PREVALENCE AND FACTORS ASSOCIATED WITH HIV VIRAL LOAD SUPPRESSION AND QUALITY OF LIFE AMONG ADOLESCENTS WITH HIV AND ON ART CARE IN KITGUM DISTRICT, NORTHERN UGANDA

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24/U/0755/MPK/PS

A DISSERTATION SUBMITTED TO THE DIRECTORATE OF RESEARCH AND GRADUATE TRAINING IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER IN PUBLIC HEALTH OF GULU UNIVERSITY, UGANDA

SEPTEMBER 2026

DECLARATION

I Paul Okidi, declare that the information contained in the research dissertation titled "Prevalence and factors associated with viral load suppression and quality of life among adolescents with HIV and on ART care in Kitgum district, Northern Uganda" is my true and original work and has never been submitted to any institution, college or university for any award of a diploma, degree and masters, and I have not copied from any source except where due reference or acknowledgement is made in the text

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APPROVAL

This certifies that this dissertation was developed under my close technical guidance, supervision and is considered approved

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	ACQUIRED IMMUNODEFICIENCY SYNDROME
ART	ANTIRETROVIRAL THERAPY
CD4	CLUSTER OF DIFFERENTIATION
DHIS2	DISTRICT HEALTH INFORMATION SYSEM 2
GUREC	GULU UNIVERSITY RESEARCH AND ETHICS COMMITTEE
HIV	HUMAN IMMUNODEFICIENCY VIRUS
HMIS	HEALTH MANAGEMENT INFORMATION SYSTEM
QOL	QUALITY OF LIFE
UNAIDS	UNITED NATIONS PROGRAM ON HIV AND AIDS
UPHIA	UGANDA POPULATION HIV IMPACT ASSESSMENT
VLS	VIRAL LOAD SUPPRESSION
WHO	WORLD HEALTH ORGANIZATION
aPR	ADJUSTED PREVALENCE RATIO
cPR	CRUDE PREVALENCE RATIO

ABSTRACT

Background

In Uganda, HIV RNA viral load suppression among adolescents living with HIV remains below the 95% global target, ranging from 68.6% to 81%. Achieving and maintaining viral load suppression is essential for optimal health outcomes and may also contribute to better quality of life (QOL) by reducing HIV-related morbidity and supporting physical, psychological, and social well-being. However, adolescents living with HIV continue to experience challenges that may compromise both treatment outcomes and QOL. Previous studies have reported relatively higher QOL scores in the social and psychosocial domains (71.6%–82.4%), with lower scores in the physical and environmental domains. This study therefore determined the prevalence of HIV RNA viral load suppression and associated factors and assessed QOL among adolescents with HIV in Kitgum District, Northern Uganda.

Methods: We conducted a cross-sectional analytical study between October 2025 and March 2026 among adolescents aged 10–19 years who had received ART for at least one year and had a written HIV RNA viral load result. Sociodemographic and psychosocial data were collected using interviewer-administered questionnaires, while clinical information was extracted from patients' medical records. Viral load suppression was defined as an HIV RNA viral load <1,000 copies/mL. Descriptive statistics summarized participant characteristics and the prevalence of viral load suppression. Factors associated with viral load suppression were assessed using modified Poisson regression with robust variance estimation to obtain adjusted prevalence ratios (aPRs) and 95% confidence intervals (CI). Significance of the statistical tests was considered at $p<0.05$, and quality of life was assessed using Stata version 16.

Results: A total of 261 adolescents were enrolled; 137 (52.5%) were female, 146 (55.9%) were aged 15–19 years, with 15 years as a median age (IQR: 13–17). Overall, 190 adolescents achieved HIV viral load suppression, corresponding to a prevalence of 72.8% (95% CI: 66.9%–78.1%). After adjustment for potential confounders, the prevalence of suppressed viral load was 29% higher among adolescents with a CD4+ T-cell count ≥500 cells/mm³ as compared to those with CD4+ T-cell counts <500 cells/mm³ (aPR=1.29, 95% CI: 1.07–1.54; p=0.003). Conversely, adolescents who had experienced ART interruption had a 27% lower prevalence of viral load suppression than those with no history of treatment interruption (aPR=0.73, 95% CI: 0.57–0.92; p=0.008). Overall, 132 (75.43%) adolescents on ART had a moderate quality of life scores; highest score of 72% (IQR: 64%-76% in the physical domain and the lowest score of 67% (IQR: 60%- 74%) in the environmental domain.

Conclusions: Viral load suppression among adolescents on ART was suboptimal, with approximately three-quarters achieving suppression. Higher CD4+ T-cell counts were associated with greater viral load suppression, while ART interruption was associated with lower suppression. Most adolescents reported a moderate quality of life, with the environmental domain recording the lowest scores. These findings underscore the importance of interventions that promote uninterrupted ART and address broader factors affecting adolescents' quality of life.

CHAPTER ONE: INTRODUCTION

Background

Globally, there are approximately 1.57 million adolescents (aged 10–19) living with HIV while many more are at risk of HIV infection(UNAIDS, 2025). The global HIV RNA viral load suppression rates among adolescents and young adults ranges from 44% to 88% (Djiyou et al., 2023a; Rakhmanina et al., 2024).

In Africa, an estimated 1.5 million adolescents are living with HIV and 760,000 newly infected with HIV in 2022 (UNAID, 2024) and an estimated of 170,000 adolescents are living with HIV in Uganda (UPHIA, 2022). Globally, up to 150 adolescents die every day due to AIDS-related illnesses (Pantelic et al., 2020). In Sub-Saharan Africa, viral load suppression among the adolescents ranges from 73% to 88% (Ally et al., 2023a; Berihun et al., 2023a; Djiyou et al., 2023b; Mwangi & Van Wyk, 2021a).

In Uganda, HIV contributes to 26% of the tertiary hospital mortality with an estimated 1,524 HIV related deaths (Owachi et al., 2024). In Eastern Uganda, viral load suppression among the adolescents was 68.6% which was far below the national target of 95% (Maena et al., 2021a) and this puts the adolescents are greater risks of dying from advanced HIV- related conditions.

Several factors are associated with HIV RNA viral load suppression among the adolescents such as anti-retroviral therapy (ART) adherence and CD4+ T-cell counts (Mchomvu et al., 2022a; Mwangi & Van Wyk, 2021a), participants sex, educational level, family sizes and food security (Okonji et al., 2021; Wang et al., 2016), family support (Abuonji et al., 2024; Nakandi et al., 2022), having access to meals (Gordon et al., 2022a), HIV Comorbidities (Kilbourne et al., 2001, Moreira-Silva et al., 2013), and being supported by a psychosocial groups (Onyango et al., 2023a).

Beyond virologic outcomes, HIV can affect adolescents' quality of life (QOL) across physical, psychological, social, and environmental domains (Akpa & Bamgboye, 2015; Chitra et al., 2019). There are several studies that have been done on the quality of life of individuals affected by HIV (Aurpibul et al., 2023; Bakiono et al., 2014a; Cronje et al., 2017; Fernandes et al., 2025a). These studies have revealed a better scores for social and psychosocial domains ranging from 71.6% to 82.4% (Akpa & Bamgboye, 2015; Aurpibul et al., 2023; Bakiono et al., 2014b; Cronje et al., 2017; Fernandes et al., 2025a). Worst or lowest quality of life scores were registered in the environmental and physical domains (Bakiono et al., 2014b; Fernandes et al., 2025a). Achieving and maintaining viral suppression is important for reducing HIV-related morbidity and supporting physical well-being, while the social and environmental

circumstances that facilitate uninterrupted treatment may also influence QOL. Conversely, treatment interruption, psychosocial difficulties and barriers to healthcare access may compromise both treatment outcomes and well-being. This relationship is particularly relevant in a post-conflict setting such as Kitgum, where adolescents may experience the interrelated effects of HIV, household socioeconomic challenges, and limitations in their broader living environment.

The experiences of adolescents receiving HIV treatment in Northern Uganda should be considered within the region's post-conflict setting. The Acholi sub-region, including Kitgum District, endured nearly two decades of armed conflict between the Government of Uganda and the Lord's Resistance Army from 1986 to 2006. This prolonged conflict caused widespread displacement, disrupted families and livelihoods, and weakened social services and infrastructure. In Kitgum District, an estimated 90% of the population was displaced during the conflict(Namakula & Witter, 2014). The war and widespread displacement disrupted family and community support systems, leaving many young people socially and economically vulnerable. These effects have persisted into the post-conflict period and continue to influence HIV-related risks among young people (Patel et al., 2012). The conflict also weakened the health system, particularly in rural areas, where health facilities have continued to face challenges in attracting and retaining an adequate health workforce (Namakula & Witter, 2014).

Despite these challenges, there is limited district-specific evidence on viral load suppression among adolescents in Kitgum District, including the factors associated with suppression and their quality of life. This study therefore aimed to determine the prevalence of HIV RNA viral load suppression, identify associated factors, and assess quality of life among adolescents receiving ART in Kitgum District.

Problem Statement

Achieving and sustaining HIV viral load suppression among adolescents is essential for reducing HIV-related morbidity and mortality, preventing disease progression and minimizing onward HIV transmission. The main objective of HIV care cascade in adolescents living with HIV is viral suppression following early initiation of ART (Kakkar et al., 2020). In sub-Saharan Africa, viral load suppression among the adolescents ranges from 73% to 88% (Ally et al., 2023a; Berihun et al., 2023a; Djiyou et al., 2023b; Mwangi & Van Wyk, 2021a).

Uganda's national HIV response has specifically identified adolescents aged 10–19 years as a population requiring improvement in ART linkage and retention; national programme data

reported 87% linkage to ART and 63% 12-month ART retention among adolescents in 2022/23, against a 95% target.(MOH, 2024).

Uganda Ministry of Health data indicate that adult HIV prevalence in Kitgum was approximately 2.8% in 2020 (MOH, 2025). However, current district-specific data quantifying HIV-related morbidity and mortality specifically among adolescents in Kitgum are limited**,** making it inappropriate to infer the present adolescent burden from older or national mortality statistics. Failure to achieve viral suppression increases the likelihood of progressive immunosuppression, opportunistic infections, and other HIV-related morbidity, and ultimately HIV-related mortality, while also increasing the potential for onward transmission. The consequences may extend beyond clinical outcomes to adolescents' physical, psychological, social, and environmental quality of life.

Despite these concerns, there was limited empirical evidence on the magnitude of viral load suppression, factors associated with suppression, and quality of life specifically among adolescents aged 10–19 years receiving ART in Kitgum District. Without such locally generated evidence, health facilities and the District Health Office have limited information to identify adolescents at greatest risk of non-suppression and appropriately target interventions to improve treatment continuity, health outcomes, and well-being. This study therefore determined the prevalence of HIV RNA viral load suppression and associated factors and assessed quality of life among adolescents receiving ART in Kitgum District, Northern Uganda

Justification

Despite widespread access to antiretroviral therapy, viral load suppression among adolescents living with HIV remains an important public health concern. These adolescents are characterised by developmental, social, and health-service challenges that may affect adherence to ART, continuity in care, treatment outcomes, and overall well-being

Findings from this study will help to provide new knowledge of HIV management among adolescents and inform clinical practices aimed at improving VL suppression among the adolescents living with HIV. The study will also help to provide new knowledge of how HIV has impacted the adolescents' quality of life. Furthermore, the findings from this study will further help in policy development and advocacy in the management of HIV.

General Objectives

To assess HIV RNA viral load suppression among adolescents with HIV and on ART in Kitgum District and their Quality of life

Specific objectives:

1. To determine the proportion of adolescents with HIV and on antiretroviral therapy with HIV RNA viral load of < 1,000 copies /ml in Kitgum district
2. To assess factors associated with HIV RNA viral load suppression among adolescents on ART in Kitgum district
3. To assess quality of life of adolescents who are in ART care in Kitgum district

Research Questions

1. What proportion of adolescents on ART in Kitgum district have HIV RNA viral load suppression?

2. What are the associated factors with HIV RNA viral load suppressions among the adolescents on ART in Kitgum District?

3. What is the quality of life of adolescents receiving ART among health facilities in Kitgum District?

Study scopes

Geographic scope

The study was conducted in Kitgum district, Acholi sub-region, Northern Uganda, among the health facilities offering HIV/AIDS care services in the district.

Content scope

The study content scope included: factors associated with viral load suppressions and quality of life among the adolescents living with HIV/AIDS who are attending HIV care in health facilities in Kitgum district

Population scope

The study population were adolescents aged 10-19 years of age living with HIV and receiving HIV care and treatment in accredited ART facilities in Kitgum district.

Time scope

The study was conducted between October 2025 to March 2026

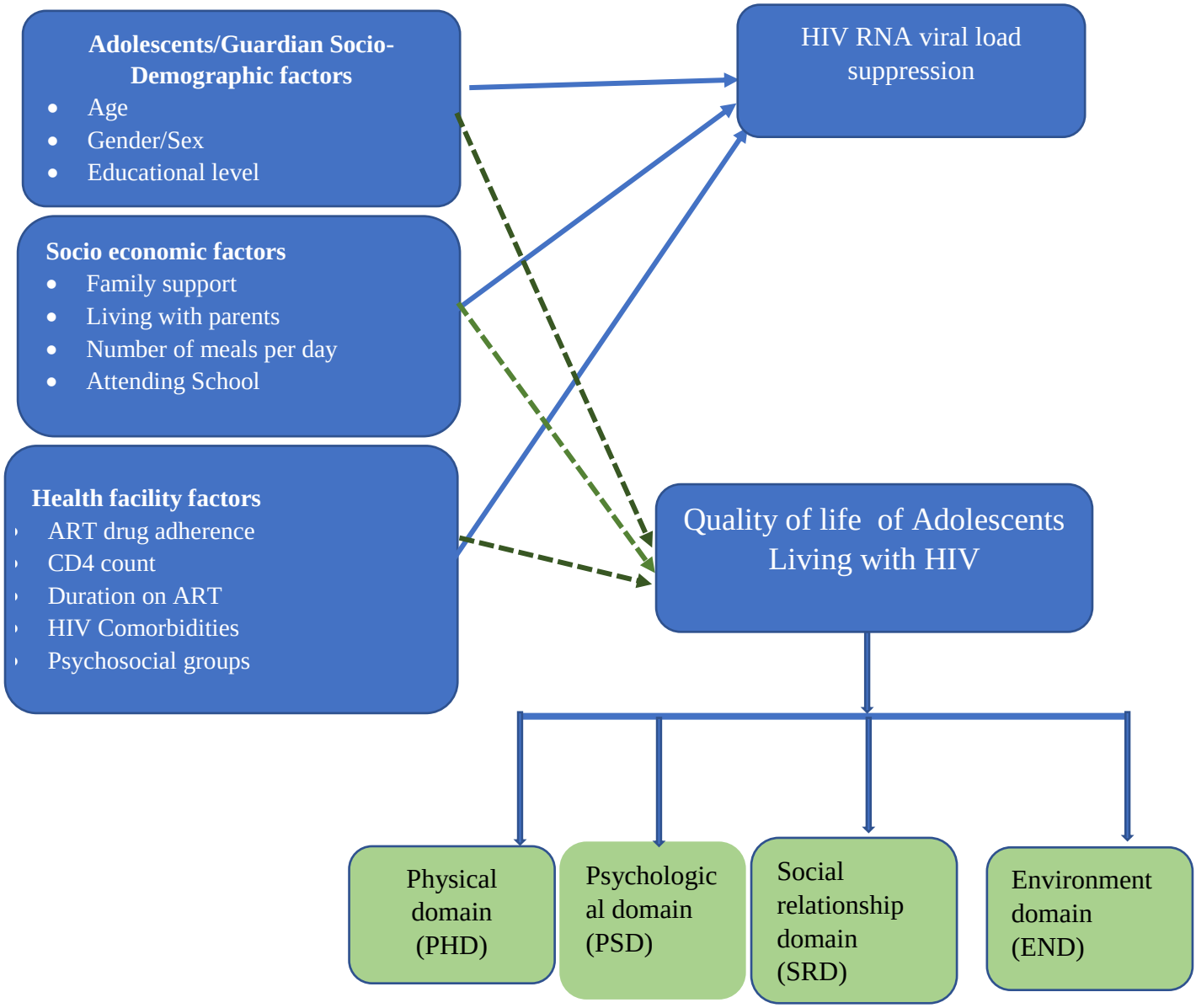


Figure 1: Conceptual framework

The study was guided by the conceptual framework which has been detailed below. Viral load suppressions among the adolescents living with HIV is associated with many factors categorized into socio-demographic, socio economic and health facility factors. Demographic factors include; adolescents' age, gender/sex, and educational. Socio economic factors which

include; Family support, living with parents, number of meals per day, attending School and Health facility factors include; Health facility factors; ART drug adherence CD4 count, Duration on ART, HIV Comorbidities and Psychosocial groups.

