UPTAKE OF ENHANCED ADHERENCE COUNSELING AMONG ADOLESCENTS WITH HIGH HIV VIREMIA IN SELECTED HEALTH FACILITIES IN NAIROBI CITY COUNTY, KENYA

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DECLARATION

I do declare that this thesis is my original work and has not been presented for a degree in any other University or institution.

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DEDICATION

I dedicate this work to my parents, Mr. and Mrs. Makokha, my husband Titus, and our lovely daughters Vivian, Valery, Veronica, and Timothy our son for their support, and encouragement to believe in God during this thesis development.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ALHIV	Adolescents living with HIV
ART	Anti-Retroviral Therapy
DHIS	District Health Information System
EAC	Enhanced Adherence Counseling
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
IPT	Isoniazid Preventive Therapy
KAIS	Kenya AIDS Indicator Survey
KNBS	Kenya National Bureau of Statistics
MMAS	Morisky Medication Adherence Scale
MOH	Ministry of Health
NASCOP	National AIDS & STI Control Programme
OI	Opportunistic Infection
PEPFAR	President's Emergency Plan for AIDS Relief
PLWHIV	People living with HIV
SPSS	Statistical Package for Social Sciences
UNICEF	United Nations International Children's Emergency Fund
UNAIDS	United Nations Programme on HIV and AIDS
VL	Viral Load
WHO	World Health Organization

DEFINITION OF OPERATIONAL TERMS

Adolescents – These are clients aged between 10 to 19 years as per the WHO definition

Enhanced Adherence support – These are strategies that are put in place to improve adherence to treatment of patients who have not achieved viral suppression

High viremia – This refers to a Viral load level of over one thousand copies per millilitre of blood according to the Kenya National ART guidelines

Viral suppression –Attaining viral load copies less than 1000 per ml of blood among clients who have been on ART after a viral load test

ABSTRACT

Enhanced adherence counselling (EAC) is a structured method of assessing current adherence levels, exploring barriers, and developing individualized adherence intervention plans to improve viral suppression. Adherence to treatment among adolescents has been reported to impede good treatment outcomes. WHO recommends EAC for patients with high Human Immunodeficiency Virus (HIV) viremia and suspected treatment failure and EAC has been associated with high re-suppression, yet limited information exists on the uptake of EACs among the adolescent population. In the UNAIDs goal of 95-95-95, the third ninety aims at achieving 95% viral suppression among those individuals who started on ART. The third ninety, especially among adolescents has remained a challenge. High HIV viremia is defined as individuals who have Viral Load (viral load less than one thousand copies of the virus in their blood. In 2017, only 66% of Adolescents living with HIV (ALHIV) had achieved viral load suppression. Nairobi City reported a viral load suppression of 56% among adolescents and young people. The study focused on assessing the uptake of enhanced adherence counseling among ALHIV on Antiretroviral Therapy (ART) with a documented high viremia in selected health facilities in Nairobi City County. The study investigated the knowledge of adolescents with high viremia, their compliance levels to enhanced adherence counseling, and the identification of factors that affect the uptake of enhanced adherence among adolescents with high viremia. The study used a cross-sectional analytical design and purposively sampled 379 respondents who were interviewed in the forty-five facilities. Data were collected utilizing questionnaires and key informant interview methods and conducted focus group discussions (FDG). Qualitative data were collected, coded, and categorized to come up with emerging themes. The Data analysis was done using Stata version 16. Continuous variables and categorical variables were described by measures of central tendencies and frequency tables, respectively. Calculation of inferential statistics was done using tests of Chi-Square tests at a confidence interval of 95% and an error of precision of 0.05 to show variable associations. According to this study's findings, only 41% of responders received satisfactory Enhanced adherence counseling (EAC). It was found that 55% were females and the median age was 14 years. The study observed high knowledge levels and level of compliance on enhanced adherence counseling at 73% and 80%, respectively. Respondents with adequate compliance ratings were more likely than those with inadequate compliance to take up EAC sessions (Odds ratio: 0.41, C.I 0.26 – 0.65) and respondents with adequate knowledge scoring were less likely to take up EAC successfully compared to those with inadequate knowledge (Odds ratio: 0.48, C.I: 0.29 – 0.8). Age, level of education and type of treatment supporter were among the factors associated with uptake of enhanced adherence counseling. The study concludes that ALHIV from selected facilities had low uptake of EAC and having adequate knowledge did not result in increased uptake similar to having high compliance ratings. Age and level of education influenced Knowledge levels while type of treatment supporter was found to be associated with uptake of enhanced adherence counseling. The study recommends structured EAC by age, reviewing the necessity of the 3 EAC sessions to define satisfactory EAC and necessity of treatment supporter for adolescents with high viremia.

CHAPTER ONE: INTRODUCTION

1.1 Background Information

Enhanced adherence counseling applies to the assessment given to an HIV positive patient with suspected or confirmed treatment failure to determine likely limitations to optimal adherence in a non-judgemental way aiming to assist a patient to develop an action plan to achieve clear adherence objectives. (Guidelines for use of Antiretroviral therapy in Kenya, 2018). It focuses on understanding HIV and ART as well as reviewing social, psychological, and emotional, issues that may result in suboptimal adherence and includes determining patients' inspiration for using medication (WHO, 2013).

Globally, the UNAIDS set targets of achieving 95% of all people living with HIV knowing their HIV status, 95% of those with diagnosed HIV infection achieving prolonged antiretroviral therapy, and 95% of those receiving antiretroviral therapy attaining viral suppression have not been achieved by most countries, (UNAIDS, 2021). This would aid in ending the HIV Epidemic by 2030. In 2020 only 65% of patients living with HIV on ART had achieved viral suppression with children aged 0-14 years performing lower at 41%. This indicates that more than half of the children on ART need more support to prevent treatment failure or achieve suppression on their current regimen. According to UNAIDs consultative forum, there are several impeding factors to successful treatment outcomes among adolescents (Mutwa *et al*., 2014). These include challenges with stigma, unfavourable policies and guidelines, problems with the transition to adult care, disclosure, and other health issues including access to reproductive health information and services. WHO recommends enhanced adherence

counseling for PLHIV on ART with viremia of above one thousand copies. Viral load monitoring together with enhanced adherence counseling has been shown to improve treatment outcomes for patients with viremia. Studies have shown that EAC leads to >70% re-suppression. However, adolescents and children are likely to have persistently elevated viral load despite undergoing enhanced adherence counseling, (Jobanputra & Parker, 2015).

Worldwide, AIDS is still among the top three causes of mortality among adolescents and the leading cause of mortality among adolescents in sub-Saharan Africa. (UNICEF, 2015). In 2012, a significant proportion of new adolescent infections were in Sub-Saharan Africa. Studies across the continents including Sub-Saharan Africa, have shown that adolescents with HIV are particularly at risk for poor adherence (Adejumo *et. al.*, 2015). Despite the high rates of persistent viremia among children on ART, few studies are focusing on both paediatric and adolescent re-suppression following EAC and this data continues to be limited in Sub-Saharan Africa, (Mena *et al*., 2023). Only 46.1% of patients with an initially increased high viral load were able to suppress after EAC, according to a systemic meta-analysis, (FORD *et al*. ,2019). The same study by Ford established that children (31.2%) and adolescents (40.4%) attained lower re-suppression rates than adults (50.9%). A few studies provided information on how EACS was conducted and additionally the approaches varied from one country to another hence difficult to tell which approaches led to the re-suppression. A study in South Africa established that 50% of viremic clients aged 10-19 years attended EAC sessions, although this was after two hundred days as opposed to the recommended 90 days (3 months) of monthly intensified adherence counseling after a documented high

viral load. (Lejone *et al*, 2019). In Uganda it was established that of the children who had a viral load of more than one thousand copies per ml, 77% underwent all 3 EAC sessions within 400 days after a detectable viral load, 7% had zero sessions and 16% had just one or two sessions. However, no difference was noted in viral load outcome between those who received EAC sessions and those who did not. (Nasuuna *et al.,* 2018). Similarly, low levels of re-suppression have been seen in Lesotho and Eswatini. These findings demonstrate that there is a need to evaluate fidelity in the implementation of the EAC as outlined in the WHO guidelines to realize the expected outcomes, especially among adolescents.

An estimated 139,000 children and 1.3 million adults are thought to be HIV positive in Kenya (KENPHIA, 2018). Of the 52,800 new infections recorded in 2017, 8,200 (16%) occurred among adolescents. National Syndemic Disease Control Council (NSDCC) acknowledged that adolescents plus young adults have significantly contributed to the increasing HIV burden in the country by 49% of HIV new infections. According to the NASCOP dashboard, adolescent viral suppression remains below the 90% UNAIDS target compared to adults, 66% among adolescents versus 82% among adults. This meant 34% of adolescents need intensified adherence support to achieve viral suppression. The 2022 Kenya ART guidelines outline different EAC support targeting different stages of treatment initiation and follow-up visits. In 2018, viral load suppression was reported to be lower among adolescents aged 10 – 19 years at 61% compared to adults at 72% (KENPHIA, 2018). Given these findings close to 40% of adolescents on ART needed EAC as a strategy following the WHO guideline to achieve re-suppression. The Kenya National guidelines for ART 2022 propose that clients

undergo at least three EAC sessions for three months (90 days) if their viral load result is above one thousand copies after 3 months of ART to identify and resolve and address potential barriers that would result in treatment failure. (MOH, 2022). Enhanced adherence counseling for adolescents is also aligned with the Adolescent package of care 2014 which also aims at addressing the clinical, psychosocial, and structural barriers to ALHIV. With limited data available this study aims to investigate the uptake of EAC among viremic adolescents aged 10 -19 years.

1.2 Statement of the Problem

The recent Global AIDS Strategy 2021–2026 outlines the urgency to equip young adults with the skills necessary to design today's HIV response and take the initiative in leading this tomorrow for them and the society at large. The uptake of enhanced adherence counseling services among adolescents remains a setback in achieving the 95% viral suppression ambitious target according to UNAIDS strategy 2015. A study on adolescents infected during their teenage years and adolescents who acquired HIV vertically shows that majority of them encounter many obstacles to adherence (Mutwa *et al*., 2014). In comparison to clients aged above 25 years, the population specifically achieves low viral suppression rates as well as the increased viral rebound in addition to interruptions in treatment. Viral suppression among adolescents aged 10-19 years remained lower at 61% among females, 52% among males, and 61.4% for both as per the recent Kenya Population-Based HIV Impact Assessment (KENPHIA) 2018 results. Thus 38.9% of ALHIV need to undergo EAC to achieve 95% viral suppression. Poor adherence can result in patients developing resistance to ARVs, poor clinical outcomes, and the public losing faith in the effectiveness of the drugs (Wandera & Keko, 2011).

This could be worse when adolescents increasingly become infected and their adherence to prevention, treatment, and care is poor compared to adults. Nairobi City County remains among the first nine counties contributing to 65% of new infections, reporting a 50% increase. In 2015, recent HIV infections in Kenya were observed among adolescents and young adults aged between 15 to 24 years (Truong et al, 2023). Starting and maintaining adolescents and young people on treatment is challenging. Compared to adults, Viral suppression among children aged 0-14 years is lower at 67.1% while in adults 15 years and above is at 90.6% (MOH, 2020). This may arise from the psychosocial, clinical and economic barriers faced by this age group (Shubber *et.al,*.2016). Suppression rates among adolescents in Nairobi City County remain low (Kangethe *et.al*., 2020). There is limited data on the implementation of EAC as a strategy to achieve viral re-suppression among this population. This study assesses the uptake of enhanced adherence counseling among adolescents with high viremia in selected facilities in Nairobi City County.

1.3 Justification of the Study

A systemic review in 2013 indicated a 70.5% re-suppression rate in patients who underwent an EAC while still on similar ART medication. Enhanced adherence counseling strategy, therefore, allows the possibility of improving viral load suppression and adherence to treatment among ALHIV. Enhanced adherence counseling allows the HCW to elicit the potential risks of non-adherence among ALHIV and development of an adherence plan that will result in viral re-suppression. Enhanced adherence counseling strategies are structured in the new ART guidelines for 2018 to cover this population, and their proper implementation and compliance

determine their treatment outcomes. It involves attending at least three adherence sessions and a follow-up repeat viral load after satisfactory adherence following barrier analysis. Failure to follow the strategies results in persistent viremia and hence transmission of the virus, which remains a setback to the epidemic control. If these strategies are well adhered to and adolescents attain undetectable viral loads, they will not transmit the virus based on their age-associated behaviour, (UNAIDS,2022) and (Okoli *et al.*, 2020). Despite the implementation of the EAC strategies for patients with high viremia, there is little documentation on the follow-up of viremic adolescents. Adolescents and young people are a unique group that has special vulnerabilities to HIV and are often underserved in HIV response.

