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Adherence to Antiretroviral Medication and Factors Affecting it Among HIV--Positive Patients Receiving it at Adama General Hospital

Takele Achalu Dengela*

Lecturer at Africa Medical College and St Lidata health science college

***Corresponding Author:** Takele Achalu Dengela, Lecturer at Africa Medical College and St Lidata health science college, Tel.: +251 911597754, E-mail: takeleachalu@gmail.com.

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Abstract

Background: Before the development of highly active antiretroviral medication, AIDS and related illnesses caused a great deal of suffering and death. All of the AIDS-related morbidities and mortality have considerably decreased thanks to modern medication, especially in industrialized nations. However, this accomplishment is still elusive in underdeveloped nations, particularly in those in sub-Saharan Africa. This failure can be attributed to a number of factors. Poverty, ignorance about the treatment, and inadequate therapy adherence are at the top of this list.

Objective: To assess patient compliance with antiretroviral therapy and the factors affecting compliance among patients in Adama general hospital who are receiving antiretroviral therapy and are infected with the human immunodeficiency virus

Methods: In a cross-sectional study of HIV-positive individuals who were being followed up from August 10 to August 24, 2018, a convenience sample technique was employed to assess adherence throughout this time period. A structured questionnaire was used to interview 179 interviewers, and self-report was used to determine adherence.

Result: Interviewers made up of 100 (68%) women, interviewees made up of 125 (70%) Oromo, and participants made up of 170 (95%) Orthodox. Approximately 127 (71%) of them reside in joint housing. It was discovered that 12 of them, or 7%, were sick and unable to work.

80 of them, or 45%, were found to make less than 150 birr per month. Most of them, 161 (90%) of them, stated being really happy with the support they get from friends and family. Of those being monitored, 32 (or 18%) experienced at least one ART-related side effect, while 166 (or

Conclusion and recommendation: The majority of participants (95%) had nearly flawless (>95%) adherence rates, and the reasons why certain subjects did not adhere may be modified. In order to increase awareness of the benefits of ART for PLWHA and problems with low adherence, health professionals (caregivers) should offer health education.

List Of Abbreviations and Acronyms

ART: Antiretroviral therapy; TDF: Tenofovir; 3TC: Lamivudine; EFV: Efavirinez; AZT: Zidovudine; HAART: Highly active antiretroviral therapy; HIV/AIDS: Human Immuno deficiency virus; NVP: Nevirapine; NNRTI: Non-nucleoside reverse transcriptase inhibitor; NRTI: Nucleoside Reverse transcriptase inhibitor; PI: Protease inhibitor; PLWHA: People living with HIV/AIDS; SRP: Students Research Project; UNAIDS: United Nations Program on HIV/AIDS; AGH: Adama General Hospital.

Background

Currently, the human immunodeficiency virus (HIV) is a leading cause of mortality and morbidity (HIV). In 2012 alone, 1.6 million individuals passed away from AIDS-related illnesses, and 35.3 million people are thought to be HIV/AIDS positive (PLWHA). The number of new HIV infections throughout the year was 2.3 million, which is a 33% decrease from the 3.4 million infections noted in 2001. [1].

According to recent statistics, as of mid-2010, 68% of all HIV-positive people lived in Sub-Saharan Africa, the region that has been most severely affected by the epidemic. In 2010, there will likely be 29% fewer AIDS-related fatalities than there were in 2005, with 1.2 million expected. [2]. One of the countries in sub-Saharan Africa that has suffered greatly is Ethiopia. According to estimations and projections from 2014, Ethiopia has a 1.14% countrywide HIV prevalence. 367,000 people and 23,400 children under the age of 15 currently utilize ART. According to estimates, AIDS was responsible for 14,872 fatalities in 2017. Given the circumstances, it is obvious that highly active antiretroviral therapy (HAART) for HIV and AIDS is the breakthrough and celebrated in the decrease in mortality and the improvement of PLWHAs quality of life. Since the introduction of HAART in Ethiopia in 2003, important reduction in progression of both AIDS and death is observed. Reductions in new HIV cases, AIDS-related deaths, and overall mortality have been related to expanded access to ART. It is designed to suppress viral replication and thus reduce likely hood of development of drug resistance virus strain. The potent and effective new combinations of antiretroviral therapy (HAART) have proven efficacious in reducing viral load morbidity and mortality so that it has a great importance in increasing quality of life of PLWHA [2, 3]

