An Assessment of the Factors that Contribute to Non-Adherence to Ant-Retroviral Therapy (Art) Treatment among HIV Patients at Nchanga North General Hospital-Chingola, Zambia

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Abstract

The research study was aimed at assessing the factors that contribute to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients at Nchanga North General Hospital-Chingola. With regards to the objectives, they were to establish the individual factors, social-cultural factors, social-economic factors, environmental factors, and health care provider factors contributing to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients. A descriptive cross-sectional design that was quantitative in nature was used for the study. The study targeted 162 non-adherent patients. In collecting data, structured questionnaires were used. A purposive sampling technique was used to select 115 respondents. The collected data was entered into data sets and analysed using Statistical Package for Social Sciences (SPSS) version 23.0 software to dissolve the portents and to evaluate the extent of ART non-adherence amongst male patients. The study concluded that non- adherence at Nchanga North Hospital is brought about by factors such as individual factors, social-cultural factors, social-economic factors, environmental factors, and health care provider factors. The research recommends that patient's preventive interventions such as community adherence supporter programs ought to be developed and implemented for the purposes of improving and ensuring ART adherence.

Keywords: Ant-Retroviral Therapy, HIV, Non-adherence.

Introduction

HIV is a virus i.e., Human Immuno deficiency Virus that tends to raid an individual's immune system, particularly the T-cells i.e., the CD4 cells [1]. These cells aid the immune system in fighting off infection. With regards to Zambia, as of the year 2018, the nation had an adult prevalence rate of approximately 11.1%, i.e., for the age group 15-59 years. For the children, they had a prevalence rate of approximately 14.6% [2]. The Zambian Demographic Health Survey of 2018 further reveals that women continued to be affected disproportionately compared to men. In addition, as of the year 2020, it was estimated that about 1.3 million Zambians were HIV positive [3]. Further, following the year 2018, it

was estimated that 78% of each and every HIV-positive individual was on treatment. As of the year 2019, 87% of each and every HIV-positive individual knew their status, 89% were on ART treatment, and 75% were virally suppressed.

In addition, in the year 2020, it was estimated that about 1.3 million Zambians were HIV positive [3]. Further, following the year 2018, it was estimated that 78% of each and every HIV-positive individual was on treatment. Lewis [4] stipulates that there is no cure for HIV/AIDS. As such, antiretroviral therapy (ART) makes available the only remedy that is viable with regards to managing and reducing the health crises brought about by the infection in sub-Sahara Africa. ART is an amalgamation of medication that is of antiretroviral nature that

subdues the load of the virus in the body to the levels that are minimal, boost the immune system of the patient by means of up surging the amount of CD-4 cells in the body, and heighten the quality of life of the individuals living with HIV/AIDS. Nevertheless, the virus is not totally done away with from the human body. As such, the patients have to consume the medication each and every day for their entire life.

ART was introduced in Zambia in the year 1995 by the private health facilities till the year 2004 when the government, through the ministry of health, introduced ART in Lusaka at four clinics. In the same year, it was declared by the government that ART would be rolled out to all health facilities in Zambia, and it will be offered at no cost to the general public [5].

ART treatment adherence is imperative for treatment to be effective in the long run. Adherence is well thought out to be the extent to which the person who is on medication follows the recommended guidelines as stipulated by the provider of health care. This includes one improving their diet and changing their lifestyle for the better [6, 7].

Several reports have been associated to non-adherence to ART treatment as a foremost challenge with regards to managing patients with HIV/AIDS successfully. Non-adherence to ART treatment has been an issue that is of critical nature when it comes to addressing the issue of HIV/AIDS worldwide. Moreover, the passing on of drug resistance viral strains has been noted to be related to non-adherence to ART [8]. ART adherence of greater than 95 percent is requisite for successful and effective HIV management [9].

For the purposes of ascertaining adherence, different methods are being used as self-report, interviews, pharmacy records, pill count, and viral load monitoring. Several studies have reported features associated with non- ART adherence of treatment, for instance, unavailability of support from the family, confusion and depression, stigma and discrimination, spiritual beliefs, forgetting to take medication, side effects of medication, and workplace factors. Other factors include abuse of alcohol and costs regarding to transport [10].