1.4 Research Questions

i. What are the sociodemographic characteristics of adolescents with high Viremia in selected facilities in Nairobi City County?
ii. What is the level of knowledge on EAC Uptake among adolescents with high viremia in selected facilities in Nairobi City County?
iii. What are the levels of compliance to EAC package among adolescents with high HIV viremia in selected facilities in Nairobi City County?
iv. What are the factors associated with EAC uptake among adolescents with high viremia in selected facilities in Nairobi City County?

1.5 Null Hypothesis

i. There are no factors associated with uptake of EAC among adolescents with high viremia in selected facilities in Nairobi City County

ii. There is low level of knowledge on uptake of EAC among adolescents with high viremia in selected facilities in Nairobi City County.

iii. There is low level of compliance to uptake of EAC package and uptake of EAC among adolescents with high viremia in selected facilities in Nairobi City County.

1.6 Objectives of the Study

1.6.1 General Objective

This study aims at determining the factors associated with the uptake of EAC among ALHIV with high viremia in selected facilities in Nairobi City County.

1.6.2 Specific Objectives

i. To assess the sociodemographic characteristics of adolescents with high viremia in selected facilities in Nairobi City County

ii. To determine the level of knowledge on EAC among adolescents with high viremia in the selected facilities in Nairobi City County

iii. To establish the compliance levels to EAC package among adolescents with high HIV Viremia in the selected facilities in Nairobi City County

iv. To determine the factors associated with uptake of EAC among adolescents with high viremia in selected facilities in Nairobi City County

1.7 Study Significance

The study informed on the understanding of enhanced adherence counseling among adolescents as a challenged population. The results of this study informed on the need for targeted EAC strategies focusing on specific age brackets. This provides

policymakers with knowledge and additional literature on enhancing treatment outcomes to achieve epidemic control among this sensitive population. This study also identified insights on the associations of enhanced adherence among viremic adolescents, hence providing opportunities to review the current EAC process in the guidelines. Therefore, this study formed a basis for further research across the whole nation in the specified age group, which seems to have been ignored yet unique. Most nationwide studies focus on ages of children below 14 years and adults above 15 years lumping this exceptional group in-between.

1.8 Delimitation and Limitation

Results from this study were narrowed to Nairobi City County an urban setting and may not represent the situation in a rural setting in Kenya. Adolescents who had obtained viral suppression were not included in this study; they focused on adolescents with detectable viral load as the key area of interest. Nairobi being a city receives different PLHIVs of different socioeconomic status and as a semi-urban set up there is mixed social status and the results will not purely represent an urban setup.

1.9 Conceptual Framework

The conceptual framework shows that independent variables have a direct influence on the dependent variable, which is the uptake of EAC among adolescents with high HIV viremia. The sociodemographic characteristics such as age, sex, education, religion, caregiver, and duration of treatment may positively or negatively influence the uptake of EAC. Level of knowledge and understanding of EAC among adolescents and compliance levels can be influenced by the demographic characteristics and other

factors associated with EAC. These will also impact of the final outcome which is uptake of EAC. This is demonstrated in figure 1.1 below.

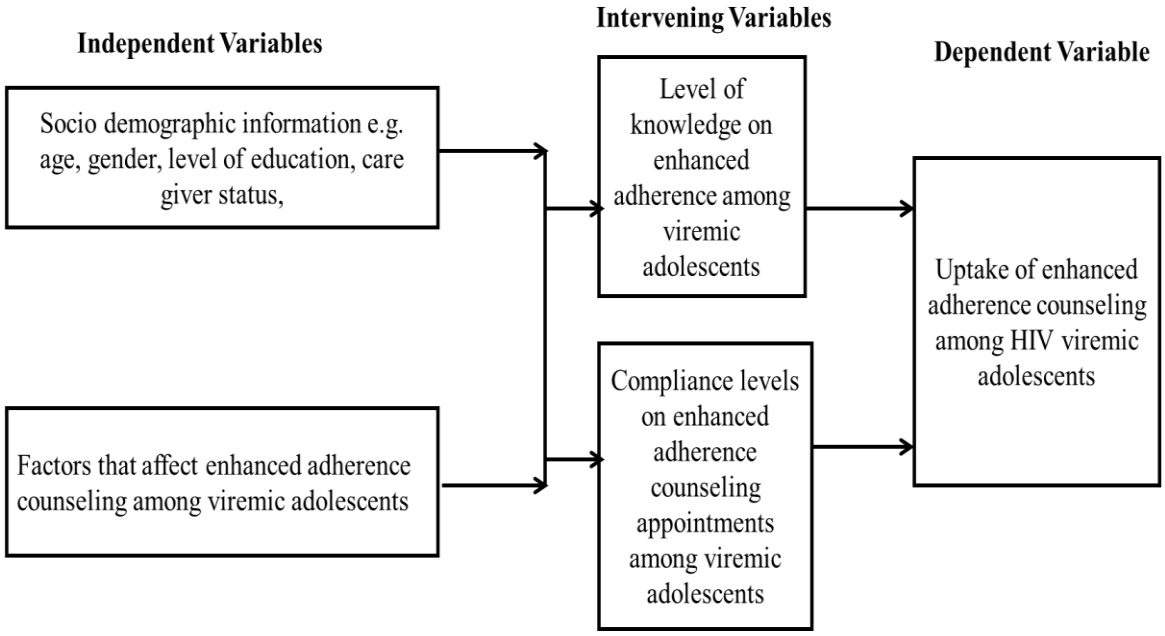

Figure 1.1 Conceptual Framework

Source, NASCOP 2018

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section presents the available literature that has been reviewed about enhanced adherence counseling and support in adolescents with high viremia. This looks at a range of studies done globally, in Africa, and Kenya.

2.2 HIV Burden among Adolescents

HIV remains a major global public health issue. Approximately, 37.9 million people were living with HIV in 2018 and this included 1.7 million children, with HIV prevalence of 0.8% globally among adults. The hard-hit regions by HIV are East and Southern Africa that harbours approximately 6.2% of the population in the world and more than half (54%) of the total number of people living with HIV in the world (20.6 million people). An estimated 800,000 new HIV infections occurred in 2018, which is almost half of the total infections globally (UNAIDS, 2019).

According to Njuguna *et al*.,2020, among 10,000 adolescents and young people enrolled in ART clinics in Kenya and have been on treatment for over 6 months nearly one-third are still highly viremic. One-third of adolescents and young adults on ART in Kenya have detectable viral loads. Initiating and staying on treatment is particularly problematic for adolescents and young people. In Kenya in 2014, only 34,800 out of 141,000 adolescents (aged 10-19) with a known HIV positive status were on ART, of whom 22,600 were virally suppressed. Acquired Immune-Deficiency Syndrome remains the leading cause of death among adolescents and young people in the country with 9,720 adolescents and young people dying from AIDS-related illnesses in 2014 (UNAIDS, 2015). Young people contributed 33 % of new infections in Kenya and

Nairobi City County led in new infection numbers among 15-24 years 2587/17,667 (15%) (Kenya HIV Estimates report, 2018) where 15% of the new infections were from children aged 0-14 years. Nairobi City County was the second contributing 660 of these new infections. According to the report, Nairobi City County also led in the number of HIV mortalities occurring among young people contributing to the 54% among 9 counties with the highest mortality in 2017. This was similarly high among 0–14-year-olds. Among this adolescent population, only 66% achieved viral suppression as compared to adults which were at 76% as (NASCOP, 2018) ART adherence challenges are the main barrier to achieving viral suppression among children and adolescents. Suppression of the HIV viral load copies to less than 1000 copies per millilitre of blood is the ultimate outcome of ART treatment (Martelli *et. al*., 2019).

2.3 Implementation of EAC among Adolescents.

To address adherence barriers, the Enhanced adherence counseling (EAC) technique has been implemented among clients with detectable viral load aimed at achieving re-suppression. World Health Organization recommends EAC for all clients with detectable viral load. This should be initiated immediately after the results are received. Enhanced adherence counseling involves monthly sessions with the clinician or adherence counselor to identify barriers and develop actions to address them within 3 months. A repeat viral load is recommended after the 3 EAC sessions. (WHO, 2013) The Kenya ART Guidelines 2018 have adopted this recommendation. This is also aligned with the adolescent package of care (APOC) guideline 2014 to achieve viral suppression among adolescents. Based on a meta-analysis and systematic investigation, a viral load re-suppression rate of 70.5% was achieved on an unchanged ART regimen

showing that upon implementation of EAC, the adolescent viral load outcomes can improve (Ford *et al.,* 2019). However, EAC implementation and approaches have not been standardized across countries and even with the guidelines in Kenya the outcomes among adolescents are still low compared to adults' re-suppression rates of 40% and 65% respectively (UNAIDS, 2021). To date there are limited to no studies conducted in sub-Saharan Africa on the viral load care cascade, from a detectable viral load, EAC, repeat viral load and appropriate switch to second-line upon confirmed failure (Kamire et al., 2018).

2.4 Knowledge of EAC among Adolescents with high Viremia

The Kenya national ART guidelines 2022, states that, treatment failure is defined as failure to attain a viral load of less than 1000 copies following ART treatment for more than 6 months and a reduction in CD4 cell count or deteriorating clinical state. The clinician confirms a failing treatment following the viral load algorithm in the guidelines (NASCOP, 2016). The guideline also illustrates in the treatment readiness assessment that all HIV-infected clients enrolled in care should know about routine tests, which include the viral load.

The Adolescent should form part of the multidisciplinary team whenever a discussion of treatment failure is done. This helps in the development of an adherence plan with the adolescent and a follow-up plan to enhance adherence. However, there exist inadequate information adherence-enhancing interventions that are effective among this age group in developing countries including Kenya (Bain-Brickley & Butler, 2011). The lack of adolescent-specific information, combined with high rates of suboptimal adherence among this group, highlights the urgency for more information

to develop interventions that have been proven to work in improving adherence. In building literature, a web has been developed comprising correlates that promote enhanced adherence in different settings but majorly focusing on populations above 18 years.

In another study, a supportive and empathetic approach to patients promotes and creates trust with the client allowing open discussions concerning treatment and adherence issues (Lippman & Koester, 2015). According to WHO (2013), adolescents need to be reassured of their confidentiality and that non-adherence is not a criminal offense, being honest with the client allows for gathering information helpful in the patient's adherence plan. In another study by Fox C. & Giddy, 2012, in south Africa on determinants of failing initial ART regimen and changing to a second line ART it was found that there were delays in changing to an alternative regimen following verified failing regimen for some duration on initial treatment. This is a factor that involves the extent to which the adolescent understands their role of decision-making that forms a basis for the intervention by the provider.

HIV diagnosis in adolescents is traumatizing when poorly managed. Many adolescents desire to know more about HIV and sexual reproductive health. The service providers never adequately meet this. Whenever this information is availed and customized to the age group with their involvement, it is appreciated (Hodgson & Ross, 2012). This group highly appreciates HIV services that are targeted, warm, and enriched with information. For adolescents living with HIV to navigate adolescence safely, they need effective, targeted, and viable HIV services

In other studies, by AMPATH in Kenya looking at knowledge on disclosure among children (Vreeman & Nyandiko, 2014), the study did not reveal an association with high viremia. Disclosure is among the required knowledge among adolescents although there are mixed results from studies to show the association between enhanced adherence and disclosure. In children disclosure may be a painful process that can elicit irritation, lack of hope, and disgust, resulting in adherence and treatment issues. Children who have been disclosed may tend to skip or hide their medication because of stigma and this will impact their adherence.

2.5 Compliance levels to Enhanced adherence Counseling package among adolescents with high viremia

The adolescent's ability to be compliant with treatment needs should be factored in to determine possible risks of non-adherence before initiating treatment. Skipping doses, and scheduled appointments may lead to limited treatment options due to failure of the regimens as a result of mutations. this warrants clinicians to have frequent follow-ups to mitigate adherence challenges (MacDonell *et al*, 2013).

