FACTORS ASSOCIATED WITH VIRAL LOAD NONSUPPRESSION AMONG CHILDREN AND ADOLSCENTS LIVING WITH HIV ENROLLED TO THE ORPHANS AND VULNERABLE CHILDREN PROGRAM AT THE MILDMAY CENTER OF EXCELLENCE IN WAKISO DISTRICT

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A Centre of Excellence in the Heart of Africa

Declaration and Approval

I Sarah Namutosi declare that all the information in this proposal is my true work and to the best of my knowledge has never been presented to any institution or training institute of higher learning for the award of a Master's degree in Public Health or any other degree.

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DEDICATION

This research is dedicated to my loving grandfather Mr Wondo John and grandmother Ms Victo Mukite my heroes, for believing in me always. My children Joanna Alona Kemigisha, Eyla Jannelle Ahumuza and Jeremiah Nathanael Aine, I wish you all the best in life and to my lovely husband Edmund Tayebwa, for helping me explore my potential.

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LIST OF ABBREVIATIONS

OVC	Orphaned and Vulnerable Children
HIV	Human Immunodeficiency Virus
VL	Viral Load
ART	Antiretroviral Therapy
WHO	World Health Organization
SSA	**S**ub-Saharan Africa
CALHIV	Children and Adolescents Living with HIV
IAC	Intensified Adherence Counselling
PWH	People Living with HIV

OPERATIONAL DEFINITIONS

Viral load non-suppression: An HIV viral load of ≥1,000 copies after at least 6 months of ART

Orphaned and vulnerable child: A child or adolescent aged < 18 years enrolled in the OVC program at Mildmay Uganda Hospital.

Children: According to the World Health Organization (WHO), "children" refers to individuals from birth up to 18 years of age. This age range is commonly used by public health professionals and policymakers to define the population of children who are the focus of public health efforts.

Adolescents: The World Health Organization (WHO) defines adolescents as individuals between the ages of 10 and 19 years. This period of development is characterized by significant physical, psychological, and social changes, and it represents a critical phase of transition from childhood to adulthood.

95, 95, 95 HIV Epidemic Response Control Strategy: The 95-95-95 HIV Epidemic Response Control Strategy is a global strategy aimed at controlling the HIV epidemic by ensuring that people living with HIV are diagnosed early, receive antiretroviral therapy (ART), and achieve viral suppression.

ABSTRACT

Introduction

This study was to determine the prevalence and factors associated with viral load non-suppression among children and adolescents orphan and vulnerable children program at MildMay center of Excellence. The study specifically sought to determine the prevalence of viral load non-suppression among children and adolescent enrolled on to the OVC program at Mild May center of Excellence in Wakiso, to explore the individual factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program at Mild May center of Excellence in Wakiso and to determine the treatment-related factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program at Mild May center of Excellence in Wakiso.

Method

This was across-sectional study design that employed both qualitative and quantitative methods. A total of 219 children and adolescent were enrolled in the study. Data was collected using a questionnaire and key informant interview guide. The data was then analyzed at univariate, bivariate and multivariate level using SPSS version 20.

Results

Majority 83(37.9%) of the respondents were aged 10-14 years. With the mean age being 9yrs. At bivariate level of analysis age (X^2=12.671, df =3, P-value=0.001), sex (X^2=17.04, df =1, P-value=0.000), residence (X^2=9.87, df =1, P-value=0.002), educational level (X^2=11.31, df =3, P-value=0.001), duration on ART, (X^2=8.17, df =2, P-value=0.001) and starting regimen (X^2=14.67, df =1, P-value=0.000), adherence (X^2=19.56, df =3, P-value=0.000) and disclosure status (X^2=11.60, df =1, P-value=0.001) were significantly associated with viral non suppression among children and adolescents enrolled on to the OVC program P-value <0.05.

At multivariate level, sex (AOR=2; 95% CI: 1.321- 2.048; p= 0.000), starting regimen (AOR=5; 95% CI: 1.895- 2.833; p= 0.003), adherence (AOR=6; 95% CI: 1.620- 1.901; p= 0.000) and disclosure (AOR=0.6; 95% CI: 1.461- 1.986; p= 0.002) were independently associated with viral

non-suppression among children and adolescent enrolled on to the OVC program at Mild May center of Excellence in Wakiso

Conclusion

The study found out that the prevalence of non-suppression among children and adolescent enrolled on to the OVC program at Mild May center in Wakiso stood at 17.4%. this prevalence is higher than the UNAIDs 10%, and therefore directly affects the 3rd 95 in the UNAIDS 95,95, 95 targets. It can also be concluded that there are individual and treatment related factors that are associated with viral non-suppression among children and adolescent enrolled on to the OVC program as shown in the results above

Recommendations

Practitioners therefore should targeted mass campaign and sensitization to both care givers and clients on the effects of having a high viral load, there should be a deliberate effort by health workers at Mild May to address barriers to good adherence with ultimate aim of improving on the virological outcome, deliberate efforts on supported disclosure to children and adolescents twelve years and above and Continuous medical education and skilling of health care workers by the program on ART optimization for children and adolescents. Policy makers at ministry of health to enforce proper management of non-suppressors with emphasis on the male child and strengthen strategies on monitoring of non suppressed children and adolescents at all levels.

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Background

About 38 million people worldwide are living with HIV (UNAIDS, 2021). Of these, 28 million have access to life-saving antiretroviral therapy (ART) as of 2020 (UNAIDS, 2023). Despite this, progress towards the global targets that would otherwise control the HIV epidemic has been slow. Moreover, no region has achieved the 90-90-90 targets that 90% of people living with HIV (PWH) should know their status, 90% of them should be enrolled on ART and 90% of those on ART should achieve viral load suppression (VL) (Mahy et al., 2021, Marsh et al., **2019**).

Sub Saharan Africa lags behind other regions in achieving HIV prevention and treatment targets (Baluku, 2021) with over two-thirds (67%) of People living with HIV (UNAIDS, 2021). However, there has been tremendous progress in the region as HIV increased from a paltry 5.7% in 2000 to 84% in 2020 (Giguère et al., 2021). Additionally, there has been a significant reduction in HIV-related deaths of almost 40% in SSA between 2010 and 2019 (Giguère et al., 2021).
Despite this progress, the region is unlikely to achieve the 90-90-90 targets due to ART attrition rates, low VL suppression rates and the emergence of HIV drug resistance (Estill et al., 2018, Kebede et al., 2021). Only 67% of PWH were retained in care after 5 years of enrolment in care in an analysis of more than 500,000 PWH in SSA (Haas et al., 2018).

In Uganda, there were 1,400,000 HIV-positive people as of 2018, down from 1,500,000 in 2015, which is a promising sign that people with the infection are taking medications, have suppressed their virus, and are no longer dying of AIDS (Basudde and Kasujja, 2019).
According to the Uganda UPHIA report 2020/2022, 81% have a known HIV status, 96% are on Antiretroviral therapy and 92% are virally suppressed. This has resulted in a reduction in new HIV infections and AIDS related deaths by 39% and 69% in 2010 and 2021` respectively (34000 to 2000 people among young people 15-24 years).
As of the 95-95-95 strategy, the country has been able to achieve 92% a clear indicator of improved progress.

On the other hand, recent studies have reported high levels of non-suppression beyond 10% which could affect the county's goal of attaining 90% suppression (Nabukeera et al., 2021b, Maena et al., 2021a, Gordon et al., 2022). As children and adolescents, over 96,000 children (0 – 14 years) were living with HIV of whom 54% are on ART and only 25% of these are virologically suppressed (MOH, 2020).

Orphaned and vulnerable children (OVC) pose a particular challenge to addressing the HIV epidemic, as they require community-based interventions, social protection measures and psychosocial interventions (Thomas et al., 2020).VL suppression among OVC is not well characterized. However, studies report a high prevalence and likelihood of non-suppression among OVC compared to their non-orphaned counterparts (Hendrickson et al., 2019, Humphrey et al., 2019). In Uganda, reports show low viral suppression even after intensified adherence and even treatment (Maena et al., 2021b, Nabukeera et al., 2021a, Nasuuna et al., 2018).

Studies (Gordon et al., 2022, Hendrickson et al., 2019, Maena et al., 2021b, Marsh et al., 2019, Nabukeera et al., 2021b) have reported poor adherence to ART, drug resistance, lack of healthcare, malnutrition and other socioeconomic issues as factors associated with non-suppression. However, few studies incline on Orphans and vulnerable children's programs. These programs aim to provide comprehensive care and support services to children and adolescents affected by HIV/AIDS, including those who have lost one or both parents to AIDS-related illnesses. However, the success of these programs in achieving viral load suppression among children and adolescents remains unclear.

Mild May Uganda has been implementing the OVC program to address social factors that hinder adherence among children and adolescents. However, VL suppression is at 91% as at COP21(DHIS2)

Therefore, this study bridged the gap for assessment and identified areas for improvement so that 95% suppression is attained in Uganda.

This study determined and explored the factors associated with unsuppressed viral load among adolescents on ART for six months or more at a Mild May center of excellence Wakiso district in a setting where the threshold of viral load suppression is defined as < 1000copies/ml.

1.2 Problem statement

The viral load non-suppression is still a significant issue among children and adolescents living with HIV, even though antiretroviral therapy is available. This problem is particularly worrying for orphans and vulnerable children, as poor viral load suppression can lead to disease progression and poor health outcomes. (Hendrickson et al., 2019). These could include mortality, chronic inflammation, persistent viremia and other conditions. Sensitization programs, mass testing, and follow up has also been made but the impact is still low to achieving the target suppression among the OVC (Nabukeera et al., 2021b).

Although there is limited data on the same, similar evidence highlights hunger, resistance, drug usage, stigma, emotional distress and overall low levels of psychological well-being as some of the factors for non-suppression (Adejuwon and Oki, 2011, Atwine et al., 2005). The impact of COVID-19 highlighted the need to investigate factors affecting HIV care for orphan and vulnerable children, few studies have yet been done on this topic in such programs.

This study determined the factors associated with unsuppressed VL and explored barriers to viral load suppression among children and adolescents on ART for six months or more at Mild May center of excellence.

1.3 Purpose of the study

To ascertain the prevalence and factors associated with viral load non-suppression among children and adolescents orphan and vulnerable children program at MildMay center of Excellence

1.4 Specific objectives

1. To determine the prevalence of viral load non-suppression among children and adolescent enrolled on to the OVC program at Mild May center of Excellence in Wakiso.
2. To explore the individual factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program at Mild May center of Excellence in Wakiso.
3. To determine the treatment-related factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program at Mild May center of Excellence in Wakiso.

1.5 Research questions

1. What is the prevalence of viral load non-suppression among children and adolescents enrolled on to the OVC program at Mild May center of Excellence in Wakiso?
2. What are the individual factors associated with VL non-suppression among children and the OVC program at Mild May center of Excellence in Wakiso?
3. What are the treatment-related factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program at Mild May center of Excellence in Wakiso?

