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FACTORS ASSOCIATED WITH ADHERENCE TO DOLUTEGRAVIR-BASED REGIMEN AMONG ADULT HIV/AIDS PATIENTS ATTENDING ANTI RETROVIRAL THERAPY CLINIC AT MILDMAY UGANDA HOSPITAL. A CROSS-SECTIONAL STUDY.

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ABSTRACT.

Background:
The purpose of the study was to determine the adherence and factors associated with adult HIV patients on DTG regimens attending the ART clinic at Mildmay Uganda Hospital.

Methodology:
This was a cross-sectional study design that used quantitative methods of data collection methods. Systematic sampling techniques were used to enroll every 2nd patient on DTG daily into the study. Data was analyzed using Microsoft Excel 2013 and presented using tables, pie charts, and graphs.
Of the 30 respondents, non-adherence was 30% and this was common among participants aged 21-30 years (67%), those who had attained secondary school educationlevel (67%), those taking alcohol (56%) and those not taking medication in time (56%).

Results:
Most of the study participants 15(50%) were aged 21-30 years. The prevalence of non-adherence was high (30%) and was common among youthful adults (21-30 years), with poor social behaviors like taking alcohol, low socio-economic status and not taking medication on time. Study findings showed that the majority (33%) of the non-adhering respondents were peasant farmers and this is where they earn their living.

Conclusion:
The prevalence of non-adherence was at 30% and was characterized by many factors. These were respondents aged between 21 and 30 years of age, young adults without partnership support, low education level, poor social behaviors like taking alcohol, low economic status, and those poor timing for taking drugs.

Recommendations:
The Ministry of Health should strengthen sensitization programs on DTG adherence through HIV treatment programs like community outreaches and community drug refills where HIV patients canbe followed up and given drug refills from their homes.

Keywords: *Adherence, Adult HIV Patients, DTG Regimen, ART Clinic, Mildmay Uganda Hospital.*
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BACKGROUND OF THE STUDY.

Globally, Human Immunodeficiency Virus (HIV) is among the most common cause of death in adults. An estimated 38.4 million people were living with HIV (Cassim N, et Al, 2023). The estimated annual HIV infections in the United States have declined by 10% from 2010 to 2014, the condition remains a serious public health concern given the burden it imposes on patients and the healthcare system (Cohen, J., et Al, 2020).

Eastern and Southern Africa accounts for 45% and 53% respectively of the world's HIV infection and people living with HIV. Early initiation of ART has significantly shown an improvement in clinical outcomes and a reduction in sexual transmission of HIV through viral suppression.

In Uganda, the incidence of HIV among adults aged 14 – 49 years has declined to 0.19% (in 2017) from 0.35% (in 2010), due to various prevention and treatment programs put by the WHO. Therefore, the management of HIV infection with the ART therapy currently are of high potency,

Acceptable, resistance profile, and tolerability. The newest ART drug class approved for HIV management is DTG for all the lines (1st, 2nd, and 3rd) and it's the most effective in suppressing HIV, it's well tolerated and has a low resistance profile.

According to WHO, at least 60 low and middle-income countries have adopted and integrated DTG into their HIV treatment guidelines with Kenya, Botswana, Uganda, and Brazil already using DTG-based regimens. In 2017, Uganda rolled out DTG as the first-line combination regimen for HIV adults and this has improved the lives of PLHIV since it is the most effective drug that highly

Suppressing the viral load, Mild May Uganda Hospital was among the healthy facilities that enrolledthe use of DTG.

However, some patients are said not to be adhering well to DTG and the cited reasons include; not honoring their appointment dates, failing to take their pills daily, too much alcohol consumption, and adverse drug reactions (Wakibi, S.N, *et al*, 2019). In Uganda and in particular MildMay Hospital, there is limited data on adherence to DTG. Therefore, the aim of conducting this study was to determine adherence and factors associated with the use of DTG regimen among HIV/AIDS patients at Mild may Uganda Hospital.

General objective.

To determine adherence and factors associated among adult patients on DTG-based regime attending ART clinic at Mild May Uganda hospital.

Specific objectives.

- To determine adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.
- To determine the factors associated with adherence among patients on DTG regimen attending ART clinic at Mild May Uganda hospital.

METHODOLOGY.

Study design and rationale.

The study employed a cross-sectional study design.

Study setting and rationale.