Compliance with adherence interventions varies across different regions globally. Studies have shown adherence is highly correlated with reduced viral load. A correlation was established between pill count and adherence among adolescents (Umar *et al*., 2019). This indicates existing issues with adherence to prescribed drugs. Although poor adherence among adolescents remains a concern in sub-Saharan Africa because of the availability of alternatives few ARTS as well as the possibility of ART medication resistance, in high-income countries, adolescents are known to have suboptimal medication compliance compared to developing settings in other age groups

(AIDS Info, 2014). Some evidence also shows that 15-year-old and older adolescents have an elevated probability of non-satisfactory adherence compared to children and younger adolescents in sub-Saharan Africa, (Bygrave *et. al.*, 2012). This could be a shift in ownership of the treatment by themselves from the caregivers.

Another study to identify the risk factors for failing treatment virologically and achieving suppression following EAC among different populations by (Jobanputra & Parker, 2015) established that receiving enhanced adherence counseling did not mean the likelihood of suppression after retesting. This study suggested the need for defined elements of enhanced adherence support and support for treatment with ART that considers barriers to adherence among young adults and adolescents. Enhanced adherence counseling is specifically for patients who have suspected treatment failure and have potential adherence barriers that need to be addressed. The package of enhanced adherence counseling includes assessing the patient's knowledge of ART and viremia, assessing the possible barriers to adherence, and developing a plan that includes increased clinic visits, referrals, and networking to other support systems like case management, home visits, support groups, Daily Witnessed Ingestion (DWI), and viremia clinics, and exploring client's motivation to treatment. It requires three sessions are conducted with structured interventions and after 3 months of satisfactory adherence, a repeat viral load is done (MOH, 2022). There are different elements of compliance that may influence EAC uptake which are discussed below.

2.5.1 Compliance to Clinic Appointments

Adherence to clinic appointments has been related to increased adherence as well as very good outcomes after treatment with ART, (UNAIDS, 2022). Patients suspected to

be failing their ART treatment by a confirmed detectable viral load must be seen monthly for 3 months before a repeat viral load is done. These appointments comprise sessions for enhanced adherence to address adherence barriers together with the development of an adherence plan. This is crucial, especially for adolescents who are in school although no documented evidence showing adherence to medication between adolescents in boarding school and those in day school or staying with guardians.

2.5.2 Support Groups and Peer Support Sessions

Compliance to enrolment into support group and peer support counseling sessions is necessary to achieve EAC. The availability of adolescent-specific groups and clubs offering literacy or education sessions tailored to this age group, have shown hope of improving adherence and may require further evaluation. Peer counseling sessions (which referred to adolescents in groups undergoing sessions to encourage and motivate them by fellow adolescents with treatment experience) offered to motivate and encourage each other, led by treatment-experienced adolescent was examined in France in an outpatient clinic in a hospital setup (Hodgson & Ross *et al*, 2012). This intervention was linked to greater emotional well-being which had an impact on possible improved clinical outcomes. However, how this is linked to adolescents living with HIV was not established hence it is necessary to investigate how adolescents comply to participating in peer support groups and attend the sessions.

2.5.3 Prescribed Adherence Sessions

Determining the level of compliance is dependent on the implementation of guidelines. All patients receiving antiretroviral therapy (ART) for more than 3 months are advised

to undergo routine viral load monitoring, according to World Health Organization (WHO) 2017 guidelines to enable earlier determination of treatment failure and to help in clinical evaluation. Both therapeutic failures due to drug resistance and poor adherence to treatment can lead to a high viral load after 3 months on ART (WHO, 2022). World Health Organization also recommends that such patients receive enhanced adherence support. A repeat viral load test is done following three months of successful and satisfactory adherence, if the viral load is still above 1000 copies, the patient should be diagnosed with treatment failure and a switch of the drug regimen will be required. Programmatic research in Kenya has shown improved clinical outcomes and viral suppression following enhanced adherence intervention for a patient who has a high viral load. This also allows possible timely switching to a viable regimen.

Limited literature exists in Kenya to establish the extent to which noncompliance the prescribed three adherence sessions among adolescents with viremia affects the overall uptake of enhanced adherence support. It is against this situation that this study is seeking to investigate adolescents' compliance with treatment after they become viremic.

2.6 Factors associated with enhanced adherence counseling among Adolescents with high Viremia

According to WHO 2013, ART guidelines data in middle-income countries show that ART treatment outcomes are poor in adolescents compared to adults. This appears to be related to the transition to adult issues, disclosure issues, and access to targeted adherence counseling and support (Namoomba *et al*., 2019)

A study done in Zimbabwe showed that adolescents had a significantly higher probability to fail treatment compared to adults. (Bygrave *et.al*., 2012). This could probably result from suboptimal adherence and agrees with different studies that have demonstrated adolescents have a likelihood of poor adherence to ART (Hawkins *et al*., 2012). According to Hawkins, 2012, possible non-adherence risks in adolescents involve late or delayed disclosure of HIV status, peer support, stigma, and schooling especially boarding schools.

Caregiver support is also another risk factor since outcomes of long-term illnesses including HIV among children and adolescents are associated with caregiver support to access care and commitment including time. Inadequate support from the caregiver especially among young adolescents may lead to suboptimal adherence and eventually resistant to ART and treatment failure. This study will therefore inform outcomes from an African setting. (Gill *et al*, 2022)

The areas that still have gaps include, behavioural aspects of the adolescents, which this study seeks to investigate; this is further necessitated by the fact that under the current system, data on HIV in adolescents is not routinely captured as the system has two categories: children and adults aged 0-14 years and more than 15 years respectively. Depression is one of the significant factors that limit the uptake of enhanced adherence support among PLHIV (NASCOP, 2016). As part of the enhanced adherence support, it is recommended that continuation of counseling, treatment, and monitoring be done.

Barriers to adherence for adolescents include the level of disclosure, lack of understanding of the disease by the adolescent, and developmental stage. Others include lack of support systems for the adolescent, refusal to take medicine, stigma, low self-

esteem, and depression, among others. Barriers to treatment include large quantities of liquid medicine that may be impalpable or increased pill counts, confusion of drug regimens, especially between tablets and syrups, side effects, and dose adjustment. In summary, these can be classified as issues related to the health system, factors associated with the care provider, or patient-associated factors (Namoomba *et al.*, 2019).

However, while this study acknowledges the identified challenges to the uptake of enhanced adherence support services, it is worth noting that there is generalization among the population. This has limited the understanding of the dynamics in adolescents living with HIV in Nairobi. Further to this, reports by NASCOP or the Ministry of Health are inclined towards situational analysis for policymaking and therefore not put into the context of academics. It is therefore important for this study to bring the perspective of academics into the management of HIV among adolescents.

2.7 Summary of Literature Review

This aims at reviewing literature to examine available published information on the uptake of enhanced adherence among adolescents globally, regionally, and locally as well as in the context of NCC. The literature reviewed focused on areas of knowledge on the uptake of enhanced adherence among adolescents with high viremia, compliance levels, and factors impeding the uptake of EAC among viremic adolescents. These also included socio-demographic factors. Knowledge, the reviewed publications showed that there are minimal information-enhancing interventions among this age group. The focus has been on adults above 18 years of age. The level of knowledge affects their involvement in decision-making for a follow-up plan and this remains a gap. There are

suboptimal mechanisms for enhancing adherence available to this age group to enable them to attain viral suppression.

On compliance reviewed studies indicated that the transfer of responsibility and ownership is a challenge and has not been clearly defined as an element in enhanced adherence counseling. This still is a major gap, as the group should be treated as a special population. Literature also showed that the psychosocial area of support on enhanced adherence still poses a challenge to this group, their social and family life the caregivers, and medication complexity whereby there is no existing literature on this area in the locality.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

In this section, the methods used in carrying out the study on the uptake of enhanced adherence counseling and support among adolescents with high viremia in selected health facilities in Nairobi City County are explained. The chapter explains the design of the research, the study location, techniques, and procedures used in sampling, the study tools used, and in addition the ethical considerations.

3.2 Study Design

The study adopted a cross-sectional analytical study design to establish the uptake of enhanced adherence counseling among adolescents with high HIV viremia in selected facilities in Nairobi City County. During data collection, both qualitative and quantitative parameters were applied to demonstrate a broader comprehension of the research questions as suggested by (Cottrell &McKenzie, 2011).

3.3 Study Variables

3.3.1 Independent Variables

In this study, the independent variables included sociodemographic characteristics like age, sex, education level, religion, caregiver, duration of ART, and household capacity. Intervening Variables will include level of knowledge and levels of compliance to EAC. Knowledge level variables included the reason for lifelong treatment, knowledge of viral load, high viral load meaning, understanding of EAC, and why viral load would be high. On compliance level, variables investigated included clinic appointments, time of medication and reminders, as well as attendance of support groups and adherence

sessions of the adolescents. Other variables comprised emotional and behavioural factors.

3.3.2 Dependent Variables

The study's main or dependent variable was the uptake of enhanced adherence counseling determined by achieving three or more adherence sessions as per the ART guidelines.

3.4 Study Location

The study was conducted in Nairobi City County (NCC), a cosmopolitan city in the Kenyan Republic. The city borders Kiambu and Kajiado counties on the North and South respectively while to the East is Machakos County and covers up to 696.1 km^2. The city-county population is approximately 4.5 million people including 2,264,636 females and 2,250,971 males, (Kenya National Bureau of Statistics (KNBS, 2022). The HIV prevalence of 3.8% according to the KENPHIA report (KENPHIA,2018) hence purposively selected because of a high burden of HIV infections, an HIV prevalence of 8% (Kenya HIV Estimates Report, 2018/19), and a low ART coverage of 84% among children below the age of 15 years. (MOH, 2017). The population of PLHIV was 1,592,342 comprising 2.1 % aged between 15 to 24 and 190,131 thousand between 0-14 years by 2018. Viral suppression among adolescents was low at 66% compared to adult suppression above 80% in 2018 (MOH, 2018). There are 10 sub-counties in Nairobi City County, namely: Dagoretti, Langata, Makadara, Westlands, Starehe, Kamukunji, Kasarani, Ruaraka, Embakasi East, and Embakasi west, and with a total of 165 facilities offering HIV care and treatment services. There is a composition of private, faith-based, or missionary and public health facilities in the county. Facilities,

where the study was conducted, were selected purposively based on the volume of ALHIV on ART and the proportion who contributed to the high viremia. These included: Eastleigh, Majengo, Pumwani, Riruta, Chandaria, Westlands HC, Mathari Hospital, Kayole1, Makadara, Kaloleni, Kayole2, Embakasi, Mukuru, Karen, Kibera D.O, Huruma Lions, Loco, Njiru, Dandora1, Dandora 2, Kabete Clinic, Mathare North health centres and Dagoretti SCH Mutuini giving to a total of 2266 ALHV (MOH, 2018) with high viremia from whom the sample was determined.

3.5 Study Population

The study focused on ALHIV across all 10 sub-counties who had HIV viremia from the selected health facilities in Nairobi City County.

3.5.1 The Inclusion Criteria

ALHIV aged between 10 and 19 years, on antiretroviral therapy for over 6 months of treatment, and a documented high HIV viremia of over 1000 viral load copies per millilitre of blood who consented to participate in the study were included in the study population. Key informants including health care providers in the comprehensive care clinics and adolescent peer experts were included to provide additional information as well as focused group discussions.

3.5.2 Exclusion Criteria

ALHIV who had not attained full disclosure of their HIV status were excluded from the study. Additionally, adolescents living with HIV who transferred out Died or were lost from care after a detectable viral load, those adolescents with a high viral load but have not completed 6 months after detectable viral load, and ALHIV who failed to ascent or obtain the consent of participation were as well excluded from the study.

3.6 Study Sample Size and Sampling Techniques

3.6.1 Techniques used in Sampling

Purposive sampling was used in this study to select Nairobi City County because of the high number of adolescents living with HIV aged 10-19 years, in the region reported to have high HIV viremia. In this region as at end of 2017, 34% (1378) of all ALHIV on ART in Nairobi City County, had a high viral load, (NASCOP, 2018). Purposive sampling is whereby the subjects are selected based on a variety of criteria determined by the researcher (Kothar *et al*., 2004). To get the sample per Sub county the number of adolescents with high viremia in the Sub- County was divided by the total number of adolescents with high viremia in the county and multiplied by the expected sample of 380 as shown in Table 1.1. Similarly, health facilities were purposively selected based on the number of ALHIV who had high viremia in each facility. A total of 45 facilities from across all the sub-counties were selected. The sample was based on the proportion contributed by each facility to the total number of adolescents with high viremia as displayed in Table 1.2. The NASCOP (MOH, 2017) data as of December 2017 was used in calculating the desired sample size in each selected facility. To identify the 380 ALHIV to participate in the study, a simple random sampling technique was used. This was applied at each facility until the desired sample is achieved.