Adolescents with HIV have poor quality of life than those without HIV (Akpa & Bamgboye, 2015). The constructs of quality of life have been classified into 4 main domains which are; Physical, Psychological, social relationship and Environmental domains. In regards to HIV infection, physical domain will assess the individual's energy levels, fatigue, pain, and sleep quality of an individual, Psychological domain evaluates self-esteem, body image, negative thoughts, and mental health issues such as anxiety and depression, Social relationship domain focuses on personal relationships, social support, sexual activity, and social inclusion and Environmental domain mainly evaluates various facets of an individual's environment that can influence their quality of life and these include; financial resources, safety, health care accessibility, home environment, and opportunities for acquiring new information and skills. A detailed conceptual framework has been visualized in figure 1 above.

CHAPTER TWO: REVIEW OF LITERATURES

Proportion of viral load suppression among adolescents living with HIV

Viral load suppression has remained very low among adolescents on ART care at various health centers. Globally the proportion of HIV RNA viral load suppression among adolescents stood at 64% and this proportion decreases with the increase in the number of years spent on ART (Han et al., 2021). A retrospective cohort study among 21,594 children and adolescents from 106 sites in 22 countries indicated a proportion of viral load proportion at 64% (Han et al., 2021).

In Sub-Saharan Africa, HIV RNA viral load suppression among the adolescents ranges from 73% to 88% (Ally et al., 2023a; Berihun et al., 2023a; Djiyou et al., 2023b; Mwangi & Van Wyk, 2021a). For instance, a cross-sectional study in Ethiopia among 522 randomly selected adolescents showed that viral load suppression was 73% CI (60.41% to 77.63%) (Berihun et al., 2023b). In Uganda, HIV RNA viral load suppression among adolescents living with HIV ranges from 68.6% to 81% (Ainembabazi et al., 2024; Gordon et al., 2022a; Maena et al., 2021b). For instance a retrospective study in the Eastern part of Uganda in Mbale district and Mbale City in 2018 among 567 adolescents living with HIV showed that a HIV RNA viral load suppression 68.6% (Maena et al., 2021a.) and in the Western Uganda, a cross-sectional study 249 adolescents in Kabale district, south Western Uganda indicated that viral load suppression among adolescent was 81% (Gordon et al., 2022b).

Factors associated with viral load suppression among adolescents

Gender

The female adolescents are more likely to achieve a HIV RNA viral load suppression compared to the male adolescents. The cross-sectional study conducted among a total of 213 adolescents on ART in rural Tanzania indicated that being a female is associated with the HIV RNA viral load suppression (aOR= 2.8; 95% CI 1.036.45; p=0.044) (Muri et al., 2017; Okonji et al., 2021). However, the study didn't describe how the sample size was determined and the methods or strategies used to select participants.

In Uganda, a retrospective study of PLHIV among 567 HIV infected adolescents indicated that HIV RNA viral load (VL) non-suppression was associated with being male. The study indicated that males were 1.78 times more likely to have a HIV RNA viral load non suppression compared to females (AOR = 1.78, 95% CI 1.06, 2.99) (Maena et al., 2021a).

Educational status.

Adolescents' enrollment in school is known to have a positive relationship with HIV RNA viral load suppression. A cross-sectional study in Kenya among 31,291 children and adolescents living with HIV showed that adolescents who are enrolled in school or active in school are 1.33 times more likely to achieve a HIV RNA viral load suppression compared to those not at school (aOR = 1.33, 95% CI: 1.07, 1.65) (Onyango et al., 2023b). A cross-sectional study in Western Kenya among 263 adolescents indicated that adolescents with at least a secondary level of education are nearly 7 times more likely to achieve HIV RNA viral load suppression than adolescents with no education or only a primary level of education (AOR=6.87, 95%CI=2.40-19.64) (Abuonji et al., 2024).

In Uganda, a cross-sectional study of 383 adolescents in Eastern Uganda revealed that adolescents who have no formal education are 3.67 times more likely to have a HIV RNA viral load non-suppression compared to adolescents with a secondary/ tertiary level of education AOR=3.67 ,95% CI 1.48,9.09), p<0.01(Maena et al., 2021b)

Family support

There is a positive association between family support and HIV RNA viral load suppression. Adolescents who receive family support are 1.57 to 12 times more likely to achieve a HIV RNA viral load suppression compared to adolescents who lack family support (Abuonji et al., 2024; Nakandi et al., 2022). For instance, a cross-sectional study of 263 adolescents in Western Kenya indicated that adolescents who are supported by their family in terms of facilitating their transport to the health facility are 2 times more likely to achieve a HIV RNA viral load suppression compared to the adolescents who don't receive such transport facilitation (AOR=2.33, 95%CI=1.82-6.65) (Abuonji et al., 2024). The study further revealed that these supports include: getting reminders from their caregiver at home to take their ARV drugs, having a primary caretaker with a regular income (Abuonji et al., 2024; Nakandi et al., 2022).

Living with parents

Adolescents who live together with their parents are more likely to achieve a HIV RNA viral load suppression. Numerous studies have indicated that adolescents who live together with their parents are 2-5 times likely to achieve a HIV RNA viral load suppression compared to adolescents who don't stay with their parents(Abuonji et al., 2024; Gordon et al., 2022a). For instance, a cross-sectional study among 263 adolescents in western Kenya showed that

adolescents who live with their parents are 5 times more likely to have HIV RNA viral load suppressions compared to adolescent who don't live with their parents (AOR=5.0, 95%CI=1.66-15.09)(Abuonji et al., 2024).

Having access to meals

Having meals is correlated with having a suppressed HIV RNA viral load. A cross-sectional study in western Uganda among 249 adolescents indicated that having a meal is associated with HIV RNA viral load suppression, with adolescents who have meals a day were nearly 6 times more likely to have a viral load suppression compared to those adolescents who don't have meals a day, OR = 5.68; C.I = 2.38–6.12, P = 0.010) (Gordon et al., 2022a).

ART drug adherence

A good ART adherence results in HIV RNA viral load suppression. In Kenya, a retrospective cross-sectional study conducted among 908 adolescents in Kenya found out that adolescents with good adherence to ART were 2.3 times more likely to achieve a HIV RNA viral load suppression compared to adolescents with poor ART adherence (AOR=2.3, 95% CI=1.38–3.84) (Mwangi & Van Wyk, 2021b). A retrospective follow-up study among 378 children and adolescents in the Tabora region, Tanzania, indicated that determinants of viral load non-suppression were poor ART adherence at ART initiation, where poorly adhering adolescents were 3.3 times more likely to register a HIV RNA viral load non-suppression (HR = 3.3; 95% CI 2.16, 4.91 (Mchomvu et al., 2022b).

In Uganda, a cross-sectional study among 397 adolescents in Jinja indicated that the adolescents with a good adherence of equal to or greater than 95% are 2.73 times more likely to achieve a HIV RNA viral load suppression as compared to the adolescents with ART adherence of less than 95% (Natukunda et al., 2019).

CD4 count

Adolescents with higher CD4+ cell count in a range of 200 to above 500 cells/ mm^3 are more likely to achieve a HIV RNA viral load suppression(Chhim et al., 2018; Elashi & Van Wyk, 2022; Mwangi & Van Wyk, 2021a; Okonji et al., 2021). For instance, a cross-sectional study among 908 adolescents in Kenya found out that adolescents with a recent CD4+ cell count of above 500 cells/mm3 were 1.87 times more likely to achieve a HIV RNA viral load suppression compared to adolescents whose CD4+ T-cell count was less than 500 cells/mm^3 (AOR=1.87, 95% CI=1.13–3.08)(Mwangi & Van Wyk, 2021a).

Duration on ART

There is an association between duration spent on ART and HIV RNA viral load suppression in the sense that the more years spent on ART, the more likely an adolescent will achieve viral load suppression. In Ethiopia, a cross-sectional study conducted among 522 adolescents showed that the adolescents who have spent less than a year on ART are 79.3% less likely to achieve HIV RNA viral load suppression as compared to adolescents who have spent four or more years on ART. (AOR 0.207, 95% CI (0.094 to 0.456); p<0.001 (Berihun et al., 2023a).

However, a retrospective study among 567 HIV infected adolescents in Mbale District Eastern Uganda, showed that adolescents who have taken 5 or more years on ART are 3.47 times more likely to have HIV RNA viral load non suppression compared to adolescents who have spent less than a year on ART (AOR = 3.47, 95% CI 1.39– 8.66; p < 0.01(Maena et al., 2021b).

ART interruption

ART interruption is defined as a temporary or a permanent stoppage of antiretroviral therapy by a person living with HIV. This can either be complete or partial, planned or unplanned stoppage. A cross-sectional study conducted in Western Uganda among 249 adolescents living with HIV indicated that there is a strong association between having no ART interruption and HIV RNA viral load suppression. Adolescents who have had ART interruption are 0.86 times less likely to achieve a HIV RNA viral load suppression compared to those who have not had ART interruption (OR = 0.86; 95% CI [2.414–6.790]; p = 0.004) (Gordon et al., 2022a).

HIV Comorbidities

The World Health Organization (WHO) defines HIV comorbidity as a physical or mental health condition that occurs in addition to HIV. Comorbidity in HIV can be defined as a disease outside the scope of an acquired immunodeficiency syndrome-associated (AIDS-defining) illness (Kilbourne et al., 2001). A point-prevalence audit of retrospective data conducted among 6719 HIV-positive patients in Brent London indicated that 29% of Brent HIV patients have at least one comorbid disease (Lorenc et al., 2014). A retrospective cohort study in Brazil among 177 adolescent living with HIV/AIDS showed that the commonest comorbidities were anaemia (67.2%), pneumonia/septicaemia/acute bacterial meningitis (ABM) (64.2%), acute

otitis media (AOM)/recurrent sinusitis (55.4%), recurrent severe bacterial infections (47.4%) and dermatitis (43.1%)(Moreira-Silva et al., 2013).

Adolescents with comorbidity are 1.09 to 3 times more likely to have a non-suppressed HIV RNA viral load as compared to the adolescents without comorbidity (Gordon et al., 2022a; Maena et al., 2021b). For instance, a retrospective study among 567 adolescents in Uganda's eastern district of Mbale District indicated that adolescents with comorbidity are 3.28 times more likely to have HIV RNA viral load non-suppression compared to adolescents without comorbidity (AOR = 3.28, 95% CI 1.20–9.00; $p < 0.05$)(Maena et al., 2021b)**.**

Psychosocial groups

Adolescents who are supported by the HIV support groups were associated with HIV RNA viral load suppression. Adolescents living with HIV and who are supported by the psychological groups are 411 times more likely to achieve a viral load suppression as compared to those who are not supported by the support groups, compared to the adolescents not in any psychological groups (aOR = 411.25, 95% CI 168.2–1,005.4) (Ally et al., 2023b). Relatedly, a cross-sectional study in Kenya among 31,291 children and adolescents living with HIV showed that child's membership in psychosocial support was associated with HIV RNA viral load suppression. Adolescents who received psychosocial support are 1.26 times likely to attain HIV RNA viral load suppression as compared to those who are not in psychosocial support (aOR = 1.26; 95% CI: 1.15, 1.38) (Onyango et al., 2023b).

Quality of life of adolescents living with HIV/AIDs

The quality of life (QoL) of adolescents living with HIV is greatly impacted by the difficulties they experience. According to the World Health Organization (WHO), quality of life (QoL) is a person's view of their place in life in relation to their objectives, expectations, standards, and concerns, as well as the culture and value systems in which they live (WHO, 1997). The adolescents with HIV in a post-conflict area like Kitgum are likely to experience poor quality of life, which is mainly attributed to the extensive population displacement, disruption of families and livelihoods, and damage to social services and physical infrastructure (Namakula & Witter, 2014).

The general constructs of the quality of life included: participants' view on the general quality of life, and assessments of different facets of human functioning classified into four (4) domains: Physical domain (PHD), Psychological domain (PSD), Social relationship domain

(SRD), and Environment domain (END). Physical domain (PHD) basically assesses energy levels, fatigue, pain, and sleep quality of an individual, psychological domain evaluates self-esteem, body image, negative thoughts, and mental health issues such as anxiety and depression, social relationship domain focuses on personal relationships, social support, sexual activity, and social inclusion and eenvironmental domain mainly evaluates various facets of an individual's environment that can influence their quality of life and these include; financial resources, safety, health care accessibility, home environment, and opportunities for acquiring new information and skills.

Overall scores variable shall be categorized into 3 groups (poor, moderate and High) using the values of standard deviation (SD) and mean Poor will be individuals whose scores are less than mean plus standard deviation (if score < mean+ SD), Moderate will be individuals whose scores fall between mean minus SD and mean plus SD (if mean– SD≤ score ≤ mean + SD) and high if the scores are above mean plus standard deviation (if score ≥ $\bar{X}$+ SD) ((Issa & Baiyewu, 2006).

Several studies have been done on the quality of life of individuals affected by HIV, and these studies have revealed better scores for social relationship domains (Aurpibul et al., 2023; Bakiono et al., 2014a; Cronje et al., 2017; Fernandes et al., 2025a).

A cross-sectional study among 63 university students in South Africa living with HIV indicated that the lowest scores were registered for Spirituality, psychological, and in physical domains, respectively, and social relations recorded the highest scores.(Cronje et al., 2017).

The Cross-sectional study conducted of 424 people living with HIV in Ouagadougou, Burkina Faso, indicated quality scores of 82.4% for all patients, where better score was registered in the spiritual domains and lowest scores in the environmental domains (Bakiono et al., 2014b). In Brazil, a cross-sectional study conducted among 200 patients living with HIV showed that psychological and social relationship domains showed the highest scores, while the environment and physical domains showed the lowest (Fernandes et al., 2025a).

A cross-sectional study among 111 adolescents and young adults living with HIV in Thailand indicated that the highest QOL score was in social relationship domain and followed by environmental domain and the overall QOL as rated as good was at 59.4% (Aurpibul et al., 2023). A cross-sectional study in Nigeria among 150 randomly selected individuals living with HIV indicated that high quality of life scores of 71.60 ± 18.40% with a standard deviation of

18.4 were registered in physical, psychological and environmental domains and the lowest was registered in social domain at 68.89 ± 16.70%(Folasire Oluyemisi F. et al., 2012).

Summary of literature review

HIV continues to the global public heath burden affecting population including adolescents. Adolescents' response to ART treatment continues below the recommended UNAIDS target of 95% which has been indicated by a low viral load suppression mostly below 85%. A similar study has not been conducted in northern Uganda, particularly Kitgum District, this is a reason why this study will be conducted in Kitgum District.

From the review literatures, many factors are known to be statistically associated with HIV viral load suppression among adolescents include; ART drug adherence and CD4 count, Gender, Educational status, Family structure and size, Having parents alive, Food security, Duration on ART and comorbidities, Psychosocial groups, Distance from the Health Facility, Patients CD4 <500 However, these factors have not been studied in Northern Uganda and hence a reason for conducting this study in Kitgum District, Northern Uganda.

Literatures have also showed that most adolescents live poor quality of life which are mainly attributed to the impact of HIV. Factors highlighted to be contributed to poor quality life of adolescents are; avoiding social interaction and seeking the necessary social care and support, believing that they are unworthy of respect and care, living sedentary life or physical inactivity, lacking the social support they desperately need, unsatisfactory relationship with the family, low level of education, poor access to the health care services mainly due to stigma and demographic differentials of the service provers.