The study was conducted at Mildmay Uganda Hospital, a non-governmental organization located alongEntebbe Road in Lweza, Wakiso district. This hospital specializes in taking care of HIV patients and it has over 43,000 patients under care. Daily, about 200 patients are attended to.

Study population.

The study targeted HIV-infected adults on a DTG-based regimen attending an ART clinic at Mildmay Uganda Hospital.

Sample size determination.

The sample size for the respondents was determined using Sloven 1962 formula (Globevnik *et al* 2003) with a precision of +/- 5% at a confidence level of 95%. It is given by the expression.

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

Where N = Target population, N = 80 (HMIS 002 Mild May Uganda Hospital) e = Fixed error, e = 0.05, and sample size

$$n = \frac{80}{1+80(0.05)^2}$$

$$n = \frac{80}{1+80(0.0025)}$$

$$1+80 \text{ X } 0.0025 = 1.2$$

$$\frac{80}{1.5} = 66$$

n = 66

Therefore, the sample size was 66. However, the study considered 30 respondents as per the Uganda Nurses and Midwives Examinations

Board research guidelines. The study involved Patients at OPD who were screened using their patient cards to identify those on DTG.

Sampling procedure.

Patients at OPD were screened using their patient cards to identify those on DTG. Using systematic sampling, every 2nd patient on DTG was enrolled in the study.

Inclusion criteria.

The study included adult males and females between the ages of 18 and 60 who were able to see and read very well and are HIV positive on a based regimen attending the ART clinic at Mildmay Uganda Hospital and are willing to participate in the study. They must have spent more than one yearon dolutegravir.

Exclusion criteria.

This study did not include young children, blind patients, dumb patients, ART patients who are not on a DTG-based regimen, and patients who are lessthan one year on a dolutegravir. regimen.

Definition of variables.

Independent variables.

Demographic factors included age, sex, marital status, level of education, tribe, and occupation. Behavioral factors included alcoholism, substance use, and smoking status.
Clinical factors included side effects of the drug and a history of underlying conditions like hypertension and diabetes.
Socio-economic factors: Lack of transport funds and lack of social support, stigma.

Dependent variables.

Non-adherence to DTG.

Research instruments.

Data was collected using a structured questionnaire.

Data collection procedure.

Patients on OPD were screened using their client cards to identify those on DTG. Those on DTG whomet the inclusion criteria were interviewed using structured questionnaires to collect demographic, behavioral, and clinical factors. From the cards, the current viral load was determined. For those whoseviral loads were not updated but bleeding was done on their last visit, client numbers were used to extract the current viral load from the system.

Data management.

All the data tools were coded with numbers and edited before leaving the area of study to ensure that there were no mistakes or no questionnaire left blank, and any mistake found was corrected before leaving the area of study. The data tools were kept in a lockable safe place to limit access by unauthorized persons. Counting of the questionnaire was done to ensure that the right number was returned.

Data analysis.

Data was entered using Microsoft Excel, cleaned, and analyzed using STATA software version 15. Categorical variables were summarized using frequencies and percentages. Normally distributed continuous variables were summarized using mean and standard deviation. Non-normally distributed data was summarized using median and Inter interquartile range. Those with high viral load (more than 1000 copies) and who have been on DTG were categorized as non-adherent to DTG.Adherence was determined as the number of people whose viral load is less than 1000 copies divided by the total number of enrolled patients expressed as a percent. To determine factors associated with non-adherence, frequencies were used.

Ethical consideration.

Permission to conduct the study was approved by the research supervisor and Research Coordinator of Mildmay Institute of Health Sciences. Thereafter, an introductory letter was obtained from the school to introduce the researcher to the study area. This study was conducted after approval by the Mildmay Uganda Research Ethics Committee. Written informed consent was sought from all patients.

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Maximum confidentiality was observed during the study and only numbers instead of names were used to identify the respondents.

PRESENTATION OF RESULTS.

Demographic, Clinical, and Behavioral Characteristics of the Research Respondents.

Most of the study participants 15(50%) were aged 21-30 years. Catholics were the majority of the respondents 11(36.7%). Many participants had attained secondary education 20(66.7%). Of the 30 participants, the majority 22(73.3%) reported taking alcohol. More than half 19(63.3%) of the study participants had spent more than 5 years on ART and very few 11(36.7%) reported side effects from drugs. Details of these characteristics are presented in Table 1

Table 1. Characteristics of study participants on DTG regimen attending ART clinic at Mild May Uganda hospital.