Three or more antiretroviral drugs are combined in the ART regimen. A three-drug regimen called triple therapy is used to start treatment. It consists of two NRTIs (nucleoside reverse transcriptase inhibitors) and a third NNRTI (non-nucleoside reverse transcriptase inhibitor) or protease inhibitor (PI) [5].

Although ART dramatically reduces viral load, morbidity, and mortality, many persons using ARVs may find it challenging to take the medication consistently due to side effects, a challenging regimen, or a challenge with taking too many pills. HAART has a significant role in the complete and long-lasting suppression of viral loads, which allows for the maximal CD+4 cell reconstitution and maintenance, improving the response to opportunistic responses [6-8]. The Ethiopian government has responded to the epidemic as a national emergency by expanding the ART program, following the advice of the United Nations General Assembly Special Session on HIV/AIDS (UNGASS). This was done in recognition of the devastating impact that HIV/AIDS has on the population as well as the beneficial effects of ART. The ministry of health (MOH) has been aiming to provide ART treatments that are secure, efficient, fair, and sustainable for persons with HIV [9].

However, determining factors such genetic variations in medication metabolism, significant baseline immunosuppression, past drug resistance, concurrent opportunistic infection, and adherence pose a threat to the success of ART.

From these factors adherence to ART is one which is potentially alterable factors in determining out comes for patient with HIV.

Full therapeutic benefit of ART requires near perfect adherence to the dosage, frequency, timing and food requirement. In order to achieve a near perfect adherence to complex ART regimen, the motivations to begin therapy, and consent of a patient is very necessary in additions to willingness of HIV positive individual to adhere to the complex ART regimen. Hence this study is concerned about adherence and reasons affecting adherence [8]

Adherence can be assessed by using different methods alone or in combination; these measurements include MEMS CAPS. Pill counts, biomarkers, information on pharmacy refills, and self-reporting. Self-reporting is a relatively quick and effective way to gauge adherence in clinical practice using this strategy. Additionally, this study uses patient self-reports and pharmacy refill data to gauge adherence [8].

Therefore, this study investigated the individual ARV-taking experiences of PLWHA and evaluated numerous parameters needed to boost and sustain ART adherence levels.

In HIV care and treatment, adherence to ART is highly important. To avoid viral resistance and treatment failure, adherence must be at least 95%. However, both in industrialized and developing nations, adherence to antiretroviral therapy has been identified as a significant barrier in the management of HIV-infected individuals. Patients' non-adherence to ART has major repercussions on the individual as well as on society.

Patients' rates of adherence to ART vary depending on the environment. In a meta-analysis of adherence rates, it was discovered that only 77 percent of those receiving antiretroviral drugs in Sub-Saharan Africa consistently followed the recommended dosage schedule [10].

To improve adherence to optimal level, it requires the intervention of many sides and contribution of many things like that intervention at patient, the medication treatment levels, the health care delivery level and intervention at community level. According to studies, poor antiretroviral therapy adherence increases the likelihood of drug resistance, treatment failure, and clinical deterioration, which increases the chance of death [11].

Numerous factors, some of which were discussed in the background, may have an impact on patient adherence. Similar to other low-resource countries, people with HIV receiving antiretroviral medication in Ethiopia may have a variety of problems that could hinder their adherence. It is a significant difficulty to execute safe and effective ART in a nation with limited resources and no management experience for such intricate regimen treatment programs. Ethiopia is one of the developing nations that must deal with this issue.

Although adherence has a dramatic effect in improving the quality of life and clinical outcomes, non adherence to ART is common in all groups of treated individuals. There have been limited studies conducted in Ethiopia at the level of primary and general hospitals to reveal the magnitude of adherence of HIV infected adult patients receiving antiretroviral therapy and determinant factors that could influence their adherence.