CHAPTER THREE: METHODS

Research study design

This study was a cross-sectional study design employing quantitative methods.

Research study area

The study area was Kitgum district, located in Acholi region, Northern Uganda. Kitgum District has a projected total population of 235,700 (UBOS) which is served by 40 health facilities (2 Hospitals, 1 HCIV, 11 HCIIIs and 26 HCII and Clinics). In terms of ownership, 27 health facilities are government/public health facilities, 6 are PFP and 7 are PNFP. In terms of ART/ HIV services 14 of which are accredited to offer comprehensive HIV care services in Kitgum district. According to district health management information system (HMIS) 2024, there are 591 adolescents aged 10-19 years living with HIV and are receiving HIV treatment in Kitgum District.

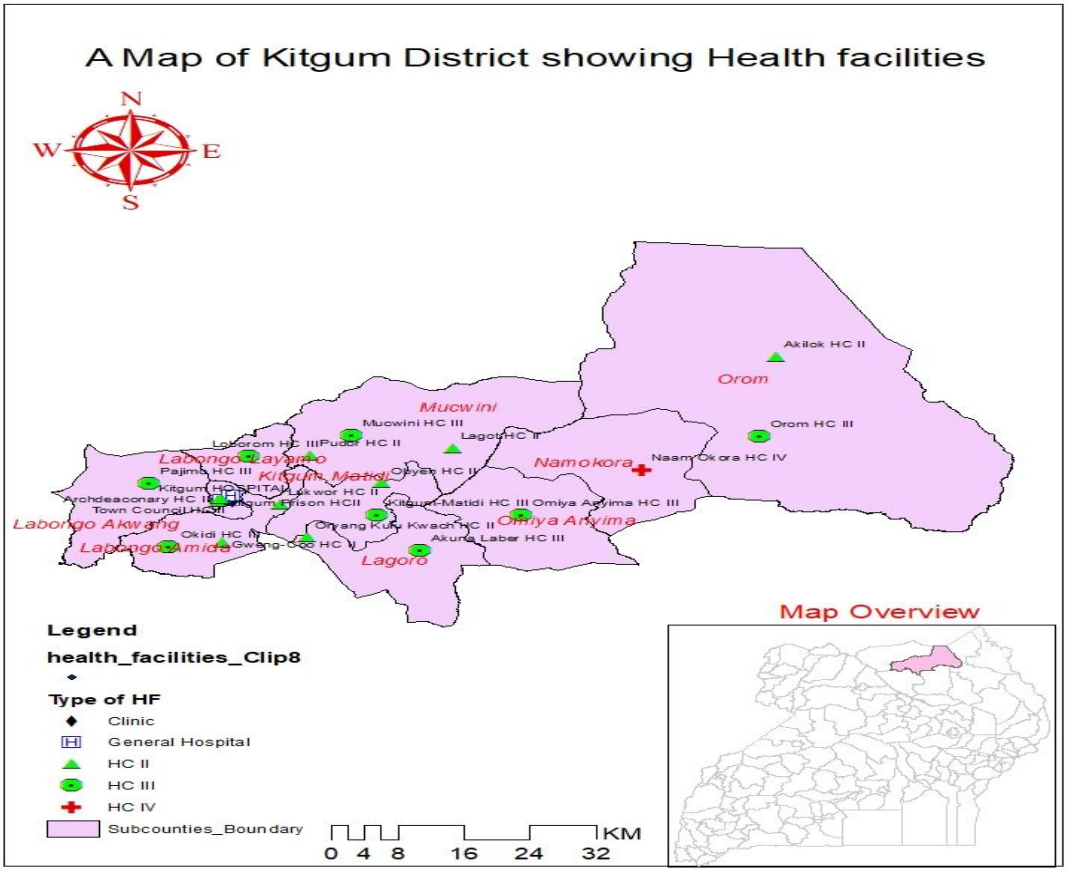


Figure 2: Map of Kitgum District with Health facilities

Research study population

The study population were the adolescents aged 10-19 years living with HIV and receiving HIV treatment services in the ART-accredited sites in Kitgum district.

Study sample size

The study sample size was computed using the Kish-Leslie formula for sample size determination.

$$Sample\ size, n = \frac{Z^2 pq}{d^2}$$

Where; n=desired sample size

Z= Z score for 95% confidence interval~1.96

p =VL suppression among adolescents at 81% (Gordon et al., 2022a). This was a study assessing factors associated with the viral load suppression among adolescents in Western Uganda.

q =complement of p (1-p) = 1-0.81=0.19

d=margin of error, 0.05

$$Sample\ size, n = \frac{1.96^2 * 0.81 * 0.19}{0.05^2}$$

$$Sample\ size, n = \frac{3.8416 * 0.81 * 0.19}{0.0025}$$

$$Sample\ size, n = \frac{0.591}{0.0025}$$

$$Sample\ size, n = 237$$

Factoring 10% non-response, Sample size=237+ (0.10*237) = **261**

Sampling strategy

The study employed simple random sampling techniques. A sampling frame was obtained from an updated patient records in Uganda EMR system and assigned whole numbers. As guided by the proportionate to size (refer to table 1), the numbers were randomly selected using Microsoft excel and thereafter interviewed for the study responses.

Table 1:ART sites in Kitgum Districts with its respective adolescent's population aged 10-19 years living with HIV

ART accredited Sites	Number adolescents aged 10-19 years	Numbers to be Sampled
St. Joseph's Kitgum Hospital	144	64
Kitgum General Hospital	143	63
Mucwini Health Centre III	55	24
New Life Health Centre III	50	22
Namokora Health Centre IV	44	19
Omiya Anyima Health Centre III	30	13
Orom Health Centre III	30	13
Kitgum-Matidi Health Centre III	27	12
Pajimo Health Centre III	27	12
Akuna Laber Health Centre III	18	8
Loborom Health Centre III	14	6
Okidi Health Centre III	9	5
Grand Total	**591**	**261**

Selection criteria

Inclusion criteria

- Adolescents aged 10-19 years with HIV and on ART care
- Adolescents on ART care for a minimum of one year and with a HIV viral load test

Exclusion criteria

- Adolescents with incomplete information in the registry (Uganda EMR system)
- Adolescents who were severely ill

Data management plan

Study data was stored in passworded Kobo toolbox. Data in Kobo toolbox was reviewed and extracted.by exporting it to Microsoft excel where cleaning was done and thereafter exported to STATA version 16 for analysis.

Data collection tool

Research data was collected using a wholly adopted questionnaires (Appendix 3) from a previous study (Gordon et al., 2022a) to collect gather clinical and sociodemographic information and WHO quality of life assessment tool (Appendix 4) for the assessment of quality of life and these questionnaires were administered by research assistants.

Data collection procedures

Data for the study was collected through review of respondent's information/ clinical data from the EMR system and through face-to-face interviews for the quality-of-life assessment. The questionnaires were administered by the research assistants and the responses were captured electronically in a programmed Kobo toolbox

Study variables

Dependent variable

The dependent variable for the research study was the H I V RNA viral load quantity measured in copies/Ml which was categorized into binary variable as suppressed and non-suppressed. Suppressed were adolescents with viral load quantity of <1000 copies/mL whereas non-suppressed were the adolescents with viral load quantity of =>1000 copies/mL.

Independent variables

The independent variables were categorized in the; socio-demographic, clinical and psychosocial variables Under socio-demographics variables include gender of respondents measured as either a male or a female, age measured as the number of completed years, religion measured as Anglican, catholic, Muslim, Seventh Day Adventist (SDA) and other religion, education level measured as; none, primary, secondary and tertiary levels of education, marital status measured as; married, single and divorced and occupation measured as; a unemployed, peasant and salary earner.

Clinical factors included; CD4 both at initiation and current CD4 values (any most recently documented CD4 count in the clinical record before or at the time of data collection or data abstraction) measured in cells/mm^3, duration on ART in completed years, previous and previous regimens measured as first or second line of treatment, ART adherence measured as good, fair and poor, assessment of severe opportunistic infection, experience of side effects, ever had treatment interruption, adolescent taking Septrin/cotrimoxazole, other medications including local herbs measured as yes or no respectively. Treated well by the health worker measured as yes or no

Psychosocial factors and socio-economic factors included; receiving family support measured as yes or no, forms of family support measured as monetary, non-monetary, living with parents measured as yes or no, disclosed HIV status to parents/guardian measured as yes or no, number of meals had in a day measured as once, twice or thrice, attending school measured as yes or , having cycle of fiends (groups of peers with whom adolecents interact or socialised) measured yes or no, having a sexual partner measured as yes or no, use of drugs/smokes measured as yes or no, pays for receiving medical services, consistency in attending clinic days measured as yes or no.

Quality of life measured as poor, moderate or high which were derived from the aggregated domain scores, mean scores and standard deviation.

Quality of life Variables

Variables under quality-of-life section were classified into the different domains/ constructs. Each question under different domains/ construct was ranked on a Likert scale of 1 to 5 where 5 represents a higher score and 1 represents the least score. Physical construct assessed questions related to fatigue and pain, sleep quality and energy of the adolescents. Psychological construct assessed questions surrounding negative thoughts, mental/ anxiety and depression. Social relationship assessed questions surrounding social support, personal relationships and social inclusions. and environmental constructs assessed questions surrounding health care accessibility, opportunity for acquiring a new information and skills, financial resources and home environment.

Data quality control and management

The designed kobo system was pre-tested and any anomality in the design stage addressed. Conditions were set in the system to allow the required response on the parameter and for

checking for completeness of the questionnaires. The identified research assistants were trained/ oriented on the kobo tool before the actual data collection from the field. A review of the submitted forms/ questionnaires was done with the research assistants for any corrections to be made.

Data analysis plan

Objective one

Descriptive statistical method was employed: Univariate analysis was conducted to establish results of objectives one. The frequency of virally suppressed adolescent was divided by the overall count of adolescents registered in the study and multiplied by 100%. This gave the results of the proportion of HIV RNA viral load suppression among the adolescents enrolled in the study.

Objectives two

Inferential statistical methods were employed; factors associated with HIV RNA viral load suppression were assessed by running bivariate and multivariate analyses. At bivariate analysis, chi-square tests were performed to ascertain the relationship between the dependent (viral load suppression) and independent variables (socio-demographic, clinical and Psychosocial factors). Variables which are significant at bivariate at 0.2 ($p \leq 0.2$) were further analyzed at multivariate analysis. At further analysis, modified Poisson regression was performed to assess any factors which are associated with viral suppression while controlling for any potential confounders. Adjusted prevalence ratio, P values and 95% confidence interval were used to describe the level of association. $P<0.05$ was considered statistically significant

Objective three

Descriptive statistical method was employed, and objective three was analyzed by computing the quality-of-life scores of each respondent and categorizing into 3 groups as; poor, moderate and high quality of life using the mean and standard deviation of the scores in each domain. The poor were individuals whose scores was less than mean plus standard deviation (if score < mean– SD), moderate were individuals whose scores were between mean minus SD and mean plus SD (if mean– SD≤ score ≤ mean + SD) and high if the scores are above mean plus standard deviation (if score ≥ $\bar{X}$+ SD) (Issa & Baiyewu, 2006). The counts and proportion for different categories for quality of life (either poor, moderate or high) were computed for different domains and expressed in 100%.

Dissemination plan

The results of the study were disseminated; to the Gulu University Library, Department of Public Health inform of a research report, a copy of the research report was disseminated to Kitgum District health Office. Research findings will be published in a peer reviewed journal and presentation will be made at both local and international conferences.

Ethical considerations

Study approval was sought from the GUREC(**GUREC-2025-431)**. In the field, administrative permission to proceed with the research study was obtained from the District Health Office Kitgum district. Participating in the study was voluntary. Assents were got from the parents for respondents whose age is less than 18 years of age Assent form (Appendix 2) and consents were sought for individuals whose age was greater or equals to 18 years of age. Consent form (Appendix 3) Information collected from the research study were strictly used for academic purposes and client's details were kept confidential.

CHAPTER FOUR: RESULTS

STUDY FLOW DIAGRAM

A total of 591 were screened for study eligibility, out of which 80 adolescents were excluded from the sampling frame mainly due to; incomplete information/ records, HIV associated psychosis and being severe illness. A total of 511 adolescents were included in the sampling frame where simple random sampling technique was performed to identify 261 adolescents were interviewed. The study finding found that 190 (72.8%) adolescents achieved HIV RNA viral load suppression whereas 71 (27.2%) adolescents didn't achieve a viral load suppression, refer to figure 3 below

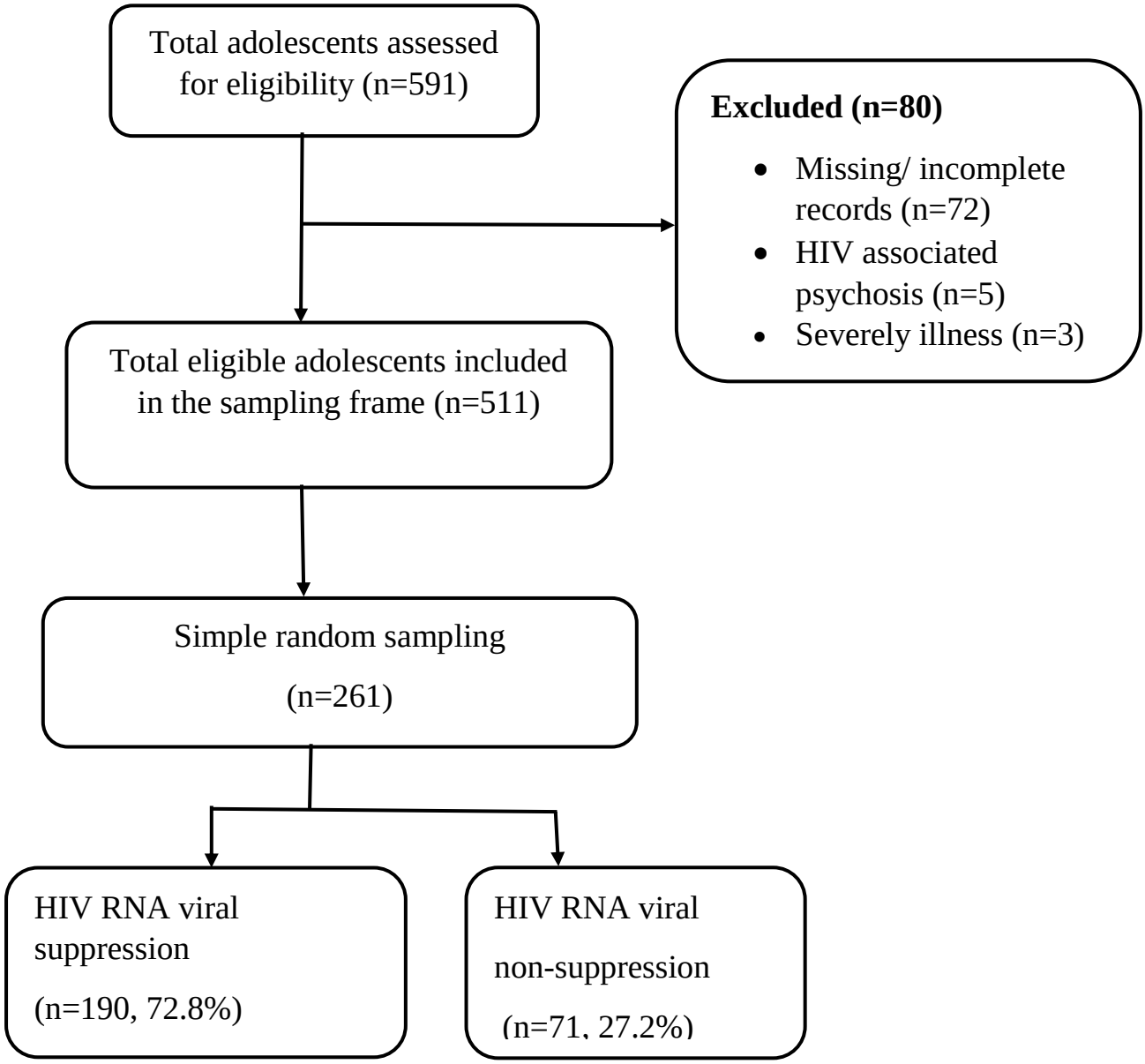


Figure 3: Flow diagram showing participant selection among adolescents in ART care in Kitgum District

Study participants

Most respondents were female (52.5%, n=137) and adolescents aged 15-19 years (55.9%, n=146) (median age=15 years, IQR=13-17 years). Most of these adolescents were unmarried/single (86.2%, n=225), of catholic faith (54%, n=141), had attained primary level (73.6%, n=192) as their highest level of education, and were unemployed (99.6%, n=260) in terms of their employment, as reported in Table 3.