Variable	Frequency (%)
Age	
15-20	1(3.3)
21-30	15(50)
31-40	7(23.3)
41-50	4(13.3)
51-60	3(10)
Religion	
Catholics	11(36.7)
Protestants	7(23.3)
Pentecostal	7(23.3)
Muslim	4(13.3)
Others	1(3.3)
Education level	
None	1(3.3)
Primary	4(13.3)
Secondary	20(66.7)
Tertiary	5(16.7)
Marital Status	
Married	9(30)
Single	14(46.7)
Divorced	5(16.7)
Widow/widower	1(3.3)
Others	1(3.3)
Take alcohol	
Yes	22(73.3)
No	8(26.7)
Take medication on time	
Yes	24(80)
No	6(20)
Side Effects of the drug	
Yes	11(36.7)
No	19 (63.3%)
Duration on ART	
Less than 3 years	6(20)
3-5 years	5(16.7)
More than 5 years	19(63.3)

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Adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

Figure 1: Adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

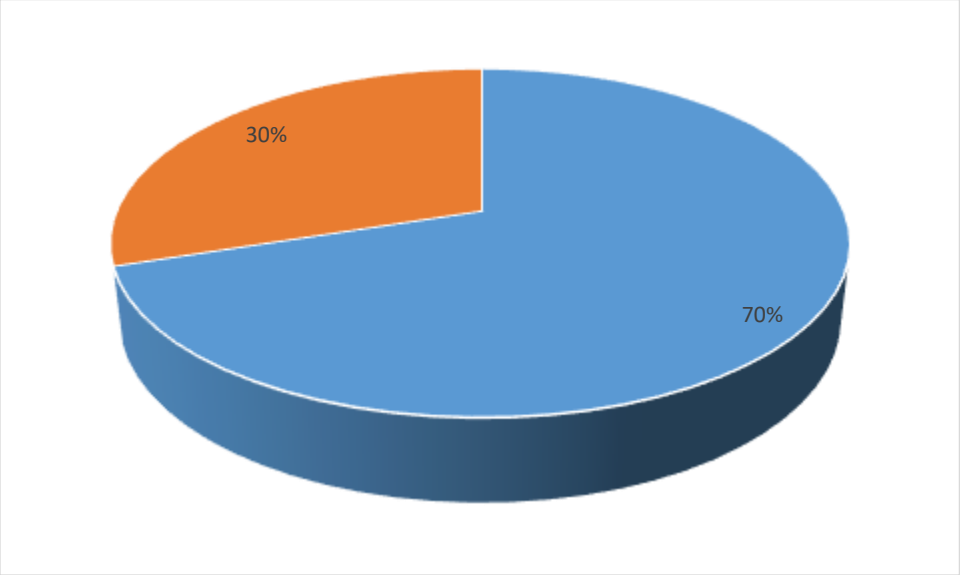

Figure 1 shows that the majority of respondents 21 (70%) adhered to treatment while 9 (30%) were not adhering to treatment.

Factors associated with Adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

The relationship between non-adherence and socio-demographic, socio-economic, clinical, and behavioral factors was assessed.

Social-demographic factors and non-adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

Of the 9(30%) who did not adhere to DTG treatment, the majority 6 (67%) were aged 21-30 years. Being a catholic 4 (44%) and being single were more likely to have poor adherence. Details are presented in Table 2.

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Table 2: Social-demographic factors and non-adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

Variable	Non-adherence; N=9
Age	
15-20	0(0%)
21-30	6 (67%)
31-40	1 (11%)
41-50	1 (11%)
51-60	1 (11%)
Religion	
Catholics	4 (44%)
Protestants	3 (33%)
Pentecostal	0 (0%)
Muslim	1 (11%)
Others	1 (11%)
Education level	
None	0 (0%)
Primary	1 (11%)
Secondary	6 (67%)
Tertiary	2 (22%)
Marital Status	
Married	2 (22%)
Single	4 (44%)
Divorced	2 (22%)
Widow/widower	0 (0%)
Others	1 (11%)
Tribe	
Muganda	6 (67%)
Musoga	1 (11%)
Munyankole	1 (11%)
Mutooro	0 (0)
Mugishu	1 (11%)
Others	0

Behavioral Factors and Non-adherence among Adult Patients on DTG based Regimen Attending ART Clinic at Mild May Uganda Hospital.