For qualitative data, a total of 14 healthcare providers and adherence counselors were subjected to key informants' interviews. The adolescent peers also supported the selection of participants for the 4 FGDs conducted. The FGDs were conveniently conducted during school holidays when a majority of the adolescents were available to come for their clinic appointments.

3.6.2 Determination of the Sample Size

The formula from (Fishers *et al*.,1998, was used to determine the sample size denoted by the letter (n).

$n = z^2 pq \div d^2$ for populations greater than 10000 (Kothari, 2004).

n = the desired sample size

z = Normal standard deviation calculated at 95% confidence interval (C.I) which is normally set at 1.96. (Usually set at 1.96)

p = Proportion of adolescents living with HIV in Nairobi City County who are not virally suppressed, 34% used from 2018 HIV estimates where 66% of adolescents aged 10-19 years were suppressed.

q = 1-0.34(10%)

d = degree of accuracy (set at 0.05) i.e., at a confidence limit of 95%.

The desirable sample size was therefore calculated as:

$n = 1.96^2 \times 0.34 \times 0.66 \div 0.05^2 = 344.8$-

n = 345

Include 10% non-response rate = 34.5 approximately 35

The number of participants was therefore 345+35 = 380

Hence the sample size of 380 respondents in total as demonstrated in Table 3.1 below.

Table 3.1 Table of Proportion of Viremic adolescents by Sub county Nairobi city County

Name of Sub county	Number of adolescents	Total with high viral load	Calculated sample	% Cumulative contribution to total sample
Langata	302	97	27	7%
Dagoretti	650	142	39	17%
Ruaraka	313	98	27	24%
Starehe	288	80	22	30%
Kasarani	324	122	34	39%
Kamukunji	547	175	48	52%
Embakasi East	299	129	36	61%
Embakasi West	460	244	67	79%
Westlands	607	225	62	95%
Makadara	212	66	18	100%
Total	**4002**	**1378**	**380**	

Source: (NASCOP Viral Load data, 2018)

Table 3.2 Sampling Table for selected facilities in Nairobi City County

S/NO	Name of Sub-County	Facility/s selected	Site Sample	SNO	Name of Sub-County	Facility/s selected	Site Sample
1	Kamukunji	AHF Mathare Blue House Clinic	25	**23**	Langata	Mbagathi District Hospital	9
2		Pumwani Maternity Hospital	14	**24**		St Mary's Mission Hospital	7
3		St Vincent Dispensary	9	**25**		KEMRI VCT	5
4	Makadara	Makadara Sub County Hospital	10	**26**		Dreams Centre Dispensary	3
5		LungaLunga Health Centre	4	**27**		Kibera Community HC - AMREF	
6		Bahati Health Centre	4	**28**	Starehe	Huruma (EDARP)	8
7	Dagoretti	Coptic Hospital	10	**29**		Mater Hospital	6
8		Lea Toto Kawangware	9	**30**		Huruma Lions Dispensary	4
9		Riruta Health Centre	8	**31**		Loco Health Centre	4
10		Lea Toto Dagoretti	6	**32**	Kasarani	Kariobangi Edarp	9
11		Liverpool VCT	6	**33**		EDARP Njiru Clinic	6
12	Embakasi East	EDARP Donholm Clinic	10	**34**		Kasarani Health Centre	5
13		Lea Toto Community Mukuru Reuben	9	**35**		Dandora II Health Centre	4
14		Soweto (EDARP) Clinic	8	**36**		Ruai Catholic Clinic	4
15		Mukuru MMM Clinic	5	**37**		Njiru Dispensary	3
16		Mukuru Health Centre	4	**38**		Kariobangi Health Centre	3
17	Embakasi West	Lea Toto Dandora	18	**39**	Westland's	Gertrudes Hospital	29
18		Edarp Komarock Health Centre	14	**40**		Lea Toto Clinic (kangemi)	20
19		Dandora (EDARP) Clinic	10	**41**		Kangemi Health Centre	13
20		Mama Lucy Kibaki Hospital	10	**42**	Ruaraka	Lea Toto Kariobangi South Clinic	10
21		Kayole II Sub-District Hospital	8	**43**		Lea Toto Mwiki	8
22		SOS Dispensary	7	**44**		Babadogo (EDARP)	5
				45		Babadogo Health Centre	4
					Totals	**45**	**380**

3.7 Data Collection tools /Instruments

The study used structured and non-structured questionnaires that were designed to collect information on client demographics, knowledge, client factors, compliance levels, patient, and provider factors consistent with the conceptual framework. In-depth interviews were conducted among adolescents receiving care and a focus group discussion involving adolescents to obtain supplementary information to the study.

3.8 Pretesting of study instruments

A pretesting of the study instruments was conducted at Waithaka Health Centre before commencement of the study to assess their validity and reliability. The selected Health Centre was not part of the health facilities selected in the real study.

3.8.1 Validity of the instruments

Validity refers to the level at which the study results after analysis represent the stated variables (Mugenda, 1999). Validity was therefore assured by training the research assistants, checking for completeness, and ensuring that the data collected is correct. The supervisors contributed to the review and formulation of the questions. The tools were improved and revised in response to the suggestions from pretesting.

3.8.2 Reliability of the study instruments

Reliability referred to the extent to which the research instrument consistently gave results upon repetition. Test and re-test technique was used to ascertain the reliability of the questionnaire. The same participants in the pilot facility were administered the questionnaire twice in a difference of one month. Pearson coefficient correlation was

calculated for the 2 scores and a score of 85% was obtained indicating high reliability of the questionnaire.

3.9 Data collection Technique

Five research assistants who had a medical background were engaged to assist with data collection after being trained on the process. Quantitative data was obtained from the study participants through administration of the questionnaire. Qualitative data was obtained from the interview guides administered to the KII comprised of clinicians in the comprehensive care clinics and adherence counselors to the adolescents and from focused group discussions with the adolescents. Additional data were obtained from patient records especially on compliance to give a deeper understanding of the practice. The research assistants included health workers recruited from each Sub-County to assist in clarifying the questions to the participants and taking notes. They were also trained on how to administer the questionnaire and the objectives of the study, the tools used, and the methods to collect data including taking notes during FDGs.

3.10 Data Management and Analysis

Following data collection and collation, the data was cleaned coded, and analysed using Microsoft excel functions and Stata. Descriptive analyses were performed, and inferential analysis was conducted using Chi-square to determine any associations between the predictor and the outcome variables. A P-value of < 0.05 was considered statistically significant. Study findings were presented using pie charts, frequency tables, and bar graphs.

3.11 Ethical Considerations

Approval was sought and granted from the Kenyatta University graduate school, clearance to proceed with the study obtained from Kenyatta University Ethical Review committee (KUERC), study authorization permit from National Commission for Science, Technology and Innovation (NACOSTI), Ministry of Health, Nairobi City County to obtain letter of permission to collect data and the health facility administrators in the respective facilities permission to interact with participants and collect data. The researcher conducted introductory meetings with facility health managers in the respective facilities to elaborate on the purpose of the study before commencing. Due to the sensitivity of the area of study, participants aged above 18 years were given written consent, which they signed upon reading, understanding, and agreeing to participate while assent was obtained from respondents below the age of 18 years. The researcher assured them both in writing and verbal for anonymity of the responses to assure confidentiality and the right to withdraw for any reason from the study at any given time. They were also explained about no associated direct benefits for agreeing to be part of the study.

CHAPTER FOUR: RESULTS

4.1 Introduction

The section outlines the findings of the study following analysis of the data collected from respondents in the 45 selected health facilities. A total of 380 questionnaires were administered and 74 were filled and returned, with a response rate of 98%. The study focused on the four main objectives which were: to identify sociodemographic characteristics associated with enhanced adherence counseling, to determine knowledge on EAC, to find out the levels of adherence/compliance to EAC and to determine the factors associated with uptake of EAC among adolescents with high viremia in the selected facilities in Nairobi City County.

4.2 Socio-Demographic Characteristics of the respondents.

Data from 374 respondents were analyzed in this study. The respondents' socio-demographic characteristics covered age, gender, education, religion, parents, siblings, treatment supporter, and duration on ART. The findings showed that 50% (188) of the respondents were aged 10-14 years while the remaining half were aged between 15 – 19 years. The female gender was 55% (204) while the male gender was 45% (170). Of note was that 60% of the respondents attained Primary education at the time of the study while only 36% had attained secondary education and 3% reported no education. In addition, 97% (361) of the respondents were found to be Christians with only 3% (12) reporting to be Muslims. From the analysis it was also found that 65% (244) of the respondents had both their parents alive,19% (72) had both parents deceased and 16% (58) had one parent alive and a majority 71% (264) had their parents as the treatment supporter. The analysis further showed that 86% (321) of the respondents had between

one and three siblings, 13% (51) had between four and five siblings, and (2) had more than five siblings. The study also established that 68% of the respondents were on treatment for over 5 years as summarized in Table 4.1.

Table 4.1 Socio Demographic characteristics of the Study respondents

Variable (N = 374)		**Frequency (n)**	**Percentage (%)**
Age	Mean (sd)	14.65 (2.74)	
	Median (IQR)	14 (4)	
	10 - 14 Years	188	50%
	15 - 19 Years	186	50%
Gender	Female	204	55%
	Male	170	45%
Highest Education attained	None	12	3%
	Primary	226	60%
	Secondary	136	36%
Religion	Christian	361	97%
	Muslim	12	3%
	Not reported	1	0%
Parents	Both alive	244	65%
	Both deceased	72	19%
	One Alive	58	16%
Number of siblings in the household	1-2 Sibling	210	56%
	3-5 Siblings	162	43%
	>5 Siblings	2	1%
Treatment supporter	Teacher	6	2%
	Friend	1	0%
	Grandparent	8	2%
	Guardian	41	11%
	Parent	264	71%
	Relative	40	11%
	Sibling	14	4%
Time on ART	12 - 24 months	29	8%
	25 - 48 months	46	12%
	49 – 60months	45	12%
	>60 months	254	68%

4.3 Knowledge levels of EAC among ALHIV with high Viremia

From the responses in table 4.5, 72% of the respondents agreed that adherence to ART is important,78% were aware of their viral load results and 87% agreed that viral load copies greater than 1000 may indicate a risk of failing ART treatment. A majority of the respondents 71.4% mentioned that their viral load could be high because the drugs may not be working while only half of the respondents 51% distinguished that a treatment support through Directly Observed Therapy (DOT) is critical in improving re-suppression rates

4.3.1 Statements about Knowledge level of EAC

The knowledge levels of participants were determined using a dichotomous scale. A total of 5 knowledge statements, shown below in table 4.2, about viral load and adherence to ART medication were put to the respondents; A score of 1 and 0 was assigned to correct answers and wrong, respectively. The scores were summed across the 5 statements and a total score of 0 – 2 was rated as inadequate knowledge while 3 – 5 was rated as adequate knowledge. The Knowledge statements scores rating has been shown in Tables, 4.2 and 4.3 below.

Table 4.2 Knowledge Statements

1	Adherence to ART is important in reducing viral load copies in blood
2	Are you aware of your latest Viral load results, if yes what was the value?
3	A viral load greater than 1000 could be a risk of treatment failure
4	What do you think could be the reason for your viral load to be higher than 1000 copies?
5	Directly Observed Therapy (DOTs) help you to take your medication well and improve viral re suppression?

Table 4.3 Scoring for Knowledge Level Responses

Knowledge Question	Response	Frequency	Percent
Adherence to ART is important in reducing viral load copies in blood	I agree	271	72%
	I disagree	13	3%
	I neither agree nor disagree	90	24%
Are you aware of your latest Viral load results?	Yes	293	78%
	No	81	22%
A viral load greater than 1000 could be a risk of treatment failure	I agree	325	87%
	I disagree	48	13%
	I neither agree nor disagree	1	0%
What do you think could be the reason for your viral load to be higher than 1000 copies?	I do not adhere to appointment	20	5.3%
	I do not know	19	5.1%
	I forget taking my medication	68	18.2%
	the drugs are not working	267	71.4%
Directly Observed Therapy (DOTs) help you to take your medication well and improve viral re suppression?	I agree	192	51%
	I disagree	150	40%
	I neither agree nor disagree	32	9%

4.3.2 Rating of Knowledge Levels of EAC

Figure 4.1 illustrates that most of the respondents 80% had adequate knowledge about EAC, while only 20% had inadequate knowledge.

