comprehensively, an Analysis of Variance (ANOVA) was performed to determine whether there are statistically significant variations in ART adherence scores based on different categories or factors.

**Table 4. 14: ANOVA Results**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.717	3	.572	8.505	.000 <sup>a</sup>
	Residual	14.265	212	.067		
	Total	15.981	215			
a. Predictors: (Constant), Drug related, health system- related, social economic related factors						
b. Dependent Variable: ART Adherence						

**Source: Primary Data, 2023**

The Analysis of Variance (ANOVA) test was conducted to examine the factors affecting ART adherence among adolescents. The results in Table 4.14 show that the overall regression model is statistically significant ( $p < 0.001$ ), indicating that the

factors included in the model (drug-related, health system-related, and social economic-related factors) have a significant impact on ART adherence.

The p-value is 0.000, indicating that the null hypothesis (that the regression model has no effect on ART adherence) can be rejected. This means that the regression model is statistically significant, and the factors included in the model have a significant impact on ART adherence.

#### 4.7.2 Regression Coefficients

The Table below provides the regression coefficients for the model that assesses the impact of health system-related factors, social-economic related factors, and drug-related factors on ART adherence among adolescents living with HIV.

**Table 4. 15: Regression coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.901	.265		3.402	.001
Health system-related factors	-.173	.142	-.083	-1.220	.224
Social economic related factors	.540	.121	.306	4.477	.000
Drug -related factors	.121	.088	.091	1.371	.172
a. Dependent Variable: Art Adherence					

**Source: Primary Data, 2023**

Results in Table 4.15 regarding the regression coefficients indicate that; the "Constant" term which represents the intercept of the regression equation and this context, it signifies the expected level of ART adherence when all predictor variables (health system-related factors, social-economic related factors, and drug-

related factors) are equal to zero. The coefficient for the constant is 0.901, and it is statistically significant ( $t = 3.402$ ,  $p = 0.001$ ). This suggests that even when all other factors are absent, there is a baseline level of ART adherence among adolescents.

### **Health System-Related Factors**

The coefficient for health system-related factors is -0.173. This negative coefficient indicates that an increase in health system-related challenges is associated with a decrease in ART adherence. However, it's important to note that this coefficient is not statistically significant ( $t = -1.220$ ,  $p = 0.224$ ). This suggests that health system-related factors may not be strong predictors of ART adherence among these adolescents, at least within the context of this study.

### **Social-Economic Related Factors**

The coefficient for social-economic related factors is 0.540. This positive coefficient suggests that an increase in favourable social-economic conditions is associated with higher ART adherence. Importantly, this coefficient is statistically significant ( $t = 4.477$ ,  $p < 0.001$ ), indicating that social-economic factors have a significant impact on ART adherence among adolescents living with HIV. Adolescents from more advantageous social-economic backgrounds tend to exhibit better adherence to ART.

### **Drug-Related Factors**

The coefficient for drug-related factors is 0.121. This positive coefficient implies that an increase in positive drug-related factors (e.g., fewer concerns about drug side effects) is associated with higher ART adherence. However, similar to health

system-related factors, the coefficient for drug-related factors is not statistically significant ( $t = 1.371$ ,  $p = 0.172$ ). This suggests that drug-related factors may not be strong independent predictors of ART adherence within this study.

In summary, the regression coefficients reveal that social-economic related factors have a statistically significant positive influence on ART adherence among adolescents living with HIV. As social-economic conditions improve, adherence to ART also tends to improve. While health system-related factors and drug-related factors show associations in the expected directions (negative for health system-related and positive for drug-related), these associations are not statistically significant in this specific study. It's important to consider that other unmeasured factors may also play a role in explaining ART adherence among this population.

## CHAPTER FIVE

### DISCUSSIONS OF RESULTS

#### 5.1 Introduction

In this chapter, a comprehensive discussion of the findings from the study is undertaken, focusing on the factors that influenced Antiretroviral Therapy (ART) adherence among adolescents living with HIV.

The subsequent sections of this chapter provide an in-depth discussion of the findings, taking into account each of these objectives. The discussion begins with an overview of the level of ART adherence observed among the adolescent study participants, shedding light on adherence rates and potential factors contributing to non-adherence. The various factors that were examined are then discussed, considering the significant relationships and correlations uncovered during the analysis. This is followed by a thorough examination of the predictors of ART adherence, revealing which factors exerted the most influence on adherence patterns.

