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Evaluating Factors Influencing Suboptimal Adherence to Antiretroviral Therapy Among HIV Patients at Hoima Regional Referral Hospital

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ABSTRACT

The study aimed to assess the adherence levels of HIV patients to antiretroviral medication (ART) at Hoima Regional Referral Hospital. The results showed that good adherence was 40.4%, while poor adherence was 59.6%. Over half of the respondents (53.4%) sometimes forget to take their medication, and 15.9% have not taken their medication in the past two weeks. Most respondents (98.6%) had taken their medication the previous day, and 2.5% stopped taking their medicines when they felt their symptoms were under control. Over half (52.7%) found it difficult to remember to take all their medicines. The majority (75%) take one ART drug daily, while a small percentage (13%) take two or three daily. Most respondents (98%) face no challenges with ART drug acquisition and do not have problems traveling to hospitals or clinics for their ART drugs. Health workers treated all respondents with respect during hospital visits, and 99% had privacy during consultations. The study suggests that factors such as forgetfulness, financial circumstances, job status, and understanding of the intervention's benefits can impact adherence. ART clinics should provide patients with more information to encourage them to take full responsibility for their health.

Keywords: HIV, Antiretroviral treatment, HIV patients, ART clinics, Health workers.

INTRODUCTION

Human Immunodeficiency Virus is one of the leading causes of mortality among young individuals aged 20 to 45[1, 2]. Although the overall virus prevalence has decreased from over 18% in the early 1990s to below 7% now, it is believed that over one million individuals in Uganda (including over 100,000 children under the age of 15 are currently infected, and a million have died from HIV. Currently, 110,000 of the 300,000 people predicted to require antiretroviral treatment have access to it. Lack of adequate ARV compliance is a primary cause of poor HIV/AIDS control worldwide, with an estimated more than half of all HIV+ patients failing to take ARVs correctly [3]. The current frequency among people aged 15 to 49 is 5.9%. Almost half of the country's HIV/AIDS diagnoses are between the ages of 10 and 24 [4]. Even if the transmission of HIV/AIDS in the country has slowed, controlling the disease in around one million HIV-positive persons remains a significant concern [5].

In 2022, around 36.7 million persons were infected with HIV globally. In 2007, around 33.2 million people worldwide were infected with HIV, with Sub-Saharan Africa accounting for 63% of infections [6, 7]. In 2019, 38 million people were living with HIV, and over 690,000 people died from AIDS-related illnesses worldwide [7]. In 2020, HIV affected around 1.3 million persons in Uganda alone. In the early 1990s, Uganda had one of the highest incidence rates in Africa (about 15%). However, this has been reduced dramatically to 5.4% [7].

Because of the development of antiretroviral treatments (ARTs), HIV has increasingly become a chronic treatable condition [8, 9]. According to UNAIDS [7], the number of persons receiving antiretroviral medication globally climbed from 6.4 million in 2009 to 25.4 million in 2019, with 26 million people receiving antiretroviral therapy by the end of June 2020[4, 7]. Efforts have been made to increase the availability of antiretroviral

treatment (ART) for HIV-positive persons; around 46% of HIV-positive patients in need of medicine receive free ART in Uganda [10], and 67% got ART in Uganda in 2016 [6, 11]. However, studies have shown that even when ART is administered free of charge to patients, they may fail to adhere to the treatment due to socioeconomic factors such as a lack of access to food and transportation fees to clinics [12, 13]. This is a significant concern since adherence to ART is critical to patient survival and the prevention of the establishment of drug-resistant strains of HIV. For virologic suppression, an adherence rate of at least 95% is recommended [14]. A high level of adherence is essential for antiretroviral treatment to be successful [15]. According to one study that looked at adherence in Sub-Saharan Africa, the top cause for non-adherence was financial restrictions [16].

According to Bukenya et al. [17], antiretroviral treatment by individuals lowers HIV transmission, morbidity, and mortality, and improves the quality of life; however, strong adherence to ART is essential to obtain these advantages. Highly active antiretroviral therapy (HAART) has been a significant advancement in the treatment of HIV patients. HAART decreases viral load and improves CD4+ lymphocyte numbers in HIV patients, resulting in better treatment results. In research published in 1998, Montaner and colleagues found that triple treatment with nevirapine, zidovudine, and Didanosine resulted in a much higher and more durable drop in viral load and an increase in CD4+ cell counts in individuals with HIV[18]. However, after one year of therapy, those patients who stayed on track achieved maximum viral load reduction [19].