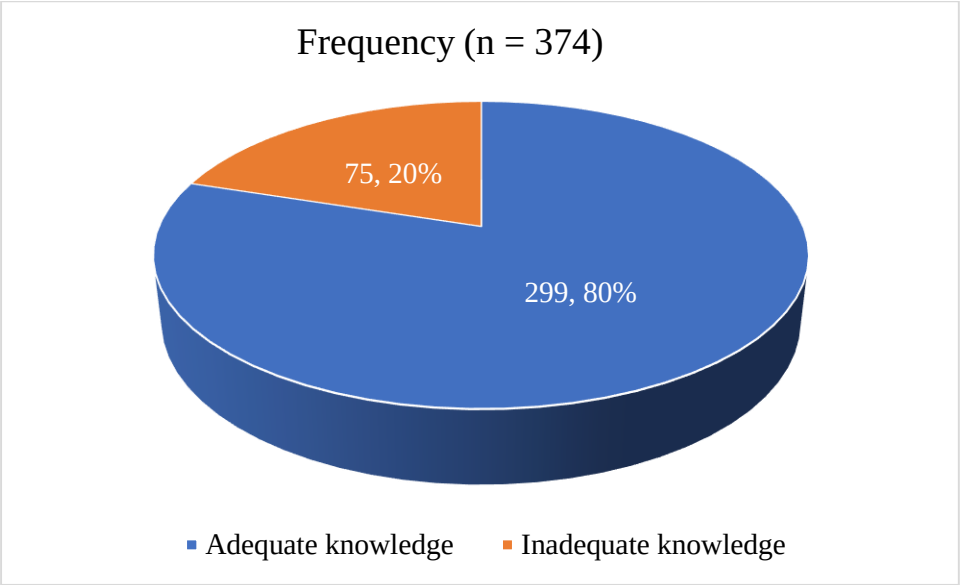

Figure 4.1 Knowledge level of EAC responses Ratings

4.4 Compliance levels to EAC package among Adolescents with high HIV viremia

The compliance levels of respondents were determined using a dichotomous scale. A total of 5 compliance statements about appointment follow-up and adherence after detectable viral load were put to respondents; correct responses for desired compliance were assigned a score of 1 and wrong answers a score of 0. The scores were summed across the 5 statements and a total score of 0 – 2 was rated as inadequate compliance while 3 – 5 was rated as adequate compliance as illustrated in table 4.4.

Table 4.4 Compliance level to EAC package Statements

1	Are you enrolled in viremia clinics
2	Have identified a reminder to take medication
3	Taking medication as prescribed by a clinician
4	Attending a support group for adolescents
5	Visited at home for DOTs by treatment supporter/case manager

The majority, 90%, of the respondents were enrolled in the viremia clinic, 52% had identified a reminder to take their medication and 71% were taking medication as prescribed. However, only 27% were attending adolescent support groups for viremia sessions and 26% had a case manager or treatment supporter to support DOTs at home.

Table 4.5 Compliance Level to EAC package Scores

Compliance question/Statement	**Frequency (N=374)**	
Responses	**Yes**	**NO**
Are you enrolled in a viremia clinic?	335 (90%)	39(10%)
Have identified a reminder to take medication	194(52%)	180(48%)
Taking medication as prescribed by a clinician	264(71%)	110(29%)
Attending a support group for adolescents	101(27%)	273(73%)
Visited at home for DOTs by treatment supporter/case manager	96(26%)	278(74%)

Compliance levels to EAC package were rated after aggregate scores as illustrated in figure 4.2. The findings demonstrated that majority of the respondents had adequate compliance score (73%) while 27% had inadequate compliance.

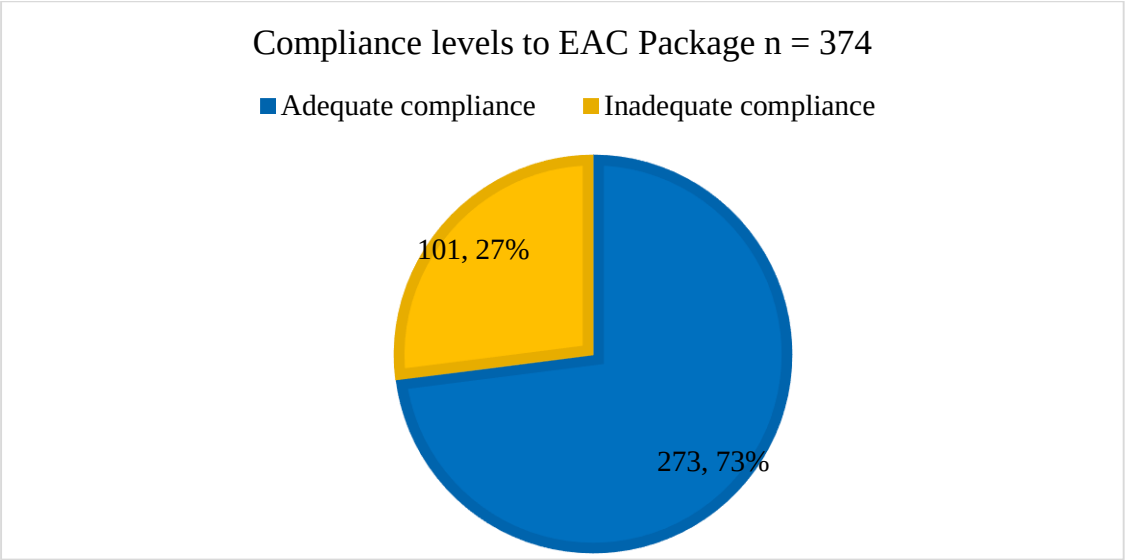

Figure 4.2 Level of Compliance to EAC among Adolescents

4.5 Factors associated with EAC uptake

4.5.1 Uptake of EAC among adolescents with high viremia

This was determined by the standard number of sessions attended by the respondent as indicated in the national guidelines. Using a dichotomous scale, clients who attended at least 3 EAC sessions after a documented viral load of more than 1000 copies as per the national guidelines on EAC uptake were assigned a value of 1 and those who had attended none or less than 3 were assigned a 0, implying they did not successfully take up EACs as per the national ART guidelines. The results are shown in Figure 4.3. which illustrates that 41% (155) of the respondents achieved the three sessions as recommended by the Kenya ART guidelines 2018, 22% (83) attended two sessions while 27% (99) only managed one session. Notably, 10 % (37) of the respondents had no EAC session following a detectable viral load.

Table 4.6 Number of EAC sessions attended by the Study respondents.

EAC category	EAC sessions attendance	Frequency	Percentage (%)
Achieved	Three or more sessions	155	41%
Not achieved	Two sessions	83	22%
	One session	99	27%
	None	37	10%
Total		**374**	**100%**

The EAC uptake was determined by the number of complete sessions attended. According to the 2018 Kenya national ART guidelines, a total of 3 or more satisfactory sessions attended were regarded as complete EAC. Sessions less than 2 were regarded as incomplete EAC. The study established that 41% of the respondents achieved EAC while 59 % did not as per the national ART guidelines as shown in figure 4.3

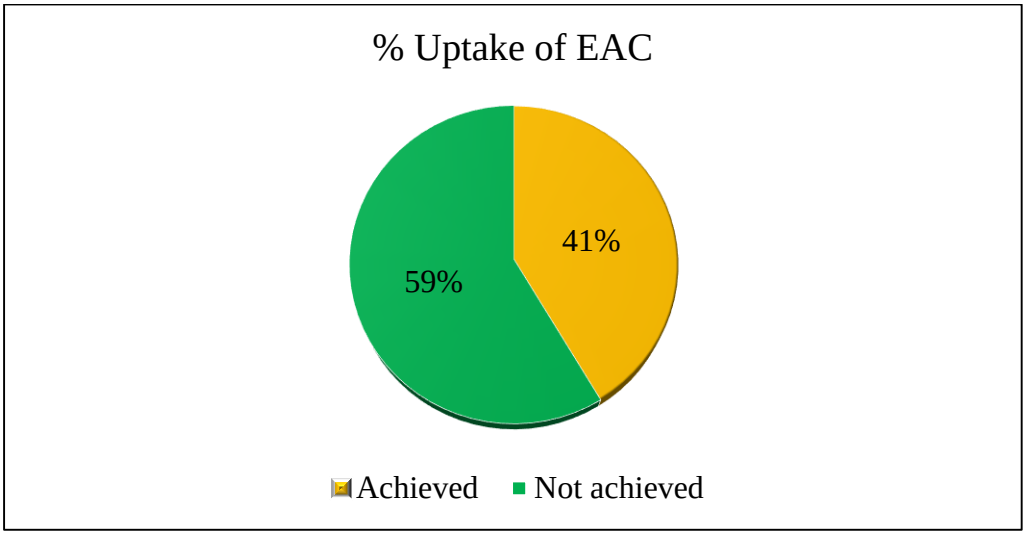

Figure 4.3 EAC uptake among respondents

4.5.2 Association between Sociodemographic characteristics and EAC Uptake

This study established that the type of treatment supporter was significantly associated with EAC uptake, (Fisher's exact *P*=0.04) as summarized in table 4.7. There were no association between age, gender, education, religion, parent category, duration on ART and household capacity. During FGD discussions, the respondents mentioned other factors which included psychosocial challenges leading to the refusal to take medication, feeling of abandonment, depression, low self-esteem, accidental disclosure, and lack of support systems. The respondents expressed fear of their confidentiality being bridged hence they were not freely willing to talk about their barriers with the healthcare worker but found their parents helpful. This agrees with the analysis that found a strong association between treatment supporter and uptake of EAC.

"I don't feel comfortable telling the clinician my private problem that made me not to take drugs, I heard them discuss us when am sited in the queue – they have even nicknamed some of us 'sumbua' meaning we are difficult, I don't think such a person wants to help you. I would rather keep quiet or share with my parent, after all, most of them do not have HIV so they do not understand what we go through" said a 15-year-old form 2 student during an FGD.

Table 4.7 Association between EAC Uptake and Socio-demographic Characteristics

Association between EAC Uptake and Socio-demographic Characteristics				
Variable n = 374		**No**	**Yes**	**Level of Significance**
Age	**10 - 14 Years**	107(57%)	81(43%)	χ^2 = 0.42, df=1, p=0.52
	15 - 19 Years	112(60%)	74(40%)	
Gender	**Female**	124(61%)	80(39%)	χ^2 = 0.92, df = 1, p=0.33
	Male	95(56%)	75(44%)	
Level of education	**None**	6(50%)	6(50%)	χ^2 = 0.56, df = 2, p=0.75
	Primary	131(58%)	95(42%)	
	Secondary	82(60%)	54(40%)	
Religion	**Christian**	210(58%)	151(42%)	Fisher's exact test, p=0.87
	Muslim	8(67%)	4(33%)	
	Not reported	1(100%)	0(0%)	
Parents	**Both alive**	149(61%)	95(39%)	χ^2 = 1.9, df= 2, p=0.39
	Both deceased	38(53%)	34(47%)	
	One Alive	32(55%)	26(45%)	
Number of siblings in the household	**2-Jan**	127(60%)	83(40%)	χ^2 = 9.91, df = 5, p=0.08
	5-Mar	91(56%)	71(44%)	
	>5	1(50%)	1(50%)	
Treatment supporter	**Friend**	0(0%)	1(100%)	**Fisher's exact P= 0.04**
	Grandparent	5(63%)	3(38%)	
	Guardian	15(37%)	26(63%)	
	Parent	163(62%)	101(38%)	
	Relative	23(58%)	17(42%)	
	Sibling	8(57%)	6(43%)	
	Teacher	5(83%)	1(17%)	
Time on ART	**12 - 24 months**	13(45%)	16(55%)	χ^2 = 5.42, df = 3, p=0.14
	25 - 48 months	32(70%)	14(30%)	
	49 – 60months	29(64%)	16(36%)	
	>60 months	145(57%)	109(43%)	

4.5.3 Association between EAC Uptake and Knowledge levels

In table 4.8 and 4.9, there is a significant relationship between knowledge levels and EAC uptake (χ^2 = 8.19, df = 1, p=0.004). Respondents with adequate knowledge scoring were less likely to take up EAC compared to those with inadequate knowledge (Odds ratio: 0.48, C.I: 0.29 – 0.80). This was also captured during FGD where most of the adolescents illustrated that the reason for taking ART is to prolong life and reduce viral multiplication and that they learned about this during treatment preparation sessions.