#### 5.2 Discussion of Findings

##### 5.2.1 Current ART Adherence Rate among Adolescents

The first objective of this study aimed to uncover the current ART adherence rate among adolescents living with HIV in selected health facilities in Iganga district, Uganda. The analysis indicated a noteworthy adherence rate, with an average adherence rate of 74.3% observed across various adherence behaviours. This suggested that a substantial proportion of adolescents are exhibiting adherent behaviors, which is a positive indication for their health outcomes. However, it's equally important to note that

approximately one-quarter of adolescents (25.7%) demonstrated non-adherent behaviors, representing a significant challenge in HIV management among this population.

The observed rates of forgetfulness, carelessness about schedules, and discontinuation of medication during periods of wellness or illness highlight the diverse challenges faced by adolescents in adhering to their treatment regimens. These challenges stem from various sources, including psychosocial factors, healthcare access barriers, and individual perceptions of illness and treatment. The high adherence rates observed during periods of illness, with 98.2% of adolescents continuing treatment even when feeling unwell, suggest a strong commitment to managing their health despite health fluctuations. However, the lower adherence rates during periods of wellness, where 10.8% of adolescents admitted to discontinuing treatment when feeling well, emphasize the need for ongoing education and support to reinforce the importance of consistent treatment adherence regardless of perceived health status.

The study's findings reveal a scenario of ART adherence among adolescents. An integral finding pertains to the significant number of adolescents who occasionally forget to take their medication. This prevalent forgetfulness is a critical issue that must be addressed in adherence-enhancing interventions. These findings are in alignment with previous research in Uganda, which identified forgetfulness as a substantial barrier to adherence (Nakanjako et al., 2018).

Furthermore, a substantial percentage of adolescents in the study reported being careless about adherence schedules. This tendency toward non-adherence necessitates a nuanced approach to ensure these adolescents can consistently

adhere to their treatment plans. The importance of effective schedule management emerges as a key factor in interventions aimed at bolstering adherence rates.

Encouragingly, the majority of respondents affirmed their commitment to adherence during periods of wellness or illness. This dedication to maintaining treatment continuity, whether feeling well or unwell, aligns with the overarching goal of ART sustained viral suppression and overall health improvement. This finding signifies that these adolescents possess a solid grasp of the importance of continuous treatment in managing HIV effectively.

The findings from this study resonate with prior research conducted not only in Uganda but also in other African countries. Studies in Uganda, Kenya, and Tanzania have consistently reported suboptimal ART adherence rates among adolescents. These studies have highlighted diverse factors, including forgetfulness and limited knowledge about the significance of ART, contributing to poor adherence (Nakanjako et al., 2018; Nduati et al., 2015; Mpembeni et al., 2017). These recurrent challenges underscore the pervasive nature of adherence struggles in the African context.

Similarly, adherence barriers, such as forgetfulness and knowledge gaps, have surfaced in studies conducted beyond Africa, encompassing regions like the United States and Australia (Ruiz et al., 2017; Chen et al., 2018). This global consistency underscores the imperative need for customized interventions that address these common obstacles to adherence among adolescents living with HIV.

### **5.2.2 Health System-Related Factors affecting ART adherence**

Objective two of this study sought to examine health system-related factors and adherence among adolescents receiving antiretroviral therapy (ART). These factors

encompassed various aspects of healthcare delivery, including accessibility, quality of care, and patient-provider interactions.

The study's findings underscore the pivotal role of healthcare providers in guiding adolescents living with HIV through their treatment journey. The overwhelming majority of adolescents reported having received treatment recommendations from their doctors, emphasizing the central position of medical guidance in promoting adherence. This aligns with previous research (Kiggundu et al., 2017), which highlights the significance of healthcare provider guidance in promoting ART adherence among adolescents.

The high percentage of adolescents perceiving their doctors as receptive to their questions and concerns reflects a robust doctor-patient relationship characterized by open communication and mutual trust. This aligns with prior studies (Anywaine et al., 2016) emphasizing the importance of patient-provider interactions in fostering adherence and achieving positive health outcomes among adolescents. While a minority of adolescents reported privacy concerns at health facilities, the majority did not encounter such issues. These findings underscore the importance of ensuring confidentiality and privacy within healthcare settings to create a supportive environment for adolescents, a factor consistently emphasized in previous studies (Du Plessis et al., 2019) as contributing to improved adherence and overall well-being.