Additionally, the change in adherence levels over time may require frequent evaluations of patient adherence in order to guide adherence interventions. So that the adherence rate and drivers and determinants for adherence are taken into account, this specific study will be done to evaluate the determining factors impacting adherence to antiretroviral medication among adult patients infected with HIV in Adama general hospital.

Materials and Methods

Study Area and Period

The study was carried out at the Adama General Hospital in Adama, Adama. It is one of the hospitals in Ethiopia where the ART program is offered. There are around 1096 patients being followed up in this facility, 889 of them are receiving ART. In 2018, the investigation was carried out between August 10 and August 24.

Study Design

A cross sectional study was conducted by using patients self-report and drug records.

Source Population and Study Population

Source Population

All people living with HIV/AIDS taking ART in ART clinic, Adama General Hospital.

Study Population

All people living with HIV/AIDS taking ART and attend ART pharmacy for refill in the study period.

Sampling Technique and Sample Size

Convenience sampling technique was used; the study attempted to cover all patients who was attended the ART clinic for refill over the study period.

Study Variables

Independent Variables

- Socio demographic characteristics
- Family disclosure
- Adverse effect of ARVS
- CD+4 count
- Duration of treatment since ART initiated
- Treatment regimen: keeping an appointment
- Patients relationship with care giver

Dependent Variables

- Number of doses of ART missed in last month
- The reason for missing the pills

- Adherence rate

Data Collection

Data Collection Instrument

With Structured questionnaire, patient was interviewed to assess the socio demographic characteristics, the number of doses missed, reason for missing, adverse effect of the drug, duration of treatment since ART initiated if there is alcohol or other abuse and family disclosure and their dissatisfaction about the care giver. From the drug records, regimen, keeping an appointment and co-medications other than ARV was reviewed and recorded.

Data Collectors Selection

After completing study materials and permission granted, selection and collection was done. The data collectors were two druggists who had training on dispensing ART.

Pilot Study

Pilot study was undertaken to check the reliability and quality of structured questionnaire.

Data Processing and Analysis

The collected data was cleared and analyzed and categorized manually. Chi square test was used to observe the association of variables with adherence. Then, the results presented using tables, graphs and charts.

Data Quality Assurance

Training was given to the data collectors and questionnaire was pre tested and consistent supervision of data collection was carried out.

Limitation of the Study

In this study, the adherence of the participants was evaluated using a self-report approach. It is well known for being subjective and for exaggerating patient adherence. Additionally, recollection bias and social desirability bias have been tested on the self-report measure of adherence.

Operational Definition

Adherence: is the extent to which client's behavior coincides with the proscribed health care regimen as agreed up on through a shared decision-making process between the clients and health care providers.

Adherence Rate: Number of doses taken divided by number of doses prescribed multiplied by 100.

Complete Adherence: Patient who never had skipped a single dose of medication during their period of therapy.

Sub Optimal Adherence: When patients only took between 80-94% of their prescribed medication.

Poor Adherence: when individuals didn't take their medication as directed 80% of the time.

Antiretroviral: Drug used to combat HIV and other retrovirus infections.

Highly Active Antiretroviral Therapy: The treatment regimens recommended to aggressively suppressing viral replication and progress of HIV disease.

CD+4 T-cell count: A way of measuring immuno competency by counting the lymphocytes that carries the CD4 molecule.

Non-Nucleoside Reverse Transcriptase Inhibitors: Are the class of ARV that block reverse transcriptase activity by binding adjacent to the enzymes active site, in during conformational changes in this site.

Nucleoside Reverse Transcriptase Inhibitors: Are class of ARV drugs which inhibits the enzyme reverse transcriptase that converts viral RNA to proviral DNA before its incorporate n in to the host cell chromosomes they are phosphyolylated by host cell.

Protease Inhibitors: These classes prevent an infected cell from producing more infections virus by binding protease enzyme.