"I know I take ARVs so that my viral load is reduced because the drugs will prevent their multiplication, the adherence counselor taught me when I started ART treatment. I know this quite well and I remember during my second visit after HIV diagnosis we were taught in a group about viral load copies, when they are above 1000 etc. We understand these things; we do not need to be called just to repeat the same information" shared by a 19-year-old girl from an FGD

Further statements picked from FGD indicated that adolescents who were experienced in ART treatment had adequate knowledge especially those aged above 15 years and were in secondary school. The level of education also influenced Knowledge levels.

"Regarding HIV information, there is nothing we do not know or understand, we read in books, on google, on the radio, and on TV everywhere. We are taught about viral load before starting ART, and our parents remind us, we listen to health talks every morning when we come, make it simpler for us, like in pictures or scripts on TV we do not need more stories, and frequent visits to hospital to repeat what we already know regarding our condition." (Said a 15-year-old boy) from FGD.

A statement by a 17-year-old girl in an FGD expounded on use of Directly Observed Therapy (DOTs).

"*DOTs are helpful. Some adolescents are tricky they need close observation to be sure they have swallowed their medication, but also, forcing me to take under observation makes me depressed and feel like I am being forced to live, I will rather choose to die than be treated like a prisoner"*

Table 4.8 Association of EAC Uptake and Knowledge Levels

Variable		**Inadequate Knowledge**	**Adequate Knowledge**	**significance**
Age	10 - 14 Years	74 (39%)	114 (61%)	**P<0.05***
	15 - 19 Years	1 (1%)	185 (99%)	
Gender	Female	40 (20%)	164 (80%)	χ 2 = 0.0556, df = 1, p>0.05
	Male	35 (21%)	135 (79%)	
Level of Education	None	4 (33%)	8 (67%)	**p<0.05**
	Primary	70 (31%)	156 (69%)	
	Secondary	1 (1%)	135 (99%)	
Religion	Christian	71 (20%)	290 (80%)	χ 2 = 1.6044, df = 2, p>0.05
	Muslim	4 (33%)	8 (67%)	
	Not reported	0 (0%)	1 (100%)	
Parents/Primary care giver	Both alive	42 (17%)	202 (83%)	χ 2 = 3.5473, df = 2, p>0.05
	Both deceased	18 (25%)	54 (75%)	
	One Alive	15 (26%)	43 (74%)	

Table 4.9 Association of EAC Uptake and Knowledge Levels

	EAC Uptake		**Unadjusted Odds ratio (95% Confidence interval)**	Significance
Knowledge level	**No**	**Yes**		
Inadequate knowledge	33(44%)	42(56%)	Ref	$\chi^2 = 8.19$, df = 1, **p=0.004**
Adequate knowledge	186(62%)	113(38%)	0.48 (0.29 – 0.80)	

4.5.4 Association between Compliance levels and Uptake of EAC

As shown in table 4.10 and 4.11, compliance levels to EAC package played a significant role in whether the respondents were likely to take up EAC sessions or not ($\chi^2 = 14.563$, df = 1, p=0.000). Respondents with adequate compliance ratings were more likely than those with inadequate compliance to take up EAC sessions (Odds ratio: 0.41, C.I 0.26 – 0.65). This was also evidenced during the FGD where one adolescent mentioned that adolescents like socializing and there would quickly enroll into an adolescent support group. In addition, they also mentioned that support groups for adolescents should be conducted from outside the facilities to include activities and socialization citing challenges associated with having the sessions in the facility.

"I appreciate the adolescent support group but let them plan and take us outside the facility to meat eat and have fun where we are free, we will even socialize and understand our problems better, here in the facility we stay for long waiting and when they come, they just repeat talking about same things we already know. I do not find it helpful to come monthly to be asked the same questions" reported by a 19-year-old girl in an FGD.

Other issues were related to socio economic status and change of caregiver as demonstrated by a 16-year-old boy.

"I have been coming to the clinic all my clinic days I only missed drugs when my grandmother died and I relocated to my uncle's place, coming frequently for adherence meant I borrow transport all the time and my cousins will ask me where I was going, the best thing would be for me to know why I have a high viral load and I will take my drugs well but not to see the counselor every month, it will not help me as opposed to taking the drugs well".

Table 4.10 Association between Compliance levels and EAC uptake

Variable		**Inadequate compliance**	**Adequate compliance**	**Significance**
Age Category	10 - 14 Years	60(32%)	128(68%)	**χ^2 = 4.62, df = 1, p<0.05***
	15 - 19 Years	41(22%)	145(78%)	
Gender	Female	56(27%)	148(73%)	χ^2 = 0.05, df = 1, p>0.05
	Male	45(26%)	125(74%)	
Level of Education	None	3(25%)	9(75%)	χ^2 = 5.78, df = 1, p>0.05
	Primary	71(31%)	155(69%)	
	Secondary	27(20%)	109(80%)	
Parents/Primary care giver	Both alive	56(23%)	188(77%)	χ^2 = 5.86, df = 2, p>0.05
	Both deceased	25(35%)	47(65%)	
	One Alive	20(34%)	38(66%)	

Table 4.11 Association between Compliance levels and EAC uptake

	EAC Uptake			
	No	**Yes**	**Unadjusted Odds ratio (95% Confidence interval)**	**Chi-Square Value**
Inadequate compliance	43(43%)	58(57%)	0.409, (0.256 – 0.651)	$\chi^2 = 14.563$, df = 1, **p=0.000**
Adequate compliance	176(64%)	97(36%)	ref	

CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This section presents insights on findings and comparisons with other studies conducted related to the uptake of Enhanced Adherence counselling among Viremic Adolescents. From the analysis conducted the study findings revealed that only 41% of the adolescents completed 3 or more EAC sessions within 3 months of high viral load as per the recommendations in 2018 and 2022 Kenya national ART guidelines and a majority (59%) of them did not achieve three or more sessions. This chapter also draws the conclusion of the study and recommendations based on the study objectives.

5.2 Discussion

This is among the few studies done in Kenya on assessing uptake of enhanced adherence counseling among ALHIV aged 10-19 years with high HIV viremia. The study established that 41% (155/374) of the ALHIV received and completed three or more EAC sessions as per the WHO recommendations similar to findings from an Ethiopian study where 46.8% of the respondents completed EAC within 3 months as per recommended guidelines (Gedefaw *et al*., 2020). This implied that 53.2% of the adolescents never complete the EAC sessions following a detectable viral load as recommended in the WHO guidelines which are adopted nationally. A similar study conducted in Swaziland showed lower rates of uptake of enhanced adherence counseling at 20% among children, adolescents, and adults (Jobanputra *et al*. 2015). A related study done in Zimbabwe showed 63% of the patients enrolled in EAC after a detectable viral load completed three sessions of EACs as per the national guidelines

(Bygrave *et al.,* 2012). However, the two studies did not separate adult and adolescent population and thus may not conclude how different was the prevalence among adolescents. A Ugandan study to evaluate Viral load outcomes after EAC also revealed that 77% of the respondents in the study had all the 3 EAC sessions while 16% and 7% received one or two sessions and no session after high viral load respectively (Nasuuna *et al*., 2018)

In this study 10% of the respondents were not initiated on any EAC, this could result from the complex nature of this age group. Constraints like schooling, caregiver status, and delayed communication of results to the adolescents by healthcare workers could result in this delayed intervention. The capacity of the healthcare worker to explore and manage adolescent treatment barriers could also have contributed to some attending less than 3 sessions Casual evidence according to the Zimbabwe study shows there could be inadequacies in the process of linking the clients from the clinician to the counsellor for initiation/enrolment into the EAC sessions (Bvochora *et.al*.,2019). The suboptimal uptake of enhanced adherence counseling among this subpopulation could explain why they have low resuppression rates even after the viral load is repeated. This also could imply that the majority of adolescents are prematurely switched to a second treatment option following a high HIV Viremia due to unsuccessful and delayed enhanced adherence sessions.

5.2.1 Socio-demographic characteristics among adolescents with high HIV Viremia

The median age in this study was 14 years, similar to another study done in Kenya looking at barriers to adherence among adolescents with suspected treatment failure

and their experience with enhanced adherence counseling (Gill *et al.,* 2022). These results are also closer to the findings from a study of adolescent viral suppression in Cambodia where the adolescents' median age was 15.9 years (Chhim *et al.,* 2018). Although the study by Gill looked at 12 to 19 years while this study assessed adolescents aged 10 to 19 years.

In this study, 55% of the adolescents were female and 60% had at least attained some primary education. This corresponds to the age distribution where a majority of the adolescents aged below 15 years are in Primary school and to the fact that HIV impacts negatively on developmental milestones, especially the cognitive behaviour hence delayed schooling. According to national statistics, majority of adolescents in primary schools are not within the normal range of age, and approximately 21% of pupils in primary school are appropriately aged for the grade and this declines even with higher grades (KDHS, 2015). This indicates that 79% are not in their appropriate classes. This study also revealed that twelve adolescents had never attained any level of education, although the number is lower, it pauses a challenge in understanding the literacy sessions associated with HIV management.

Of the 374 respondents, 65% had both parents alive and 71% had a parent as a caregiver. Among those whose parents were diseased, 16% were reported to be total orphans while 19% had one parent diseased. In a systemic review of studies done from 8 papers on adherence where 6 were from African countries including Kenya, Uganda, Rwanda and Tanzania, it was established that a double orphan status was a risk to ART non-adherence while those orphaned by one parent had a lesser likelihood of non-adherence. while the other orphanhood statuses were less likely to be associated with ART non-

adherence. In this study being an orphan was, either double or by single parent was not statistically associated with uptake of EAC (Kamau *et al*., 2024). In this study all the responded had been disclosed to their HIV status and hence early awareness may have contributed to ownership of HIV care by the adolescents.

This study also found that the majority of the adolescents 68% had been on ART for more than 5 years. The study focused on those on ART and had a documented high viral load they must have been in care for more than 6 months after the detectable viral load. This allowed adequate time to assess the EAC sessions since the guidelines indicate that the minimum period to complete 3 EAC sessions was 12 weeks (3 months).

5.2.2 Knowledge Levels on Uptake of EAC among adolescents with Viremia

In this study, a substantial proportion of the respondents (80%) reported correct information about HIV, viral load, and Enhanced adherence. In this study, adolescents under the age of 18 were supported by guardians to respond to the questions through ascent. This may have contributed to the high knowledge levels attained. Of the 374 respondents 87% implied that they are aware of why they take their medication,85% knew that a high viral load of >1000 copies per milliliter of blood is bad and 82% clearly articulated some barriers that could result in them having a high viral load. Furthermore, 72% responded in agreement that enhanced adherence sessions could positively influence their viral load outcomes. Only 13 respondents disagreed that EAC is not important. These findings are unique sine majority of studies conducted on general adherence have indicated knowledge as a positive facilitator to adherence interventions (Gedefaw *et al.,* 2020) but a qualitative study in Homabay county established mixed perception among adolescents and caregivers on importance of EAC among viremic

adolescents. The study demonstrated that the information was repetitive and that health care providers shouted at them. One study done in Nairobi Korogocho and Kibera slums on knowledge of HIV among adolescents found that the majority of the adolescents understood facts about HIV and why adherence to ART should be intensified (Obonyo, 2012).

Other findings in a study on Knowledge, Attitude, and practices among adolescents Living with HIV in Abidjan indicated adolescents had adequate knowledge related to HIV from the may media sources and need guided strategies to minimize information pollution (Azogoh-Kouadio *et al*., 2020).