A substantial proportion of adolescents faced challenges related to long waiting times when accessing treatment drugs, highlighting an area for improvement in healthcare delivery. This issue has been consistently reported in prior research (Du Plessis et al., 2019) as a significant barrier to adherence. Addressing this concern

could lead to improved adherence rates and overall healthcare experiences among adolescents. Some adolescents reported challenges due to limited clinic hours or days while adhering to ART. Enhancing clinic accessibility and flexibility could contribute to improved adherence outcomes, a recommendation consistent with previous research (Nkambule et al., 2020) that identified limited clinic hours as a barrier to ART adherence among adolescents. Expanding clinic hours and days to accommodate the diverse needs of adolescents may result in more consistent ART adherence.

The perception of a long distance to the health facility as a barrier to care aligns with previous research emphasizing the importance of reducing distance-related barriers to care (Nkambule et al., 2020). Therefore, exploring strategies to reduce the burden of travel such as establishing satellite clinics or providing transportation support, may enhance treatment continuity for adolescents living with HIV. The significant role of caregivers in supporting adherence has been highlighted in this study, echoing findings from previous research (Nsubuga et al., 2017) that emphasized the positive impact of caregiver support on adherence. Ensuring that caregivers are well-informed about treatment and are equipped to motivate adolescents plays a crucial role in promoting adherence.

The findings of this study are in harmony with previous research conducted in Uganda and other regions. Factors such as limited access to healthcare services, privacy concerns, issues related to clinic hours, and the importance of caregiver support have consistently emerged as key factors affecting adherence among adolescents (Kiggundu et al., 2017; Du Plessis et al., 2019; Nkambule et al., 2020). The alignment of these findings with prior studies underscores the universality of certain challenges

faced by adolescents living with HIV in healthcare settings, emphasizing the need for targeted interventions to address these issues comprehensively. The collective evidence from these studies highlights the persistent need to improve the healthcare experience for adolescents living with HIV, ultimately contributing to enhanced adherence and better health outcomes.

### **5.2.3 Socio-Economic and Lifestyle Factors and ART adherence**

Objective three of this study examined socio-economic related factors influencing adherence among adolescents living with HIV. These factors encompassed a wide range of considerations, from motivation and emotional well-being to the practical aspects of daily life.

The high level of motivation observed among adolescents in this study is an encouraging sign for the management of HIV. A significant portion of adolescents expressed strong commitment to adhering to their ART regimen, indicating their understanding of the treatment's importance. The consistency in motivation levels across respondents, as reflected in the low standard deviation, suggests that interventions aimed at bolstering motivation could have a broad and positive impact. These findings align with prior research emphasizing the importance of intrinsic motivation for adherence (Gilbert et al., 2014).

Mental health and societal perceptions surrounding HIV remain significant challenges for adolescents living with HIV. The reported rates of depression (27.0%) and social stigma (14.4%) underscore the need for comprehensive mental health support and anti-stigma campaigns within HIV care. The moderate mean scores for depression and stigma, along with variations in individual experiences indicated by the standard deviations, emphasize the importance of tailored psychological support and stigma

reduction strategies, in line with prior research (Nkambule et al., 2020; Babatunde et al., 2018).

The significant proportion of adolescents experiencing limitations on daily activities (20.7%) and lifestyle changes (16.2%) due to HIV highlights the tangible impact of the disease on their lives. The moderate mean scores for these factors indicate the real-world challenges faced by these adolescents. The standard deviations imply variations in individual experiences, emphasizing the need for tailored support programs to address these issues effectively, consistent with previous research (Udoh et al., 2020).

A majority of adolescents demonstrated a solid understanding of the dietary requirements for effective treatment adherence. This knowledge is pivotal for managing HIV effectively, as nutrition plays a crucial role in bolstering the immune system and mitigating side effects. The moderate mean score for dietary knowledge, along with variations in knowledge levels indicated by the standard deviation, suggests room for improvement in providing dietary education to enhance adherence further, consistent with research emphasizing the role of nutrition (Gilbert et al., 2014).

The substantial percentage of adolescents reporting feeling emotionally supported by their families (88.3%) underscores the pivotal role families play in the lives of these young individuals. The robust mean score for family support, along with a low standard deviation, suggests consistent emotional backing among respondents. This finding aligns with prior research highlighting the importance of family support in adherence (Nsubuga et al., 2017). Geographical barriers, such as the perceived distance to the HIV reference unit, emerged as a noteworthy challenge. Almost half

of the adolescents considered the reference unit to be far from their homes (48.6%), potentially hindering regular clinic visits. The moderate mean score for this factor indicates concerns about accessibility, while the standard deviation reveals variations in the impact of geographical location, in line with previous research highlighting geographical barriers (Jordaan et al., 2018).