Dose Missed: Dose missing is said to be if the patient fails to take the drug within 2 hours of scheduled time.

MEMS CAPS: Is an instrument used to measure adherence by utilizing computer.

Ethical Consideration

Written consent was taken from research project. Informed verbal consent was given for respondents before proceeding to the interview and also Privacy and confidentiality of the respondents was tried to be improved by taking the ID no only.

Result

In WGH, there are a total 1096 PLWHA on follow up, out of which 889 patients started on ART. In the study period a total 179 subjects were interviewed. 125 of them were female making the percent of 70%. Most of subjects were in age distribution of 25-29 making the percentage of 30%. Most of them (95%) were Oromo in ethnicity and the least of them were afar (2%). More than half of them were Orthodox in religion (68%), followed by Muslim (27%), and protestant (5%). Regarding to the living condition, about 127 of the participants (71%) live with other people, and 52 of them live alone (29%). It was observed that more than half the participant had an educational level ranging between grade one and eight. 34 of them are illiterate (19%) and those grade12 and above were 27(15%). It was observed that about 80 of participant had a monthly income of less than 150 birr (45%) and about 25 of them had income greater than 1000. 15% had monthly income ranging from 150-300 [Table1].

Table 1: Showing numerical distribution of ART patients with Socio demographic characteristics in WGH, Adama, Ethiopia, August, 2018.

S. No	Socio demographic characteristic		No	%
1	Age	<15	1	0.56
		15-19	1	0.56
		20-24	19	11.1
		25-29	53	30
		30-34	36	20.1
		35-39	27	15.4
		40-44	29	16.3
		45-49	8	3.2
		50+	5	2.78

		Total	179	100
2	Sex	Male	54	30
		Female	125	70
		Total	179	100
3	Ethnicity group	Oromo	170	94.9
		Tigre	6	3.4
		Afar	3	1.7
		Total	179	100
4	Religion	Orthodox	100	68.2
		Muslim	48	26.8
		Protestant	31	5
		Other	0	0
		Total	179	100
5	Educational level	Illiterate	34	19
		1-8	93	52
		9-12	25	14
		12	27	15
		Total	179	100
6	Monthly income	< 150	80	45
		151-300	27	15
		301-500	18	10
		501-800	9	5
		801-1000	20	11
		1000+	25	14
		Total	179	100
7	Occupation	Unemployed	27	15
		Not working because of disease	12	7
		Students	4	2
		Government employee	27	15
		Merchant	20	11
		House wife	23	13
		Daily laborer	66	37
		Total	179	100

It was showed that most of them (90%) were very satisfied by the support they get from the friends and the family members. And about 11 of them (8%) are somewhat satisfied. In 89.2% of the cases the friends and family members help were a lot in taking their

pills. In about (1.8%) of cases their help was not there at all and 2.9% of cases, their help was not appreciable. Almost all of the participants were not alcohol drinkers (99.3%). And about 95% of the participant had no the habit of chewing chat. The study also showed that about 142 of subjects (79.2%) was on follow up for more than one year. 8.96% of them were on follow up in range of 6-12 month, 6.14% of them in range 3-6 month and 5.7% of them for < 3 month. Out of those in follow up about 18% of them had at least one side effect related to ART. Out of which majority of them complain headache (40%) and 18% of them complain rash, and fatigue, insomnia, pain and numbness had the percentage of 14%. (Figure 1)