Table 2: Socio-demographic characteristics of the study respondents

Study variables	Frequency (n=261)	Percentage (%)
Gender		
Female	137	52.5%
Male	124	47.5%
Age		
10-14 years	115	44.1%
15-19 years	146	55.9%
Religion		
Anglican	110	42.2%
Catholic	141	54.0%
Muslim	01	0.4%
Other (Born Again & PAG)	09	3.4%
Educational level		
No formal education	16	6.1%
Primary	192	73.6%
Secondary	50	19.2%
Tertiary	03	1.1%
Marital status		
Single	255	97.7%
Married	5	1.9%
Divorced	1	0.4%
Employment status		
Unemployed	260	99.6%
Salary earner	1	0.4%

Clinical characteristics of the participants

The majority of the study participants had a suppressed viral load (72.8%, n=190) and had current CD4+ cell counts above 500 cell/mm (59%, n=154). Most of these adolescents have spent over 5 years on ART (91.2%, n=238) and are on the 1st first line of ARV regimen (98.1%, n=256). Most of these adolescents have good adherence to ART medicines (69.7%, n=182) and have no opportunistic infections (90.4%, n=236), and a minority is taking Septrin/ Cotrimoxazole (63.6%, n=166) and the majority reported not to have had ART interruption (76.2%, n=199) and have reported good treatment by the health workers (95.8%, n=250) as reported in table 4 below.

Table 3 Clinical characteristics of the study respondents

Study variables	Frequency (n)	Percentage (%)
Viral load Suppression status		
1. Suppressed	190	72.8
2. Non-suppressed	71	27.2
Participants' CD4 grouping		
1. <500 cells/mm	107	41.0
2. >=500cell/mm	154	59.0
ART_Duration		
1. 6 month to 1 year	02	0.8
2. 1 to 3 years	08	3.0
3. 3 to 5 years	13	5.0
4. 5 years and above	238	91.2
current_ARV_regimen		
1. 1st Line	256	98.1
2. 2nd Line	05	1.9
Adherence		
1. Good	182	69.7
2. Fair	56	21.5
3. Poor	23	8.8
Opportunistic Infection		
1. Yes	25	9.6
2. No	236	90.4
Side effect		
1. Yes	24	9.2
2. No	237	90.8
ART interruption		
1. Yes	62	23.8
2. No	199	76.2
Adolescent taking Septrin/Cotrimoxazole		
1. Yes	95	36.4
2. No	166	63.6
Health workers treat/handle you well		
1. Yes	250	95.8
2. No	11	4.2

Proportion of viral load suppression among adolescents who are on ART in Kitgum district

Overall, 190 (72.8%, 95% CI: 66.9%-78.1%) of the 261 adolescents on ART had a suppressed viral load refer to Figure 4.

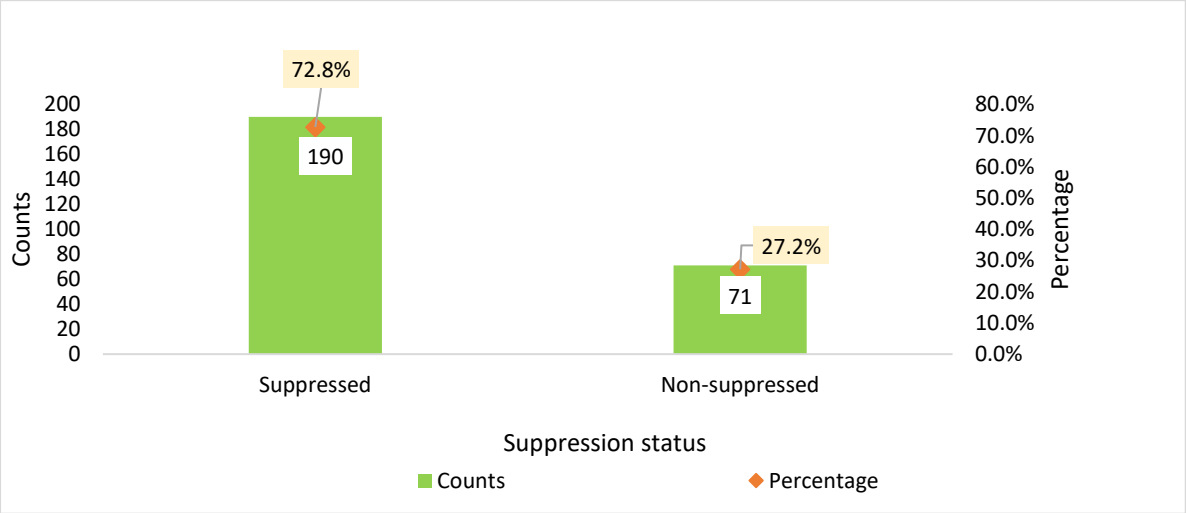


Figure 4: Proportion of viral load suppression among adolescents aged 10-19 receiving ART among health facilities in Kitgum District

Factors associated with viral load suppression among adolescents on ART in Kitgum District

Bivariable analyses identified several factors associated with HIV viral load suppression (Table 5). Pearson's Chi-square test was used to compare categorical variables, while Fisher's exact test was applied where expected cell counts were less than five. The Mann–Whitney U test was used to compare continuous variables that were not normally distributed, these variables were age and the current CD4+ T cell counts.

Educational level (p=0.031), current CD4+ T-cell count (p<0.001), ART adherence (p<0.001), history of opportunistic infections (p=0.014), ART interruption (p<0.001), school attendance (p=0.006), and perceived good treatment by healthcare workers (p=0.037) were significantly associated with viral load suppression. Support group participation, parental survival status,

meal frequency, and sexual activity met the pre-specified threshold (p<0.20) for consideration in the multivariable analysis despite not reaching conventional statistical significance.

Variables associated with viral load suppression at bivariable analysis (p<0.20), together with variables considered epidemiologically important based on biological plausibility and evidence from previous studies, were entered into the multivariable modified Poisson regression model. These included educational level, current CD4+ T-cell counts, ART interruption, opportunistic infections, support group participation, parental survival status, school attendance, meal frequency, sexual activity, and other clinically relevant variables (Table 4).

Table 4: Bivariate analysis of demographic, psychosocial, and clinical factors associated with viral load suppression among the study respondents

Study variables		**Viral suppression status**		**P-values**
	Sample size=261	**Suppressed (n=190) n (%)**	**Non-suppressed (n=71) n (%)**	
Gender	**261**			
Female	137	102 (53.68)	35 (49.30)	0.528
Male	124	88 (46.32)	36 (50.70)	
Age, Median (IQR)	**261**	**15 (12-17)**	**15 (13-18)**	**0.3959**
10-14 years	115	87 (45.79)	28 (39.44)	0.358
15-19 years	146	103 (54.21)	43 (60.56)	
Educational level	**261**			
No Formal education	16	7 (3.68)	9 (12.68)	**0.031***
Primary	192	145 (76.32)	47 (66.20)	
Secondary	53	38 (20.0)	15 (21.13)	
current CD4 counts Median (IQR)	**261**	708.5 (398, 1000)	358 (201, 647)	***p*<0.001***
<500copies/mm	107	61 (32.11)	46 (64.79)	***p*<0.001***
>=500copies/mm	154	129 (67.89)	25 (35.21)	
Baseline_CD4, Median (IQR)	**261**			
<200copies/mm	12	8 (66.70)	4 (33.30)	0.625
>=200copies/mm	249	182 (73.09)	67 (26.91)	
ART duration	**261**			
6mnth-1yr	02	02 (1.05)	0 (0.00%)	0.860
1-3 years	08	07 (3.68)	01 (1.41)	
3-5 years	13	10 (5.26)	03 (4.23)	
5+ years	238	171 (90.00)	67 (94.37)	
Current Regimens	**261**			
1st line	256	187 (98.42)	69 (97.18)	0.516
2nd line	05	3 (1.58)	2 (2.82)	
Baseline Regimens	**261**			
1st line	256	188 (98.95)	68 (95.77)	0.126

2nd line	05	2 (1.05)	3 (4.23)	
Adherence	**261**			
Fair	56	33 (17.37)	23 (32.39)	***p*<0.001***
Good	182	154 (81.05)	28 (39.44)	
Poor	23	3 (1.58)	20 (28.17)	
Any opportunistic infections	**261**			
Yes	25	13 (6.84)	12 (16.90)	**0.014***
No	236	177 (93.16)	59 (83.10)	
ART Side effects	**261**			
Yes	24	16 (8.42)	8 (11.27)	0.479
No	237	174 (91.58)	63 (88.73)	
ART Interruptions	**261**			
No	199	158 (83.16)	41 (57.75)	***p*<0.001***
Yes	62	32 (16.84)	30 (42.25)	
Cotrimoxazole	**261**			
No	166	124 (65.26)	42 (59.15)	0.361
Yes	95	66 (34.74)	29 (40.85)	
Herbs	**261**			
Yes	08	4 (2.11)	4 (5.63)	0.219
No	253	186 (97.89)	67 (94.37)	
Support groups	**261**			
Yes	132	91 (47.89)	41 (57.75)	**0.157***
No	129	99 (52.11)	30 (42.25)	
Parents alive	**261**			
Yes	220	165 (86.84)	55 (77.46)	**0.064***
No	41	25 (13.16)	16 (22.54)	
Living together with parents	**261**			
Yes	233	172 (90.53)	61 (85.92)	0.284
No	28	18 (9.47)	10 (14.08)	
HIV disclosure	**261**			
No	13	8 (4.21)	5 (7.04)	0.349
Yes	248	182 (95.79)	66 (92.96)	
Meals	**261**			
Sometime misses all meals	01	00	01 (1.41)	**0.120***
More than 2 meals	107	79 (41.58)	27 (38.03)	
Once	15	8 (4.21)	7 (9.86)	
Two meals	139	103 (54.21)	36 (50.70)	
Attending school	**261**			
Yes	215	164 (86.32)	51 (71.83)	**0.006***
No	46	26 (13.68)	20 (28.17)	
Have a friend	**261**			
Yes	179	133 (70.00)	46 (64.79)	0.420
No	82	57 (30.00)	25 (35.21)	
Sexually active	**261**			
Yes	79	53 (27.89)	26 (36.62)	**0.172***
No	182	137 (72.11)	45 (63.38)	
Drugs	**261**			
Yes	09	7 (3.68)	2 (2.82)	1.000
No	252	183 (96.32)	69 (97.18)	
Distance	**261**			
<5Km	151	110 (57.89)	41 (57.75)	0.319
>5Km	110	80 (42.11)	30 (42.25)	

Transport	**261**			
Yes	102	73 (38.42)	29 (40.85)	0.721
No	159	117 (61.58)	42 (59.15)	
Health workers treatment	**261**			
No	11	5 (2.63)	6 (8.45)	**0.037***
Yes	150	185 (97.37)	65 (91.55)	

Note: IQR: Interquartile range

Modified Poisson regression with robust variance estimation was performed to identify factors independently associated with HIV viral load suppression after adjusting for potential confounders (Table 5). The prevalence of suppressed viral load was 29% higher among adolescents with a CD4+ T-cell count ≥500 cells/mm³ as compared to those with CD4+ T-cell counts <500 cells/mm³ (aPR=1.29, 95% CI: 1.07–1.54; p=0.003). Conversely, adolescents who had experienced ART interruption had a 27% lower prevalence of viral load suppression compared with those who had no history of ART interruption (aPR = 0.73, 95% CI: 0.57–0.92; p = 0.008).

Educational level, opportunistic infections, cotrimoxazole use, parental survival status, school attendance, age, sex, and sexual activity independently did not indicate any association with viral load suppression after adjustment (Table 5).

There was no evidence of problematic multicollinearity, with a mean VIF of 1.84 and all individual VIFs below 10 (range: 1.06–5.06**).** The modified Poisson regression model demonstrated good fit based on both the deviance goodness-of-fit test (χ^2=107.57, df=247, p=1.000) and the Pearson goodness-of-fit test (χ^2=68.99, df=247, p=1.000), indicating no evidence of lack of fit. Overall, the model explains 17.7% variation in viral load suppression among adolecents on ART care in Kitgum District (R^2 = 0.171).

Table 5: Modified Poisson regression model of demographic, psychosocial, and clinical factors associated with viral load suppression among the study respondents

Study variable	Suppressed (n=190) n (%)	Non-suppressed (n=71) n (%)	cPR, 95% CI	P-value	aPR, 95% CI	P-value
Gender						
Male	88 (46.32)	36 (50.70)	1		1	
Female	102 (53.68)	35 (49.30)	1.05 (0.90, 1.22)	0.530	1.02 (0.89, 1.18)	0.736
Age, Median (IQR)	**15 (12-17)**	**15 (13-18)**				
10-14 years	87 (45.79)	28 (39.44)	1		1	
15-19 years	103 (54.21)	43 (60.56)	0.93 (0.80, 1.08)	0.354	0.95 (0.80, 1.13)	0.562
Educational level						
No Formal education	7 (3.68)	9 (12.68)	1			
Primary	145 (76.32)	47 (66.20)	1.72 (0.98, 3.03)	0.057	1.46 (0.84, 2.54)	0.180
Secondary	38 (20.0)	15 (21.13)	1.6 (0.89, 2.87)	0.116	1.35 (0.75, 2.43)	0.319
current CD4+ T-cell counts Median (IQR)	708.5 (398, 1000)	358 (201, 647)				
<500 cells /mm^3	61 (32.11)	46 (64.79)	1		1	
>=500 cells /mm^3	129 (67.89)	25 (35.21)	1.47 (1.22, 1.76)	***p*<0.001***	1.29 (1.07, 1.54)	**0.003 ****
Any opportunistic infections						
Yes	13 (6.84)	12 (16.90)	**1**		1	
No	177 (93.16)	59 (83.10)	1.44 (0.98, 2.12)	0.017	1.13 (0.81, 1.59)	0.476
ART Interruptions						
No	158 (83.16)	41 (57.75)	**1**		1	
Yes	32 (16.84)	30 (42.25)	1.54 (1.20, 1.98)	0.001	0.73 (0.57, 0.92)	**0.008 ****
Parents alive						
Yes	165 (86.84)	55 (77.46)	1		1	
No	25 (13.16)	16 (22.54)	0.81 (0.63, 1.05)	0.114	0.88 (0.69, 1.11)	0.299
Attending school						
Yes	164 (86.32)	51 (71.83)	**1**		**1**	
No	26 (13.68)	20 (28.17)	0.74 (0.57, 0.97)	0.026	1.02 (0.77, 1.38)	0.846
Sexually active						
Yes	53 (27.89)	26 (36.62)	1		1	
No	137 (72.11)	45 (63.38)	1.12 (0.94, 1.34)	0.199	1.05 (0.85, 1.28)	0.632
Health workers treat you well						
Yes	185 (74%)	65 (26%)	1		1	
No	5 (45.45%)	06 (54.55%	0.61 (0.32, 1.18)	0.143	0.69 (0.37, 1.28)	0.236
Support groups						
Yes	91 (47.89)	41 (57.75)	1			
No	99 (52.11)	30 (42.25)	1.11 (0.96, 1.29)	0.158	1.09 (0.95, 1.27)	0.241

Quality of life of adolescents who are in ART care in Kitgum district.

Study findings show that most (174 (66.7%) of adolescents who are in ART in Kitgum District are living a moderate quality of life as shown in Figure 5.