1.7 Justification

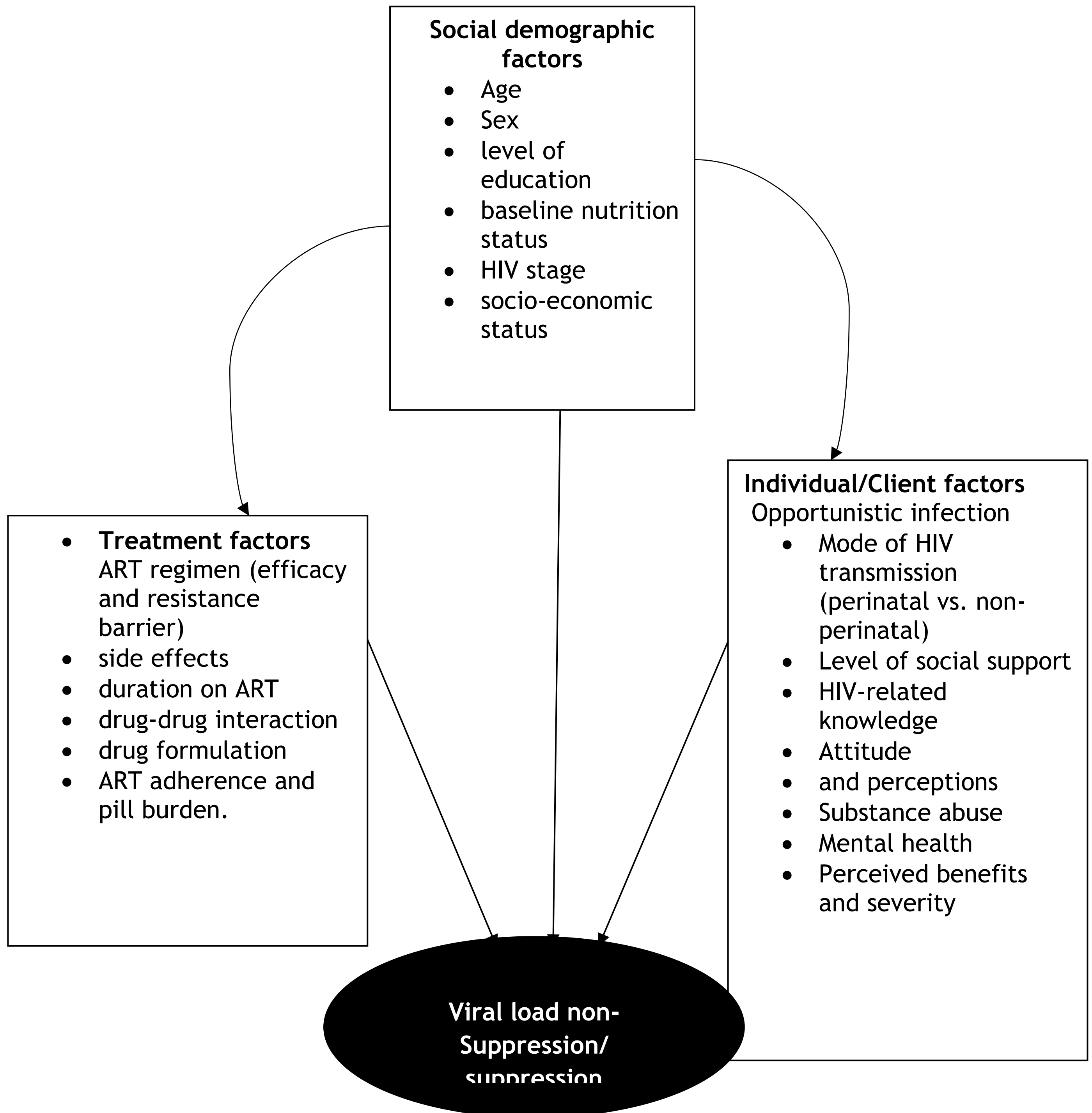
Un suppressed Viral load may indicate sub optimal adherence and presence of treatment failure and is associated with increased transmission, disease advancement and drug resistance. There is a knowledge gap regarding the factors associated with VL non-suppression among OVC living with HIV in Uganda and in particular Wakiso. The purpose of this study is to fill the knowledge gap. This will contribute to the limited amount of data available. By identifying factors associated with VL non-suppression, the study will inform care teams of possible specific interventions that could improve VL suppression of OVC living with HIV. Ultimately, this has the potential to

improve the quality of care and clinical outcomes of OVC living with HIV. Moreover, overarching factors such as access to health insurance, social protection measures, education and regions of residence are identified to influence VL non-suppression, then multi-sectoral interventions will be recommended to policy makers.

Lastly, the study is in tandem with the UNAIDS 95-95-95 targets of having 95% of those on ART should achieve viral load (VL) suppression which is not being realized in most countries in SSA and by Mild may Uganda whose quarterly report indicated suppression rate of 91% among children and adolscents. It will therefore Cleary describe current status for non-suppression and the critical areas of improvement with recommendation to specific stakeholders like the MOH, private partners and other partners.

1.9 Conceptual framework

The figure below shows the conceptual framework of the study. Adherence to ART is a central factor in influencing viral load suppression (Altice et al., 2019). In turn, adherence is influenced by various client and treatment factors. Client factors include gender, social support, mental health issues, and substance abuse, (Heestermans et al., 2016, Shubber et al., 2016). Treatment factors such as side effects, formulation, and pill burden could affect adherence (Chen et al., 2017, Oh and Han, 2021). However, both treatment and client factors can have a direct effect on VL suppression. For example, ART regimens have varied efficacy, resistance barriers, and drug-drug interactions that influence the effect of ART on viral replication (Bessong et al., 2021). As discussed above, VL non-suppression has several adverse health consequences for the client and the community and these too are modulated by treatment and client factors.


Social demographic factors
Age
Sex
level of education
baseline nutrition status
HIV stage
socio-economic status
Treatment factors
ART regimen (efficacy and resistance barrier)
side effects
duration on ART
drug-drug interaction
drug formulation
ART adherence and pill burden.
Individual/Client factors
Opportunistic infection
Mode of HIV transmission (perinatal vs. non-perinatal)
Level of social support
HIV-related knowledge
Attitude
and perceptions
Substance abuse
Mental health
Perceived benefits and severity
Viral load non-Suppression/

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter summarizes the literature relevant to the current study. It starts by discussing the burden of OVC and the prevalence of HIV in OVC. Later it addresses the prevalence of VL non-suppression among OVC with HIV. Lastly, factors associated with VL non-suppressed, as reported in literature, are enumerated.

2.2 The burden of HIV/AIDS epidemic

One of the most important public health issues in the world is HIV, the virus that causes AIDS. However, there is an international commitment to halting new HIV infections and making sure that everyone living with HIV has access to treatment. The commitment falls under the HIV care continuum which also includes ART (UNAIDS, 2021, HIV, 2020, HIV, 2021).

The process an HIV-positive individual goes through from getting diagnosed through receiving treatment and until their viral load is lowered to undetectable levels is known as the HIV care continuum. An evaluation of the number of individuals who have reached each level on the continuum serves as a marker for that step. The stages are receiving an HIV diagnosis, being connected to medical care, beginning antiretroviral therapy (ART), following the prescribed course of treatment, and eventually having HIV suppressed to undetectable levels in the blood. Furthermore, according to the Joint United Nations Programme on HIV/AIDS (UNAIDS), 84 percent of persons living with HIV globally knew their HIV status in 2020, 73 percent had access to ART, and 66 percent had viral suppression (HIV, 2020).

2.3 The burden of OVC and the role of the HIV/AIDS epidemic

The World Bank defines OVC as "the group of children that experience negative outcomes, such as the loss of their education, morbidity, and malnutrition, at higher rates than do their peers" (Tovo et al., 2005). This includes street children, children in worst forms of labor, children affected by armed conflict, children affected by HIV/AIDS, and children living with disability (Tovo et al., 2005). Because parents a key in ensuring social and economic protection of children, the death or desertion of a parent is key in increasing a child's vulnerability. Skinner et al., present a broader definition of a vulnerable child as one who has little or no access to basic rights (Skinner et al., 2006). Arora and colleagues summaries three attributes of a child/adolescent that would designate one as vulnerable: 1. Material aspects that denote a lack of money, food, clothing, shelter, health care and education; 2. Emotional aspects that include absence of care, love, support, space to grieve and containment of emotions; and 3. Social aspects that indicate absence of a supportive peer group, of role models to follow, or of guidance in difficult situations, and risks in the immediate environment (Arora et al., 2015).

HIV is a key driver in rendering children orphans or vulnerable. Globally, about 18 million children were estimated to have lost one or both parents to HIV/AIDS by 2015 (Bryant and Beard, 2016). In a large cohort of 4,300 children in six Asian countries, 58% of children initiating ART were orphaned (Huy et al., 2016). HIV-related orphanhood has disproportionally affected countries in SSA. As such, over 15 million children in SSA were orphaned by HIV/AIDS and the prevalence of orphans ranged from 24% in Swaziland, 13% in Zambia, 11% in Malawi, 8% in Uganda (Bryant and Beard, 2016). In Cameroon, a quarter of all OVCs were HIV/AIDS orphans and this number was projected to reach 350,000 children by 2020 (Nsagha et al., 2012). Unfortunately only 9% of OVCs received any form of social support (Nsagha et al., 2012). In Tanzania, there are about 3 million children orphaned by HIV but only 11,000 OVCs were living in residential care centers (Makuu, 2019). Among children (0 – 14 years) initiating ART in western

Kenya, 63% were orphaned (Vreeman et al., 2008). Ethiopia was estimated to have 800,000 orphans attributed to the HIV/AIDS epidemic in 2013 (Pegurri et al., 2015).
The incidence of HIV and HIV-related deaths are declining globally. One might expect a decline in HIV-related orphanhood. A study in South Africa found that the rate of orphanhood rose from 26% to 36% between 2000 and 2010 and thereafter declined to 32% in 2014 in tandem with increased access to ART (Mejia-Pailles et al., 2020). However, for older children (15 – 19 years), 53% were orphaned in 2014 in that study. This indicates that the children who were victims of the earlier years of the HIV epidemic have matured and it would be important to understand what impact has long-term orphanhood has had on them. To further illustrate the impact that HIV has had on incident orphanhood, an old study in Nigeria found that 36% of children with HIV attending an infectious disease clinic were orphaned (Oladokun et al., 2009). In 2014, Nigeria had over 1.2 million orphans as a result to HIV/AIDS (Awofala and Ogundele, 2018).

OVCs experience many contextual disadvantages that can adversely affect their health and life outcomes. A study in Nigeria reported that of 825 OVCs, 67% lived in households that experienced food insecurity, 17% were abused or exploited, 58% were in households that had no source of income while 60% lived in debilitated structures (Tagurum et al., 2015). A nationwide population-based survey in Kenya found that the country had 1.8 million orphans and 750,000 vulnerable children and 22% of households experienced moderate to severe hunger (Lee et al., 2014). Unfortunately, there was little OVC support in terms of medical (3.7%), psychological (4.1%), social (1.3%), material support (6.2%) and educational (11.5%) support in that study. Conversely, in Uganda, a study of over 19,000 OVCs found that almost 80% of OVCs had attended school in the preceding 3 years although females were less likely than their male counterparts to attend school (Olanrewaju et al., 2015). Nonetheless, OVCs in Uganda experience similar challenges to those reported elsewhere. In a study among Youth OVCs in Uganda, Swahn and colleagues report high proportion of OVCs who reported hunger, parental physical abuse, alcohol use, other substance abuse, experiencing violence, and suicidal ideation (Swahn et al., 2019).
Considering these challenges, it no surprise that OVCs affected by HIV report high rates of depression, traumatic stress, somatization, anxiety, loneliness, suicidal ideation, and hopelessness

(Chi and Li, 2013). Moreover, they also tend to have early and high risk sexual behavior that puts them at risk of HIV infection (Chi and Li, 2013).