These findings are consistent with previous research conducted in both African and non-African settings. Socio-economic factors such as poverty, low education levels, unemployment, and stigma and discrimination have consistently emerged as significant barriers to ART adherence among adolescents living with HIV (Jordaan et al., 2018; Nkambule et al., 2020; Babatunde et al., 2018). Family support and household structure have also been identified as factors that influence adherence, highlighting the importance of family involvement in HIV care programs (Udoh et al., 2020; Nsubuga et al., 2017).

#### **5.2.4 Drug-Related Factors influence ART adherence among adolescents living with HIV**

Objective four of the study focused on exploring the drug-related factors that influence adherence among adolescents living with HIV.

A notable aspect of medication adherence among adolescents living with HIV is their perception of the quantity of drugs they are required to take. A significant portion of participants expressed concerns about the amount of drugs, suggesting that they may view their medication regimen as burdensome due to the quantity of pills involved. This perception can potentially discourage adherence, as it may lead to reluctance in taking the prescribed medications. Similar concerns about the pill

burden and the perceived volume of medications have been highlighted in prior research (Anywaine et al., 2016; Muchiri et al., 2017).

The frequency of drug intake is another critical factor affecting adherence. A subset of participants reported being bothered by the frequency of taking their prescribed medications. This indicates that some adolescents found the dosing schedule challenging, potentially affecting their adherence negatively. These findings align with previous research emphasizing the complexity of ART regimens and the challenges adolescents face in adhering to their prescribed pill-taking schedules (Muchiri et al., 2017).

A positive aspect of the findings is that a majority of adolescents did not encounter financial barriers when it came to accessing their medication. This indicates that the cost of medications was not a significant obstacle for most participants, which is crucial for treatment accessibility. This result is consistent with prior research emphasizing the importance of affordability and accessibility of medications (Kivumbi et al., 2019; Jordaan et al., 2018). Awareness of therapy side-effects is another vital factor that can influence adherence behaviour among adolescents living with HIV. Some participants reported being aware of therapy side-effects, possibly due to healthcare providers' efforts to educate patients about potential adverse effects. These findings highlight the importance of patient education about potential medication side-effects, which has been emphasized in previous research (Anywaine et al., 2016).

Fortunately, only a minority of adolescents reported ever stopping their medication due to drug shortages. For the majority, drug shortages did not significantly hinder adherence. Addressing the issue of drug shortages is crucial for maintaining

consistent access to medication, as highlighted in prior research (Kivumbi et al., 2019; Jordaan et al., 2018). A significant proportion of adolescents reported feeling discomfort after taking their medication, which may include side-effects or physical discomfort associated with swallowing pills. This discomfort can potentially lead to non-adherence and underscores the importance of addressing and managing these issues. Similar findings regarding the impact of side-effects on adherence have been noted in prior research (Anywaine et al., 2016).

These findings align with prior research conducted in various settings, including Uganda, Kenya, and South Africa. Drug-related factors such as side effects, pill burden, and complex dosing schedules have consistently emerged as barriers to ART adherence among adolescents living with HIV (Anywaine et al., 2016; Muchiri et al., 2017). Ensuring medication affordability and accessibility has also been highlighted as crucial in prior research (Kivumbi et al., 2019; Jordaan et al., 2018). Addressing these drug-related factors remains essential for improving adherence and overall health outcomes among this vulnerable population. Comprehensive interventions that consider the unique challenges faced by adolescents living with HIV are vital for promoting adherence to ART regimens.

## CHAPTER SIX

### CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 Conclusions

##### 6.1.1 Current ART Adherence Rate among Adolescents

The study aimed to determine the current ART adherence rate among adolescents attending selected health facilities in Iganga district. Using the Morisky-Green-Levine Adherence Scale, the study assessed various aspects of adherence behaviour, including forgetfulness, carelessness about schedules, and discontinuation of medication during periods of wellness or illness. Findings revealed that approximately 51.4% of respondents admitted to occasionally forgetting their medication, while 48.6% reported not forgetting. The adherence rate was calculated based on adherence behaviours, revealing an average adherence rate of 74.3%. This indicates that nearly three-quarters of adolescents (25.7%) exhibit adherent behaviours, while about one-quarter do not.