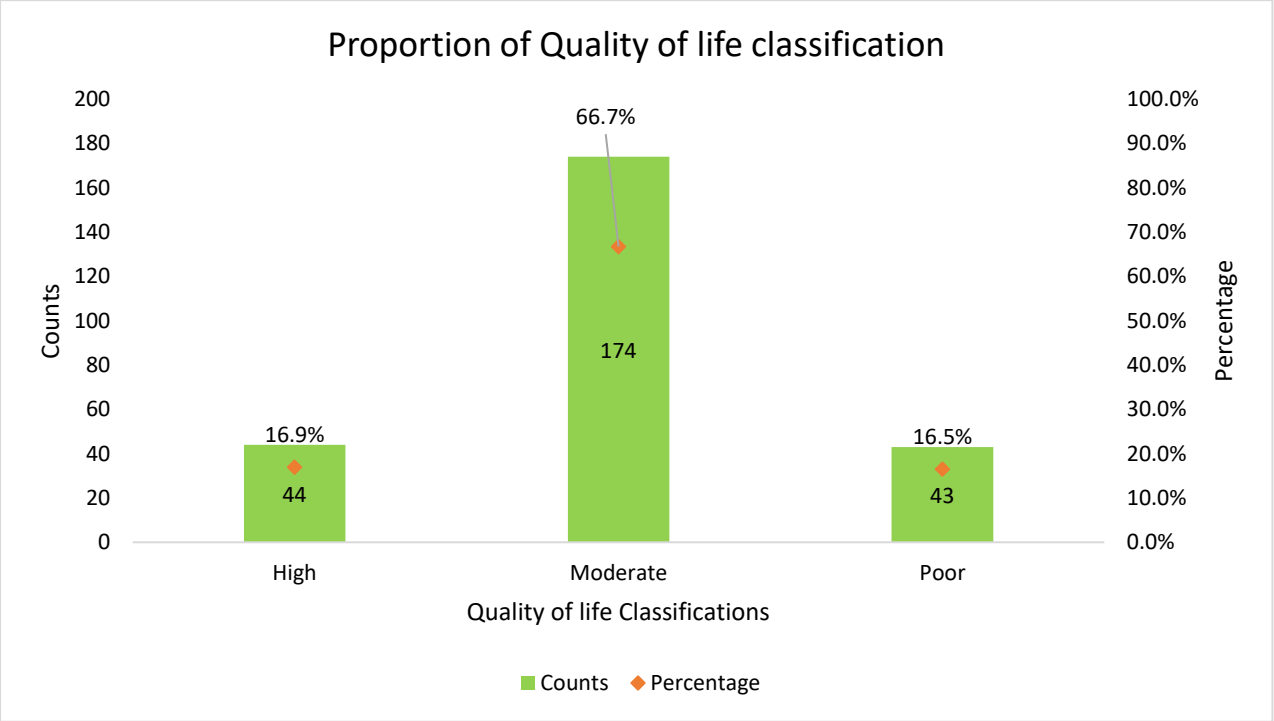


Figure 5: Proportion of participants with high, moderate, and poor quality of life classification amongst the adolescents on ART in Kitgum District

The proportion of viral load suppression was higher among the adolescents who had a moderate quality of life, 132 (75.43%). However, quality of life and attaining viral load suppression didn't indicate any significant statistical association (p=0.138), as shown in Table 5.

Table 6: Stratification of viral load suppression and the quality of life categorization

	Suppressed (n=190) n (%)	Non-suppressed (n=70) n (%)	p-value
Quality of life Rating			
High	33 (17.37	11 (15.49%)	0.138
Moderate	131 (68.95)	43 (60.56%)	
Poor	26 (13.68%)	17 (23.94%)	

The study findings indicate that adolescents had the highest score of 72% (IQR: 64%-76% in the physical domain and the lowest score of 67% (IQR: 60%- 74%) was registered in the environmental domain, refer to figure 6.

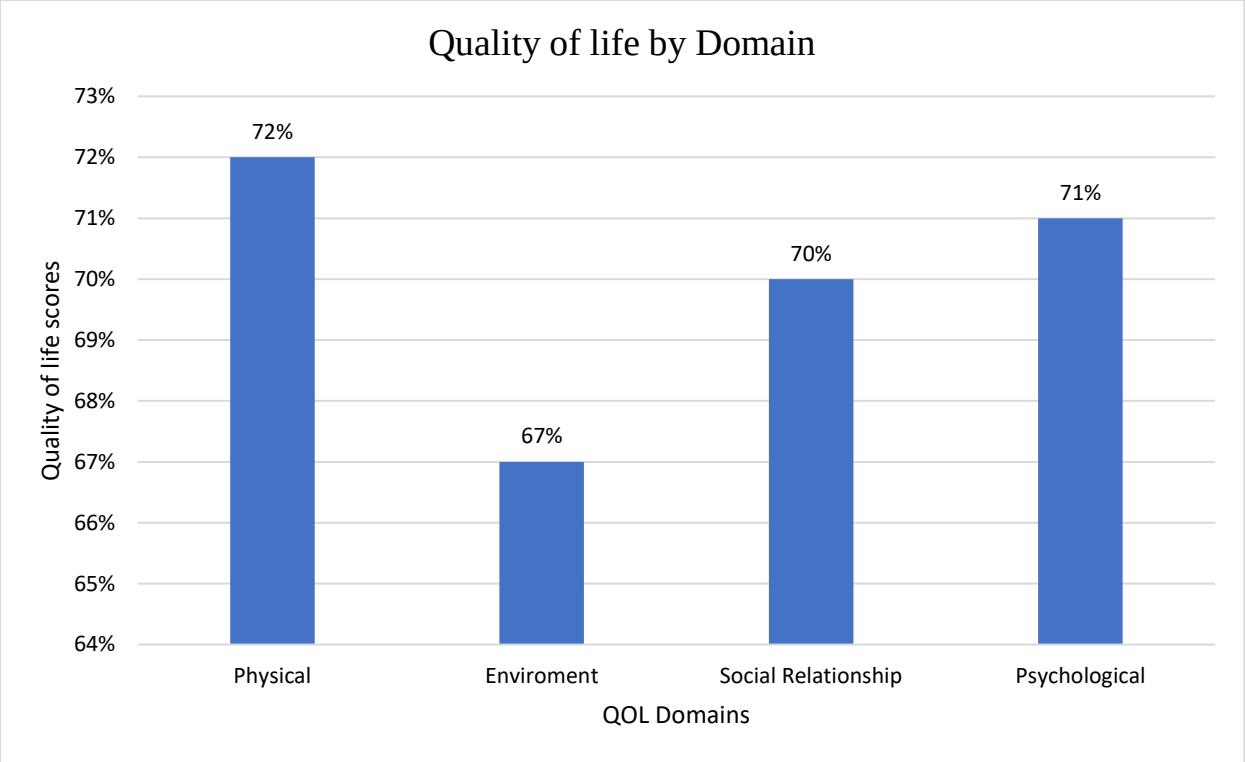


Figure 6: Quality of life by Quality of life domains

CHAPTER FIVE: DISCUSSION

This study assessed HIV RNA viral load suppression, factors associated with viral load suppression, and quality of life among adolescents aged 10–19 years receiving antiretroviral therapy (ART) in Kitgum District, Northern Uganda. These outcomes are particularly important among adolescents, who experience unique clinical, psychosocial, and socioeconomic challenges that may affect continuity of HIV treatment and overall well-being. The study found that 72.8% of adolescents achieved viral load suppression, while more than one-quarter remained unsuppressed. Higher current CD4+ T-cell counts were positively associated with viral load suppression, whereas ART interruption was associated with a lower prevalence of suppression. Regarding quality of life, most adolescents had a moderate overall quality of life, with the physical domain recording the highest score and the environmental domain the lowest.

This chapter discusses these findings in relation to existing evidence from Uganda, sub-Saharan Africa, and other settings, while considering the post-conflict and health-service context of Kitgum District. The discussion is structured according to the study objectives, beginning with the proportion of adolescents achieving viral load suppression, followed by factors associated with suppression, and finally the quality of life of adolescents receiving ART. Where findings differ from previous studies, potential contextual and methodological explanations are considered

Proportion of HIV RNA viral load suppression among adolescents who are on ART

The study found that a few of adolescents on ART in Kitgum District, Northern Uganda achieved HIV viral load suppression. This finding is slightly higher than the proportion of viral load suppression reported in Eastern Uganda at 68% (Maena et al., 2021b) and its additionally similar to the study in Ethiopia where viral load suppression was found to be at 73% (Berihun et al., 2023a). However, the finding falls within HIV viral load suppression rates of 73% -88% as reported in sub-Saharan Africa (Ally et al., 2023a; Djiyou et al., 2023; Mwangi & Van Wyk, 2021a). Although the suppression rate is moderately high, it still falls short of global and national targets of 95% (Han et al., 2021b). This finding indicates the persistent gaps in HIV care and management among adolescents which result in poor treatment outcomes that include; virological failure, antiretroviral drug resistance, immune system deterioration, and an increased risk of severe opportunistic infections like tuberculosis (Munyayi & Van Wyk, 2024a) This mainly stems from high dependence on the caregivers, guardians and parents (Munyayi & Van Wyk, 2024b). The caregivers, parents and guardians of adolescents living

with HIV/AIDs are always required to accompany their children to the health centre to have a clinical encounter with the health workers, however, most often times, they are always taken up by other priorities and forgetting to prioritize the health of their children (Nasuuna et al., 2019). Adolescents also faces developmental challenges and stigma and disclosure issues which impact their ability to achieve HIV viral load suppressions (Mukuku et al., 2025). These issues should be targeted and addressed at every clinical encounter at the health facility (Takwi et al., 2025).

Factors associated with HIV RNA viral load suppression among adolescent who are on ART

This study shows that adolescents with a current CD4+ cell counts of above 500 cells /mm^3 had a 29% higher prevalence of viral load suppression than those with a current CD4+ T-cell count <500 cells/mm^3. This finding is similar to a study conducted in Kenya, which also found that adolescents with CD4 counts >500 cells /mm^3 had a higher odds of attaining viral load suppression(Mwangi & Van Wyk, 2021c) (Mwangi & Van Wyk, 2021a). Having a higher CD4 count reflects strong body immune recovery and effective ART response and hence having a good ART outcome, a higher CD4 count is thus an indicator of immune recovery resulting from sustained viral suppression (Fiseha et al., 2022). All the adolescents who are in care/ treatment should have CD4 counts assessed routinely while receiving ART treatment, as this helps in determining treatment outcomes(Lilian et al., 2020). Health facility clinical team should ensure that there is consistent ART adherence, early ART initiation and timely Cd4+ cell count assessment in order to attain good and a higher CD4+ T cell counts (Bishop et al., 2016). There should be proper management of co-morbidities like diabetes, and hypertension that are likely to have a higher CD4+ T cells count(R Muralitharan et al., 2024) .

This study shows that adolescents who have had an ART interruption had a 27% lower prevalence of viral load suppression. This finding aligns with the findings in Western Uganda which found that having no ART interruption was statistically associated with viral load suppression. (Gordon et al., 2022a). World health defines ART interruption as a person living with HIV (PLHIV) who has no clinical contact for at least 90 days (or 3 months) after their last missed scheduled clinical appointment (WHO, 2023). Such interruptions are linked to a heightened risk of viral load non-suppression and AIDS-related occurrences and mortality and are presently not advised except under circumstances and meticulous medical oversight.(McNeil et al., 2017). Health workers and the implementing partners should focus on the strategies to improve retention on adolescents on ART treatment such as implementation

of differentiated time and space for adolescent and young adult HIV care (Wirawan et al., 2025). Uninterrupted ART maintains a constant, inhibitory concentration of drugs in the body, which prevents HIV from replicating and without replication, the virus cannot mutate to escape the drugs (Mostafa Essam Eissa, 2025) and hence leading to sustained viral load suppression.

Quality of life of adolescents who are on ART

The study demonstrates that most of the adolescents are living a moderate quality of life. The highest quality of life score was observed in the physical domain and the lowest score was observed in the environmental domain. The study finding is similar to the finding in Brazil where the lowest quality of life score was observed in the environmental domain (Fernandes et al., 2025b). The observed highest quality of life (66.7% is quite lower when compared to a study done in Bukina-Faso where the quality of life score was identified as 82.4%. (Bakiono et al., 2014b) with a better scores observed in spiritual domains and low scores in environmental domain. (Bakiono et al., 2014b). In Nigeria, the highest quality of life score was identified as 71.6% with the highest scores registered in the physical and psychological domains and the lowest score was registered in the social domain (Folasire Oluyemisi F. et al., 2012).

Generally, the quality of life scores is different across many countries among adolescents living with HIV mainly driven by driven by stigma, antiretroviral therapy (ART) adherence, family support, and nutritional status(Kotut et al., 2026) . The highest and lowest quality of life scores also vary across the quality of life domains. This is attributed to the various and different level of attention or focus given to the various domains of quality of life by different institutions or countries in the context of ART clients. Variation in the scores across different domains is also attributed to the financial status where being well off financially is associated with higher scores across physical, psychological, independence, environmental, spiritual domains (Kotut et al., 2026). Viral load suppression and quality of life is independent but not equivalent for instance, an adolescent can have undetectable viral load but can have poor quality of life, and this mainly attributed chronic ART side effects, internal stigma, depression and probably social isolation and on the other hand, an ART client can have undetectable viral load suppression and have a good quality of life and this is mainly attributed to minimal bothersome ART side effects, strong social support and financial stability (Nomatshila et al., 2026).

Strengths and limitations

The study employed a population-based district coverage approach, reaching 12 health facilities and employing proportionate to size and simple random sampling techniques, which improves generalizability.

The study used HIV viral load from the patient's clinical records thereby minimizing social desirability and recall bias.

The study applied a rigorous analytical approach using a modified Poisson regression to estimate adjusted prevalence ratios (aPR), controlling for confounders using STATA16.

However, the study noted the following limitations;

The study used abstracted clinical data, prone to missing data, and these were mitigated by excluding participants with incomplete information.

The study has highlighted selection bias, which may overestimate the suppression rate, and this was mitigated by considering 12 health facilities in the District, and employing the Kish and Leslie formula for sample size determination while factoring in 10% non-responses.

The study used a cross-sectional design that shows association but cannot establish causality between ART interruption and non-suppression. This was mitigated through adhering to eligibility criteria and controlling for confounders.

Implications of study findings to practice

The clinical providers should ensure that adolescents are given special attention when having clinical contact with clinicians. Parents/ Guardians should be guided on giving priority to their adolescents' health. Routine quality of life needs to be routinely assessed by the clinical workers to assess the quality of life as adolescents come for their ART drug refill.

Implications of study findings to policy

The study findings push policy makers to consider and adopt the fourth 95% target, which focuses on the quality of life and the national strategic plan. Quality of life should be added among matrices which are assessed routinely when adolescents come to the health facility.

The policy makers should push for one stop shop models for adolescents that combines ART distributions with mental health counselling and reproductive health services.

Enhancing inter-sectoral collaboration and policy action to address social and structural factors affecting viral load and quality of life among adolescents. The sectors include: health, education, and social welfare ministries to implement protective measures such as cash transfers and anti-stigma campaigns in schools.

Revision of the legal framework to lower the consent age for adolescents regarding seeking HIV care services.

Areas for future research

The researcher recommends the following future research;

- Conducting a similar study in an urban area and comparing the outcomes with similar studies
- Compare viral load outcomes among key adolescent subgroups: orphans, out-of-school youth, those in conflict settings, pregnant adolescents, or adolescents who inject drugs
- Assessment of barriers and facilitators to timely viral load sample collection, result return, and clinical action in adolescent-friendly clinics

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

In conclusion, the HIV RNA viral load suppression rate among the adolescent who are on ART in Kitgum District is unacceptable, standing at 73%, and this is below the national and global UNAIDS targets of 95%. Viral load suppression is statistically associated with CD4+ cell count and having no ART interruption. Most adolescents on ART in Kitgum District are living a moderate quality of life, with the highest score in the physical domain and the lowest in the physical domain.