2.4 Prevalence of HIV among OVCs

The prevalence of HIV among OVCs globally is not well established. This because the few studies available are mostly from SSA and are relatively old. Nonetheless, the studies consistently show that OVCs report a higher prevalence of HIV than their peers. In a study among orphaned and homeless youth (15 – 24 years) found the seroprevalence to be 16% among the orphaned, 17% among the homeless and 28% among those who were both homeless and orphaned. This study illustrates how being both homeless and vulnerable can synergistically increase ones risk for HIV infection (Hillis et al., 2012).

In SSA, an analysis of data from 19 countries found that orphaned adolescents are 2 – 3 times more likely to be HIV positive that their non-orphaned counterparts (Kidman and Anglewicz, 2016). In that study, the HIV prevalence was highest among doubly orphaned (lost both mother and father) girls at 5.0% compared to only 1.3% among non-orphaned girls. A similar trend was observed among boys (2.9%in doubly orphaned boys vs. 0.8% in non-orphaned boys) (Kidman and Anglewicz, 2016). In another earlier analysis of data from 10 African countries, the prevalence of HIV among orphaned adolescents was 3.3% (compared to 3.0% in non-orphaned) and orphanhood did not confer a higher HIV (Robertson et al., 2010). However, this analysis was limited by a very small number of adolescents with HIV to make meaningful comparisons. A survey among adolescent girls (15 – 19 years) in Zimbabwe, the prevalence of HIV was 8.5% among orphaned girls (compared to 6.3% among non-orphaned) and girls who had lost their mothers had the highest prevalence (12.2%) (Birdthistle et al., 2008). The effect of being a maternal orphan in increasing one’s HIV risk has been demonstrated elsewhere in SSA as well (Kidman and Anglewicz, 2016). Similarly, in Tanzania, while the overall prevalence of HIV among OVCs was 7.1%, it was higher among OVCs with male caregivers (7.8%) than in those with female caregivers (6.8%) (Exavery et al., 2022). Another study among OVCs aged < 5years found that 18% had HIV infection; highlighting the role of mother-to-child transmission of HIV and the need to scale up prevention

of mother-to-child transmission of HIV (Patel et al., 2012). In a large prospective cohort of OVCs in Kenya, the prevalence of HIV was 3% at baseline and the incidence of HIV was 2.06 cases per 1000 person-years (Braitstein et al., 2021). This cohort highlighted the risk that street-living poses to OVCs since living on the street was associated with a 17 times higher risk for incident HIV infection when compared to OVCs living in a family-based setting. In Ethiopia, the prevalence of HIV was 11.9%

The high prevalence of HIV reported in the studies above could be attributed to high risk sexual behavior among adolescent OVCs that is characterized by early sexual debut, number of sexual partners, and engaging in transactional sex due to the influence of substances (Pufall et al., 2017). A study in Kenya reported that adolescent OVCs (50%) were more likely to report ever having sex than their non-orphaned counterparts (40%) (Juma et al., 2013). Participating in night activities and perceiving their caregivers as unable to provide for basic needs influenced the OVC's likelihood of having sex. Obviously, for younger OVCs, mother-to-child transmission of HIV is the most important risk factor.

2.5 The first 90-90 cascade among OVCs with HIV

From the literature reviewed below, the rate of uptake of HIV testing, and ART initiation rates are historically low among OVCs. Moreover, OVCs presented with more advanced disease and tend to have worse outcomes including lower rates of VL suppression than their non-orphaned counterparts.

In an analysis of data from six Asian countries, orphaned children had significantly lower CD4 counts and CD4% than non-orphaned children and tended to initiate ART at an older age (Huy et al., 2016). A similar observation was made in Kenya (8.3 versus 4.7 years) and India (7.7 versus 6.5 years) where orphaned children-initiated ART at an older age (Bhattacharya and Saxena, 2012, Nyandiko et al., 2006). A study intended to increase uptake of HIV testing among OVCs found that only 24% had been tested for HIV at baseline (Thurman et al., 2016). In this study, home visits doubled the rate of HIV testing among OVCs. OVCs also posted high rates of ART non-adherence in Rwanda with as many as 59% of doubly orphaned children not adhering to ART (Kikuchi et al.,

2012). In western Kenya, non-adherence to ART was 18% among orphans who had lost only the father, 31% among those who had lost only the mother and 22% of those who had lost both parents (Vreeman et al., 2008). With regard to clinic attendance, 22% of those who had lost the father were non-adherent to appointments, while 29% and 18% of those who'd lost the mother or both parents, respectively, were non-adherent to clinic appointments (Vreeman et al., 2008). Another study in Kenya found that although ART adherence was similar among orphaned and non-orphaned children, orphaned children tended to have a higher rate of loss-to-follow up (Nyandiko et al., 2006). Conversely, a recent study from South Africa found that orphaned children had lower odds of attrition out of care and this was attributed to the fact that orphaned children were institutionalized (Hendrickson et al., 2019). This was also observed in Kenya where more OVCs were in care compared to non-orphaned children and this was attributed to enrolment in OVC programs that promoted engagement in care (Kose et al., 2022). Another study from India found no significant differences in ART adherence, although the sample size was quite small (n = 87) (Bhattacharya and Saxena, 2012).

2.6 Rates of Viral load non-suppression among OVCs with HIV

In a cohort of children in Asia, the rate of VL non-suppression was 19% among orphaned children compared to 16% among non-orphaned ones (Huy et al., 2016). In South Africa, OVCs (18%) were more likely than their non-orphaned counterparts (14.8%) to have a detectable viral load (VL) after 12 months of ART in a South African cohort (Hendrickson et al., 2019). In another study, VL non-suppression was 32% among orphaned children in western Kenya (Humphrey et al., 2019). A study among adolescents in Kenya also found the rate of VL non-suppression to be 27% among orphaned adolescents compared to 16% of non-orphaned counterparts (Kose et al., 2022). In Nigeria by Yiltok showed that VL non-suppression was prevalent among 45% of OVCs and VL non-suppression was higher among doubly orphaned than singly orphaned CALHIV (Yiltok et al., 2020). This is similar to what is reported by Ally (2021) in neighboring Tanzania where she observed an overall VL non-suppression rate of 15% as well, although for OVCs who were in care at 12 months, the rate was <2% (Ally, 2021).

2.8 Factors associated with viral load non-suppression among OVCs with HIV

2.8.1 Social demographic factors associated with viral load non-suppression among OVCs with HIV

Despite advances in antiretroviral therapy (ART) access and coverage, viral load non-suppression remains a significant challenge among OVCs with HIV. This literature review aims to summarize the social demographic factors associated with viral load non-suppression among OVCs with HIV. Age is one of those factors that has been associated with viral load non-suppression. Several studies have shown that younger OVCs are at higher risk of viral load non-suppression compared to older children. This may be due to poor adherence to ART regimens or difficulties in understanding the importance of adhering to medication schedules among younger children. Viral suppression may be predicted by older age. This may be connected to older long-term survivors' increased treatment experience, which has been found in other studies (Mburu et al., 2013). The effects of self-efficacy, self-competency, and risk-taking on ART adherence may modulate the connection between viral suppression and age among long-term HIV survivors (Agwu and Fairlie, 2013). In a study of HIV patients in South Africa, it was discovered that adolescents under the age of 15 were more likely than older patients to have an unsuppressed viral load (viral load > 400 RNA copies/mL) (Joseph Davey et al., 2018).

Some studies have reported that female OVCs are more likely to experience viral load non-suppression compared to males. This may be due to differences in health-seeking behaviors, social and cultural norms, and access to healthcare services. A study shows how over male children with a non-suppressed viral load was slightly higher (23.7%, n = 31) compared to that of the female children (22.5%, n = 38) (Nabukeera et al., 2021a). Additionally, a qualitative study on healthcare-seeking behaviors of HIV-infected mothers and male partners in Nairobi, Kenya also reports that

female participants are likely to follow healthcare messages and thus good health seeking behaviors compared to the male counterparts (Drake et al., 2015).

Educational status of the caregiver has been associated with viral load non-suppression among OVCs with HIV. Children with caregivers who have a higher level of education have been found to have a lower risk of viral load non-suppression. According to a study by Parsons, people with lower levels of education delayed seeking treatment either because they were unaware of the hazards or found it more challenging to receive medical care.

Even in high-income nations, where the proportion of patients with lower education levels is relatively low, late ART initiation is associated with low education level and thus high percentage of non-suppression (Parsons et al., 2014). On the other hand, OVCs who have lost both parents or have no parental care are at higher risk of viral load non-suppression compared to those who have parental care. This may be due to the lack of emotional and psychological support, financial constraints, and difficulties in accessing healthcare services (Chhim et al., 2018).

The social demographic factors associated with viral load non-suppression among OVCs with HIV are complex and interrelated. Interventions aimed at improving ART adherence and viral load suppression should consider addressing these social demographic factors. Strategies such as targeted education campaigns, income-generating activities, and community-based support systems may be useful in addressing these factors and improving viral load suppression among OVCs with HIV.

Individual/ client factors associated with viral load non-suppression among OVCs with HIV

Poor adherence to ART has been identified as a significant barrier to viral load suppression among OVCs with HIV. Studies have shown that children who miss doses or stop taking medication altogether have a higher risk of viral load non-suppression (Nabukeera et al., 2021b).

Depression and other mental health disorders have been identified as significant barriers to viral load suppression among OVCs with HIV. Studies have shown that children with depression or other mental health disorders have a higher risk of viral load non-suppression due to poor adherence to ART (Spielman et al., 2021). Lack of disclosure of HIV status shows children who are not aware of their HIV status or have not been informed by their caregivers have a higher risk of viral load non-suppression due to poor adherence to ART and lack of motivation to adhere to

treatment regimens (Haberer et al., 2011). On the other hand, stigma has been linked to depression and also as a factor for non-HIV disclosure which also accounts for poor ART adherence hence non VL suppression (Spielman et al., 2021). Studies have shown that children who experience stigma and discrimination have a higher risk of viral load non-suppression due to poor adherence to ART and reluctance to seek medical care (Haberer et al., 2011).

Substance abuse, particularly alcohol and drug abuse, has been identified as a significant barrier to viral load suppression among OVCs with HIV. Alcohol usage is widespread among those with HIV, with some studies showing that up to 42% of those with HIV engage in excessive drinking (Williams et al., 2016). Across the HIV care continuum, the impacts of alcohol consumption and use are pretty well established. According to a systematic study, drinking alcohol (measured in many ways, such as use or abuse) is linked to (lack of) HIV testing, lower rates of linkage to and retention in care, subpar medication adherence, and a reduced likelihood of reaching viral suppression (Vagenas et al., 2015).

Poor knowledge and attitudes towards HIV is another factor associated with non-suppression. This means poor understanding of the importance of adherence to ART, negative attitudes towards HIV and ART, lack of knowledge about HIV transmission and prevention (Maena et al., 2021a).

There are very few studies that have determined factors associated with VL non-suppression among OVCs with HIV. Male gender, level of health facility, district of residence, protease inhibitors, having health insurance, ART adherence, family size and food security have been implicated as predictors of VL suppression in anecdotal reports (Ally, 2021). Among these factors, having health insurance, good ART adherence, attending age-appropriate ART clinics, and a family size of ≥5 people were associated with higher odds of VL suppression (Ally, 2021). Conversely, receiving ART from low-level health facilities, male gender, and ART regimens containing protease inhibitors are associated with higher odds of VL non-suppression.