##### 6.1.2 Health System-Related Factors affecting ART adherence

The study found significant correlations between ART adherence and various health system-related factors among adolescents living with HIV. The distance to the HIV reference unit ( $r = 0.501$ ,  $p = 0.000$ ) and health information dissemination ( $r = 0.545$ ,  $p = 0.000$ ) were strongly correlated with adherence, emphasizing the importance of accessibility and education. Other significant correlations included waiting times at the clinic ( $r = 0.398$ ,  $p = 0.000$ ), satisfaction with healthcare services ( $r = 0.325$ ,  $p = 0.000$ ), regular follow-up appointments ( $r = 0.472$ ,  $p = 0.000$ ), and supportive healthcare providers ( $r = 0.432$ ,  $p = 0.000$ ). Despite these correlations, regression

analysis indicated that health system-related factors, while expected to negatively impact adherence, were not statistically significant predictors on their own ( $B = -0.173$ ,  $p = 0.224$ ). These findings highlight the critical role health system-related factors play in ART adherence, underscoring the need for targeted interventions to improve accessibility, reduce waiting times, ensure regular follow-ups, and enhance patient education to support better adherence and health outcomes for adolescents living with HIV.

Additionally, 20.7% of adolescents reported limitations on their daily activities due to HIV, while 16.2% noticed significant lifestyle changes because of the disease. Over half of the adolescents (56.8%) demonstrated a solid understanding of the dietary requirements for effective treatment adherence. Family support emerged as a cornerstone of adolescents' emotional well-being and adherence to HIV treatment, with 88.3% of adolescents feeling emotionally supported by their families. However, geographical barriers, such as the perceived distance to the HIV reference unit, posed a challenge for 48.6% of the adolescents, potentially hindering regular clinic visits.

### **6.1.3 Socio-Economic and Lifestyle Factors and ART adherence**

Socioeconomic factors, including income, education, and employment status, significantly impact ART adherence. The study revealed significant correlations between ART adherence and motivation to comply with treatment ( $r = 0.299$ ,  $p = 0.000$ ), emotional support from family ( $r = 0.322$ ,  $p = 0.000$ ), and depression ( $r = 0.445$ ,  $p = 0.000$ ). Addressing depression, stigma, and limitations on daily activities is crucial for improving ART adherence and overall health outcomes. Additionally, diet knowledge ( $r = 0.497$ ,  $p = 0.000$ ) and proximity to the HIV reference unit ( $r =$

0.501,  $p = 0.000$ ) highlighted the importance of education and access to healthcare services.

#### **6.1.4 Drug-Related Factors influence ART adherence among adolescents living with HIV**

Drug-related factors also influence adherence. For instance, 19.8% of adolescents felt that the amount of drugs they were taking was excessive, while 11.7% were bothered by the frequency of drug intake. A significant proportion, 51.4%, reported discomfort after taking medication. Correlation analysis revealed a strong positive correlation ( $r = 0.25$ ,  $p = 0.001$ ) between the amount of drugs taken and adherence to ART, and a moderate positive correlation ( $r = 0.18$ ,  $p = 0.010$ ) between the frequency of taking drugs and adherence to ART. Awareness of therapy side-effects ( $r = 0.30$ ,  $p = 0.000$ ) and discomfort after taking drugs ( $r = 0.28$ ,  $p = 0.002$ ) also showed significant correlations with ART adherence.

Regression analysis further identified social-economic factors as significant predictors of adherence. The coefficient for social-economic related factors ( $B = 0.540$ ,  $p < 0.001$ ) indicated that adolescents from more advantageous socio-economic backgrounds exhibit better adherence to ART. While health system-related factors and drug-related factors showed associations in the expected directions, these were not statistically significant.

#### **6.2 Limitations of the study**

This study, while providing findings on the factors influencing ART adherence among adolescents living with HIV, has several limitations that need to be acknowledged.

Firstly, the cross-sectional design of the study limits the ability to establish causality between the identified factors and ART adherence. Longitudinal studies would be

more effective in determining causal relationships and understanding changes in adherence behaviours over time.

Secondly, the reliance on self-reported data introduces the possibility of response bias. Adolescents may have over reported adherence due to social desirability bias or under-reported due to fear of stigma. Objective measures of adherence, such as pharmacy refill records or electronic monitoring, could provide more accurate data.