5.2.3 Compliance levels to EAC package among adolescents with high HIV viremia

This study established that adolescents aged 10-19 years have adequate compliance levels (73%) to EAC package. A majority 90% were enrolled in the viremia clinic this could result from the fact that enrolment in the viremia clinic is usually the first step in EAC. It was noted that less than a third of adolescents liked the support groups and DOTs at home. This could be explained by the fact that a majority were in school and the scheduled sessions would be affected by the schooling calendar, organizing adolescent viremia clinics over the holidays were seen to be effective in improving viral load outcomes (Diress *et al*., 2019) This study found that adolescents who had inadequate compliance levels were less likely to take up EAC. The compliance package included; keeping clinic and drug appointments and viremia clinic days, attending support groups, observing DOTs after home visit, and attending a clinic with a treatment supporter or buddy. The highest compliance was enrolment in Viremia clinics

similar to a study done by (Murray *et al*., 2017). The findings in this study having been conducted in an urban set up could imply enhanced structures that support older adolescents like youth-friendly services and peer support.

Another study in Kenya established that fear among adolescents led to poor compliance to scheduled EAC appointment. Adolescents did not want to go back to the clinic after missing an appointment or after a detectable viral load because the health care providers were angry with them and that they would be harassed (Gill *et al*., 2022). This may mean that individualised interventions and peer led strategies would be necessary to understand and address individual barriers to compliance and EAC uptake (Mukumbang, 2017).

5.2.4 Factors associated with uptake of Enhanced adherence counselling among adolescents

EAC is aimed at addressing the barriers to adherence and when satisfactorily done after 3 months, it is expected that the clients will achieve resuppression (viral suppression after a high initial viral load). Studies have demonstrated good resuppression rates of more than 70% among patients who had an initial elevated HIV viremia (Diress *et al*., 2019). For such good suppression to be achieved there has to be facilitators in the adherence process. This study demonstrated that treatment supporter was associated with on uptake of EAC. Other sociodemographic characteristics did not have any association with EAC uptake.

This study found that adolescents with adequate knowledge were less likely to complete the EAC sessions as per the Kenya national ART guidelines This could be attributed to the level of understanding of adherence and HIV management with cognitive maturity.

This could be attributed to the limitation of half of the adolescents aged below 15 years who were supported by the guardians to respond with assent. Majority of the adolescents were on ART for over 24 months, this could be explained by the fact that adolescents who had been on care for a longer duration had undergone other adherence sessions and saw this as a repetition or a bother. They had undergone other literacy sessions either at initial viral loads or as a booster adherence that is usually done every 6 months according to the national guidelines. This is also supported by the influence of age. In another study it was established that poor EAC uptake was associated with health provider attitude, structural and compliance challenges and therefore do not regard the EAC sessions to be helpful but rather perceived as a blame, quarrel or scolding with HCP and conducted in a harsh environment (Gill *et al*., 2022). A study in Zambia showed that what the patients knew about HIV and adherence even before ART initiation was not necessarily dispelled by the literacy sessions attended. Unless enhanced adherence is structured and packaged in an easy to understand for adolescents, it does not occur as additional information (Namoomba *et al*., 2019)

This study also showed that respondents who had poor compliance were less likely to complete EAC. This meant that these patients were initially keeping appointments and may have missed treatment for some reason that is well known to them. Identifying their barrier during their first session would make them feel it is necessary to have regular follow-ups. These findings contradicts to the MSF programmatic strategies 2016, which show that the level of viral load at initial testing predicts treatment failure in patients with good adherence meaning they are unlikely to benefit from EAC. This study also established that 316/374 respondents had initially kept their appointments. However, only 129(34%) respondents reported not to have missed drugs in the past 6

months, which was a period after their detectable viral load. Thus 66% missed at least once after a detectable viral load. This depicts the inadequacy of adherence information that they receive leading to delayed intervention. These findings support results from a study in South Africa on barriers to adherence among clients on ART (Fox & Giddy, 2012). The study findings showed that clients missed schedules due to poor or inadequate follow-up by the healthcare provider. This would imply that patients who were initially compliant and did not have frequent schedules might need to be frequently reminded about their restructured clinic visits. They could be used to a long appointment but with a high viral load, they need shorter monthly appointments. (Azia *et al*. 2016)

From the Focus group discussions it was also found that other factors like stigma faced by adolescents who do not live with parents, fear of accidental disclosure and limited resources for frequent clinic visits affected uptake of EAC. They also mentioned that the information is useful but repetitive and hence the 3 sessions may not be necessary. Other studies have shown unfavorable drug formulas social background especially caregiver and psycho-developmental stage including disclosure, to affect adherence (Jobanputra *et al*., 2015)

5.3 Conclusion

The study draws the following conclusions based on the analysis and the objectives:

1. Overall, the study established that EAC uptake among ALHIV with high viremia in selected facilities in NCC is still suboptimal at 41%.
2. The study also established that the majority (80%) of the adolescents with high viremia have adequate knowledge of viremia and EAC.

3. In this study, it was found that majority (73%) of the adolescents with high viremia have adequate compliance levels to EAC package especially on taking medication as prescribed.
4. Compliance levels, Level of Knowledge and Treatment supporter were associated with uptake of EAC.
5. Uniquely the study established that Adolescents who had adequate knowledge and compliance levels were less likely to complete the 3 EAC sessions

5.4 Recommendations

5.4.1 Recommendations from the Study

This study recommends the following:

1. In order to achieve optimal EAC as outlined in the guideline, the sessions need to be structured and targeted to the specific adolescent groups
2. The ministry of health and stakeholders to consider reviewing the number of sessions considered adequate for EAC for adolescents with viremia. The most critical session may be the initial EAC to establish barriers and plan of intervention with the adolescents
3. The MOH and NASCOP should consider inclusion on treatment supporter as a requirement for adolescents enrolled on EAC

5.4.2 Recommendation for further research

i. To determine the Impact of EAC on viral load outcomes among adolescents with high viremia
ii. To conduct qualitative analysis among the treatment supporters on facilitators of EAC uptake

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APPENDICES

Appendix I: Letter of Introduction to the Study

Dear respondent,

RE: REQUEST FOR YOUR PARTICIPATION IN AN ACADEMIC RESEARCH

My name is Violet Nafula Makokha, a postgraduate student in the School of Public Health, at Kenyatta University. I am carrying out academic research on the uptake of enhanced adherence counseling among viremic adolescents living with HIV in selected facilities in Nairobi County. This study will help provide useful information regarding the knowledge of adolescents on HIV care, behaviour, and practices of viremic adolescents living with HIV and factors affecting the uptake of enhanced adherence counseling services. The information provided will therefore support the improvement of HIV care for adolescents.

You are selected to participate in the research because you meet the inclusion criteria. As an adolescent, your medical records will be reviewed, interview you individually and have a group discussion as well. As a health care provider, questionnaire will be administered at a convenient time, and this will not affect your daily routine.

Please note that you will voluntarily participate in the study, and I must keep all your health information or responses confidential.

Violet Nafula Makokha **Tel: 0723097703**

C/O Kenyatta University

Appendix II: Informed Consent Form

Hello to you. My name is Violet Nafula Makokha, a master's student at Kenyatta University and I intend to conduct a study on the uptake of enhanced adherence support among viremic adolescents living with HIV in Nairobi County. The study is in partial fulfilment of my academic requirements. By agreeing to participate in the study, you will provide important information helpful to yourself, the community and society at large, and even the whole county in designing appropriate interventions in viremia management among adolescents living with HIV in Nairobi City County.

It is for the above reason that I kindly request your participation in responding to questions related to the study. This session will take you about or less than 30 minutes of your time. Your identification will remain confidential if you choose to participate. I wish to also let you know that, participating in this study is voluntary and you will not attract any financial benefits or rewards. Your decision not to participate in this research will be respected and you are free to choose not to answer some of the questions. Be assured that the information you give is only meant for academic purposes and no other reason.

Signature:

My signature above confirms that I have read or have been read to the above consent statement and understood that my decision to participate or not to participate in the study is voluntary and that I will not be reimbursed financially for choosing to participate

Please, fill in the following sub-section as guided ***(If YES, proceed to Q1, if No, end by appreciating the research assistant):***

YES, I agree to participate: *Sign:* _____ *Date:* _____

No, I have declined to participate: *Sign:* _____ *Date*: _____

Research Assistant: I _____, do confirm that the above consent was read and signed in my presence: *Sign:* _____ *Date:* _____

Appendix III: Questionnaire for Adolescents with high viremia

ADOLESCENTS QUESTIONNAIRE

Introduction

Please, provide your response(s) to each question asked. Note that there is no correct or false answer but ensure your responses are as honest as possible.

Exclusion and Inclusion Question

Are you aware of your HIV status?

Yes (Means disclosure has been done) [] No (Means disclosure has not been done) [ ]

If Yes Proceed with the interview and if No thank the client and stop the interview

Date of interview: ...../ ...../..... (DD/MM/YYYY)

Name of interviewer: .....

Facility Name: .....

Questionnaire No….

Section A: Background Information (Tick Appropriately)

1. Gender:

   Male [ ] Female [ ]

2. Age:

   10 – 14 years [ ] 15-19 years [ ]

3. Level of Education

   Primary [ ] Secondary [ ] College [ ] Never attended school [ ]

4 Religion

   Christian [ ] Muslim [ ] Other [ ] None [ ]

5 Care Giver status

a. Are your parents both alive?

Both are alive [ ] Both died [ ] Only Mother is alive [ ] Only Father is alive [ ]

b. Who do you live with?

With Parents [ ] Grandparents [ ] With other Relative [ ] A church friend [ ]

Children's Home [ ] Sibling [ ] Teacher [ ] Other Relative [ ]

6 How many siblings do you have ?

1-3 [ ] 4-5 [ ] More than 5 [ ]

7 For how long have you been taking ART drugs?

6 months -24 months [ ] 25 -48 months [ ] 49 – 60months [ ] >60 months [ ]

8 How many households in your family are infected with or get treatment for HIV?

(Indicate a number) …….

Section B: Level of knowledge of Adolescents

In 2016, the government of Kenya introduced new guidelines on enhanced Adherence Counseling as part of the ART guidelines. Adherence enhancing strategies should be implemented beginning at the point of HIV diagnosis (as part of post-test counseling and linkage), and continued during initial evaluation and follow-up for ART. Based on this, kindly answer the following questions.

9 Have you ever heard about viral load?

No [ ] Not Sure [ ] Yes [ ]

If yes in 10 above, continue answering the following questions:

10 Do you know your latest Viral Load?

No [ ] I do not know [ ] Yes [ ]

If yes, what is the value ……

a. If your Viral Load is more than 1000 copies, is it good or bad?

Good [ ] Bad [ ] I do not know [ ]

11 What did you feel when you learnt about your viral load results? Tick only one answer [✓]

Wished to change my care giver [ ] I was confused [ ] I thought I will stop going to school[ ] I wanted to know more from the care giver [ ] I knew my virus has become resistant[ ] I wanted to die[ ] I wanted to stop ART because they were not helping me[ ]

12 Which one of the following is true about ART? *Tick the answer* [✓]

They cure HIV [ ] They increase Viral load [ ] They lower viral load copies in blood [ ] They stop prevent opportunistic infections [ ]

13 Who informed you about your viral load results?

Doctor [ ] Counselor [ ] Care giver [ ]

14 What ART regimen are you taking?

First Line [ ] Second line [ ] Third line [ ] I do not know [ ]

15 How many times can one miss a drug appointment?

Only once [ ] Never [ ] Many times [ ] I do not know [ ]

16 Is it good to be visited at home when your viral load is high?

Yes [ ] No [ ] I do not know

17 After how long should one have a repeat Viral load after the VL is high

Immediately [ ] After 3 months [ ] After 6 months [ ] VL is repeated after every year [ ]

Section C: Compliance levels of enhanced adherence counseling among adolescents

18 How many times have you ever missed your clinic appointment?

Yes [ ] No [ ] I do not know [ ]

19 When your VL was >1000 were you called back to clinic before your appointment?

Yes [ ] No [ ] I do not Know [ ]

20 Do you come to clinic with your care giver?

Yes [ ] No [ ] I do not Know [ ]

21 Do you attend an adolescent support group? Y [ ] N [ ]

22 Do you have someone who supports you take your medication? Y [ ] N [[ ]

If yes please specify: Clinician [ ] Counselor [ ] Guardian [ ] Teacher[ ] Treatment supporter [ ] Peer educator [ ] Parent [ ] Other [ ] Specify…….

23 Do you have a reminder to help you take your medication? Y [ ] N [ ]

If yes which one (Specify)

…….