More studies are needed to determine predictors of non-suppression among OVCs with HIV to help design interventions to reduce the rate of VL non-suppression. The current proposed study will hopefully contribute to this knowledge gap.

2.8.2 Treatment factors associated with viral load non-suppression among OVCs with HIV

In recent years, significant strides have been made in the fight against HIV/AIDS, with improved access to antiretroviral therapy (ART) resulting in a decline in HIV-related mortality and morbidity globally. However, despite these advances, some HIV-positive children continue to experience viral load non-suppression, which poses a significant challenge to the goal of achieving the Joint United Nations Programme on HIV/AIDS (UNAIDS) target of 95% viral suppression among people living with HIV (PLHIV) by 2030 (HIV, 2020, HIV, 2021). Understanding the treatment factors associated with viral load non-suppression is critical for optimizing HIV care and achieving better outcomes for HIV-positive children.

Adherence to ART is a crucial factor in achieving viral suppression among PLHIV, including OVCs. Studies have shown that non-adherence to ART is a significant predictor of viral load non-suppression among HIV-positive children (Mesic et al., 2021, Ngarina et al., 2015). A meta-analysis of 21 studies found that poor adherence to ART was associated with an increased risk of virologic failure (odds ratio [OR] = 3.20, 95% confidence interval [CI]: 2.27-4.50) (Nachega et al., 2011). Several factors can affect adherence to ART among OVCs, including medication side effects, food insecurity, stigma, and lack of social support (Mutwa et al., 2013). Interventions aimed at addressing these factors, such as nutritional support, psychosocial counseling, and peer support, have shown promise in improving adherence and viral suppression among HIV-positive children (Haberer et al., 2011, Van Dyke et al., 2002).

The choice of ART regimen is another critical factor in achieving viral suppression among HIV-positive children. Some ART regimens may be less effective than others, especially in resource-limited settings where access to newer and more potent drugs may be limited. A study conducted in South Africa found that children who received a non-nucleoside reverse transcriptase inhibitor (NNRTI)-based regimen had a higher risk of virologic failure than those who received a protease inhibitor (PI)-based regimen (Patel et al., 2008). However, other studies have reported no significant differences in virologic outcomes between NNRTI- and PI-based regimens among HIV-positive children.

The development of drug resistance is a significant challenge in the treatment of HIV infection and can result in virologic failure and treatment failure. Studies have shown that HIV-positive children who experience virologic failure are more likely to develop drug resistance than those

who achieve viral suppression (Petersen et al., 2007, Al-Dakkak et al., 2013). Factors associated with the development of drug resistance among HIV-positive children include poor adherence to ART, suboptimal drug concentrations, and the use of suboptimal drug regimens (Linnemayr et al., 2017, Ryscavage et al., 2011).

Achieving viral suppression among OVCs with HIV remains a significant challenge, with non-adherence to ART, suboptimal treatment regimens, and the development of drug resistance among the factors associated with viral load non-suppression. Addressing these treatment factors requires a comprehensive approach that includes interventions to improve adherence to ART, optimize treatment regimens, and monitor for drug resistance. Further research is needed to better understand the complex interplay between these treatment factors and to develop targeted interventions that can improve viral suppression among OVCs with HIV.

Summary: Studies on unsuppressed viral load among children and adolescents enrolled on orphans and vulnerable children programs are limited both globally and in Uganda. There are various factors which have independently been associated with unsuppressed/ suppressed VL in previous studies with varying strength in association. Most studies on viral load among children and adolescents were done before 2014 when viral load testing was still limited in Low and Middle Income Countries. In addition, the threshold definitions of viral suppression ranged from below 400copies/ml to below 1000copies/ml with most biased to below 400copies/ml. This study therefore sought to determine the factors associated with viral load non-suppression among children and adolescents at Mild May center of excellence a setting where the VL suppression threshold is defined as less than 1000copies/ml as recommended by WHO.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

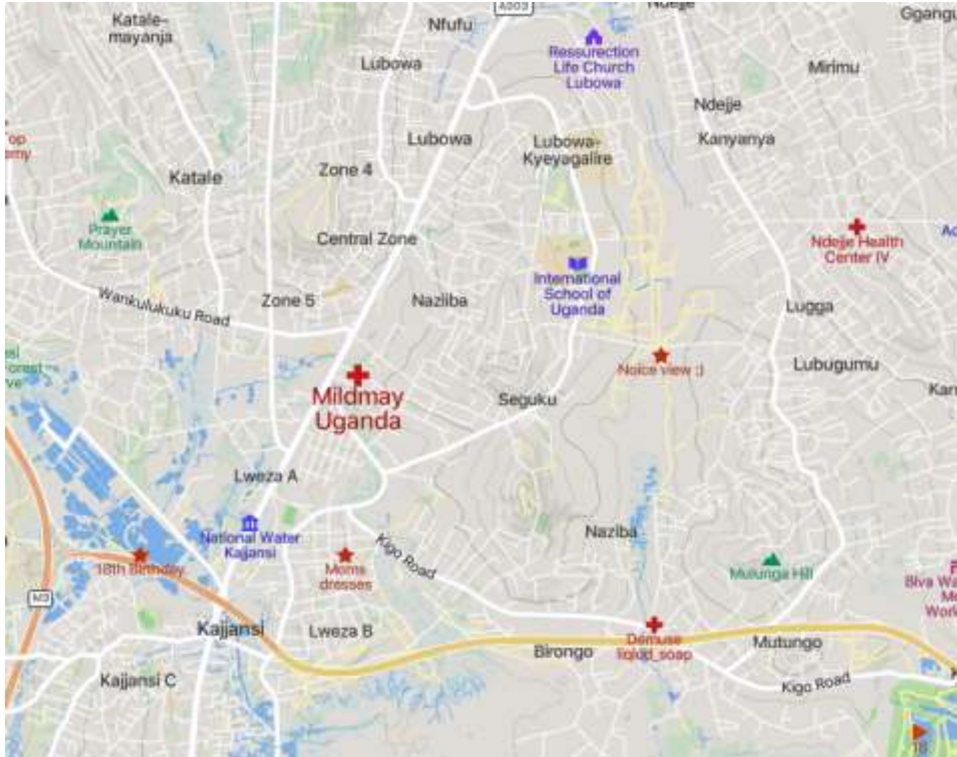
This chapter describes the study area, study population, sample size determination, sampling technique, data collection methods, data analysis, quality control and the data collection procedure.

3.2 Study design

This was a cross sectional descriptive study design employing both qualitative and quantitative methods. The quantitative approach was used on descriptive and explanatory data obtained from respondents while the qualitative approach involved interpretation of data from the respective sources.

3.3 Setting/study area

The study was conducted at Mildmay Uganda hospital in Wakiso district of Uganda. Mildmay Uganda hospital is one of the 58 health facilities in Wakiso and provides comprehensive HIV prevention, care, and treatment services. The facility currently serves over 500 OVCS that are enrolled on ART. It is a private not-for-profit hospital located in Wakiso district of Uganda, 12 kilometers from Kampala, the capital city of Uganda. The hospital is a centre of excellence for HIV care but also provides general and specialist services for HIV-negative patients. Mildmay Uganda hospital's inpatient bed capacity for medical patients is 12 beds (49 for all patients), and over 200 medical patients are admitted annually, of whom 70% are PLHIV. Wakiso district is a peri-urban area found in the Central region, surrounding Kampala Capital City Authority, and bordering Mpigi district in the west, Mityana, Nakaseke, and Luwero districts in the north, Mukono in the east and Kalangala district to the south



3.4 Study Population

The study included HIV positive children and adolescents' 0-19years on ART for six months or more who had attended at least one clinic in the past twelve months at the time of the study.

3.5. Inclusion criteria Exclusion criteria.

3.5.1. Inclusion criteria

Only C/ALHIV aged 0-19 years enrolled in the OVC program at Mildmay Uganda hospital and who Had been in care for at least 6 months with at least one most recent viral load measurement shall be considered for this study.

3.5.2 Exclusion criteria

C/ALHIV who did not consent to participate in the study and those who at the time of the study were not in their right state of mind were excluded from the study

3.6 Sample size estimation

The sample size was determined using the Leslie Kish (1965) formula using a 95% confidence interval (Z), an acceptable error of 10% While Considering p = 15.2%

$n=z^2 pq/d^2$

n=sample size

z=Z-score for the desired confidence level(1.96 for 95% confidence level)

p=Assumed true population prevalence

q=Complement of p(1-p)

d=Margin of error (0.05)

$$n = \frac{(1.96)^2 \times 0.152 \times 0.848}{(0.05)^2}$$

= 198.1 (Rounding off to the nearest whole number

The sample size, therefore, will be 199 patient records

Consider a possible 10% rate of incomplete data, we targeted to enroll at least 219 records of OVCs with HIV.

3.7 Sampling technique

The study strategy involved identifying the health facility which is MildMay Uganda Hospital where OVC with HIV are receiving antiretroviral therapy (ART) and then reviewing the medical records of all OVC who meet the inclusion criteria. Of these, a simple random sampling method was used to get the intended sample size. Later, simple random sampling was employed using ART numbers in the electronic clinic master as the sampling frame. Simple random sampling gives

each CALHIV an equal opportunity to be part of the study population and minimizes selection bias. Records of CALHIV in the OVC program were selected using random computer-generated sequences.

3.7.1 Sampling procedure

500 OVC enrolled in care at Mild may

248 OVC eligible to be included in the study as per Leslie kish formula

Using simple lottery(the ART numbers of 248 were written on pieces of paper, folded and placed in a container, mixed together, and randomly one piece was picked at a time until 219 records were reached.

It is these 219 records that participated in the study

3.7.2 Qualitative sample size

Interviews are conducted until no new information can be generated. In this study five key informants were included because of time constrains. These were estimated to provide the desired information

3.8. Study variables

3.8.1. Dependent variable

viral load non-suppression among children and adolescents

3.8.2. Independent variable

Social demographic factors Age, Sex, level of education, religion, residence among others

Treatment factors, ART regimen (efficacy and resistance barrier), side effects, duration on ART, drug-drug interaction, drug formulation, ART adherence and pill burden.

Individual/Client factors Opportunistic infection, adherence, Level of social support, HIV-related knowledge, Attitude among others

3.9 Data collection techniques and tools

The core data collection instruments for the study were questionnaires, key informant guide and focused group discussion

3.9.1 Questionnaire

A standard questionnaire was administered to all the respondents. The questionnaire was used to collect quantitative data and it comprised both closed ended questions with predetermined responses. The use of questionnaires enabled reaching a large number of respondents in a very short time

3.9.2 Key informant interview guide

An interview guide is a set of questions that an interviewer uses when interviewing. The interview guide with open ended questions was used to give detailed information to supplement data that was obtained from questionnaires. Key informant guide was used to collect qualitative data from the clinician, counsellors, the lead pharmacy technician and medical technical team leader.during which time they provided additional information about on the subject under study

3.10. Validity and reliability of the data collection tools

3.10.1 Validity

Validity is the extent to which the scores represent the variable they are intended to. Before the study, the research tool was pretested in a pilot study among the randomly selected care givers of

children and adolescents enrolled in OVC Program who were representative of the study population. Pretesting allowed for necessary adjustments to be made in the questionnaire to ensure clarity before the study. Irrelevant questions were removed from the questionnaire. To ensure the validity of the tool, it was sent to three experts to assess its validity to the relevance of each item in the questionnaire to the objectives and rate each on the scale of very relevant (4), quite relevant (3), somewhat relevant (2) and not relevant (1). The questions within the questionnaire were examined for face, content, and criterion validity. This helped to identify questions that needed to be rephrased so that they would clearly be understood by the research respondents. Content validity refers to the extent to which the items on a test are fairly representative of the entire domain the test seeks to measure. Content validation methods sought to assess the quality of the items on a test. Content validity index (CVI) was computed as the number of experts giving a rating of either 3 or 4, divided by the total number of items in the questionnaire.