The Ugandan Ministry of Health observed that despite the government's efforts to establish the services at nearly all hospitals, the majority of HIV/AIDS patients in Uganda fail to receive appropriate information and clear instruction about the proper use of antiretroviral medicines. It should be noted that people who receive the medications do not take them as prescribed, wasting this limited resource without providing any therapeutic benefit. All of these factors, along with others, lead to poor patient compliance, which significantly leads to treatment failure. Antiretroviral treatment (ART) has significantly improved patients' health and quality of life while also causing viral suppression in HIV-infected people. However, treatment compliance is necessary for ART to be effective. Since adherence is a major obstacle to ART treatment effectiveness, it is crucial to determine the factors that influence adherence so that effective intervention methods may be created and put into practice [20]. Lack of social support, being single, depression, HIV stigma, food insecurity, the expense and travel time to the clinic, and alcohol usage are just a few of the things that have been identified as obstacles to ART adherence [21]. However, no research has been conducted to ascertain the level of adherence and the impact of its determinants in HIV patients receiving antiretroviral medication at Hoima Regional Referral Hospital."

METHODOLOGY

Study Design

A quantitative cross-sectional study was conducted to assess the factors associated with adherence to antiretroviral therapy among HIV patients at Hoima Regional Referral Hospital.

Area of Study

The study was conducted at Hoima Regional Referral Hospital, situated approximately 110 kilometers (68 miles) northwest of Mubende Regional Referral Hospital by road. Furthermore, it is about 198 kilometers (123 miles) northwest of Mulago National Referral Hospital in Kampala, Uganda's capital city. The coordinates of Hoima Regional Referral Hospital are 01°25'41.0"N, 31°21'16.0"E (Latitude: 1.428051; Longitude: 31.354451). Hoima Hospital is a public hospital funded by the Uganda Ministry of Health, and general care in the hospital is free. It is one of the thirteen Regional Referral Hospitals in Uganda. The hospital also serves as one of the fifteen internship hospitals in Uganda, where graduates of Ugandan medical schools can serve a one-

year internship under the supervision of qualified specialists and consultants. In 2013, Hoima Hospital had a reported bed capacity of 280. However, as of March 2011, out of the 337 gazetted staff positions, only 251 were filled, leaving 85 vacant positions. Established in 1935, the facility initially functioned as a district hospital. In 1994, it was upgraded to Regional Referral status for the Bunyoro sub-region and also serves patients from the nearby Eastern Democratic Republic of the Congo. In 2019, the Ugandan Ministry of Health estimated the hospital's catchment population to be approximately 3 million people.

Study Population

The study was conducted among HIV patients at Hoima Regional Referral Hospital.

Inclusion Criteria

It included all HIV patients at Hoima Regional Referral Hospital who were available at the time of data collection and willing to participate in the study.

Exclusion Criteria

Those who declined to participate in the study.

Sample Size Determination

The sample size was determined using the Kish Leslie's formula [22] as shown below:

$n = (Z\alpha/2)^2 * p(1-p) / e^2$

Where 'n' is the desired minimum sample size, Z is the value at $\alpha = 0.05$, which is 1.96, e is the margin of error, proposed to be 0.1, and p is the prevalence of adherence to HAART among HIV patients at Hoima Regional Referral Hospital. Since no published data about 'p' were available, a 50% proportion was used to calculate the minimum sample size, taking into account a 90% confidence interval ($Z\alpha/2=1.96$) and a marginal error (d) of 10%. Based on these considerations, the minimum calculated sample size was 96 respondents. However, the researcher was able to interview 150 respondents in this study.

Sampling Procedure

A simple random sampling technique was used to select respondents for participation in the study, from whom data was collected.

Dependent Variable

Adherence to antiretroviral therapy among HIV patients

Independent Variables

The independent variables include knowledge and attitudes.

Data Collection Method and Tools

Data was collected using an interviewer-administered questionnaire. The researcher met with the targeted respondents who participated in the study after obtaining permission for data collection. Each participant was required to give informed consent before enrolling in the study. The researcher assisted the respondents in filling out the questionnaires and clarified any questions they had. The properly filled questionnaires were then collected, and the data was recorded for analysis.