NNGH is the second-largest hospital in Chingola Copper belt province of Zambia, located in the former mine area township. Being the only public hospital, it serves both the urban and rural population as the first referral centre with a non-specific catchment area of the district with a population of about 160,000. Under ART services in Zambia, NNGH is an accredited ART centre receiving support both from the government of Zambia and non-government organizations. The ART services are provided on a daily basis by the ART clinic done as an outpatient department with linkages to the other departments within the hospital and the district stakeholders.

Purpose

The purpose of the study was to assess factors contributing to non-adherence to ART treatment among HIV-positive patients at Nchanga North General Hospital (NNGH) in Chingola, Zambia.

Statement of the Problem

ART treatment adherence implies that an individual is consuming the prescribed medication as directed by the medical personnel, at the time that is right, the person is eating a balanced diet and they restrain from bad habits such as drinking (among others) for the rest of their lives. However, a number of studies, for instance [11, 12, 13], have established that in Zambia, adherence to ART is a problem.

The 2018 Zambian HIV statistics indicate that 17,000 individuals died from an AIDS-related illness, and in the year 2019, 26,000 new HIV infections were recorded [14]. The high number of deaths and new infections recorded signify that ART treatment adherence is still a problem in Zambia. This is for the reason that patients that adhere to treatment reach virus suppression levels, and the chances of them transmitting the virus are very minimal, i.e., less than 1% [15]. As such, one would ask, what is causing non-

adherence? In this regard, in view of the aforementioned, there is a need to assess factors contributing to non-adherence to ART treatment among HIV-positive patients at Nchanga North General Hospital (NNGH) in Chingola Zambia.

Objectives

The main objective of the study was to assess the factors that contribute to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients at Nchanga North General Hospital-Chingola.

The specific objectives were to:

1. To establish the individual factors contributing to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.

2. To determine social-cultural factors contributing to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.

3. To ascertain social-economic factors contributing to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.

4. To identify the environmental factors contributing to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.

5. To find out the health care provider factors contributing to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.
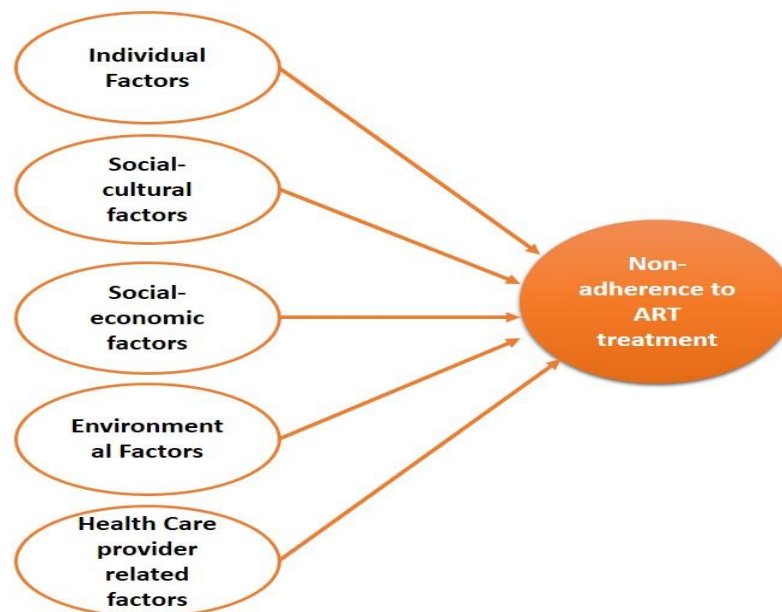
Conceptual Framework and Hypotheses

Figure 1. Conceptual Model

Source: Authors construct (2021)

Hypotheses

1. H1: Individual factors contribute to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.

2. H2: Social-cultural factors contribute to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.

3. H3: Social-economic factors contribute to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.

4. H4: Environmental factors contributing to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.

5. H5: Health care provider factors contribute to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients.

Methodology

Research Design

A quantitative descriptive cross-sectional design was used encompassing patients that were HIV positive attending for ART services at NNGH.