Content validity index was computed using the formula.

$$\text{CVI} = \frac{n}{N}$$, Where,

n - Is the total number of items rated relevant (3 or 4) by 3 content experts.

N is the total number of items in the questionnaire.

A CVI of > 0.79 was considered relevant.

3.10.2 Reliability

This measures the degree to which an assessment tool produces stable and consistent results. Test-retest method was used. The questionnaire was administered to 10 randomly selected care givers of children and adolescents enrolled in OVC program and after one week, the same questionnaire

was administered to the same participants to compare the responses given. This was done during the period of pre-testing.

The researcher recruited and trained three (03) research assistants who were familiar with Mild may operations and had participated in other research studies.

3.11. Data processing and analysis

The data collected in the field was appropriately managed and analyzed to generate results.

3.11.1 Data storage

Questionnaires were treated with high-level confidentiality under a lockable cabin while computerized data was secured with a passcode. An external drive was used for back up.

3.11.2 Data analysis

Quantitative data

Quantitative Data was first checked manually for completeness. Data was cleaned, coded, and entered into Excel. The data was then exported to Statistical Package for Social Scientists (SPSS) version 20 for statistical analysis.

The analysis was done at Univariate, Bivariate, and Multivariate levels. At the univariate level, the researcher obtained summaries, frequencies, percentages of the variables under study.

At the bivariate level, Pearson's Chi-square (x^2) tests were used to determine the relationship or association between the dependent and independent variables. The corresponding P-values were obtained, variables with P-values less than 0.05 were considered statistically significant. At the multivariate level, logistic regression of variables that were statistically significant at the bivariate

level was analyzed. The corresponding P-values, Adjusted Odds ratio, and Confidence Intervals were also obtained.

Qualitative data

Qualitative data was subjected to content analysis. The data was recorded, transcribed, coded and analyzed. Emerging themes in the data were identified; the themes were related to the study objectives in order to find out how they contribute to answering the study problem. This brought out the perspective of the people. Direct quotes and comments from the key informants helped in further understanding the subject under study.

3.12. Ethical consideration

The researcher sought institutional approval from the Uganda Christian University after reviewing of the proposals, UCU in turn offered a letter of approval and introduction to conducting the research. The researcher sought administrative approval from MildMay Uganda Hospital to conduct the study in the target population. The researcher also sought a waiver of consent to access secondary data from the IRB before any data collection takes place. Data was de-identified and study data abstraction tools used study-specific numbers. Also sought informed assent for children below 18 years. Respondents were informed of their liberty to withdraw from the study at any given time without any penalty. The study materials did not bear the names of the respondents and

the responses remained anonymous. The responses that were collected were not shared with anyone outside the study team.

3.13. Study limitations

Mild May Uganda is a non-government organization which runs specialized children and adolescent clinics once every third Wednesday of the month, with additional reproductive services provided on any working day. Children and adolescents receive two months ART refill and there are games on clinic visits as they wait to see the service providers. Majority of children and adolescents at Mild May are perinatal infected and ART experienced. Services are mainly provided by nurses, clinical offers and counsellors with limited physician input. Caution should be taken when generalizing these findings to other settings.

Secondary data which was used may have had some human errors. Although comparison of different data sources was used, complete elimination of this risk is not guaranteed.

ART adherence was measured on the day of most recent viral load testing which limits causal association but this study was not interested in causal relationships but prevalence.

Factors like school type and drug side effects were not adequately assessed by the qualitative interviews.

Only Children and adolescents with unsuppressed viral load who attended the clinic at time of the study were interviewed for the qualitative findings. This introduced selection bias as the views of children and adolescents with suppressed viral load and those who did not come to the clinic may be different.

The prevalence of unsuppressed viral load in this study may indicate changes due to IAC or social changes in the lives of children and adolescents since viral load suppression is a changing outcome

CHAPTER FOUR: STUDY FINDINGS

4.1 Introduction

This chapter presents the findings from the study. It includes descriptions of the background characteristics of the respondents, the prevalence of viral load non-suppression among children and adolescent enrolled on to the OVC program at Mild May centre of Excellence in Wakiso, individual factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program at Mild May centre of Excellence in Wakiso and the treatment-related factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program at Mild May centre of Excellence in Wakiso.

4.2. Characteristics of the study participants

Table 1: Background characteristics of the respondents

Variable	Frequency	percentage
Age in years n=219		
0-4 years	49	22.4
5-9 years	59	26.9
10-14 years	83	37.9
15-19 years	28	12.8

Sex		
Male	83	37.9
Female	136	62.1
Religion		
Catholic	104	47.5
Protestant	63	28.7
Muslim	13	5.9
Pentecostal	33	15.1
Others….	6	2.7
Number of people under same roof		
1-4	89	40.6
5-9	117	53.4
10+	13	6

Residence		
Rural	54	24.7
Urban	165	75.3
Educational level		
None	16	7.3
Primary	184	84
Secondary	17	7.8
Tertiary	2	0.9

From the table above 83(37.9%) of the respondents were aged 10-14 years, 59(26.9%)were aged 5-9 years, 49(22.4%) were aged 0-4 years and 28(12.8%) of the respondents were 15-19years old

Majority 136(62.1%) of the respondents were females and 83(37.9%) were males

In regards to religion 104(47.5%) of the respondents were Catholics, 63(28.7%) were protestants, 33(15.1%) were Pentecostals, 13(5.9%) of the respondents were Muslims and 6(2.7%) of the respondents reported belonging to other religion mainly SDA

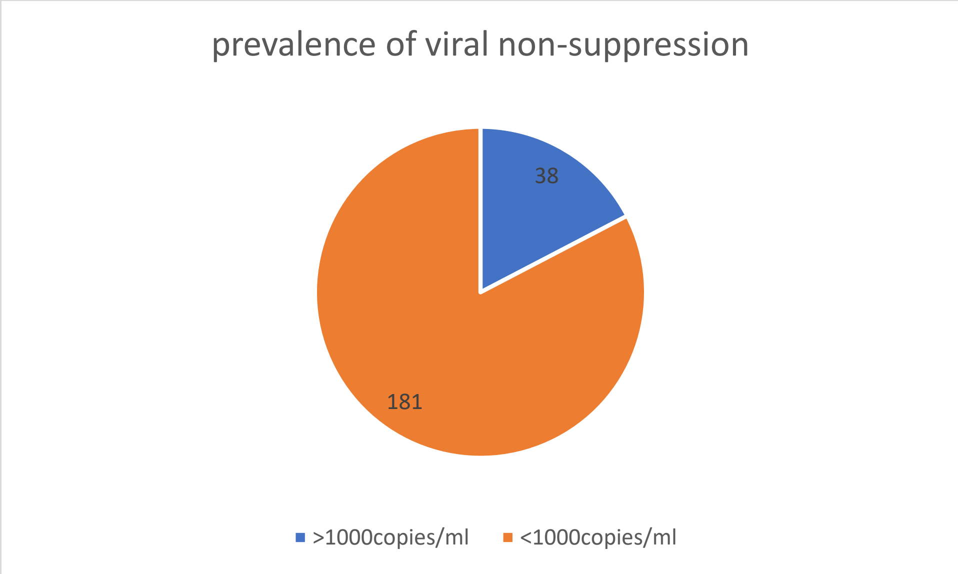
Slightly more than half 117(53.4%) of the respondents reported staying with 5-9 people under one roof, 89(40.6%) of the respondents reported staying with 1-4 people under one roof and 13(6%) of the respondents reported staying with 10 or more people under the same roof

Majority 165(75.3%) of the respondents reported staying in urban area and 54(24.7%) of the respondents reported staying in rural area

More than three quarters 184(84%) of the respondents had attained primary education and only 2(0.9%) had attained tertiary level of education

4.3. Prevalence of viral non-suppression among children and adolescent enrolled on to the OVC program

Figure 1. Prevalence of viral non-suppression among children and adolescent enrolled on to the OVC program



More than three quarters 181(82.6%) of the respondents had a viral load <1000 copies and 38(17.4%) had a viral load greater than 1000 copies

Similary majority of the Key Informants noted that majority of the children and adolescents enrolled on OVC program were virally suppressed

"Yes, we do have some of the children and adolescents who are non- suppressed but they are not very many. Most of the children and adolescents are suppressed. I think our suppression rate is over 80%" (KI4)

4.4. Treatment factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program

Table 2: Treatment factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program

Variable	Frequency	Percentage
Duration on ART		
0-4 yrs	58	26.5
5-9yrs	66	30.1
Above 10yrs	95	43.4
Clinical stage at ART initiation		
Stage 1	198	90.4
Stage 2	16	7.3
Stage 3	4	1.8
Stage 4	1	0.5
Starting regimen		
AZT/3TC/EFV	13	5.9
AZT/3TC/NVP	54	24.7

TDF/3TC/DTG	104	47.5
ABC/3TC/LPV/r	48	21.9
Current regimen		
AZT/3TC/DTG	9	4.1
TDF/3TC/DTG	193	88.1
ABC/3TC/DTG	17	7.8
Reason for switch n=115		
Policy	63	54.8
Regimen out of stock	4	3.5
Weight and age increased	48	41.7

From the table above, 95(43.4%) of the respondents reported being on ART for more than 10 years, 66(30.1%) reported spending 5-9 years on drugs and 58(26.8%) of the respondents reported being on ART for 0-4 years

Majority 198(90.4%) of the respondents were in clinical stage 1 at the time of ART initiation, 16(7.3%) were in clinical stage 2 ,4 (1.8%) were in clinical stage 3 and only 1(0.5%) of the respondents were in clinical stage 4 at the time of ART initiation

In regards to ART regime, 104(47.5%) of the respondents reported TDF/3TC/DTG as their ART starting regimen and 13(5.9%) of the respondents reported AZT/3TC/EFV their ART starting regimen

Also 193(88.1%) of the respondents reported TDF/3TC/DTG as their current ART regimen, 17(7.8%) of the respondents reported ABC/3TC/DTG as their current regimen and only 9(4.1%) of the respondents reported AZT/3TC/DTG as their current ART regimen

Also majority of the key informants noted that most of the children and adolescents have had most of their ART regimen optimized to a DTG based regimen

"Majority of the children have had their ART regimen optimized to a more potent DTG based regimen and we have continuously guaranteed constant supply of the same to avoid stock outs and indeed most children and adolescents are doing well on it" (Pharmacy technician)

More than half 63(54.8%) of the respondents switched regimen because of policy, 48(41.7%) of the respondents switched regimen due increase in age and weight and only 4(3.5%) of the respondents switched regimen due to regimen stock out.