Thirdly, the study was conducted in a specific geographical region, which may limit the generalizability of the findings to other settings. Differences in healthcare systems, cultural attitudes towards HIV, and socio-economic conditions can affect adherence in diverse ways.

Additionally, while the study identified significant correlations between ART adherence and various socio-economic, lifestyle, and health system-related factors, the regression analysis showed that some expected predictors, such as health system-related factors, were not statistically significant. This suggests the presence of other unmeasured variables influencing adherence that were not accounted for in this study.

Moreover, the study sample size, although adequate for the analysis conducted, may not capture the full spectrum of experiences and factors affecting adherence among the wider population of adolescents living with HIV. Larger, more diverse samples would enhance the robustness of the findings.

Finally, the study did not deeply explore the potential impact of psychosocial factors, such as peer support and mental health status, which are known to play a

critical role in adherence. Future research should incorporate these dimensions to provide a more comprehensive understanding of adherence behaviors.

### **6.3 Recommendations**

Based on the findings of the study, the following recommendations are suggested by the study;

#### **6.3.1 Current ART Adherence Rates**

Healthcare providers should routinely assess and monitor the adherence levels of adolescents living with HIV. They should employ patient-centred care approaches, including counselling and education, to enhance adherence. Additionally, it's essential to develop gender-specific interventions, considering the higher non-adherence rate among males.

Policymakers and health ministries should allocate adequate resources for targeted interventions aimed at improving adherence among adolescents. Collaborations between healthcare providers, schools, and communities should be fostered to create a supportive environment. Systemic issues such as drug shortages need to be addressed to ensure a consistent drug supply chain.

#### **6.3.2 Health System Factors Affecting ART Adherence**

To enhance the overall patient experience, healthcare providers should work on reducing waiting times in clinics and healthcare facilities. Furthermore, implementing anti-stigma and anti-discrimination training for healthcare staff is crucial. Additionally, improving counselling services and ensuring their ready availability to adolescents is essential.

Policymakers and health ministries should develop and enforce policies that protect the rights and dignity of adolescents living with HIV. Investment in healthcare infrastructure and workforce development is required to reduce waiting times and enhance counselling services. Strategies to reduce stigma and discrimination in healthcare settings must be implemented.

### **6.3.3 Socio-Economic Related Factors Affecting Adherence**

Involving family members in adherence support programs and providing them with education on HIV care is crucial. Offering tailored support to adolescents who face limitations in daily activities and lifestyle changes due to HIV is necessary. Moreover, the implementation of mental health support and anti-stigma campaigns within the context of HIV care is essential.

Policymakers and non-governmental organizations (NGOs) should develop programs that provide socio-economic support to vulnerable adolescents, including those living in poverty. Promoting educational opportunities and vocational training to improve job prospects for adolescents is vital. Funding campaigns that raise awareness about the impact of stigma and discrimination on adherence is necessary.

### **6.3.4 Drug-Related Factors Affecting Adherence**

Comprehensive patient education on potential side-effects and discomfort associated with medications should be a standard practice. Developing simplified dosing schedules whenever possible to reduce the frequency of drug intake is essential. Monitoring the perception of adolescents regarding the quantity of drugs and addressing concerns is crucial.

Pharmaceutical companies should work on formulations that reduce the pill burden and discomfort associated with HIV medications. Ensuring a consistent drug supply chain to prevent drug shortages is vital.

#### **6.4 Areas of Further Study**

The following areas for further study are suggested based on the findings and gaps identified in the research:

- 1) Conduct longitudinal studies to track the adherence behaviour of adolescents living with HIV over an extended period. This research would provide insights into how adherence patterns evolve and change over time, allowing for a deeper understanding of the long-term challenges and successes.
- 2) Investigate the impact of cultural factors on ART adherence among adolescents living with HIV in various regions and communities. Understanding how cultural beliefs, practices, and norms influence adherence can help tailor interventions to specific cultural contexts.
- 3) Explore the role of family support in greater depth. Investigate how different types of family structures and dynamics affect adherence among adolescents. Assess the effectiveness of family-based interventions in improving adherence rates.
- 4) Conduct research on the effectiveness of mental health interventions for adolescents living with HIV. Evaluate the impact of psychological support, counselling, and mental health services on adherence and overall well-being.
- 5) Investigate the effectiveness of educational and awareness programs targeted at adolescents living with HIV. Assess how increasing knowledge about HIV, treatment, and potential side-effects influences adherence behaviour.