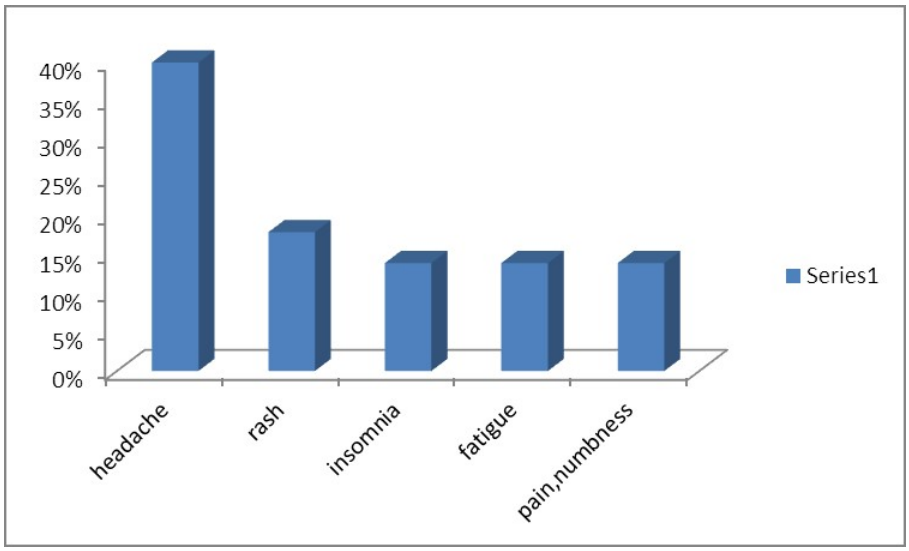

Figure 1: distribution of side effects faced by patients on ART in WGH, Adama, August 2018.

Almost all of the participants had not missed one or more of doses (93%), and about 7% of them missed one or more pills. Of those missed their doses, more than half of them missed it in last month of study period (55%), 30% of them missed it in the last week

And 15% them missed it in the last 3 days of the study period. The maximum dose missed was six and the minimum dose missed was one.

The study showed that the participant linked being too busy with other things as reason for missing pills in more than half of cases (55%). And simple forget, feel sleepy and other cause like the clinic being closed were the other reasons for missing pills in the same percentage (15%) of cases. Most of the participants who missed pills, handle the missed pills by waiting for the next dose (85%), about 5% of them double the dose, and 10% of them took the drug immediately. (Figure 2).

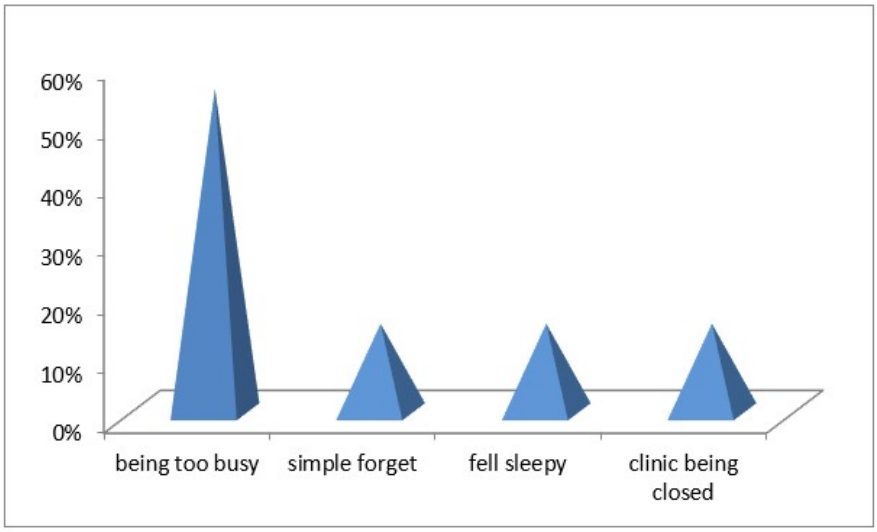

Figure 2: Distribution of reason for missing pills by pationts on ART in WGH, Adama, Ethiopia August 2018.

About 75.9% of the participants follow specific schedule to take the drug in about all of the time, 18% of them follow the schedule in most of the time and about 6.1% of them in about half of the time. Almost all of the respondents had no specific instruction to take the drug (97%), and the rest (3%). From those who had instruction more than half of them follow the instruction in all of the time (62.5%) and about 37.5% in most of the time.