4.5. Individual factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program

Table 3: Individual factors **associated with VL non-suppression among children and adolescents enrolled on to the OVC program**

Adherence n=219		
Poor	8	3.7
Fair	21	9.6
Good	151	68.9
Excellent	39	17.8
Previous opportunistic infection		
Yes	23	10.5
No	196	89.5
If yes, type of opportunistic infection		
T.B	2	8.7

Candida	9	39.1
PCP	12	52.2
Co-morbidities		
Diabetes	4	19
Hepatitis B	14	66.7
Psychiatric illness	2	9.5
Others	1	4.8
Disclosure of status		
Yes	202	92.2
No	17	7.8
If yes, to who (multiple responses)		
Parents	191	87.2
Siblings	44	20.1

Friends	9	4.1
Others……	58	26.5
Baseline CD4		
>200 cell/mm^3	186	84.9
<200 cell/mm^3	33	15.1

Majority 151(68.9%) of the respondents reported good adherence to ART, 39(17.8%) of the respondents reported excellent adherence, 21(9.6%) of the respondents reported fair adherence and only 8(3.7%) of the respondents reported poor adherence

Similarly, majority of the key informants noted good adherence among children and adolescents however, they were concerned about poor adherence among the non-suppressed

"in regards to adherence, most of the children and adolescents are doing well however, we still have challenges with adherence among some children that has resulted into viral non-suppression. Most of the children who are virally non-suppressed are really having poor adherence and we are trying our best to address this at every clinic visit" (clinical officer working in ART clinic)

More than three quarter 196(89.5%) of the respondents reported not having previous opportunistic infection and 23(10.5%) of the respondents reported having opportunistic infection previously

Of those who reported having previous infection, 12(52.2%) reported PCP, 9(39.1%) reported candida and 2 (8.7%) reported T.B

In regards to co-morbidities, majority 14(66.7%) had hepatitis B, 4(19%) had diabetes, 2(9.5%) reported psych triatic illness

Nearly all 202(92.2%) of respondents reported disclosing their status and only 17(7.8%) of the respondents reported never disclosing their status

Of those who disclosed their status, 191(87.2%) disclosed to their parents, 44(20.1%) disclosed to their siblings, 9 (4.1) disclosed to their friends and 58(26.5%) of the respondents disclosed to others, mainly teachers, close relatives among others

More than three quarters 186(84.9%) of the respondents had a CD4 cell of more than 200 and only33(15.1%) had a CD4 cell of less than 200 cells/mm^3

Also the majority of the key informants noted that most of the children and adolescents had CD4 of more than 200cells/mm^3

"We normally use CD4 cell count to assess for advanced HIV disease and I am glad to note that the majority of the children and adolescents under our care on average have a CD4 count of 612 cell/mm^3 except for a few, less than 20% who have issues with lower CD4 cell count" (Medical technical team leader)

4.6. Bivariate analysis of background characteristic associated with viral non-suppression among children and adolescents enrolled on to the OVC program

Table4.Bivariate analysis of background characteristic associated with viral non-suppression among children and adolescents enrolled on to the OVC program

		Viral load Suppression status		X^2	df	P-value (at 95% confidence level
		VL>1000 copies n=38(17.4%)	VL<1000 copies n=181(82.6%)			
Age n=219						
0-4 years	49	8	41	12.67	3	0.001
5-9 years	59	6	53			
10-14 years	83	17	66			
15-19 years	28	7	21			
Sex						
Male	83	14	69	17.04	1	0.000
Female	136	24	112			
Religion						

Catholic	104	18	86	2.73	4	0.671
Protestant	63	12	51			
Muslim	13	4	9			
Pentecostal	33	3	30			
Others….	6	1	5			
Number of people under same roof						
1-4	89	8	81	1.21	2	0.922
5-9	117	24	93			
10+	13	6	7			
Residence						
Rural	54	13	41	9.87	1	0.002
Urban	165	25	140			

Educational level						
None	16	4	12	11.31	3	0.001
Primary	184	28	156			
Secondary	17	5	12			
Tertiary	2	1	1			

From the bivariate table of analysis above, age (X^2=12.671, df =3, P-value=0.001), sex (X^2=17.04, df =1, P-value=0.000), residence (X^2=9.87, df =1, P-value=0.002) and educational level (X^2=11.31, df =3, P-value=0.001), significantly influenced viral non suppression among children and adolescents enrolled on to the OVC program P-value <0.05.

4.7. Bivariate analysis of treatment factors associated with viral non suppression among children and adolescents enrolled on to the OVC program

Table 5. Bivariate analysis of treatment factors associated with viral non suppression among children and adolescents enrolled on to the OVC program

Variable	Viral load Suppression status	X^2	df	P-value (at 95% confidence level

		VL>1000 copies n=38(17.4%)	VL<1000 copies n=181(82.6%)			
Duration on ART						
0-4 yrs	58	9	49	8.17	2	0.001
5-9yrs	66	11	55			
Above 10yrs	95	18	77			
Clinical stage at ART initiation						
Stage 1	198	28	170	2.01	3	0.087
Stage 2	16	8	8			
Stage 3	4	1	3			
Stage 4	1	1	0			
Starting regimen						

AZT/3TC/EFV	13	8	5	14.67	3	0.000
AZT/3TC/NVP	54	23	31			
TDF/3TC/DTG	104	2	102			
ABC/3TC/LPV/r	48	5	43			
Current regimen						
AZT/3TC/DTG	9	4	5	3.73	2	0.064
TDF/3TC/DTG	193	27	166			
ABC/3TC/DTG	17	7	10			
Reason for switch n=115						
Policy	63	25	38	1.04	2	0.901
Regimen out of stock	4	2	2			
Weight and age increased	48	11	37			

From the bivariate analysis of the treatment factors above, duration on ART, (X^2=8.17, df =2, P-value=0.001) and starting regimen (X^2=14.67, df =1, P-value=0.000) were significantly associated with viral non suppression among children and adolescents enrolled on to the OVC program P-value <0.05.

4.8. Bivariate analysis of individual factors associated with viral non suppression among children and adolescents enrolled on to the OVC program

Table 6. Bivariate analysis of individual factors associated with viral non suppression among children and adolescents enrolled on to the OVC program

	Viral load Suppression status				**P-value (at 95% confidence level**
	VL>1000 copies n=38(17.4%)	VL<1000 copies n=181(82.6%)	**X^2**	**df**	
Adherence n=219					

Poor	8	7	1	19.56	3	0.000
Fair	21	18	3			
Good	151	12	139			
Excellent	39	1	38			
Previous opportunistic infection						
Yes	23	11	12	2.44	1	0.069
No	196	27	169			
If yes, type of opportunistic infection						
T.B	2	1	1	4.31	2	0.907
Candida	9	4	5			
PCP	12	8	4			
Co-morbidities						

Diabetes	4	3	1	1.12	3	0.731
Hepatitis	14	8	6			
Psychiatric illness	2	1	1			
Others	1	1	0			
Disclosure of status						
Yes	202	29	173	11.60	1	0.001
No	17	9	8			
If yes, to who (multiple responses)						
Parents	191	3	188	1.07	3	0.511
Siblings	44	13	31			
Friends	9	3	6			
Others……	58	19	39			

Baseline CD4						
>200 cell/mm^3	186	29	157	2.22	1	0.201
<200 cell/mm^3	33	9	24			

From the table above, adherence (X^2=19.56, df =3, P-value=0.000) and disclosure status (X^2=11.60, df =1, P-value=0.001) were significantly associated with viral non suppression among children and adolescents enrolled on to the OVC program P-value <0.05.

4.9. Multivariate analysis of factors associated with viral non suppression among children and adolescents enrolled on to the OVC program

Table 7. Multivariate analysis of factors associated with viral non suppression among children and adolescents enrolled on to the OVC program

Variable	AOR (CL)	P-value
Age		
0-4 years	4 (1.031-1.641)	0.071

5-9 years	2(1.664-1.905)	
10-14 years	0.8(0.502-1.089)	
15-19 years	1	
Sex		
Male	2 (1.321- 2.048)	0.000
Female	1	
Residence		
Rural	3(1.230- 1.607)	0.062
Urban	1	
Educational level		
None	6(0.004- 1.035)	0.503
Primary	2(1.112- 2.043)	
Secondary	0.3(1.640- 1.977)	

Tertiary	1	
Duration on ART		
0-4 years	4(1.897- 3.010)	0.071
5-9 years	0.6(1.331-2.089)	
10 + years	1	
Starting regimen		
AZT/3TC/EFV	3 (0.328-1.673)	0.003
AZT/3TC/NVP	5(1.895- 2.833)	
TDF/3TC/DTG	0.6(0.007-1.946)	
ABC/3TC/LPV/r	1	
Adherence		
Poor	6(1.620- 1.901)	0.000
Fair	4(0.004- 1.796)	

Good	0.4(1.844- 1.314)	
Excellent	1	
Disclosure status		
Yes	0.6 (1.461- 1.986)	0.002
No	1	

From the multivariate logistic analysis sex (AOR=2; 95% CI: 1.321- 2.048; p= 0.000), starting regimen (AOR=5; 95% CI: 1.895- 2.833; p= 0.003), adherence (AOR=6; 95% CI: 1.620- 1.901; p= 0.000) and disclosure (AOR=0.6; 95% CI: 1.461- 1.986; p= 0.002) were independently associated with viral non-suppression among children and adolescent enrolled on to the OVC program at Mild May center of Excellence in Wakiso.

4.9 Qualitative results on factors associated with Viral load non-suppression

The key informants included one clinician, two adolescent counsellors, lead pharmacy technician and the medical technical team leader. Four themes which included; medication related barriers, clinical barriers, social barriers and facility barriers were set basing on the conceptual framework.

4.9.1 Treatment related barriers

All key informants reported poor adherence as the major barrier to viral suppression. The reasons given for poor adherence included; antiretroviral side effects, non-disclosure, being tired of the drugs, feeling no need for the drug, lack of food and relaxing about their treatment. Taking drugs when there is no food was reported to worsen the ART related side effects.

"I think poor adherence is close to 100% among the children and adolescents with unsuppressed viral load like I have mentioned children and adolescents have many reasons for not taking their medicines" (KI3, counsellor).

"Something interesting many already on second line are not also suppressing as the ones on first line. So what does that mean, they are picking medicines but are not adhering" (KI2, pharmacy technician).

Key informants reported children and adolescents to have drug preferences and any changes in brands were likely to cause poor adherence and unsuppressed viral load especially if the change is not well explained by the dispenser. Adolescents associated change in drug brands with bitter test, big tablet size and side effects. Changes in brands of the drugs involved tenofovir, and lopinavir although the key informants reported that the changes were not common.

*"Adolescents don't like the AZT3TCLPVr because it's a twice a day dozing with no fixed doze combination the pill is taken morning and evening, the pills are many and bigger with side effects like diarrhea. They will tell you they want the a single in one pill fixed doze combination. They will ask you to look for the TDF3TC DTG and ABC3TCDTG" (*KI4).

4.9.2 Social barriers

These included barriers at home, school and attitude of the adolescent. Lack of family support in homes was reported as; lack of food, lack of transport to attend clinics, transient caregivers, non-vigilant caregivers and sometimes discrimination.

"we have the transient care takers; stay with the mother today and some if mother is tired let me go to aunt`s place yet the aunt doesn't know anything about the drugs the child/adolescent is taking whether the child/ adolescent takes drugs or not is not a big concern to the aunt and yet change of caretakers is a way of survival" (KI1).

Key informants mentioned that school going children and adolescents reported; teacher`s attitudes, stigma, peer influence, fear of being seen, lack of reminders to swallowing drugs and school programs crushing with time for swallowing medicine. Adolescents in boarding school were most affected.