Data Entry and Cleaning

The data in the questionnaire were checked for completeness, cleaned, and sorted to eliminate obvious inaccuracies and omissions. The data were then coded and entered into a computer.

Data Analysis

The qualitative data collected was statistically analyzed and documented using Microsoft Excel and Word version 2019. The analyzed data was presented in the form of tables and graphs, which served as a basis for discussion and conclusion.

Quality Control

To ensure quality control, the researcher conducted a pre-test using 8 questionnaires in the target population before the actual study. This pre-test helped in refining the questionnaire where necessary.

Ethical Considerations

Participants were provided with information regarding the research and were asked for their consent. Each participant's choice to participate or not was respected, and data collected from participants were kept confidential.

Privacy Protection

Participants' names were not included while filling out the questionnaire to maintain privacy.

Confidentiality

It was clearly communicated that the information obtained from the participants would be kept under lock and key and would only be used for research purposes.

RESULTS

Socio-demographic characteristics of respondents

Of a total of 139 clients interviewed, equal proportions of 26.3% were in the age groups of 40-49 and 50-59 years. Majority (73.6%) of the respondents were self-employed with the least (4.3%) being students and home makers. Half of them (52.3%) earned less than 500,000 UGX per month with few (5.1%) of them earning between 1,000,000 to 1,500000 UGX monthly. A third of the respondents (30.3%) stayed less than 5km from the health facility whilst 27.8% lived over 20km away. Half (51.3%) of the respondents have been living with HIV for more than 5 years. Majority (65.0%) were female with most (45.0%) being Anglicans, followed by Catholics (32.0%), Muslims (14.0%) and other religions (9.0%). Nearly half (45.1%) of the respondents were married. About 7% had tertiary education whilst 36.8% had completed the Ordinary level of high school. 23.5% had no formal education Table 1.

Table 1: Demographic characteristics of respondents and adherence to ART

Variable	Frequency	Percentage	Adherence practices	
			Good	**Poor**
			N	**N**
Age (years)				
< 30	11	7.6	2	9
30-39	34	24.6	11	23
40-49	37	26.3	15	22
50-59	37	26.3	16	20
60+	21	15.2	10	12
Gender				
Male	49	35.0	20	28
Female	90	65.0	34	56
Religion				
Anglicans	63	45.0	24	39
Catholic	44	32.0	25	20
Muslims	19	14.0	9	11
Other	13	9.0	5	8
Marital status				
Single	37	26.3	14	23
Married	63	45.1	25	38
Divorced	19	13.7	9	10
Widowed/Cohabiting	21	14.8	7	14
Level of education				
No formal education	33	23.5	15	18
Primary	29	20.6	11	17
Ordinary level	51	36.8	17	34
Advanced level	17	12.3	6	11
Tertiary	10	6.9	4	6
Employment status				
Employed for wages	22	15.9	9	13

Self-employed	102	73.6	40	62
Home maker/Student	6	4.3	1	4
Unemployed	8	6.1	4	4
Level of income (Monthly)				
<500,000	73	52.3	36	37
500,000-,1000,000	27	19.1	7	19
1,000,000-1,500,000	7	5.1	1	6
>1,500,000	33	23.5	10	23
Distance from health facility				
< 5 kilometers	42	30.3	19	23
5-10 kilometers	30	21.3	13	17
11-20 kilometers	29	20.6	10	19
> 20 kilometers	39	27.8	12	27
Years with HIV				
< a year	30	21.3	14	16
2 years	13	9.0	4	9
3 years	12	8.9	7	6
4 years	13	9.7	4	10
5 years and above	71	51.3	27	44