The study also showed that all of the participants had not missed their pills in the last weekend (100%). From the participants about 73% of them come for follow up every month, 16% of them come every two months and 11% of them come every three months. Nearly all of the participants satisfied by the support that they took from the care giver during their follow up. Almost all of respondents had not missed the appointment during the follow up (99%) and about 1% of them missed appointment and the reason was being busy with other things (100%). All of the subject discusses freely and openly on the problems they got during their follow up. Regarding opportunistic infection, about 20% had tuberculosis, 6.1% PCP, 4.3% had herpes zoster infection and 2.5% had Toxoplasmosis. The rest 68% had not opportunistic infection. [Table 2]

Table 2: Frequency of opportunistic infection in patients on ART in WGH, Adama, Ethiopia, August 2018

Opportunistic infections	No	%
Tuberculosis	35	61.4
PCP	11	19.3
Herpes zoster	7	12.3
Toxoplasmosis	4	7
Total	57	100

Regarding to additional drug that they took about 39% of them were taking Cotrimoxazole in addition to the ART, 12% of them were on anti TB in addition to ART and about 1.4% of them were taking acyclovir. About 46.6% of them were not taking additional drug (Table 3).

Table 3: drugs in addition to ART taken by patients in WGH, Adama, Ethiopia August 2018.

Additional drug	No	%
Anti TB	22	23.18
Cotrimoxazole	69	74

Acyclovir	3	2.82
Total	94	100

From those who were in additional drug about 74% of them were on Cotrimoxazole, 23% on Anti TB and 3% of them on acyclovir.

The study also showed that all of the participant were non pregnant. About 71% of the subjects had stage three diagnosis, 16.5% had stage two, 10 % had stage four and 2.5% had stage one diagnosis (Table 4).

Table 4: Stage of HIV in patients on ART in WGH, Adama, Ethiopia, August 2018

HIV stage	No	%
Stage one	5	2.5
Stage two	29	16.5
Stage three	127	71
Stage four	18	10
Total	179	100

Regarding the drug regimen, about 47% of them were on D4T/3TC/NVP regimen and 25% were on TDF/3TC/EFV regimen. The least 2.5% were on AZT/3TC/NVP regimen (Table 5).

Table 5: Distribution of drug regimen that patients on ART were on, WGH, Adama, Ethiopia, and August 2018

Regimen	No	%
D4T/3TC/NVP	84	47
D4T/3TC/EFV	15	8
AZT/3TC/EFV	22	12.5
AZT/3TC/NVP	4	2.5
TDF/3TC/NVP	9	5
TDF/3TC/EFV	45	25
Total	179	100

It was observed that, most of subjects (93%) had level of adherence of 100%, about (5%) of them had ranging 95-99% and 2% of them had level of adherence 81-94% (Table 6).

Table 6: level of adherence of patients on ART in WGH, Adama, Ethiopia, August 2018

Level adherence	No	%
100%	166	93%
95-99	9	5
81-94	4	2
<80%	0	0
Total	179	100

Lastly, it was found that there was a stastically significant association between family and social support, duration of treatment and

monthly income (Table 7).

Table 7: Associations between variables with adherence rate in WGH, Adama, Ethiopia, August 2018

Variables		Adherence						X^2	P-Value
		100%		95-99%		81-94%			
		No.	%	No.	%	No.	%		
Family and social support	Very satisfied	148	82.8	9	4.7	6	2.9	19.74	0.003
	Somewhat satisfied	8	4.3	1	0.7	1	0.7		
	Never satisfied	1	0.7	1	0.7	1	0.4		
	Very dissatisfied	1	0.7	1	0.7	1	0.7		
Educational level	Illiterate	34	19	1	0.7	2	1.1	7.16	0.306
	1-8	85	47.4	2	1.1	2	1.1		
	9-12	21	11.9	2	1.1	2	1.1		
	12+	23	13	3	1.4	2	1.1		
Occupation	Unemployed	21	11.8	4	2.1	2	1.1	14.86	0.041
	Student	1	0.7	1	0.7	1	0.7		
	Government employee	23	12.8	2	1.1	2	1.0		
	Merchant	17	9.6	2	1.1	1	0.7		
	House wife	19	10.7	3	1.3	2	1.0		
	Daily laborer	62	34.4	2	1.1	2	1.1		
	Not working because of disease	9	5.2	1	0.7	2	1.1		
Duration on ART	<3 month	6	3.6	3	1.4	1	0.7	15.56	0.016
	3-6 month	8	4.3	2	1.1	1	0.7		
	6-12 month	13	7.2	2	1.1	1	0.7		
	>1 yrs	131	73.1	10	5.4	1	0.7		
Monthly Income	<150	74	41.6	4	2.1	3	1.4	16.79	0.002
	150-300	23	13	3	1.4	2	1.1		
	301-500	15	8.2	2	1.1	1	0.7		
	501-800	6	3.2	2	1.1	1	0.7		
	801-1000	15	9	2	1.1	1	0.7		
	1000+	21	11.5	3	1.4	1	0.7		