> "*We have had cases where our counsellors have had to go to school to really find out who the teacher is in scenarios where pupils have been told, have you seen how the HIV has affected this person in a classroom. She comes late to class, it's just HIV in her brain. I mean apart from the stigma the attitude teachers have may not, and so if there is anyone in that class who has or may be affiliated to any HIV that may be a cause of mayhem all through"* (KI5).

Children and adolescents who did not appreciate the need for treatment did not comply with the treatment.

> *"In fact there is a case the father would say but I make sure she takes the drugs. There was a part of the puzzle we had not solved. The client would go after taking the drug put a finger and induce vomiting so it's that serious"* (KI3).

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.0 Introduction

This chapter discusses all findings reported in chapter four according to the research questions of the study as shown below.

5.1. Prevalence of viral load non-suppression among children and adolescent enrolled on to the OVC program at Mild May center of Excellence in Wakiso.

This study established that the prevalence of non-suppression among children and adolescent enrolled on to the OVC program at Mild May center stood at 17.4%. this finding is similar to a finding by Huy et al who in Asia that established that the rate of VL non-suppression was 19% among orphaned children compared to 16% among non-orphaned ones (Huy et al., 2016).

Similarly Hendrickson et al, In South Africa, established that OVCs (18%) were more likely than their non-orphaned counterparts (14.8%) to have a detectable viral load (VL) after 12 months of ART (Hendrickson et al., 2019). However, Humphrey et al. In another study found out that VL non-suppression was 32% among orphaned children in western Kenya (Humphrey et al., 2019) a finding that is contrary to the finding in this study.

A study among adolescents in Kenya also found the rate of VL non-suppression to be 27% among orphaned adolescents compared to 16% of non-orphaned counterparts (Kose et al., 2022) a finding that is comparable to a finding in this study however In Nigeria Yiltok showed that VL non-suppression was prevalent among 45% of OVCs and VL non-suppression was higher among doubly orphaned than singly orphaned CALHIV (Yiltok et al., 2020).

The prevalence of unsuppressed viral load among children and adolescents on ART for six months or more was found to be higher than the acceptable UNAIDS 10% (UNAIDS, 2017). This suggests poor treatment adherence among adolescents as reported in previous studies (Sung-Hee Kim et al,

2014). This finding indicates a slight decrease from that reported in the Mild May center of excellence quarterly report, 35.2%

The finding is slightly higher than previous percentages reported in Uganda, 27% (Bulage et al., 2017) probably because only adolescents, 15-19years were included in this percentage. The finding is also lower than the estimates from the Uganda population-based HIV impact assessment survey 2017, 55.1%, female and 67.5%, males probably because the survey included both ART experienced and ART naïve young people. High prevalence of unsuppressed viral load increases the risk of drug resistance, morbidity and individual level(Etta et al., 2017). At population level there is continued HIV transmission, increased risk of transmitting drug resistant strain and high disease burden (CDC, 2014)

5.2. Individual factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program at Mild May center of Excellence in Wakiso.

Good adherence was associated with reduced prevalence of unsuppressed viral load as expected. Good and sustained adherence is key to successful treatment of HIV/AIDS. Previous studies have reported poor ART adherence to be associated with virologic failure. A study by Nabukeera et al showed that Poor adherence to ART is a significant barrier to viral load suppression among OVCs with HIV. In their Study Nabukeera et al shown that children who miss doses or stop taking medication altogether have a higher risk of viral load non-suppression (Nabukeera et al., 2021b). this finding is consistent with a finding in this study that established that adherence (AOR=6; 95% CI: 1.620- 1.901; p= 0.000) significantly influenced viral non-suppression children and adolescents enrolled on to the OVC program where by children with poor adherence, were 6 times more likely to be non-suppressed as compared to their counterparts who had excellent adherence similarly A meta-analysis of 21 studies found that poor adherence to ART was associated with an increased risk of virologic failure (odds ratio [OR] = 3.20, 95% confidence interval [CI]: 2.27-4.50) (Nachega et al., 2011)

This study also established that disclosure (AOR=0.6; 95% CI: 1.461- 1.986; p= 0.002) significantly influenced viral non-suppression of children and adolescents enrolled on to the OVC program where by children who disclosed their status were 0.6 times less likely to be non-suppressed as compared to those who did not disclose their status a finding that is consistent with a finding by Haberer et al who showed that Lack of disclosure of HIV status shows children who are not aware of their HIV status or have not been informed by their caregivers have a higher risk of viral load non-suppression due to poor adherence to ART and lack of motivation to adhere to treatment regimens (Haberer et al., 2011) On the other hand, Spielman et al.established that stigma has been linked to depression and also as a factor for non-HIV disclosure which also accounts for poor ART adherence hence non VL suppression (Spielman et al., 2021).

Finally, A study by Nabukeera et al shows that male children had a slightly higher (23.7%, n = 31) viral load compared to that of the female children (22.5%, n = 38) (Nabukeera et al., 2021a). Additionally, a qualitative study on healthcare-seeking behaviors of HIV-infected mothers and male partners in Nairobi, Kenya also reports that female participants are likely to follow healthcare messages and thus good health seeking behaviors compared to the male counterparts (Drake et al., 2015) this finding is consistent with a finding in this study that showed that sex significantly influenced viral non-suppression of children and adolescents enrolled on to the OVC program where by male children were 2 times more likely to be non-suppressed compared to their female counterpart (AOR=2; 95% CI: 1.321- 2.048; p= 0.000)

This study found WHO staging not to be associated with unsuppressed viral load. This is probably because of misclassification of participants by the service providers since we used secondary data. Previous studies have reported advanced disease (WHO stage III/IV) to be associated with increased likelihood of unsuppressed viral load (Bulage et al., 2017; Huong et al., 2011; Rangarajan et al., 2016). Baseline WHO stage I has also been associated with unsuppressed viral load in Latin America (Laura Edison et al, 2014)

5.3. Treatment-related factors associated with VL non-suppression among children and adolescents enrolled on to the OVC program at Mild May center of Excellence in Wakiso.

A study conducted in South Africa found that children who received a non-nucleoside reverse transcriptase inhibitor (NNRTI)-based regimen had a higher risk of virologic failure than those who received a protease inhibitor (PI)-based regimen (Patel et al., 2008). This finding is consistent with a finding in this study that established that starting regimen (AOR=5; 95% CI: 1.895- 2.833; p= 0.003) significantly influenced viral non-suppression among children and adolescents enrolled on to the OVC program where by children and adolescents on a non-nucleoside reverse transcriptase inhibitor (NNRTI) in this case AZT/3TC/NVP where 5 times more likely to be non-suppressed as compared to those protease inhibitors in this case ABC/3TC/LPV/r.

The choice of ART regimen is another critical factor in achieving viral suppression among HIV-positive children. Some ART regimens may be less effective than others, especially in resource-limited settings where access to newer and more potent drugs may be limited.

CHAPTER SIX: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This chapter provides the conclusions and makes recommendations in relation to the study. The conclusions and recommendations were made basing on study objectives and study findings.

6.1: Conclusion

1.The prevalence of viral load non-suppression among children and adolescents enrolled on the orphans and vulnerable program at Mild May center of excellence in Wakiso was 17.4% which is higher than the acceptable UNAIDS 10%.

2.This study also established that the predictors for viral load non-suppression among children and adolescent enrolled on to the OVC program at Mild May center of Excellence were, sex (AOR=2; 95% CI: 1.321- 2.048; p= 0.000), starting regimen (AOR=5; 95% CI: 1.895- 2.833; p= 0.003), adherence (AOR=6; 95% CI: 1.620- 1.901; p= 0.000) and disclosure (AOR=0.6; 95% CI: 1.461- 1.986; p= 0.002)

6.2 Recommendations

6.2.1To the practitioners

1. The practitioners should strengthen the achievements of viral load suppression through intensified pre-ART and follow up adherence counselling for all HIV positive children and adolescents starting ART, direct observational therapy sessions. Special consideration should be accorded to male children and adolescents.
2. The practitioners should strengthen treatment switching mechanisms through weekly switch meetings to ensure that adherence concerns of children and adolescents are appropriately addressed before treatment switch.

3. They should ensure that all children and adolescents receive single dose fixed combination ART so as to improve adherence and viral load suppression. This can be achieved through identifying all children and adolescents on multiple pill and frequent dosage antiretroviral regimens and changing them to alternatives with fixed dose combinations. Also, ensure that all adolescents starting ART are initiated on the standard fixed dose combination antiretroviral drugs.
4. Practitioners should ensure that all children of age 12 years and above, are disclosed to and empowered to adhere to their medication.
5. Targeted mass campaign and sensitization to both care givers and clients on the effects of having a high viral load

6.2.2 To Mild May center of excellence management

1. Mild may center of excellence management should strengthen the conduct of treatment switch meetings for all patients with unsuppressed viral load so as to reduce unnecessary and delayed treatment switching. This can be achieved through actively monitoring the conduct of switch meeting and patients on second line.
2. The management of Mild May center of excellence should sensitize health workers on the MoH guidelines on test and treat with correct and appropriate start regimens in order to achieve viral load suppression.

6.2.3 To the Policy maker

1. The ministry of health should enforce team decision making in the management of all patients with unsuppressed viral load at all levels.
2. The ministry of health needs to intensify monitoring of unsuppressed viral load among children and adolescents to ensure timely disclosure, good adherence and male children involvement .

6.2.4 Areas for future research

Further research should be conducted to generate knowledge on the factors associated with non-disclosure, poor adherence to inform quick identification of those at increased risk and early intervention.

Further research is required to increase understanding on sex i.e being male and non-suppression, and ART start regimen.

ANNEX ONE
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APPENDIX 1: DATA COLLECTION TOOL

Prevalence and factors associated with viral load non-suppression among children and adolescents orphan and vulnerable children program at Mildmay Uganda Hospital

CLIENT FACTORS	
1. Date of evaluation	[_D_][_D_]/[_M_][_M_]/[_Y_][_Y_]
2. ART number	______________________________
3. Age	_____________________________
4. Sex	☐ Male ☐ Female
5. Marital status	☐ Single ☐ Married ☐ Divorced ☐ Widowed
6. Tribe	
7. Religion	
8. No. of people under same roof	________________________
9. Client type	☐ KP______________ ☐ PP_______________ ☐ AGYW ☐OVC _______________ ☐ Regular ___________________________
10. Profession	☐ Student ☐ Unemployed ☐ Employed____________________
11. Residence	☐ Rural ☐ Urban
12. Level of education	☐ None ☐ Primary ☐ Secondary ☐ Tertiary
TREATMENT FACTORS	
13. Date of HIV diagnosis	[_D_][_D_]/[_M_][_M_]/[_Y_][_Y_]
14. Stage of HIV at ART initiation	☐ Stage 1 ☐ Stage 2 ☐ Stage 3 ☐ Stage 4
15. Start date of ART	[_D_][_D_]/[_M_][_M_]/[_Y_][_Y_]

16. Previous ART regimen(s)	☐ None ☐ Yes 1. ____________________ 2.____________________ 1. Date of switch [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_] Reason for switch ____ 2. Date of switch[_D_][_D_]/[_M_][_M_]/[_Y_][_Y_] Reason for switch ____
17. Current ART regimen	________________________________
18. ART formulation	
19. Adherence	☐ Poor ☐ Fair ☐ Good ☐ Excellent
20. Previous opportunistic infection (OI)	1. ☐Yes (Type of OI) ____________________________________ 2. Date of diagnosis [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_] 3. ☐No
21. Other co-current chronic diseases	☐ Hypertension ☐ Allergic disease ☐ chronic kidney disease ☐ heart disease ☐ Psychiatric illness ☐ Hepatitis B infect ☐ Diabetes ☐ Other Illness ____________
22. Disclosure of HIV	☐ Yes ☐ No
If yes, disclosure to	☐ Spouse ☐ Mother ☐ Father ☐ Brother ☐ Children ☐ Friends ☐ Sexual partner

	☐ Other than medical staff
23. Baseline CD4	____ ________________________________Date [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_]
STUDY OUTCOME	
24. Most recent viral load	____ ________________________Date [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_]
25. Virally suppressed	☐ Yes ☐ No

Uganda Christian University

In-depth interview guide

Study Title: factors associated with unsuppressed viral load among children and adolescents on ART enrolled on the OVC program at Mild May center of excellence.