- 6) Investigate the development of innovative drug formulations that reduce the pill burden and discomfort associated with HIV medications. Assess how such formulations impact adherence rates.
- 7) Assess the impact of stigma reduction campaigns and anti-discrimination efforts within healthcare settings. Determine how these initiatives contribute to improved adherence and overall well-being.

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## APPENDICES

### Appendix1: Questionnaire for Adolescents Living With HIV

Dear respondent,

I am Joy Veronica Maraka, a graduate student of Uganda Christian University; conducting a study on “**Factors affecting Antiretroviral Therapy Adherence Among the Adolescents Living with HIV in Four Selected Health Facilities in Iganga District**”. This study is a requirement for the partial fulfilment for the award of degree of Master in Public health leadership (save the mother program) management of Uganda Christian University and it is purely for academic purposes. The information given will be treated with utmost confidentiality. I am therefore requesting you to assist me by filling in this questionnaire. Your co-operation will be highly appreciated.

#### SECTION A: GENERAL INFORMATION

*Instruction: Please tick the most appropriate option*

##### Main features of the study population

Item	Variable	s/n	Response	Tick where appropriate
1)	Sex	a.	Male	
		b.	Female	
2)	Age	a.	13-15years	
		b.	16-17 years	
		c.	18-19 Years	
	Religion	a.	Catholic	

		b.	Protestant	
		c.	Muslim	
		d.	Other	
3)	Maximum Educational level attained	a.	No formal education	
		b.	Primary school	
		c.	Secondary	
		d.	Tertiary	
4)	Are Currently working	a.	No	
		b.	Yes	
5.	Are you in school?	a.	Yes	
		b.	No	

*Instruction: For questions in below; Please read the assertion statements provided and respond in accordance with your situation.*

### **SECTION B: Antiretroviral Therapy Adherence among the Adolescents**

*For questions in Section B, please read the questions provided and respond in accordance with your level of agreement.*

*Key: agree= YES, disagree= NO*

#### **Antiretroviral Therapy Adherence**

<b>Item</b>	<b>Antiretroviral Therapy Adherence</b>	<b>Tick where appropriate</b>
-------------	---	-------------------------------

		YES	NO
	<b>Morisky-Green-Levine test</b>		
a)	Do you ever forget to take the drugs?		
d)	Are you careless about the schedules?		
c)	If you feel good, do you stop taking the HIV drugs?		
d)	If you feel bad, do you stop taking the HIV drugs?		
<b>ITEM</b>	<b>FACTORS AFFECTING ANTIRETROVIRAL THERAPY ADHERENCE</b>	<b>YES</b>	<b>NO</b>
	<b>A. Health system related factors</b>		
a)	Have you ever received treatment recommendations by your doctor?		
b)	Do you think that the doctor is receptive to your questions and concerns?		
c)	Do you have experiences of no privacy at the health facility?		
d)	Is there a challenge of long waiting times when accessing the treatment drugs?		
e)	Do you experience limited clinic hours/days while adhering to Antiretroviral Therapy?		
f)	Is the distance to the health facility too long?		
g)	Do care givers have adequate awareness regarding treatment?		

h)	Do you think the care givers motivate you enough to adhere to Antiretroviral Therapy?		
	<b>B. Social-economic related factors</b>		
a)	Do you feel motivated to comply with treatment?		
b)	Do you feel depressed for having the disease?		
c)	Do you feel stigmatized socially?		
d)	Do you think that this disease has limited your daily activities?		
e)	Have you noticed changes in your lifestyle due to this illness?		
f)	Do you know the diet to comply with the treatment?		
g)	Do you feel emotionally supported by your family		
h)	Is the HIV reference unit far from your home?		
	<b>C. Drug related factors</b>		
a)	Do you consider that the amount of drugs you´re taking is too much?		
b)	Do you feel bothered by the frequency of taking drugs		
c)	Have you ever paid for the drugs?		
d)	Are you aware of any therapy side-effects?		
e)	Have you ever stopped taking drugs due to drugs shortage?		
f)	Have you ever felt any discomfort after taking the drugs?		