RECOMMENDATIONS TO DIFFERENT ACTORS BASED ON THE STUDY FINDINGS

1. Kitgum District Health Office and District HIV/AIDS Programme

Given that only 72.8% of adolescents achieved viral load suppression, the District Health Office should strengthen adolescent-focused HIV services across ART facilities, with particular emphasis on identifying adolescents with unsuppressed viral loads and ensuring timely enhanced adherence counselling, repeat viral load testing, and appropriate clinical follow-up. District HIV programme reviews should routinely monitor adolescent viral load suppression as a distinct performance indicator to identify facilities requiring additional support.

2. ART clinics and healthcare providers

ART clinics should prioritize prevention, early identification, and management of ART interruption, as adolescents with a history of treatment interruption had a 27% lower prevalence of viral load suppression (aPR=0.73; 95% CI: 0.57–0.92). Providers should routinely assess treatment interruptions during clinic visits and provide individualized adherence counselling, treatment continuity plans, and prompt follow-up for adolescents who miss appointments or interrupt treatment.

Healthcare providers should also give particular clinical attention to adolescents with CD4+ T-cell counts below 500 cells/mm³, since adolescents with counts ≥500 cells/mm³ had a 29% higher prevalence of viral load suppression (aPR=1.29; 95% CI: 1.07–1.54). CD4 results, where clinically indicated and available, should be used alongside viral load and clinical assessment to identify adolescents who may require closer clinical and adherence support.

3. Health facilities and adolescent HIV programmes

Health facilities should strengthen differentiated, adolescent-responsive HIV care that supports uninterrupted ART, including convenient clinic scheduling, adherence counselling, treatment literacy, appointment tracking, and follow-up of missed visits. Interventions should particularly target adolescents with previous ART interruptions and those with evidence of poorer immunological status rather than applying the same intensity of follow-up to all adolescents.

4. Kitgum District, implementing partners and adolescent-support programmes

Because most adolescents had only a moderate quality of life and the environmental domain recorded the lowest score, HIV programmes should extend beyond virological outcomes to routinely assess adolescents' broader well-being. Programmes should strengthen linkages to services addressing environmental QOL needs, including access to health services, opportunities for information and skills development, financial/social support, safety, and supportive home environments—the components assessed within the study's environmental domain.

5. Parents, caregivers and communities

Parents and caregivers should be actively engaged in age-appropriate treatment support, particularly helping adolescents maintain uninterrupted ART and attend scheduled HIV care appointments. Community and adolescent-support structures should complement facility-based care by providing psychosocial and practical support while maintaining adolescents' confidentiality and autonomy.

6. Ministry of Health and HIV programme policymakers

The Ministry of Health should continue strengthening adolescent-specific HIV strategies that integrate viral suppression, treatment continuity, and quality of life rather than assessing programme success solely through clinical indicators. Routine adolescent HIV services could incorporate brief QOL assessments to identify adolescents requiring additional psychosocial, social, or environmental support.

7. Researchers

Further longitudinal or prospective studies should investigate the temporal relationship between ART interruption, immunological status, viral load suppression, and QOL among adolescents. Qualitative or mixed-methods research would also be valuable for understanding

why adolescents interrupt ART and the specific environmental challenges underlying the comparatively low environmental QOL scores. Because the present study was cross-sectional, these future designs would provide stronger evidence about temporal and potentially causal pathways

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PROPOSED BUDGET

Item	Quantity	Unit cost	Total Cost
Pre-testing of Research Assistants	3	30,000	90,000
Training of Research Assistants	3	30,000	90,000
Data collection allowances	9	30,000	270,000
Participants Compensation (a bar of Soap)	261	2000	522,000
Administration	3	50,000	150,000
GUREC	1	1,000,000	1,000,000
Transport	1	250,000	250,000
Total			**2,750,000**

WORK PLAN

ACTIVITY	Oct-Dec2024	Jan-Mar2025	Apr-Jun 2025	Jul-sept 2025	Oct-Dec2025	Jan-Mar2026	Apr-Jun 2026
Topic identification and selection							
Approval of the research topic							
Proposal writing and submission							
Pretesting of the research tools							
Data collection							
Data processing and analysis							
Report writing							
Report submission							
Dissemination of the findings							

APPENDICES

APPENDIX 1: CONSENT FORM

Study Title: FACTORS ASSOCIATED WITH VIRAL LOAD SUPPRESSION AND QUALITY OF LIFE AMONG ADOLESCENTS LIVING WITH HIV IN KITGUM DISTRICT, NORTHERN UGANDA

Investigator(s): Paul Okidi

Institution(s): Gulu University

Introduction

Welcome to participate in a research study about factors associated with viral load suppression and quality of life among adolescents living with HIV in Kitgum District, Northern Uganda. Before agreeing to take part, it is important that you understand the purpose, procedures, risks, and benefits of the study. This document provides detailed information about the study, and your participation is voluntary.

This research project is being self-sponsored by the principal investigator, who is a student of Gulu University.

Purpose:

This study is aimed at assessing factors associated with suppressed H I V viral load and quality of life among adolescents in Kitgum District. The findings of this study will help to improve HIV care services to the adolesents groups and improve their quality of life.

Procedures:

Your participation will involve Providing personal, medical and quality of life information during interviews and allowing researchers to review your medical records (with your permission) for information related to HIV care and services

Who will participate in the study

You have been chosen to participate in this study because you are among the adolescents receiving HIV services in Kitgum District. The interview will last for approximately 45mins to 1 hours and a total of 261 adolescents with HIV and on ART will participate in this research study.

Mild risks and discomforts

Participation in this study is not expected to cause any harm or significant discomfort. However, you may experience minor inconvenience due to the time required for the interview. Every effort will be made to protect your privacy and keep the information you provide confidential.

Benefits:

There will be no direct benefit from participation in the study. However, the findings from this research study will help in improving adolescents H I V care and treatment within Kitgum, and beyond.

Confidentiality:

Any information obtained from you that identifies you by name will be kept private and secure in a locked place and will be accessed only by the principal investigator, teams conducting research or ethical committees of Gulu University. We will not identify you by your name. The soft copy of the information obtained from you will be kept in a password- protected computer that is only accessible by the research team and the GUREC members.

Alternatives:

Your participation is entirely voluntary. You are free to withdraw at any time without any impact on the medical care or services you receive.

Cost:

There will not be any additional cost incurred as a result of participating in this study. However, a bar of soap will be provided to the participants as compensation for time spent

Questions:

If you have any questions related to the study as a research participant, you can contact the principal investigator, Paul Okidi on telephone number +256775979678 or via email on hokidi92@gmail.com

Statement of voluntariness:

Taking part in this study is entirely voluntary. You are free to decide whether or not to participate, and you may withdraw from the study at any time without any penalty. If you have any questions or concerns about your rights as a research participant, you may contact the Chairperson of the Gulu University Research Ethics Committee, Dr. Julaina A. Obika, on 0772964491 or by email at j.obika@gu.ac.ug You may also contact the Uganda National Council for Science and Technology (UNCST), Plot 6 Kimera Road, Ntinda, Kampala, on 0414 705500.

Consent Statement

_____has explained to me the purpose of the study, what my participation will involve, the possible risks and benefits, and my rights as a participant. I have understood the information provided and have had an opportunity to ask questions.

I understand that my participation is voluntary and that I may withdraw from the study at any time without any penalty or negative consequences. I also understand that my identity will be kept confidential when the study information is used or reported.

By signing or placing my thumbprint on this form, I confirm that I have freely agreed to participate in this study. I understand that signing this form does not mean that I give up any of my legal rights. I will be given a copy of this consent form.

Participant's name: _____

Signature/Thumbprint: _____ Date: _____

Witness's name: _____

Signature/Thumbprint: _____ Date: _____

Interviewer's name: _____

Signature: _____ Date: _____

APPENDIX 2: INFROM ASSENT FORM (FOR CHILDREN 8 YEARS TO 17 YEARS AND PERSONS INCAPABLE OF SELF DETERMINATION)

I am Paul Okidi, a student of Gulu University, Faculty of Medicine, Department of Public health.

I am conducting a study on factors associated with viral load suppression and quality of life among adolescents in Kitgum District. In simple term, Viral load suppression is the reduced number HIV virus resulting from a good adherence on the treatment you are taking. An individual who is virally suppressed doesn't fall sick frequently compared to non-virally suppressed clients.

Objectives of the study

The study aims to assess factors associated with viral load suppression and quality of life among adolescents in Kitgum District. The findings of this study will help to improve HIV care services to the adolesents groups and improve their quality of life.

You have been identified as a participant for this study because you are among the adolescents receiving HIV services in Kitgum District, and I/We kindly request you to take part.

Study procedure

By participating in this study, you will be interviewed on the HIV services and quality of life associated with being on treatment. This will involve taking your personal details like age, sex, medical information, social and family information. This will be a one-off interview process and there will be no follow up visits.

Benefits:

There will be no direct benefit from participation in the study. However, the findings from this research study will help in improving adolescents' H I V care and treatment within Kitgum, and beyond.

Confidentiality:

Any information obtained from you that identifies you by name will be kept private and secure in a locked place and will be accessed only by the principal investigator, teams conducting research or ethical committees of Gulu University. We will not identify you by your name. The soft copy of the information obtained from you will be kept in a password- protected computer that is only accessible by the research team and the GUREC members.

Participants' rights

Taking part in this study is entirely your choice. If you decide not to participate, you will not be treated differently or denied any services or benefits. You may also choose to leave the study at any time if you feel uncomfortable with any of the study procedures or believe that your rights are not being respected. If you withdraw, any information already collected from you will be destroyed and will not be included in the study analysis or dissemination of findings.

If you have any questions about the study, you may contact the Principal Investigator, Paul Okidi, on +256 775 979678 or by email at hokidi92@gmail.com If you have concerns about confidentiality or your rights as a research participant, you may contact the Chairperson of the Gulu University Research Ethics Committee, Dr. Julaina A. Obika, on 0772964491 or at j.obika@gu.ac.ug You may also contact the Uganda National Council for Science and Technology (UNCST), Plot 6 Kimera Road, Ntinda, Kampala, on 0414 705500

Assent statement

I have been informed of this study on factors associated with the viral load suppression and quality of life among adolescents aged 10-19 years living with HIV/AIDS in Kitgum District. I have been given enough explanation about the study procedures, benefits, risks, and my rights as a participant in this study. I am aware that participation in this study is entirely voluntary and that I can withdraw, without prejudice, from the study at any stage in case I do not feel comfortable with the procedure or study. I understand that it will not affect my access to the healthcare that I will receive from this health facility or any other social services/facilities that I intend to access/visit. I therefore accept to take part in this study as a study participant.

Name of the child/ Participant's name: _____

Signature/Thumbprint: _____ Date: _____

Witness's name: _____

Signature/Thumbprint: _____ Date: _____

Interviewer's name: _____

Signature: _____ Date: _____

APPENDIX 3: RESPONDENTS QUESTIONNAIRE

Instructions for Participants:

- Please answer all questions to the best of your ability.
- Your responses will be kept confidential and used solely for research purposes.
- If you have any questions or need assistance, please contact the research team.

Questionnaire number:_____

NO	Question	Response	Answer appropriately
Socio demographic			
1	Gender	1. Male 2. Female	
3	Age		
4	What is your religion?	1. Anglican	
		2. Catholic	
		3. Muslim	
		4. Seventh Day Adventist	
		5. Others(specify)	
6	What is your education attainment?	1. None	
		2. Primary	
		3. Secondary	
		4. Tertiary	
7	What is your marital Status?		
		1. Married	
		2. Single	
		3. Divorced	
8	Occupation	1. Unemployed	
		2. Peasant	
		3. Salary Earner	
Clinical Factors			
9	Viral load Values/	Write the current viral load values	
10	Patientst CD4 counts		
11	CD4 count at ART Initiation		
12	Patient period on ARVs	1. 6 months to 1yr 2. Greater than 1 to less than 3 yrs 3. Three yrs. to less than five yrs 4. Five years and above	

NO	Question	Response	Answer appropriately
13	Current ARV Regimens	1. 1st line 2. 2nd Line	
14	Previous ARV regimens	1. 1st line 2. 2nd Line	
15	ART adherence	1. Good 2. Fair 3. Poor	
16	Severe opportunistic infection	1. Yes 2. No	
17	Experience of side effects	1. Yes 2. No	
18	Ever had treatment interruption	1. Yes 2. No	
19	Adolescent taking Septrin/Cotrimoxazole	1. Yes 2. No	
20	Other medications including local herbs	1. Yes 2. No	
	Psychosocial factors		
21	What is the size of your family?		
22	Belong to any support group	1. Yes 2. No	
23	Your parents alive	1. Yes 2. No	
24	Other family members living with HIV	1. Yes 2. No	
25	Patient and/or caregiver disclosed about HIV status	1. Yes 2. No	
26	Meals had in a day	1. Misses all meals in some days 2. One 3. Two 4. More than Two	
27	Attend School	1. Yes 2. No	
28	Have friends/Partner	1. Yes 2. No	
29	Sexually active	1. Yes	

NO	Question	Response	Answer appropriately
		2. No	
30	Use drugs/smokes/alcohol	1. Yes 2. No	
31	Pay any fee for receiving health services	1. Yes 2. No	
32	Distance for this facility to your home	1. <5km 2. >5	
33	Sometimes miss attending the clinic due to lack of transport	1. Yes 2. No	
34	Health workers treat/handle you well	1. Yes 2. No	

APPENDIX 4: QUALITY OF LIFE ASSESSMENT USING THE WHOQOL-BREF

Ddomains	No	Questions	Likert Scale Options				
a.) The following questions ask about how much you have experienced certain things in the last two weeks.							
			Not at all	**A little**	**A moderate amount**	**Very much**	**An extreme amount**
Physical	1	To what extent do you feel that (physical) pain prevents you from doing what you need to do?	1	2	3	4	5
Environmental	2	How much do you need any medical treatment to function in your daily life?	1	2	3	4	5
Social Relationship	3	How much do you enjoy life?	1	2	3	4	5
Psychological	4	To what extent do you feel your life to be meaningful?	1	2	3	4	5
			Not at all	**A little**	**A moderate amount**	**Very much**	**Extremely**
Psychological	5	How well are you able to concentrate?	1	2	3	4	5
Environmental	6	How safe do you feel in your daily life?	1	2	3	4	5
Environmental	7	How healthy is your physical environment?	1	2	3	4	5
b.) The following questions ask about how completely you experience or were able to do certain things in the last two weeks.							
			Not at all	**A little**	**Moderately**	**Mostly**	**Completely**
Physical	8	Do you have enough energy for everyday life?	1	2	3	4	5
Psychological	9	Are you able to accept your bodily appearance?	1	2	3	4	5
c.) The following questions ask about how completely you experience or were able to do certain things in the last two weeks.							
Environmental	10	Have you enough money to meet your needs?	1	2	3	4	5
Environmental	11	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
Environmental	12	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5
			Very poor	**Poor**	**Neither poor nor good**	**Good**	**Very good**
Environmental	13	How well are you able to get around?	1	2	3	4	5
d.) The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the last two weeks.							
			Very dissatisfied	**Dissatisfied**	**Neither satisfied**	**Satisfied**	**Very satisfied**

					nor dissatisfied		
Physical	14	How satisfied are you with your sleep?	1	2	3	4	5
Physical	15	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
Physical	16	How satisfied are you with your capacity for work?	1	2	3	4	5
Psychological	17	How satisfied are you with yourself?	1	2	3	4	5
Social Relationship	18	How satisfied are you with your personal relationships?	1	2	3	4	5
Social Relationship	19	How satisfied are you with your sex life?	1	2	3	4	5
Social Relationship	20	How satisfied are you with the support you get from your friends?	1	2	3	4	5
Environmental	21	How satisfied are you with the conditions of your living place?	1	2	3	4	5
Environmental	22	How satisfied are you with your access to health services?	1	2	3	4	5
Environmental	23	How satisfied are you with your transport?	1	2	3	4	5
e.) The following question refers to how often you have felt or experienced certain things in the last two weeks.							
			Never	**Seldom**	**Quite often**	**Very often**	**Always**
Psychological	24	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	1	2	3	4	5
			Very poor	**Poor**	**Neither poor nor good**	**Good**	**Very good**
General	25	How would you rate your quality of life?	1	2	3	4	5
			Very dissatisfied	**Dissatisfied**	**Neither satisfied nor dissatisfied**	**Satisfied**	**Very satisfied**
General	26	How satisfied are you with your health?	1	2	3	4	5