Omutwe omukulu: Nsongaki elemesa edagala lyasilimu okukendeza akawuka kasilimu mubaana ne mubavuvuka abaa'funira obulezi ku Mildmay

Welcome and thank you for volunteering to take part in this interview on facilitators of unsuppressed viral load.

Webale kujja era nakwewayo okwegata mukunonyerezako kuno "lwaki akawuka kasilimu teka'kendera mubaana ne mubavuvuka abaali dagala.

You have been asked to participate as your point of view on this question is important, and we would like to hear it.

Tukusaba wegate mukunonyereza kuno, tuwulirize ebirowozobyo kunsonga eno enzito.

Preliminary information:

Name of interviewer Participants registration number	
Age of informant	
District of residence	

Level of education	
Duration on ART	
Current ART regimen	
Place of interview Start time	End time

Introduction: This interview is designed to help us understand the barriers to VL suppression among adolescents.

Enyanjula: okunonyereza kuno kujatuyamba okufuna okutegera “lwaki akawuka kasilimu tekakendera mubana ne mubavuvuka abaa’tandika kudagalai lyasilimu”

This interview will last 45-60 minutes and will be audio recorded. If you don’t understand anything please ask for clarity.

Omusomo guno gugya kumala edakika 45-60, nga kukwata namalobozi gaffe. Wewabawo kyotategera bulungi, buza tukinyonyole.

Ice breaker: what do you enjoy doing during your free time?

Tutandike: Kiki kyosinga okunyumirwa okukola mubiserabyo ebyedembe?

We shall start this discussion with your experience on antiretroviral therapy

Katutandike nobumanyirivubwo bukyango’kozesa edagala lyakawuka kasilimu

1 What makes it easy for you to take your ARVs?

Mberaki ekwanguyiza okumira edagala lya'akawuka kasilimu?

Probe on; facility factors (waiting time, service mix, adherence counselling, peer support, treatment support, reminder SMS)

Buza kubino; Mumalwaliro gaffe (ebisera byomala ngolindirila? ofuna obujanjabi obulala? emisomo kansolingi eyokumira edagala? mikwanogyo okujukiza nokuwagira okumira edagala? okujukizibwa kusimu?)

Probe on; medication related (ARV side effects, number of pills, dosing, duration on ART, food requirements)

Ebikwata kudagala (buzibuki bwewafuna ngomira edagala? obungi obwe'empeke? omira emirundi emeka mulunaku? omaze emyaka emeka nga'omira edagala? obwetavu obwe'emere?)

Social factors (family support, food supply, substance abuse, transport)

Embera yawaka (eka bakuyamba batya? ofuna emere? Onywakuki (sigara, mwenge, njaye etc)?)

2. What makes it hard for you to take your ARVs?

   Kiki ekikulemesa okumira edagala lya'akawuka kasilimu?

Probe on; health system factors, medication related factors, community factors and individual factors

Buza kubino; mumalwaliro gaffe, Ebikwata dagala, Ensonga zomubyalo oba ensonga ezilemesa omulwadde yenyini nga omuntu obutamira dagala.

When you hear about viral load suppression, what comes to your mind?

1. Bwebakugamba nti akawuka kasilimu ebyuma tebikalabye mumusayi ate nga olikudagala, mundowozayo kiba titegeza ki?

3. What do you think caused your viral load to be unsuppressed?

Nsaba ombulileko, olowooza kyavakuki akawuka obutakendera mumusayi?

Probe on; sociodemographic factors, medication related factors, health facility factors

Buza kubino; embera yabulijo, ebikwata kubyedagala na'malwaliro.

4. What do you think can be done to help you achieve viral suppression?

Olooza kiki ekiyinza okolebwa okukuyamba okukendeza kubungi obwa'akawuka musayigwo?

Probe on; adherence, health facility factors and family support

Buza kubino; okumira edagala buli lunaku? Ebyamalwariro gaffe? Obuwagizi okuva mubantu abawaka?

Ending question; anything we have not discussed that you would like to share?

Ekibuzo ekisembayo; waliwo kyewalyetaze twogereko ekilala?

Conclusion

Okukomekereza

Thank you for participating. I really appreciate your opinions and hope you found this interview beneficial.

Webale nyo okwewayo nokwegata mukunonyereza kuno, nkwebaza olwebiroowozo byompadde. Kansubire nti omusomo guno gulina kyegukuyambyeko.

Key informant interview guide

Study Title: Factors associated with unsuppressed viral load among children and adolescents on ART at Mild May center of excellence.

Welcome and thank you for volunteering to take part in this interview on barriers to VL suppression among children adolescents on ART. You have been asked to participate because you are involved in adolescent's service delivery and your point of view on this question is important, and we would like to hear it. I realize you are busy and I appreciate your time.

The interview will last 45-60 minutes and will be audio recorded.

Preliminary information

Date of interview	
Age of informant	
Sex of informant	
Cadre of informant	
Informants role in the adolescent clinic	
Name of interviewer	
Place of interview	
Start time:	End time

Introduction: This interview is aimed at obtaining your expert opinion on the barriers to VL suppression among the adolescents in your care.

Ice breaker: What do you enjoy about working with children and adolescents?

1. How do you prepare adolescents for ART?

Probe on; counselling, treatment partner, family involvement

2. What ARV regimen are the children and adolescents using?

   Probe on; TDF/3TC/EFV, TDF/3TC/DTG, AZT3TCNVP, PI based regimens

3. What are the common challenges faced by children and adolescents on ART?

   Probe on; facility system, medication related, sociodemographic and clinical factors.

4. How are you supporting children and adolescents with such challenges to ensure they stay in care and adhere to their treatment?

   Probe; follow up adherence counselling, medical reviews, material support.
5. How is VL monitoring among children and adolescents done?
   Probe on; identification of adolescents for VL testing and how often
6. In your opinion, what do you consider to be the major barriers to VL suppression among adolescents?
   Probe on clinical factors, sociodemographic factors, medication factors and sociodemographic factors.
7. How are you supporting children and adolescents in care to ensure they attain and sustain VL suppression? Probe on; follow up counselling, identification of children and adolescents who miss appointments and are lost to follow.
8. How are you managing children and adolescents with unsuppressed VL? Probe on; intensive adherence counselling, follow up VL testing and treatment given.
9. How are children and adolescents with unsuppressed VL responding to this management? Probe on; suppressing or not suppressing

Ending question; anything we have not talked about, that you would like to share?

Conclusion

Thank you for participating. I really appreciate you taking the time to engage in this discussion.

. We hope you found the interview interesting.

UGANDA CHRISTIAN UNIVERSITY

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UGANDA CHRISTIAN UNIVERSITY

SCHOOL OF RESEARCH & POSTGRADUATE STUDIES

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

Date:28th/3/2024

Name of Candidate: SARAH NAMUTOSI **Reg. No: RJ20M21/101**

Title of Dissertation FACTORS ASSOCIATED WITH VIRAL LOAD NONSUPPRESSION AMONG CHILDREN AND ADOLSCENTS LIVING WITH HIV ENROLLED TO THE ORPHANS AND VULNERABLE CHILDREN PROGRAM AT THE MILDMAY CENTER OF EXCELLENCE IN WAKISO DISTRICT

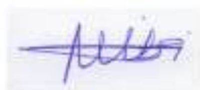
SN	COMMENTS BY EXTERNAL EXAMINER	ACTION TAKEN	INDICATOR
1	The first sentence under conclusion should be improved through rephrasing the sentence	I rephrased the sentence	First conclusion pg 57
2	The first sentence under recommendations in the abstract should be rephrased to improve the deserved action state who will do what, to who and how to achieve specified activities and to avoid specific issues	I have added the who, what and how	See recommendation 6.2.1 pg 57
3	The conceptual framework should be re-arranged to reflect independence.	I have rearranged	See conceptual frame work pg 6
4	Variables and should not be super imposed on 2.0. literature review which appears to be a typing error	Corrected this typo	It's now well aligned pg 7

5	At the end of literature coverage provide a summary of recent data with a highlight for the research gap that the study focused in	I have included the summary	See summary at the end of the literature review pg 17
6	under the study design 3.2, the study population was not one respondent, make appropriate corrections under the design providing reasons for the chosen design	I have corrected this	Added s on respondent pg 18
7	Ethical issues especially the first sentence under 3.12 should be rephrased	Corrected this	See rephrased statement 3.12 pg 25
8	Study limitations are well disclosed under table 1 of results, the variables age should be indicated as age in years and not just left as mere members	Edited table	Added Age in years pg 27
9	Indicate age in years where age appears in such a table like table 4	Edited	Included age in years pg 39

SN	COMMENTS BY INTERNAL EXAMINER	ACTION TAKEN	INDICATOR
1			
2			
3			
4			
5			

SN	COMMENTS BY VIVA VOCE PANNEL	ACTION TAKEN	INDICATOR
1	Need to see the qualitative findings only quantitative were presented	Added the qualitative findings	See 4.9 pg 51
2	Why did you choose to use simple random sampling. What was the fraction of selecting the sample or what was the chance for selecting the 248; 1 out of 248 The better recommendation would be to do all of the children	To give every individual an equal chance, I used the Kish leslie formula that dictated the number of participants included in the study. census sampling will be considered in the subsequent research	See sampling procedure on pg 21
3	The DV of Viral load Non-suppression given does not answer the fact that MV and IVs may lead to non suppression or suppression. Therefore, the DV needs to either consider both suppression and non-suppression to accommodate both sides	Added on the out come viral load suppression or non-suppression	On the conceptual frame work on the DV pg 6
4	How do you justify the significance of the study since the WHO data talks about 92%	92% because the UNAIDs target is 95%, which is below the target	Added to the justification see pg 5
5	General statistics used for national cover the whole country and are cutting across the HIV patients and not orphan children. If there is a reason for comparing the two then it should be said and clear	Added quarterly report data for Mild may center of excellence	91 % suppression rate for children and adolescents pg 5

	Get data from the records at your centre that are non- suppression children		
6	Ensure that you separate the methodology used for each method used. Quali should have its own and well as Quanti How does the two methods answer or compliment each other in terms of the way you present the findings or the data results Which study objective or question did you want the quantitative to answer? Was it necessary to have both? Please think through this and qualify it in your findings	Added the qualitative data	See 4.9 pg 51
7	Discuss findings based on each objective	I have discussed findings per objective	Chapter five pg 53-55
8	How the research is going to inform policy or practice and other things	I have made recommendations to practitioners, policy makers and researchers	Chapter six pg 57-59

SARAH NAMUTOSI  **OGWANG ROBINSON**

Candidate's Name Signature Supervisor's Name Signature