24 How many times have you attended enhanced adherence sessions after your VL was high?

Once [ ] Twice [ ] Thrice [ ] More than three times [ ] None [ ]

25 Would you wish to be visited at home to address your barriers to adherence?

Yes [ ] No [ ] I do not know [ ] My guardian/parent will not allow [ ]

26 Have you willingly shared your barriers to adherence with the counselor?

Fully shared [ ] partially shared [ ] Not shared at all [ ] Am not willing [ ]

27 Did you have a repeat Viral load after 3 months when your adherence was satisfactory?

Yes [ ] No [ ] Yes, I did even though my barriers were not addressed [ ]

28 Have you ever attended a session with your treatment supporter after your viral load was more than 1000?

Yes [ ] No [ ] I do not have [ ]

29 Have you ever had a session with a peer adolescent after your viral load was more than 1000? Yes [ ] No [ ] Never [ ]

30 If you are in boarding school, would you wish that your visits are scheduled during holidays only?

Yes [ ] No [ ] Am not sure [ ]

Section D: Factors affecting uptake of enhanced adherence counseling services

31 What do you think is the reason you may not want to join a support group? (provide multiple answers)

i. I do not like the way the sessions are conducted [ ]

ii. My problem will not be addressed in a group [ ]

iii. The leader of the support group is old and cannot understand my issues [ ]

iv. There are no refreshments [ ]

v. There is no confidentiality for me to give my opinions [ ]

vi. We have no time and room to play [ ]

32 What do you think are the reasons you may not wish to visit the counselor frequently for counseling education? (Provide multiple answers).

Other Adolescents do not visit frequently [ ]

I do not have transport to come [ ] I do not have someone to come with me [ ] The sessions are not helpful to me [ ] The session does not address my social problem [ ] I do not want to miss school [ ] I still have to take the pills anyway[ ]

Inadequate structures at school to support adherence [ ]

It is not lively because there are no ART therapies [ ] No counseling on social life [ ]

Others [ ] (please specify)……..

33 Who among the following would you not freely disclose your HIV status to:

Aunt [ ] [Church friend [ ] Father [ ] Mother [ ] Grandparent [ ] Neighbor [ ] Siblings[ ] Teacher [ ] Uncle [ ] Social friend [ ]

34 What are some of the reasons you would not want to disclose your status to this social system?

I trust no one [ ] I do not feel it is necessary[ ] Fear of abuse[ ] Fear of abandonment [ ]

Feeling guilty [ ] Stigma [ ]

35 What are the reasons you do not wish to be observed while taking your medication? (Provide multiple answers).

Too many pills to swallow [ ] Sometimes I miss food and do not want to take pills [ ]

My clinic timing is on a school day [ ] My care giver does not understand [ ] Other specify……

36 What should be done to improve enhanced adherence counseling for adolescents living with HIV in this facility?

i. ……

ii. ……

iii. …….

iv. ……

v. ……

Thank you for your responses

Appendix IV: Focus Group Discussion for Adolescents living with HIV

Instruction:

Please ask the following questions to a group of adolescents living with HIV and record their common views.

1. Is it true that doctors/clinicians in this health facility inform us satisfactorily on:
    a) Basic description about HIV?
    b) Viral load testing? Why and how?
    c) ART and side effects? Why and how?
    d) Adherence and Treatment failure? Why and how?
    e) Keeping clinic appointments and reminders? Why and how?
    f) Need for support group? Why and how?
    g) Case management? Why and how?
2. What are the factors you think affect the uptake of enhanced adherence counseling and support?
3. What should be done to improve the uptake of enhanced adherence counselling for adolescents?

Appendix V: Research Authorization

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: O57/CTY/PT/31214/2015

DATE: 11th October, 2017

Director General,
National Commission for Science
& Innovation,
P.O. Box 30623-00100,
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MAKOKHA VIOLET NAFULA – REG. NO. O57/CTY/PT/31214/2015

I write to introduce Ms. Makokha Violet Nafula who is a Postgraduate Student of this University. She is registered for M.P.H degree programme in the Department of Community Health.

Ms. Nafula intends to conduct research for an M.P.H Proposal entitled, "Uptake of Enhanced Adherence Counselling among Adolescents with High HIV Viremia in Selected Health Facilities in Nairobi City County, Kenya".

Any assistance given will be highly appreciated.

Yours faithfully,

MRS. LUCY N. MBAABU
FOR: DEAN, GRADUATE SCHOOL

jc/rwn

Appendix VI: Ethical Review Committee Aprroval

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: kuerc.chairman@ku.ac.ke
kuerc.secretary@ku.ac.ke
Website: www.ku.ac.ke

P. O. Box 43844,
Nairobi, 00100
Tel: 8710901/12

Our Ref: **KU/ERC/ APPROVAL/VOL.1** (211) Date: 27th September, 2018

Makokha Violet Nafula
P.O Box 43844-00100
NAIROBI

Dear Violet,

APPLICATION NUMBER: PKU/863/1928 "UPTAKE OF ENHANCED ADHERENCE COUNSELING AMONG ADOLESCENTS WITH HIGH HIV VIREMIA IN SELECTED HEALTH FACILITIES IN NAIROBI CITY COUNTY, KENYA "

1. **IDENTIFICATION OF PROTOCOL**

The application before the committee is with a research topic "**Uptake Of Enhanced Adherence Counseling Among Adolescents With High Hiv Viremia In Selected Health Facilities In Nairobi City County, Kenya** " received on 27th June, 2018 and discussed on 14th August, 2018.

2. **APPLICANT**

Makokha Violet Nafula

3. **SITE**

Nairobi City County, Kenya

4. **DECISION**

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines and **APPROVED that the research may proceed for a period of ONE year from 14th August , 2018.**

5. ADVICE/CONDITIONS

i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
ii. Serious and unexpected adverse events related to the conduct of the study are reported to this committee immediately they occur.
iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
iv. Submit an electronic copy of the protocol to KUERC.

When replying, kindly quote the application number above.
If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.

KENYATTA UNIVERSITY OFFICE OF THE CHAIRMAN 22 OCT 2018 ETHICS REVIEW COMMITTEE P.O BOX 43844 - 00100 NAIROBI

PROF. JUDITH KIMIYWE
CHAIRMAN ETHICS REVIEW COMMITTEE

I VIOLET N. NAMOKHA accept the advice given and will fulfill the conditions therein.

Signature..... Dated this day of..... 2018.

cc.
DVC-Research Innovation and Outreach

Appendix VII: Approval by MOH Nairobi City County

NAIROBI CITY COUNTY

Telephone 020 344194

Web: www.nairobi.go.ke

City Hall,
P. O. Box 30075-00100,
Nairobi,
KENYA.

COUNTY HEALTH SERVICES

CHS/5/3/RESEARCH/19/2/19 — 20th March, 2019

To:

COD,

COMMUNITY HEALTH,
KENYATTA UNIVERSITY,
BOX 43844 - 00100.

RE: VIOLET NAFULA MAKOKHA ADM. NO: Q57/CTY/PT/30214/2015

Reference is made to your application on the above subject matter.

The above named student is carrying out a research on ***"Uptake of enhanced adherence counselling among adolescents of high HIV viremia in selected facilities in Nairobi County, Kenya"*** and has been authorized to collect data as from 1st April, 2019 to 30th April, 2019. The data collection process will culminate in the preparation of dissertation as part of her final qualifying examination requirements.

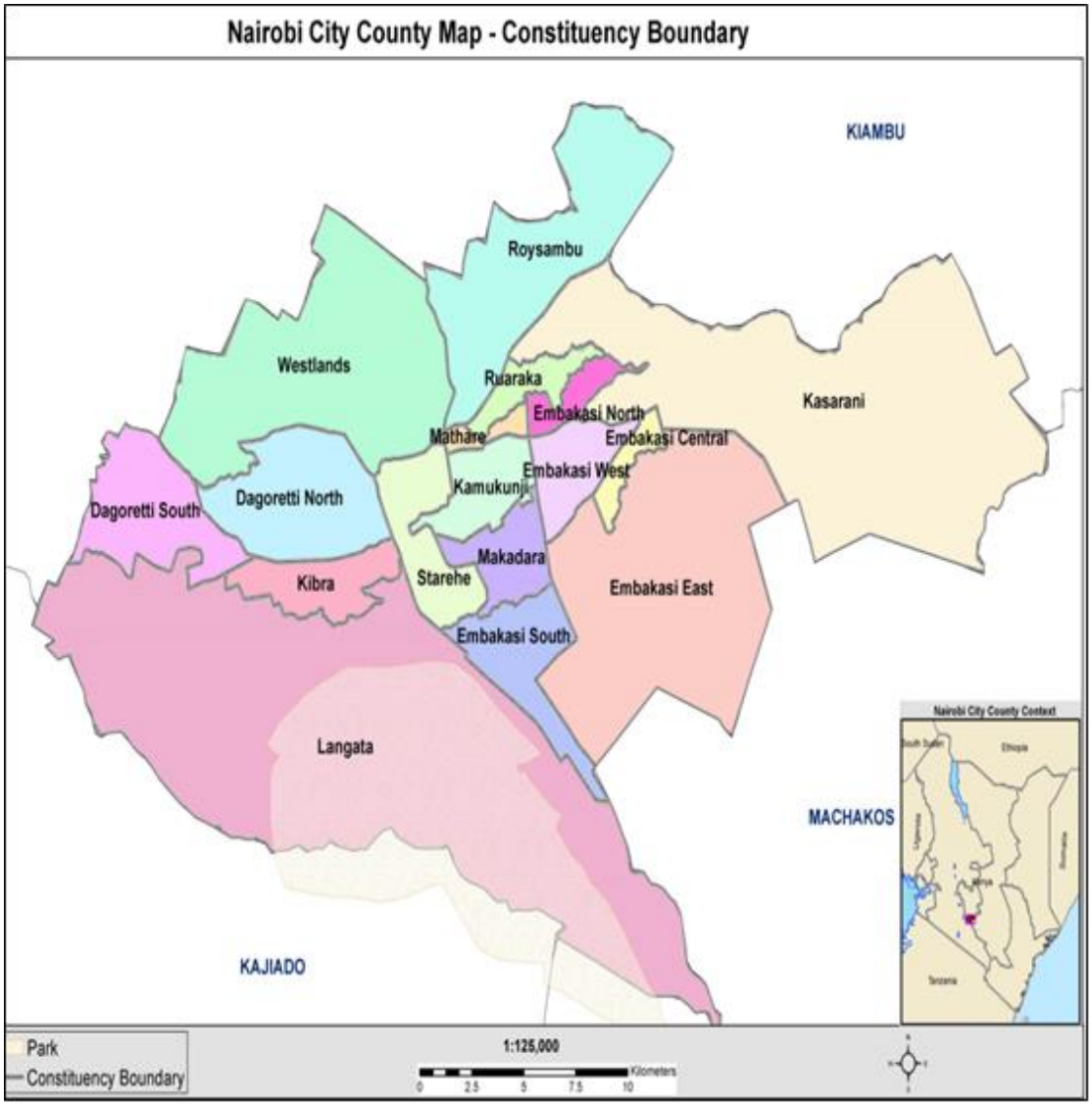
During the exercise, she is expected to adhere to the rules and regulations to the terms and conditions of Nairobi City County on data collection.

By a copy of this letter, the Sub-County/ Unit / Program Heads/ Health Facility in-charges concerned are hereby notified to assist her.

WILSON LANGAT
FOR: **CHIEF OFFICER HEALTH SERVICES**

cc. Chief Administrative Officer
ALL SCMOHs

Appendix VIII: Map of Nairobi County



Appendix IX: NACOSTI Permit

THIS IS TO CERTIFY THAT:
MS. VIOLET NAFULA MAKOKHA
of KENYATTA UNIVERSITY, 290-50200
BUNGOMA,has been permitted to
conduct research in *Nairobi County*

on the topic: *UPTAKE OF ENHANCED ADHERENCE COUNSELING AMONG ADOLESCENTS OF HIGH HIV VIREMIA IN SELECTED FACILITIES IN NAIROBI COUNTY ,KENYA*

for the period ending:
11th March,2020

Permit No : NACOSTI/P/19/78153/26464
Date Of Issue : 12th March,2019
Fee Recieved :Ksh 1000

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.

National Commission for Science, Technology and innovation
P.O. Box 30623 - 00100, Nairobi, Kenya
TEL: 020 400 7000, 0713 788787, 0735 404245
Email: dg@nacosti.go.ke, registry@nacosti.go.ke
Website: www.nacosti.go.ke

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH LICENSE

Serial No.A 23517

CONDITIONS: see back page