Discussion

At WGH, there were 1096 PLWHA in total; 889 of these patients started ART. The adherence rate was calculated based on the required dose that was taken within the previous month. It was found that 93% of the study's subjects showed 100% adherence. Comparatively, it was found that this study's degree of adherence was comparable to the findings of other related studies carried out in

Ethiopia, which showed total adherence of between 79.3% and 82.7%. [30].

The outcomes of this study are also comparable to those of other research projects carried out in industrialized and developing countries [31]. This suggests that, in contrast to those in many previous trials, a sizable portion of the study subjects were able to demonstrate a higher level of adherence to their HIV medications in this particular circumstance. The fact that most patients understood the importance of ART and their obligation to follow it—topics that are typically covered in adherence counseling sessions held while patients receive refills for their HIV medications—may help to explain this. These sessions are held while patients receive refills for their HIV medications. It's possible that the adherence rate was overestimated as a result of the adoption of the self-report adherence measurement. The result that almost all of the participants had not missed their appointment during their follow up and all of them discuss their problem freely and openly with their care giver can be the reason for the higher adherence rate beside common factors.

In this study, it was discovered that adherence rate was correlated with family and social support, occupation, length of ART treatment, and monthly income. There was no correlation between the participants' educational status and their adherence rate. When there is widespread family and societal support, the adhesion rate rises. In around 82.8% of the cases, those who had a 100% adherence rate expressed great satisfaction with their family and societal support. 78.7% of all respondents who had been on ART for more than a year had a 100% adherence rate, 7.9% of those who had been on ART for less than six months had a 100% adherence rate, and 7.2% of those who had been on ART for between six and twelve months had a 100% adherence rate. These can be due to the increase in knowledge because of the repeated contact with their care givers who provide them with health education.

In this study, being overly preoccupied with other activities was the leading cause of non-adherence (55%) followed by forgetfulness (15%), clinic closure (15%), and feeling sleepy (15%). This is more in line with a research done in Black Lion and St. Paul's hospitals, where 33% of instances involved non-adherence due to being too busy. And each one of them is changeable.

Conclusions

According to the study, the majority of participants (98%) had adherence rates that were almost flawless (>95%). It was discovered that the adherence rate was steadily correlated with occupation, time on ART, overall family and social support, and monthly income. The causes of non-adherence could all be changed. Since there is a clear correlation between adherence rate and the aforementioned, health professionals (caregivers) should provide health education to raise knowledge about the significance of ART for PLWHA and the issues with low adherence. Since the majority of excuses for forgetting to take a pill may be avoided, health professionals (caretakers) should urge patients to employ several reminder tactics (such as an alarm clock). On the day of their appointment, many patients forget to take their morning prescription because they are out of it. Therefore, patients should receive the proper amount of medications during refills, including those for the day of their next checkup. To increase patient satisfaction, hospital administrations must take a number of actions. There have been few studies on adherence rate conducted in the study location (WGH ART clinic), and none have been discovered detailing the nationwide adherence rate. Therefore, it is important to encourage undergraduate and graduate students to conduct research in this field, and the Ethiopian Ministry of Health should conduct studies outlining the national adherence rate and any potential obstacles to it.

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