The majority of respondents 5 (56%) who did not adhere to treatment took alcohol. Not taking medication in time 5 (56%) was associated with poor adherence. Details of more lifestyle and behavioral factors and their association with non-adherence are presented in Table 3.

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Table 3. Behavioral Factors and Non-adherence among Adult Patients on DTG based regimen attending ART Clinic at Mild May Uganda Hospital.

Variable	Non-adherence; N=9
Take alcohol	
Yes	5 (56%)
No	4 (44%)
Take medication on time	
Yes	4 (44%)
No	5 (56%)
Spouse Take Alcohol	
Yes	4 (44%)
No	0(0%)
Single	5 (56%)

Socio-economic factors and non-adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

The majority of the non-adherence respondents 3(33%) were peasant farmers while those who were in formal employment were the same as business people and those with other forms of employment 2 (22%), the majority 3 (33%) had a monthly income of more than 500,000. Details are presented in Table 4.

Table 4: Socio-Economic Factors and Non-adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda Hospital.

Variable	Non-adherence; N=9
Employment Status	
Formal employment	2 (22%)
Peasant farmer	3 (33%)
Business	2 (22%)
Others	2 (22%)
Monthly Income	
None	2 (22%)
50,000-100,000	0 (0%)
100,000-200,000	1 (11%)
200,000-300,000	2 (22%)
300,000-500,000	1 (11%)
More than 500,000	3 (33%)
Get support from family	
Yes	8 (89%)
No	1 (11%)

Clinical Factors and Non-adherence among Adult Patients on DTG based regimen attending ART Clinic at Mild May Uganda Hospital.

The majority of the respondents 5(56%) who reported side effects of the drug after taking medication did not adhere to DTG treatment. Most of the respondents 7 (78%) have been on ART for more than 5 years. More clinical factors are presented in Table 5.

Table 5: Clinical Factors and Non-adherence among Adult Patients on DTG-based Regimen Attending ART Clinic at Mild May Uganda Hospital.

Variable	Non-adherence; N=9
Experience Side Effects after medication	
Yes	5 (56%)
No	4 (44%)
Duration on ART	
Less than 3 years	2 (22%)
3-5 years	0(0%)
More than 5 years	7 (78%)

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DISCUSSION OF THE FINDINGS.

Prevalence of non-adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

The prevalence of non-adherence to ART among the respondents was 30%. This was lower than adherence in a study conducted in Zambezia province, Mozambique by Filimao, D. B., *et al* (2019) where 43% of the respondents were non-adhering to ART including Dolutegravir. The study findings are contrary to the study by Ritah, F. M, *et al* (2020) done in Tanzania where high self-reported adherence among ART clients was at 71% to dolutegravir-based regimens.

Factors associated with non-adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

Socio-demographic factors associated with non-adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

Study findings showed that the majority (67%) of the non-adhering respondents were aged between 21- 30 years of age. This is a very youthful age group that has a lot of distractions and challenges. Others are still schools staying in hostels which makes them uncomfortable to take their medications when their fellow students are around hence making them forget to take their treatment in time and go for reviews on time. Another reason could be that this age bracket indulges in alcoholism and very unhealthy lifestyles that are known to affect adherence. These findings are similar to a study conducted in Ethiopia by Mitiku, H. et al (2013) where young adult respondents gave reasons for non-adherence as forgetting to take their pills in time 47.2%, due to traveling long distances 18.9% and being busy doing other things.

The study findings revealed that the majority (67%) of the non-adhering respondents were of secondaryschool level. This is because someone at this education level lacks enough guidance to fight stigma and this makes most of them keep themselves busy or in hiding. Similarly, it was also shown in the study by McCluskey, S. M, *et al* (2021) where younger ages had poor adherence to DTG since they a lack of guidance from elders.

The study revealed that the majority (44%) of the non-adhering respondents were single. This might be because having no partners creates a lack of support in taking medication. Similarly, the study by Adeniyi, O V. *et al* (2018), showed that most respondents lacked marital support to help them adhere to the treatment of DTG.

Clinical Factors Associated with Non-adherence among Adult Patients on DTG-based Regimen Attending ART Clinic at Mild May Uganda Hospital.