Target Population

Each and every HIV patient that was 18 years and above and did not adhere to the ART treatment for the duration of 6 months, i.e., from January 2021 to June 2021, was targeted. The hospital register indicated that a total of 162 patients were non-adherent.

Sampling and Sample Size

For the purposes of determining the size of the sample, Taro Yemani's (1964) [16] statistical formula was used as follows:

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

Where:

n = the size of the sample to be determined

N = population of interest

e = error margin (0.05)

1 = constant value

$$n = \frac{162}{1 + 162\,(0.05^2)} = 115.302$$

Therefore, the sample size was determined to be 115 (to the nearest whole number).

Purposive sampling was used in selecting 115 non-adherence patients. The clinician in charge of NNGH ART clinic assisted on the recruitment of participants by providing the list of names, address, and mobile numbers for ART non-adherence patients. During the selected time frame, the respondents were called using cell phones, and the study purpose was well elucidated then and there; the respondents were asked whether they wished to be part and parcel of the study. Furthermore, participants were called on the phone to arrange the date, time, and the place where the interviews were to take place.

Data Collection

A self-developed structured questionnaire that was verified by competent professionals in the field was used to collect primary data. The questionnaire was made up of 4 sections, i.e., section 1 had responses to collect demographic data, section 2: individual factors, section 3: social-cultural factors, and section 4: social-economic factors. Also, section 5: environmental factors, section 6: health care provider factors and section 7 non-adherence. Except for the demographic data, the responses were 5 rated on a Likert, i.e. (1 being strongly disagreed to 5 being strongly agreed).

The interviews were carried out in a place that was, i.e., a place of the respondents' choice, and it was typically in their homes or at the hospital offices. For the respondents who opted for more time to answer the questionnaire they were either given a physical or an electronic questionnaire that they completed in their own free time.

Data Analysis

The primary data was collected within a period of two months i.e., from the month of July 2021 to the month of August, September 2021. The data were coded, entered, and analysed using SPSS version 25. Descriptive and inferential statistics were used to analyse the demographic characters of the participants as well as the factors contributing to the non-adherence to ART treatment among patients.

Results

Demographic Data

From the distributed questionnaires, only 103 were returned fully completed. Table 1 illustrates the respondents' demographic data. The table depicts that for gender, 65 (63.1 percent) were male, and 38 (36.9%) were female. For age, 4 (3.9%) were of the age group 18-25 years, 48 (46.6%) were 26-33 years, 32

(31.1%) were 34-41 years, 17 (16.5%) were 42-49 years, and 2 (1.9%) were 50 years and above.

It is also depicted that 4 (3.9%) had no formal education, 6 (5.8%) had attained primary education, 9 (8.7%) had attained secondary school, and 23 (22.3%) had college certificates. Also, 17 (16.5%) had a diploma, 30 (29.1 percent) had a university degree, and 14 (13.4%) had a postgraduate degree. With regards to employment, most of the respondents were in informal employment, i.e., 65 (63.1%) and 38 (36.9%) were formally employed.

The table reveals that the majority of the respondents were widowed, i.e., 31 (30.1%), followed by those who were cohabiting, i.e., 29 (28.2%). The other marital statuses depict that 11 (10.7%) were single, 18 (17.5 percent) were married, and 14 (13.6%) were divorced.