APPENDIX 5: DATA ABSTRACTION TOOL

Version 2.0

Sources of abstraction: (Electronic Medical Record) - with triangulation from - Patient Blue card or facility database

Socio-Demographic factors

1. What is gender (Male/Female)
2. How old are you? (In completed years)
3. What is your religion? (Anglican, Catholic, Muslim, Seventh Day Adventist, Others(specify)
4. What is your educational attainment? (None, Primary, secondary, Tertiary)
5. What is your marital Status? (Married, single, divorced, Others (specify)
6. Occupation (employed, peasant, salary earner)

Clinical Factors

7. Viral load Values
8. Viral load date (dates)
9. Current CD4 counts
10. CD4 count at ART Initiation
11. Patient period on ARVs (6months-1 year, 1-3 years,3-5 years, 5+ years)
12. Current ARV Regimens (1^{st}, 2^{nd} line)
13. Previous ARV regimens (1^{st}, 2^{nd} line)
14. ART adherence (good, fair, poor)
15. Severe opportunistic infection (yes/no)
16. Experience of side effects (yes/no)
17. Ever had treatment interruption (yes/no)
18. Adolescent taking Septrin/Cotrimoxazole (yes/no)
19. Other medications, including local herbs (yes/no)

APPENDIX 6: INFORMED CONSENT FORM-ACHOLI TRANSLATED VERSION
Version 2.0

Title of the study: JAMI MA KWAKO KUM KIT ME JWIKO KERO PA KWIDI TWO JONYO GI KIT MA RWOM ME KWO PA LUTINO MA TYE KA KWO KI KWIDI ME TWO JONYO TYE KWEDE I KITGUM DISTRICT, KUMALO ME UGANDA

Lakweda(s): Paul Okidi

Dul(s): Gulu University

Wiye wiye ma dongo

In ki yeri me bedo in Kikweda ma tye me neno jami ma kwago kum kit me jwiko kero pa kwidi two jonyo gi kit ma ryom me kwo pa lutino ma tye ka kwo ki kwidi two jonyo tye kwede i kitgum district I kumalu me Uganda. Pire tek ni iniang pingo, yoo mene magibi tiyo kwede, rac gi dong ber pa kikweda man ma pud pe iyee me bedo i iyee . karatac man mini ngec weng malube ki kikweda man dak bene bedo i kikweda man tye i miti ne.

lakweda man tye ka cule pi kweda man kene, en tye lakwan me Gulu University

KIKWEDA MA TYE PI NGO:

Kikweda ma tye me neno jami ma kwako kum kit me jwiko kero pa kwidi two jonyo gi kit ma ryom me kwo pa lutino ma tye ka kwo ki kwidi two jonyo tye kwede i kitgum district. Kikweda ma ka konyo me ilu kero pa Kony me yoto kum pa lutino magi gi kit me kwo gi.

Procedures:

Bedo in kikumi ii kwani obi weko ii nongo kony me yat in ki kumi ka cel ki kwo maber ka ii bedo ka gamo lapeny ma ki penyi kwede ki dong weko ladiru me neno karatac ma kwako yoto kumi ma dok ii lok kum kwidi two jonyo (ni wok ki itwero ma megi) pi ngec ma lube ki kony me kwidi two jonyo.

ANGA MA KABEDO I KIKWEDA MAN?

In ki yeri me bedo i kikweda man pyini i itye i kin dano ma tye ka nongo kony me yoto kum pi kwidi tyo jonyo i kitgum district. Kikweda man ka tero dakika 45min me chito i wang cawa acel dak lutino 261 ma kitye ka kwo dak ki tye ka nongo kony me yoto kum malupe ki kwidi two jonyo gibu bed i kikweda man.

Peko/pe bedo agaonya:

Petye peko mo ma bimaki i anyim pi konyo i kikweda man. Peko gwok romo bino ikit me gwoko lok ma ibimiwa i mung ki gwok a yela yela me cawa romo bedo tye bene i kare me kikweda man. Kibi keto teko i gwoko lok komi me mung maber.

BER PA KIKWEDA MAN

Pe tiye gin moo ma ibi nongo atii gi i kikweda man ento ngec ma wa bi nongo ki i kikweda man kabu konyo me ilo kero me kong me yoto kum in kin lutino matye ka kwo ki kwidi me two jonyo i lobo Uganda gi makato

Gwoko mung:

Ngec mo keken ma wa bin nongo ki bot in ma nyutu nya ma in i bedo kabu bedo alora ma no nyat ma romo neno ne ayee ladit ma tye ka loyo kikweda man , lakweda gi dong dul me Gulu University Research and Ethics Committee (GUREC). Pe wa bi tic ki nying in kwed man. Lokomi ma wabigamo ni wabi gwoko mukene i yamo kama dano perome nongo ne ata ata mapat ki jo ma gitye ka kwan man ki jo me GUREC.

Yoo mukene:

Konyo i kikweda man tye i tetwero ni.. iromo woto wii ki kikweda man dok bene pe bi gengo in mede ki nongo kony me yat kit ma jwi.

cul:

Pe ibi nongo cul mo keken pi konyo i kikweda man. Ento ki bi mini cabun bar acel me culu pi cawa ni ma nongo ibalo.

Lapeny ikom kikweda:

Ka itye ki lapeny mo keken macalo lakony i kikweda man, iromo nongo lakwed ping, Paul Okidi in namba cim man +256775979678 onyo i email man hokidi92@gmail.com.

Statement of voluntariness:

Konyo i kikweda man tye ite twero ni dok iromo woto wii cawa mo keken bene peko mo bedo peke i komi. Ka itye ki lapeny mo keken ma kwako lok kom twero ni i kikweda man, nong won kom me , Gulu University Research Ethics Committee, Dr. Julaina A. Obika namba cim., 0772964491; email: j.obika@gu.ac.ug ; or the Uganda National Council for Science and Technology, on plot 6

Kimera Road, Ntinda, Kampala. Tel: 0414705500.

Statement of consent

..... o mina ngec ducu ma kwago kum gin ma kabi time i kikweda man, bee ne, rac ce gi bene twero na macalo ngat ma gi tiye ka kwedo. A Nyang ni yee ma mega me bedo i kikweda man pe be gudu kuma i yoo mo keken. Pe ka bi yute ka mokeken ni lagam me kikweda man o a ki bota. A tye ki nyec ni a romo a ki in kikweda man cawa mo keken. I nyeyo ni ketu cinga i karatac man pe chato twero na ento nyutu ni anyang ngec ducu ma kwako kum kikweda man ma a dyere me bed oi iye. Karatac man mokene ki bimiyo bot an.

Nyingi ……Signature/ ko cingi……nino dwe ……

Nying ……Signature/ ko cing la cung kori…… nino dwe…….

Nying…….Signature pa lapeny peny……nino dwe……

APPENDIX 7: INFORMED ASSENT FORM (FOR CHILDREN 8 YEARS TO 17 YEARS)-ACHOLI TRANSLATED VERSION

Version 2.0

An nyinga Paul Okidi, lakwan me Gulu University, Faculty of Medicine, Department of Public Health.

Atye ka timu Kikweda i kum jami ma kwako kit me jwiko kero pa kwidi two jonyo gi kit ma rwom me kwo pa buli matino ma i kitgum district. In simple terms, Viral load suppression is the reduced number of HIV resulting from good adherence to the treatment you are taking. Ngat acel acel ma rwom kwidi me two jonyo ne tye lapiny, pe two tutwal ka ii poro ki ngat ma rom kwidi ikume tye lamal entwo tutwal

Objectives of the study

Kikweda ma tye me neno jami ma kwako kum kit me jwiko kero pa kwidi two jonyo gi kit ma ryom me kwo pa lutino ma tye ka kwo ki kwidi two jonyo tye kwede i kitgum district. Ngec ma wa bi nogo ki kum Kikweda man bi konyo me ilu kero pa Kony me yoto kum pa lutino magi gi kit me kwo gi.
In ki yeri me bedo i kikweda man, pyen i itye i kin dano ma tye ka nongo kony me yoto kum pi kwidi two jonyo i kitgum district.

Study procedure

Ka konyo i kikweda man, ki bi penyi lok kom two cilim ki kero me kwo mabino ki bedo iyat. Ikin lok man ki bi gamo lok kumi macalo mwaka ni, sex, lok kom yot komi, social and family information. Kibi menyi lok magi weng ki cel dok pe kibi lubu kori nino malacen.

Benefits:

Pe tiye gin moo ma ibi nongo atii gi i kikweda man ento ngec ma wa bi nongo ki i kikweda man kabu konyo me ilo kero me kong me yoto kum in kin lutino matye ka kwo ki kwidi me two jongo i lobo Uganda gi makato

Compensation:

Wa bi mino cabwen acel it ngat ma o bi bed i kikweda man .

Risks

Petye peko mo mabi maki i anyim ma bi a ki i in konyo i kikweda man. Peko romo bedo tye ikit me gwoko lo ki mung ki gwok a yelayela me cawa bene romo bedo tye i kare me kikweda man. Kibi keto kero mate ki gwoko lok me mung ma megi.

Confidentiality

Ngec mo keken ma wa bin nongo ki bot in ma nyutu nga ma in i bedo kabu bedo alora ma no nyat ma romo neno ne ayee ladit ma tye ka loyo kikweda man , lakweda gi dong dul me Gulu University Research and Ethics Committee (GUREC). Pe wa bi tic ki nying in kwed man. Pe watiyo ki ngingi i kwed man . karatac man mokene ki bi gwoko i yamo kama dano peromo nongo ne ata ata mapat ki jo ma gitye i kwan man ki jo me GUREC.

Participants' rights

Konyo i kwed man tye ite twero ni dok kwero ne pe bi kelo it in peko mo keken. Iromo woto wii cawa mo keken ka gwok inongo waci ki tye katuru twero n ii yoo mo keken onyo ka gwok yoo ma kitye ka tic kede nit ye kadiini i yoo mo keken. Ka iyero me woto wii, lok kumi manongo dong ki gamo kibi bayo ne woko dok dong pe ki bi tiyo kede. Ka gwok in tye ki lapeny mo mukene il ok kom kwan man iromo goyo cim ki principal investigator, Paul Okidi I namba cim +256775979678 onyo i meili hokidi92@gmail.com. Ka bene itye gi lapeny mo ma kwako gwoko mung ki twero ni calo lagam lapeny, iromo bene goyo cim bang wonkom pa Gulu University Research and Ethics Committee, Dacta. Julaina A. Obika I nmaba cim 0772964491, iromo bene cwalo ire email i: j.obika@gu.ac.ug ; or the Uganda National Council for Science and Technology, on plot 6 Kimera road, Ntinda, Kampala on Tel 0414705500

Assent statement

An ki nanga i kikweda man ma kwago jami ma kwago kit me jwico kero pa kwidi two jonyo gi kit ma rom me kwo pa lutino (myaka 10-19) ma tye ka kwo kwidi two jonyo tye kwede i kitgum district. Gi mina ngec ducu ma kwago kum kikweda ma ma calo pingo kikweda man tye ka time, bee ne, rac ne gi bene tyero na macalo ngat ma gi tiye ka kwedo. Angeyo ni konyo ikwan ma tye ite twero na dok a

romo woto wiya, labongo lworo, ki ikwan man ikrare mo keken ka gwok tye ka diyo kwon ai yoo mo keken. Anayang ni pe obi gengo an medi ki nongo kony ki io t yat kit ma nino ducu ki io t yat kany onyo ka mo mukene ma amito ceto iyee.ki dong a yee mebedo i kin dano ma obikonyo i kwan man.

Nying lagam peny	**cing/opany**	**nino dwe**
……	……	…….
Nying lapeny peny	**cing**	**nino dwe**
……..……	…….	…….
Nying caden	**cing caden**	**nino dwe**
…….	……..…	……

APPENDIX 08: PARENTS' INFORMED CONSENT FORM-ACHOLI TRANSLATED VERSION

Version 2.0

Title of the study: JAMI MA KWAKO KUM KIT ME JWIKO KERO PA KWIDI TWO JONYO GI KIT MA RWOM ME KWO PA LUTINO MA TYE KA KWO KI KWIDI ME TWO JONYO TYE KWEDE I KITGUM DISTRICT, KUMALO ME UGANDA

Lakweda(s): Paul Okidi

Dul(s): Gulu University

Wiye wiye ma dongo

Ki yero latin me megi me bedo in Kikweda ma tye me neno jami ma kwago kum kit me jwiko kero pa kwidi two jonyo gi kit ma ryom me kwo pa lutino ma tye ka kwo ki kwidi two jonyo tye kwede i kitgum district I kumalu me Uganda. Pire tek ni iniang pingo, yoo mene magibi tiyo kwede, rac gi dong ber pa kikweda man ma pud pe iyee me bedo i iyee . karatac man mini ngec weng malube ki kikweda man dak bene bedo i kikweda man tye i miti ne.

lakweda man tye ka cule pi kweda man kene, en tye lakwan me Gulu University

KIKWEDA MA TYE PI NGO:

Kikweda ma tye me neno jami ma kwako kum kit me jwiko kero pa kwidi two jonyo gi kit ma ryom me kwo pa lutino ma tye ka kwo ki kwidi two jonyo tye kwede i kitgum district. Kikweda ma ka konyo me ilu kero pa Kony me yoto kum pa lutino magi gi kit me kwo gi.

Procedures:

Bedo pa latini ikwani ene obi weko ii nongo kony me yat in ki kumi ka cel ki kwo maber ka ii bedo ka gamo lapeny ma ki penyi kwede ki dong weko ladiru me neno karatac ma kwako yoto kumi ma dok ii lok kum kwidi two jonyo (ni wok ki itwero ma megi) pi ngec ma lube ki kony me kwidi two jonyo.

ANGA MA KABEDO I KIKWEDA MAN?

ki yero latin ni me bedo i kikweda man pyini en tye i kin dano ma tye ka nongo kony me yoto kum pi kwidi tyo jonyo i kitgum district. Kikweda man ka tero dakika 45min me chito i wang cawa acel dak

lutino 261 ma kitye ka kwo dak ki tye ka nongo kony me yoto kum malupe ki kwidi two jonyo gibu bed i kikweda man.

Peko/pe bedo agaonya:

Petye peko mo ma bimaki in onyo latini anyim pi konyo i kikweda man. Peko gwok romo bino ikit me gwoko lok ma ibimiwa i mung ki gwok a yela yela me cawa romo bedo tye bene i kare me kikweda man. Kibi keto teko i gwoko lok komi me mung maber.

BER PA KIKWEDA MAN

Pe tiye gin moo ma ibi nongo atii gi i kikweda man ento ngec ma wa bi nongo ki i kikweda man kabu konyo me ilo kero me kong me yoto kum in kin lutino matye ka kwo ki kwidi me two jonyo i lobo Uganda gi makato

Gwoko mung:

Ngec mo keken ma wa bin nongo ki bot in ma nyutu nya ma in i bedo kabu bedo alora ma no nyat ma romo neno ne ayee ladit ma tye ka loyo kikweda man , lakweda gi dong dul me Gulu University Research and Ethics Committee (GUREC). Pe wa bi tic ki nying in kwed man. Lokomi ma wabigamo ni wabi gwoko mukene i yamo kama dano perome nongo ne ata ata mapat ki jo ma gitye ka kwan man ki jo me GUREC.

Yoo mukene:

Konyo i kikweda man tye i tetwero ni.. iromo woto wii ki kikweda man dok bene pe bi gengo in mede ki nongo kony me yat kit ma jwi.

cul:

Pe ibi nongo cul mo keken pi konyo i kikweda man. Ento ki bi mini cabun bar acel me culu pi cawa ni ma nongo ibalo.

Lapeny ikom kikweda:

Ka itye ki lapeny mo keken macalo lakony i kikweda man, iromo nongo lakwed ping, Paul Okidi in namba cim man +256775979678 onyo i email man hokidi92@gmail.com.