The study findings show that non-adherence was higher in respondents who experienced side effects (56%) following medication. Drugs having side effects influence consistency in taking medication as instructed by the health care workers. This is similar to a study conducted in Ethiopia by Mitiku, H. *et al (*2013) where young adult respondents gave reasons for non-adherence as forgetting to taketheir pills in time 47.2%, due to traveling long distances 18.9% and being busy doing other things.

According to the findings, 56% reported having had problems at the start of using Dolutegravir. This might be because their bodies were trying to adjust from the old regimen to the new regimen.

Similarly, it was also stated in the study by Zakumumpa, H, *et al* (2021) in Uganda where 60% of the respondents reported having experienced adverse drug reactions after being transitioned to DTG.

Behavioral factors associated with non-adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

The study findings show that most (56%) of the non-adhering respondents take alcohol. Taking alcohol puts the liver at a great risk of not functioning well which in turn affects the first-

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pass effects of the drugs hence causing non-adherence.

Study findings revealed that the majority (56%) of the non-adhering respondents don't take their medication in time. This might be because most of the non-adhering respondents are aged between 21 and 30 years of age which is an active and busy age group that makes most of them take their medication in time. This is similar to a study conducted in Ethiopia by Mitiku, H. *et al (*2013) where young adult respondents gave reasons for non-adherence as forgetting to take their pills in time 47.2%, due to traveling long distances 18.9% and being busy doing other things.

Social Economic Factors associated with non-adherence among adult patients on DTG-based regimen attending ART clinic at Mild May Uganda hospital.

Study findings showed that the majority (33%) of the non-adhering respondents were peasant farmers and this is where they earn their living. This could be one of the reasons why most respondents (22%) of the non-adhering don't have a monthly income that could support them to access health services in time. Similarly, the study by Opara, H. C, *et al* (2022) done in South Eastern Nigeria showed that most respondents did not have enough transport fares which affected adherence negatively.

CONCLUSIONS.

The prevalence of non-adherence was at 30% and was characterized by many factors. These were respondents aged between 21 and 30 years of age, young adults without partnership support, low education level, poor social behaviors like taking alcohol, low economic status, and those poor timing for taking drugs.

LIMITATIONS OF THE STUDY.

The researcher had a limitation of the literature review as few studies on DTG had been conducted and published.

RECOMMENDATIONS.

To the ministry of health.

The Ministry of Health should strengthen sensitization programs on DTG adherence through HIV treatment programs like community outreaches and community drug refills where HIV patients canbe followed up and given drug refills from their homes.

To Mild May Uganda Hospital.

Mild May Uganda Hospital should offer a wide range of treatments for PLHIV that can address the treatment demands of non-adhering patients.

Local leaders.

Local leaders should encourage and support community members living with HIV by forming community support groups which can help to fight the stigma of PLHIV hence increasing the patients' chances of seeking care without fearing to be laughed at by community members.

Local leaders should also link up with the healthcare workers treating PLHIV to bridge the gap that can be created between patients and healthcare workers.

Health workers.

Health workers should health educate PLHIV on the dangers one can get with poor adherence to HIV treatment.

Health workers are encouraged to create open communication means where they can easily communicate with the patients any time the need arises. This can help to remind patients of their drugrefills in time.

Healthcare workers should sensitize patients and the community to the dangers that can be caused by drinking alcohol. They should tell the community and patients about the economic, physical, and social negative outcomes of taking alcohol, especially for someone who is on HIV treatment.

To the PLHIV.

People Living with HIV should always take health care workers' and community leaders'

advice asimportant to avoid implications of poor adherence to HIV treatment.

To the Nursing Practice

Non-adherence to DTG is attributed to factors that can be improved through the intensive engagement of nurses through health education and the provision of preventive services like community outreaches.

ABBREVIATIONS/ACRONYMS.

ADRs: Adverse Drug Reactions
AIDS: Acquired Immune Deficiency Syndrome.
ART: Anti-Retro Viral Therapy
CASG: Community ART Support Group
DTG: Dolutegravir.
HAART: Highly Active Anti-Retroviral Therapy
HIV: Human Immuno deficiency Virus.
MoH: Ministry of Health
PLHIV: People Living with Human Immunodeficiency Virus.
UNAIDS: United Nations Program on HIV/AIDS
VL: Viral Load
WHO: World Health Organization.

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