Knowledge of ART among HIV patients

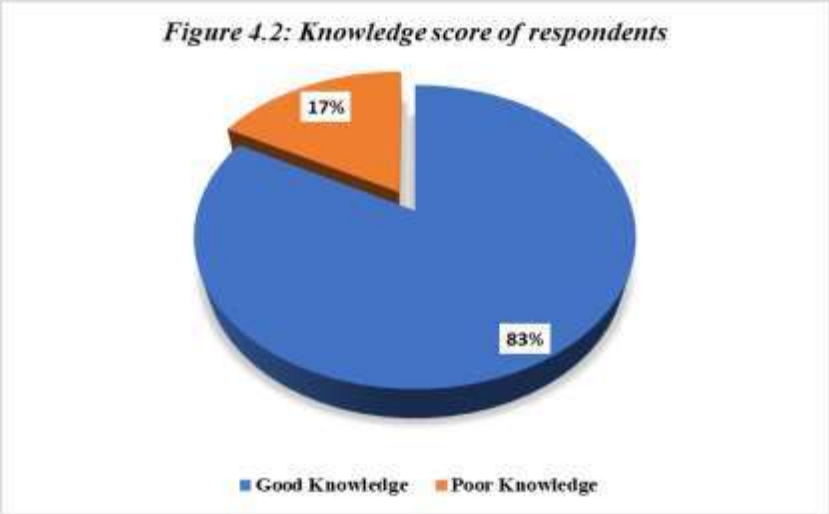
When knowledge on ART among the HIV patients was assessed, nearly half (46.6%) knew the name of the ART they were taking while the rest did not. A large proportion (93.1%) stated that ART prevents mother to child transmission of infection. Nearly all (96.0%) respondents knew HIV can be controlled by ART with majority, (86.4%) stating that taking ART prevents disease progression; 62.5% opined missing ART drugs can lead to transmission of the disease. Six of the respondents (2%) indicated that it is advisable to stop ART drugs when one suffers no opportunistic infection but majority (62%) stated otherwise. Detailed information can be found in Table 2.

Table 2 Knowledge on ART and Adherence to ART

Knowledge statement and response	Frequency	%
Can you mention the name of the ART drug you are taking?		
Yes	65	46.6
No	37	26.7
Don‘t know	37	26.7
ART prevents mother-to-child transmission		
Yes	129	93.1
No	0	0.0
Don‘t know	10	6.9
HIV can be controlled by ART		
Yes	133	96.0

No	1	0.4
Don‘t know	5	3.6
HIV can be cured by ART		
Yes	2	1.4
No	103	74.0
Don‘t know	34	24.6
Missing ART drugs can worsen the disease		
Yes	93	66.8
No	3	1.8
Don‘t know	44	31.4
Missing ART drugs can lead to transmission of the disease		
Yes	87	62.5
No	2	1.4
Don‘t know	50	36.1
It is advisable to stop ART drugs when one suffers no opportunistic infection		
Yes	3	2.2
No	86	62.1
Don‘t know	50	35.7
Taking ART prevents disease progression		
Yes	120	86.4
No	5	3.6
Don‘t know	14	9.8
Not starting ART when indicated to do so can worsen the disease		
Yes	100	71.8
No	3	2.2
Don‘t know	36	26.0
ART drugs have side effects		
Yes	97	69.7
No	3	2.5
Don‘t know	39	27.8

Respondents’ knowledge of ART is summarized in Figure 1 below. The majority (83%) had good knowledge while 17% had poor knowledge of ART Figure 1.



Adherence to ART medication and perceived challenges to adherence

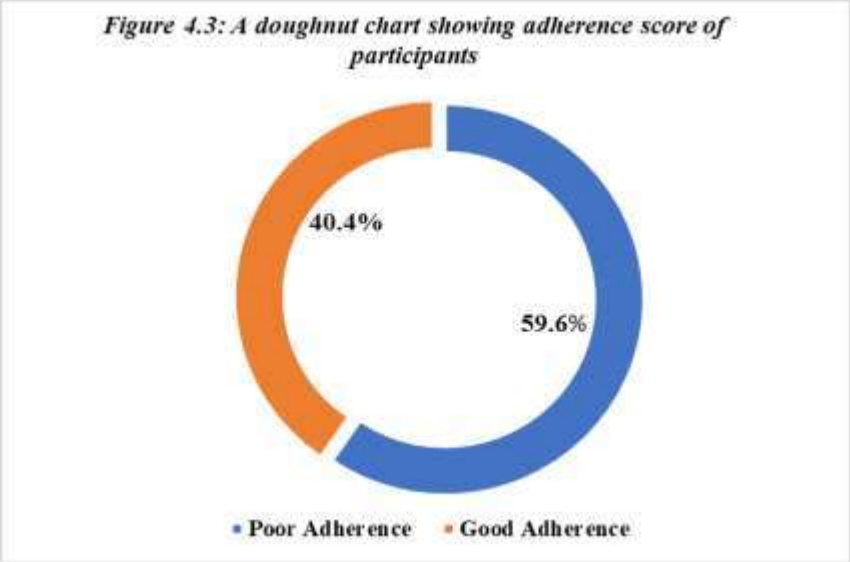
More than half (53.4%) of the respondents sometimes forget to take their medication; 15.9% of respondents indicated that there were days when they did not take their medication in the past 2 weeks. Nearly all (98.6%) respondents had taken their medication the previous day; 2.5% of the respondents said they sometimes stopped taking their medicines when they felt their symptoms were under control. More than half (52.7%) of the respondents stated they found it difficult sometimes remembering to take all their medicines Table 3.