Statement of voluntariness:

Konyo i kikweda man tye ite twero ni dok iromo woto wii cawa mo keken bene peko mo bedo peke i komi. Ka itye ki lapeny mo keken ma kwako lok kom twero ni i kikweda man, nong won kom me , Gulu University Research Ethics Committee, Dr. Julaina A. Obika namba cim., 0772964491; email: j.obika@gu.ac.ug ; or the Uganda National Council for Science and Technology, on plot 6 Kimera road, Ntinda, Kampala on Tel 0414705500.

Statement of consent

..... o mina ngec ducu ma kwago kum gin ma kabi time i kikweda man, bee ne, rac ce gi bene twero na macalo ngat ma gi tiye ka kwedo. A Nyang ni yee ma mega me bedo i kikweda man pe be gudu kuma i yoo mo keken. Pe ka bi yute ka mokeken ni lagam me kikweda man o a ki bota. A tye ki nyec ni a romo a ki in kikweda man cawa mo keken. I nyeyo ni ketu cinga i karatac man pe chato twero na ento nyutu ni anyang ngec ducu ma kwako kum kikweda man ma a dyere me bed oi iye. Karatac man mokene ki bimiyo bot an.

Nyingi ……Signature/ ko cingi……nino dwe ……

Nying ……Signature/ ko cing la cung kori…… nino dwe…….

Nying…….Signature pa lapeny peny……nino dwe……

APPENDIX 09: DATA COLLECTION TOOL – QUESTIONNAIRE -ACHOLI TRANSLATED VERSION

Version 2.0

Instructions for Participants:

- Kony wa igam lapeny weng iyoo maber loyo ma itwero.
- Lagam maegi ki bi gwoko imung dok ki bi tiyo kede me kwan kiken.
- Kagwoki ityeki lapeny m oi lok kom kwan man iromo cedo bot dano am git ye ka timi kwan man.

Questionnaire number:_____

NO	Question	Response	Answer appropriately
	Socio demographic		
1	What is gender	1. Lacoo 2. Dako	
2	Mwaka ni adii		
3	I tye i deni ango	1. Anglican	
		2. Catholic	
		3. Muslim	
		4. Seventh Day Adventist	
		5. Others(specify)	
4	Rwom kwani komo ogik kwene	1. None	
		2. Primary	
		3. Secondary	
		4. Tertiary	
5	In mono inyome	5. Others (specify)	
		1. Anyome	
		2. pa anyome	
		3. wapoke	
6	Itiyo tic ango	1. Unemployed	
		2. Peasant	
		3. Salary Earner	
	Clinical Factors		
7	wel kwidi	Write the current viral load values	
8	Adwoki me pim me remo kyokkyoki ni CD4		
9	Adwoki me pim me cd4 ii acyaki ne		

10	I rii i yat kara marom mene	1. dwe abicel mi oo kede ii mwaka acel 2. Greater than 1 to less than 3 yrs 3. Three years to less than five yrs 4. mwaka abic odok kede malo	

NO	Question	Response	Answer appropriately
11	yat lajin mene ma in itye ka tic kwede iikare man	1. yat lajin me dul me acel 2. yat lajin me dul me aryo	
12	yat lajin mene ma ii tiyo kwede chon	1. yat lajin me dul me acel 2. yat lajin me dul me aryo	
13	i lubu cawa me yat lajin	1. ber 2. ladyere 3. rach	
14	Two mogo maracu ma ngole	1. tye 2. Pe	
15	Lanyut mogo ma nen	1. tye 2. Pe	
16	Ibedo ki kare me ngol pa kin yat ni	1. tye 2. Pe	
17	buli matino ma ki ti ka munyu yat septrin/cotrimoxazole	1. tye 2. Pe	
18	Yadi mukene calo me te kwaro	1. tye 2. Pe	
	Psychosocial factors		
19	Dano ti rwom mene ii gang wu		
20	Itye i kin gurup mo ma gi cuku cwinyi	1. tye	

		2. pe	
21	Lunyodo ni tye makwo?	1. tye 2. pe	
22	Dano gang wu mukene tye ma tye ka kwo ki kwidi two jonyo bene	1. tye 2. Pe	
23	latwo kacel ki lagwok latwo no ki minigi ki ngec ikum kwidi two jonyo ma ikum latwo ni	1. tye 2. pe	
24	i Camo kidi inino acel	1. Keng inino mukene 2. kicel 3. kiryo 4. Makato kiryo	
25	Itye i gang kwan	1. tye 2. pe	
26	Itye ki lurem onyo lu ot wu	1. tye 2. pe	
27	Itye ka timotim me bwutu tere tere	1. Tye	
		2. pe	
28	Itiyo ki yat/imato tar/ imato kongo	1. tye 2. pe	
29	Iculu pi gamo kony me yat	1. tye 2. pe	
30	Bor pa ot yet man ki kama ibedo iye	1. <5km pe oo meters 5 2. >5 kato km 5	
31	Cawa mukene i keng bino ka gamo yat pyeni i pe ki cene me gin wot	1. tye 2. pe	
32	Lutic otyat gi teri maber	1. tye 2. pe	

APPENDIX 10: QUALITY OF LIFE ASSESSMENT USING THE WHOQOL-BREF - ACHOLI TRANSLATED VERSION

Version 2.0

Ddomains	No	Questions	Likert Scale Options				
a.) The following questions ask about how much you have experienced certain things in the last two weeks.							
			pe tye	**tye manok**	Tye lakite mo	**Tye marach**	**Tye makato**
Physical	1	I rwom ango ma arem gengo in ki timu gin ma omira in i tim	1	2	3	4	5
Environmental	2	I rwom mene ma in i mitu kede kony me yat pi kw oni weng	1	2	3	4	5
Social Relationship	3	I rwom ango ma i maro kede kwo ni	1	2	3	4	5
Psychological	4	Tam megi o gik ka kwene me Nyang ni kwoni pire tek	1	2	3	4	5
			Pe tye	Tye ma nok	Tye lakite mo	tye marach	Tye makato
Psychological	5	I ngeyo nining ni ii ti ka keto cwinyi maber	1	2	3	4	5
Environmental	6	I winyo ninig ni kwo ni tye kamaber	1	2	3	4	5
Environmental	7	Kabedo mu orumu in yoto ne tye ninng	1	2	3	4	5
b.) The following questions ask about how completely you experience or were able to do certain things in the last two weeks.							
			Ma rach tutwal	rach	Pe rach bene pe ber	ber	Ber tutwal
Physical	8	I tye ki kero ma oromo pi kwo ni ninu ki ninu?	1	2	3	4	5

Psychological	9	I twero yee i kum kit ma in kumi nen kwede?	1	2	3	4	5
c.) The following questions ask about how completely you experience or were able to do certain things in the last two weeks.							
Environmental	10	I tye ki cente ma romo nogi jami ma i mitu me kwo?	1	2	3	4	5
Environmental	11	I rwom mene ma i romo nogo kwede ngec ma mite pi kwo ma megi ninu ki ninu	1	2	3	4	5
Environmental	12	Cawa maninig ma in i romo nongo ne me yweyo wii	1	2	3	4	5
			Ma rach tutwal	rach	Pe rach bene pe ber	**ber**	Ber tutwal
Environmental	13	Ber bedo me wot ni ii kin ping tye nining	1	2	3	4	5
d.) The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the last two weeks.							
			A pe ki gen matut	Ape ki gen mo weng	Ati ki gen onyo a pe ki gen	A ti ki gen	Very satisfied a ti ki gen matut
Physical	14	I cawa me nini ni i nino ma ber	1	2	3	4	5
Physical	15	Mine me tiyo tic ma omito ii tii nino ducu tye nining	1	2	3	4	5
Physical	16	Yeyo nit ye nining i kum kero me tic	1	2	3	4	5
Psychological	17	I yom ii kum in keni keni	1	2	3	4	5
Social Relationship	18	Wat ii kin in ki danu tye maber	1	2	3	4	5
Social Relationship	19	Kit in ma itye kwede ii maru	1	2	3	4	5

Social Relationship	20	Kony ma ii nongo ki bot luremi romi	1	2	3	4	5
Environmental	21	I kit kabedo ma in itye kabedo ii iye tye nining	1	2	3	4	5
Environmental	22	Kony me i nogo ilok kum yoto kum tye ma romo	1	2	3	4	5
Environmental	23	Gin wot ni tye ma romo	1	2	3	4	5
e.) The following question refers to how often you have felt or experienced certain things in the last two weeks.							
			Pa aparu	Kicel kicel	Pe tutwal	tutwal	Cawa weng
Psychological	24	Pii kare ma rom mene ma in i bedo ki lakal i kum in keni keni calo wangi no col, kiniga onyo no wangi weng chol	1	2	3	4	5
			Marach	rach	Pe rach bene pe ber	ber	Ma ber
General	25	I rwom me ma i ryomo ketu kwo ni	1	2	3	4	5
			A pe ki gen ma tut	Ape ki gen no weng	Ati ki gen onyo a pe ki gen	Ati ki gen	Ati ki gen ma tut
General	26	Yot komi yomo i in i rwom ma rom mene?	1	2	3	4	5

APPENDIX 11: APPROVAL LETTER

GULU UNIVERSITY

P.O. Box 166, Gulu (U)
Website: www.gu.ac.ug
Email: gurec@gu.ac.ug

Tel: +256 471 432 096
Fax: +256 471 432 913
Mob: +256 772 964 491
+256 776 812 147

RESEARCH ETHICS COMMITTEE

Review Type: Initial Review

Re:GUREC-2025-431: PREVALENCE AND FACTORS ASSOCIATED WITH HIV VIRAL LOAD SUPPRESSION AND QUALITY OF LIFE AMONG ADOLESCENTS LIVING WITH HIV IN KITGUM DISTRICT, NORTHERN UGANDA

I am pleased to inform you that at the **129th** convened meeting on **21/08/2025**, the Gulu University REC meeting voted to approve the above referenced application.
Approval of the research is for the period of **13/10/2025** to **13/10/2026.**

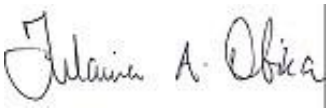
As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

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 **13/10/2026** 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.

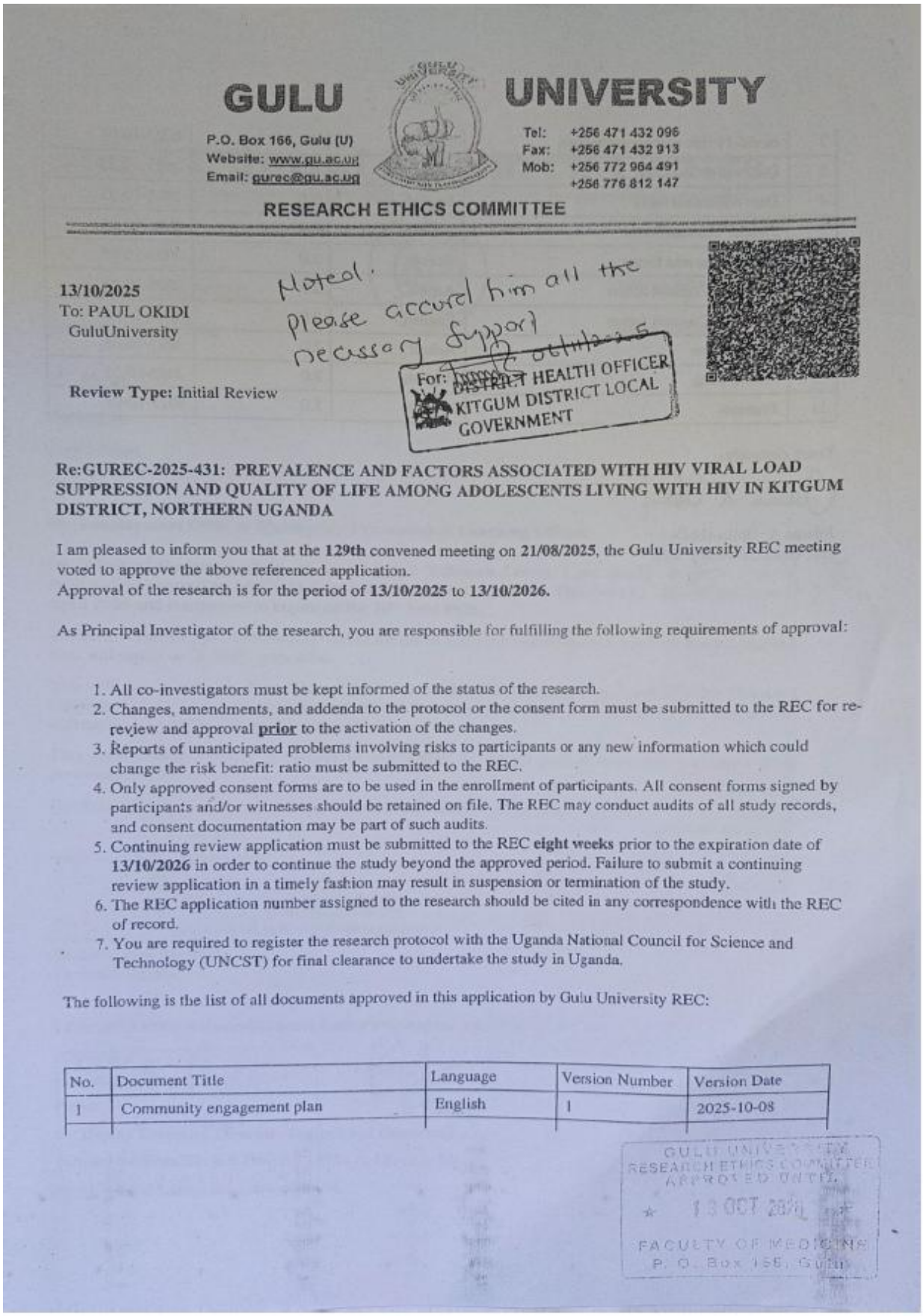
The following is the list of all documents approved in this application by Gulu University REC:

No.	Document Title	Language	Version Number	Version Date
1	Community engagement plan	English	1	2025-10-08
2	covid-19 risk management plan	English	1	2025-10-08
3	Data collection tools	Acholi	2.0	2025-10-05
4	Data collection tools	English	2.0	2025-10-05
5	Parents' consent forms	Acholi	2.0	2025-10-05
6	Parents' consent forms	Acholi	2,0	2025-10-05
7	Informed Consent forms	Acholi	2.0	2025-10-05
8	Informed Consent forms	English	2.0	2025-10-05
9	Assent form	Acholi	2.0	2025-10-05
10	Assent form	English	2.0	2025-10-05
11	Protocol	English	2.0	2025-10-05



Yours sincerely,
Julaina A.
Obika (PhD)
For: Gulu
University
REC

APPENDIX 12: DISTRICT HEALTH OFFICE APPROVAL



GULU UNIVERSITY

P.O. Box 166, Gulu (U)
Website: www.gu.ac.ug
Email: gurec@gu.ac.ug

Tel: +256 471 432 096
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Mob: +256 772 964 491
+256 776 812 147

RESEARCH ETHICS COMMITTEE

13/10/2025
To: PAUL OKIDI
GuluUniversity

Noted.
Please accord him all the necessary support

For: DISTRICT HEALTH OFFICER
KITGUM DISTRICT LOCAL GOVERNMENT

Review Type: Initial Review

Re:GUREC-2025-431: PREVALENCE AND FACTORS ASSOCIATED WITH HIV VIRAL LOAD SUPPRESSION AND QUALITY OF LIFE AMONG ADOLESCENTS LIVING WITH HIV IN KITGUM DISTRICT, NORTHERN UGANDA

I am pleased to inform you that at the **129th** convened meeting on **21/08/2025**, the Gulu University REC meeting voted to approve the above referenced application.
Approval of the research is for the period of **13/10/2025** to **13/10/2026.**

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 **13/10/2026** 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 Gulu University REC:

No.	Document Title	Language	Version Number	Version Date
1	Community engagement plan	English	1	2025-10-08

GULU UNIVERSITY
RESEARCH ETHICS COMMITTEE
APPROVED UNTIL
13 OCT 2026
FACULTY OF MEDICINE
P. O. Box 166, Gulu