**Thank you for participating in the study**



**UGANDA CHRISTIAN  
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19/06/2023

To: Veronica Maraka

0772874265

**Type:** Initial Review

**Re: UCUREC-2023-544: Factors affecting Antiretroviral Therapy Adherence Among the Adolescents Living with HIV in Four Selected Health Facilities in Iganga District**

I am pleased to inform you that the Uganda Christian University REC, through expedited review held on **15/06/2023** approved the above referenced study.  
Approval of the research is for the period of **19/06/2023** to **19/06/2024**.

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:


1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of **19/06/2024** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by Uganda Christian University REC:

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No.	Document Title	Language	Version Number	Version Date
1	Assent form if applicable to your study	English	1	2023-06-05
2	Informed Consent forms	English	1	2023-06-05
3	Protocol	English	1	2023-06-04
4	Data collection tools	ENGLISH	1	2023-06-04

Yours Sincerely



Prof. Peter Waiswa  
For: Uganda Christian University REC

### It's Deep **sQoop**

MC Kats dropping mic after 20 years ...P.20



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## 70 teens catch HIV every day - report

**World Aids Day.** Our analysis of Uganda Aids Commission statistics shows that more than 50,000 new HIV infections in the last two years have been among young people aged 15-24 years, triggering a crisis for the country's future. ...[Stories on P.4,5](#)







# UGANDA CHRISTIAN UNIVERSITY

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SCHOOL OF RESEARCH & POSTGRADUATE STUDIES

## DISSERTATION CORRECTION COMPLIANCE REPORT BY THE CANDIDATE (POST VIVA FORM)

Date: 15/05/25.

Name of Candidate: JOY VERONICA MARAKA

Reg. No: RS21M07/001

Title of Dissertation: **FACTORS AFFECTING ANTIRETROVIRAL THERAPY ADHERENCE AMONG ADOLESCENTS RECEIVING SERVICES FROM FOUR SELECTED HEALTH FACILITIES IN IGANGA DISTRICT**

SN	COMMENTS BY EXTERNAL EXAMINER	ACTION TAKEN	INDICATOR
1	Use most current target 95% instead of 90%	Considered the fast-track 95%	The report reading the target of 95%
2	Some of the literatures were outdated as latest ones were available. Use most recent data or report of 2022/2023	Used most recent report of UNAIDS, 2022 and 2023).	Global, regional and national statistics changed e.g global statistics from 37.9 to 39.9 million people

			living with HIV
3	Provide a table showing the ART adherence scores on which basis ANOVA was conducted. This is so because the data presented show proportions and not means.	NO data set	
4	Some of the references put in the text are not on the list. Examples include; 1. Nabukeera et al, 2015 2. Nangobi, 2018 3. Tucker et al, 2019	Complied all the citation into the reference	All included in the reference

<b>SN</b>	<b>COMMENTS BY INTERNAL EXAMINER</b>	<b>ACTION TAKEN</b>	<b>INDICATOR</b>
1	Please include a section of operational definitions of key terms in your study. How did you define adherence in your study?	Added a section of operational definitions of key terms	Operational definitions section included in the study.
2	Did the researcher independently do this? Were there any other assistants? Were they trained in the tool? Please clarify	Data collection was conducted by the researcher with assistance of trained research assistant. The assistant went through a 2 days training session on the data collection tools and procedures to ensure accuracy of that data	Clear description of data collection process and research assistant training and qualifications documented
3	Please indicate the REC Number	Included the REC approval number in the study documentation: REC approval (UCU REC 2023-554)	REC approval number documented
4	Number the references	Formatted references with corresponding numbers	References are numbered correctly
5	Attach UCU REC Letter as well as the administrative clearances from the district.	Attached the UCU Research Ethics Committee (REC) letter	REC approved letter attached

<b>SN</b>	<b>COMMENTS BY VIVA VOCE PANNEL</b>	<b>ACTION TAKEN</b>	<b>INDICATOR</b>
1	The statement of the problem needs to be tightened to include adherence levels at the different level.	Stated at global, regional, national and at district level.	Iganga district adherence rate was 86.9% in 2022
2	Include adherence rate in the conceptual frame work	Included in the conceptual frame worker.	Iganga district adherence rate was

			86.9% in 2022
3	Candidate needs to explore social demographic relationship to ART adherence if the data still exists	Original dataset is not available	
4	Waiting time needs to be explored and added to the findings if the data still exists	Original dataset is not available	

**VERONICA JOY MARAKA**



Candidate's Name

Signature

Dr E.K. Mukooza



Supervisor

Supervisor's Name