Table 3: Adherence to ART medication

Adherence measuring scale	Frequency	%
Did you take all your medicines yesterday		
Yes	137	98.6
No	2	1.4
Sometimes stop taking your medicines when you feel like your symptoms are under control		
Yes	3	2.5
No	136	97.5
Do you ever feel hustled about sticking to your treatment plan?		
Yes	19	13.7
No	120	86.3
Difficulty remembering to take all your medicines		
Never/rarely	46	32.9
Once a while	73	52.7
Sometimes	20	14.4
Do you sometimes forget to take your medication		
Yes	74	53.4
No	65	46.6

Were there any days when you did not take your medication in the past 2 weeks		
Yes	22	15.9
No	117	84.1
Ever cut back or stopped taking your medication without telling your doctor		
Yes	3	2.2
No	136	97.8
Sometimes forget to bring along your medicines when you travel/leave home		
Yes	53	38.3
No	86	61.7

Overall, good adherence to ART was 40.4% while poor adherence was 59.6%.



The majority (75%) of the respondents take one ART drug in a day, 13% take two in a day and 12% take three per day. Nearly all the respondents (98%) do not face any challenge with ART drug acquisition and the majority (87%) do not have a problem with travelling to hospitals or clinics for their ART drugs. All (100%) of the respondents stated they had been treated with respect by health workers during their visit to the hospital. Nearly all (99%) have privacy during consultation at the hospital. None of the respondents resorted to traditional methods for treatment but 1% indicated they have cultural beliefs about the condition. Table 4.4 contains details. The most 63(44.8%) perceived challenge to adherence to ART was forgetfulness, followed by sleeping away from home 32(22.1%) and daily routine 25(17.7%). Only a small percentage 2(0.9%) deliberately refuse to adhere to ART Figure 4.

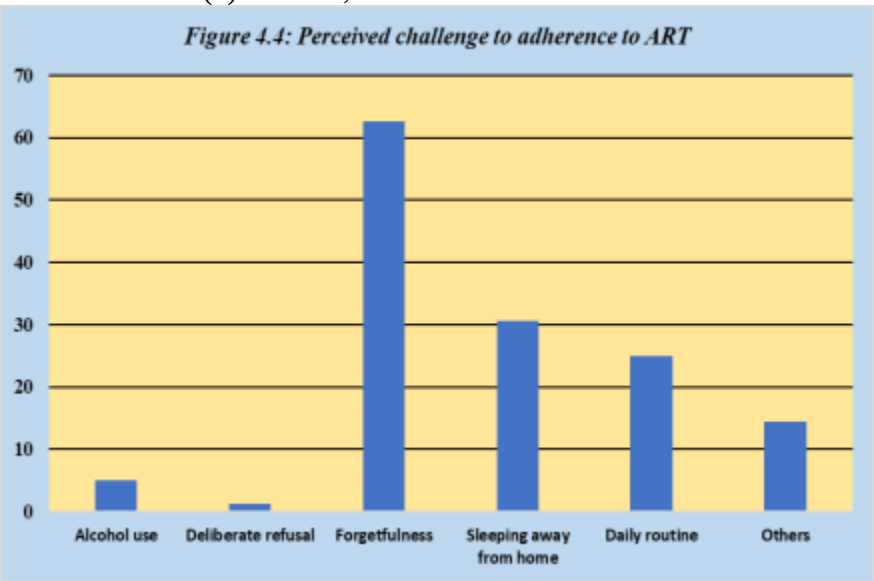


Table 4: Experiences with ART

Variable	Frequency	Percentage
Number of ART drugs to take in a day		
One	104	75.1
Two	18	13.0
Three	17	11.9
Number of ART drugs missed in the past 2 days		
Zero	132	95.3
One	3	2.5
Two	2	1.4
Three or more	1	0.7
Number of ART drugs missed in the past 7 days		
Zero	127	91.3
One	8	5.4
Two	3	2.5
Three or more	1	0.7
Have challenges with ART drugs acquisition		
Yes	3	2.2

No	136	97.8
Able to attend clinic/hospital during stated hour		
Yes	137	98.6
No	2	1.4
Have problem with travelling to hospital/clinic		
Yes	18	12.6
No	121	87.4
Treated with respect by health workers during visit to hospital		
Yes	139	100.0
No	0	0.0
Have privacy during consultation at hospital		
Yes	137	98.6
No	2	1.4
Waiting time before attended to at hospital		
1-5 minutes	2	1.1
10 minutes	1	0.4
15-20 minutes	1	0.7
30-45 minutes	10	6.9
An hour	88	63.2
More than an hour	39	27.8
Experience any side effect after taking ART		
Yes	46	32.8
No	93	67.2
Resort to traditional methods for treatment		
Yes	0	0.0
No	139	100.0
Have cultural belief about condition		
Yes	2	1.1
No	137	98.9

DISCUSSION

Evaluations of antiretroviral medication adherence tend to be a common assessment in these countries, as a result of many societal obstacles that appear to impact adherence to ART [23, 24]. Regardless of the adverse effects or the requirement for daily medication, antiretroviral therapy regimens are critical for effective treatment and long-term viral control [25]. The current study sought to measure HIV patients' comprehension of ART as well as the factors influencing their adherence to ART. It assessed the level of antiretroviral treatment adherence among HIV patients. Due to ART, HIV infection is now a chronic, partially curable condition [26]. Unfortunately, the need for continued therapy remains a challenge, particularly in developing countries [27]. Only 40.4% of those polled for this study adhered to antiretroviral treatment as prescribed. This ratio is concerning because it implies that more than half of the patients in the study population are missing out on opportunities to preserve their health. As a result, reaching the Sustainable Development Goals (SDGs), notably goal three, which aims to ensure everyone's well-being, as well as the 90-90-90 cascade, is hampered [16]. This finding, however, is significantly higher than the 14.9% discovered in Okoronkwo et al. [28] study at the Nnamdi Azikiwe University Teaching Hospital. The total adherence rate in this research was also found to be lower than in neighboring Kenya, Sudan, and South Africa [16, 29]. These variations in adherence levels might be due to geographic locations, adherence measuring procedures used in various studies, ecological obstacles, cultural norms, different health systems, and other methodological variations.

Among other things, the role of family caregivers in encouraging worldwide adherence to antiretroviral therapy (ART) among persons living with HIV is crucial [30]. Similarly, knowledge about antiretroviral medication cannot be excluded from this equation [30]. HIV education is critical for HIV patients in order to reduce HIV transmission and super-infection [31]. Furthermore, an individual's comprehension of their medical situation and treatment recommendations is associated with good medication adherence, including reduced viral load and greater CD4 cell count[31]. Knowledge about an intervention is important because it has the opportunity to eliminate any questions or misconceptions about antiretroviral treatment. It provides inspiration and hope to the vast majority of HIV-infected people [24]. This study discovered that HIV patients at HRRH had a high degree of awareness regarding antiretroviral medication (83%). These findings are in line with earlier research on HIV patients in SSA [31]. The findings are also similar to prior studies in Nigeria, where around 80.8% of HIV-positive patients understood antiretroviral medications [16], and 98.1% in the Nyamagana district by Kahema and colleagues. [32], on the other hand, discovered that fewer than half of the patients, or 45.5%, had a good degree of comprehension regarding antiretroviral medication.

The high level of ART knowledge reported in this survey might be due to the fact that the majority of persons participating in this study have some degree of education, with just 23.5% having no formal education. This educational background may ignite their interest in discovering and better understanding the illness dynamics that are causing them harm. Another possible explanation is that more than half of the HIV-positive individuals questioned in this research had the infection for more than 5 years. Individuals may have a greater grasp of the causes, symptoms, and potential remedies as they advance or live with the disease. Their better comprehension might possibly be linked to repeated visits to antiretroviral treatment centers. According

to the findings of this study, HIV patients on antiretroviral medication demonstrated a general comprehension of antiretroviral therapy. However, comprehension of other items was limited. For example, 26% of participants were uninformed that failure to begin antiretroviral medication when recommended might worsen illness, and 26.7% were unsure of the name of the antiretroviral therapy tablet they were getting. The reasons for optimum adherence among HIV patients were ART knowledge, work status, and financial position. This was demonstrated in research done by Heestermans et al. [16], in which drinking, traditional medicine use, stigma, and dissatisfaction with healthcare facilities and healthcare workers were variables influencing ART adherence. The study revealed that adherence to ART was connected to patients' financial level. Despite this economic discrepancy, the majority of respondents have no problem getting to a hospital to acquire drugs. Treatment expenditures such as transportation, food support, and laboratory testing, on the other hand, were highlighted by [33] as key hurdles to optimum adherence among their patients. Ayaike et al. [34] revealed that money plays a significant role in non-adherence. People with lesser incomes skip drugs due to a lack of funds and travel expenses. Morowatisharifabad et al. [27] observed that the expense of transportation and the challenges connected with travel hinder individuals from seeking treatment at hospitals. According to Morowatisharifabad [27], the client's perception of the quality of service provided and adherence are influenced by their financial situation. He argues that as a patient's money rises, so will his or her expectation of service quality and adherence. According to this thinking, any additional expenditures associated with therapy must be kept to a minimum in order to promote patient patronage. The study also revealed that one of the factors impacting patients' non-adherence to ART medications is their work situation. A boost in income, according to the study, diminishes the chance of adhering to ART. Other studies have not adequately demonstrated this because they observed that a high level of affluence enhances the chance of adhering to ART[16]. This conclusion might be ascribed to the fact that when individuals make more money, they become less busy, as seen by the fact that 76.3% of those questioned were self-employed.

People who are well-informed are more likely to keep to their anti-retroviral therapy regimens. Adequate understanding might enhance awareness, importance, and grasp of the significance of ART adherence. This might be due to the fact that the majority of individuals asked were aware of ART, which could be a predictor of adherence. Finally, persons who work from home or who are students are 0.09 less likely to engage in ART. This group of people is unemployed indirectly; yet, students may shun ART due to stigma, scorn, and other circumstances. Homemakers, on the other hand, have been reported to have less initiative and strength in their health-seeking activity. They are typically related to their inability to make autonomous decisions, especially those concerning their health. They are wrapped and are influenced by the health decisions of others, which are comparable to seeking ART regimens. Individuals who are unemployed or housebound may find it difficult to get to ART clinics for prescriptions. Furthermore, such persons may have difficulty undergoing laboratory procedures that need immediate payment. Morowatisharifabad et al.[27] identified a relationship between educational level and adherence to ART medication among patients, which contradicts the conclusions of this study. This suggests that educated individuals understand the significance of adhering to ART since it is critical to their health and survival.

CONCLUSION

According to the study, persons living with HIV have a high degree of awareness

but a low level of adherence to ART. Certain HIV patients' non-adherence is impacted by factors such as forgetfulness, financial circumstances, job status, and comprehension of the benefits of the intervention. Antiretroviral therapy (ART) services are medical therapies that attempt to reduce morbidity and mortality among HIV patients. The compliance of patients with ART medicines is crucial to the efficacy of ART therapy. Treatment failure results from noncompliance. As a result, ART clinics should provide patients with more information in order to encourage them to take full responsibility for their own health.

Recommendations

1. On-site training of ART clinic health staff on appropriate counseling ways on a regular basis, with each session emphasizing the necessity of rigorous adherence to ART prescriptions among patients. Customers are more inclined to employ ART services as a result of this, resulting in higher adherence.
2. Every time a client visits an ART clinic, they should be reminded of the importance of sticking to their prescription regimen. This will very certainly reduce the amnesia associated with drug usage.
3. HIV patients and their health care providers should work together to develop optimal ART regimens that ensure drug adherence. This is also expected to reduce the likelihood of clients developing forgetfulness as a result of drug usage.
4. HIV patients should continue to take their ART medicine in order to improve their health and avoid treatment failure.

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