Table 1. Socio-Demographic Data of Participants

Variable	Description	Frequency	Percent
Gender	Male	65	63.1
	Female	38	36.9
	Total	**103**	**100**
Age	18-25 Years	4	3.9
	26-33 Years	48	46.6
	34-41 Years	32	31.1
	42-49 Years	17	16.5
	50 years and above	2	1.9
	Total	**103**	**100**
Education level	No formal education	4	3.9
	Primary school	6	5.8
	Secondary school	9	8.7
	College certificate	23	22.3
	Diploma	17	16.5
	University degree	30	29.1
	Post graduate degree	14	13.4
	Total	**103**	**100**
Employment	Formally employed	38	36.9
	Informally employed	65	63.1
	Total	**103**	**100**
Marital status	Single	11	10.7
	Married	18	17.5
	Cohabiting	29	28.2
	Divorced	14	13.6
	widowed	31	30.1
	Total	**103**	**100**

Correlation Analyses

Table 2. Correlations amongst Variables

#	Variable	Mean	Std. Dev	N	1	2	3	4	5	6	7	8	9	10	11
1	Non-adherence to ART treatment	4.172	0.129	103	-	-	-	-	-	-	-	-	-	-	-
2	Gender	1.280	0.452	103	0.203	-	-	-	-	-	-	-	-	-	-
3	Age Group	2.660	0.869	103	0.367	0.344**	-	-	-	-	-	-	-	-	-
4	Education Level	3.290	1.234	103	0.575**	0.644**	0.208	-	-	-	-	-	-	-	-
5	Employment	2.570	0.787	103	0.021	0.0025	0.014	0.006*	-	-	-	-	-	-	-
6	Marital Status	2.250	1.031	103	0.261**	0.464**	0.630*	0.451**	0.297*	-	-	-	-	-	-
7	Individual Factors	4.167	0.445	103	0.599**	0.316*	0.091	0.203*	0.288**	0.125	-	-	-	-	-
8	Social-Cultural Factors	3.843	0.573	103	0.593**	0.197**	0.545*	0.140*	0.314**	0.522**	-0.020	-	-	-	-
9	Social-Economic Factors	4.241	1.214	103	0.308**	0.304	0.009*	0.306*	0.269*	-0.064	0.435*	0.029*	-	-	-
10	Environmental Factors	4.189	0.886	103	0.328**	0.276*	0.328*	0.100*	0.131*	-0.031	0.002	0.234*	0.582*	-	-
11	Health care provider factors	3.935	0.554	103	0.327**	0.166*	0.179*	0.038*	0.118*	0.122*	0.468*	0.282*	0.011*	0.201*	-

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

For the purposes of assessing the strength and bearing of associations among the research variables, Pearson correlation analysis was carried out. In table 2, the dependent variable (non-ART adherence) and independent variable (individual factors, social-cultural factors, social-economic factors, environmental factors, and health care provider factors) mean, standard deviations, and correlations are presented. All the correlations depicted are below 0.8, i.e. (low correlations), which gives an indication that multicollinearity is not a problem [17].

In addition, Table 2 gives an indication that ART treatment non-adherence is positively significantly correlated (all sig. ≤ 0.01) with each non-adherence dimension i.e., individual factors ($r = 0.599$), social-cultural factors ($r = 593$), social-economic factors (0.308), environmental factors ($r = 0.328$) and health care provider factors ($r = 0.327$). The effect sizes are generally medium based on Cohen's criteria i.e., small = 0.10 to 0.29, medium .30 to 0.49 and large = 0.50 to 1.00 [18]. The positive significant correlations give an indication that the higher the level of factors causing non-adherence, the higher the level of non-adherence to ART treatment.

Regression Analyses

Table 3. Hierarchical Regression Analyses

Variable	Model 1 Beta, t	Model 2 Beta, t	Model 3 Beta, t	Model 4 Beta, t	Model 5 Beta, t	Model 6 Beta, t	VIF
Control Variables							
Education Level	0.286*	0.277*	0.061	0.072	0.150*	0.172	
	2.706	0.160	1.049	1.249	3.129	4.125	1.361
Marital Status	0.211*	0.180	0.305*	0.307*	0.239**	0.228	
	1.999	3.496	4.854	0.037	0.262	0.250	1.524
Independent Variables							
Individual Factors	-	0.328***	0.292*	0.223*	0.313*	0.449*	
		5.213	2.791	2.195	0.343	0.367	1.107
Social-Cultural Factors	-	-	0.211*	0.268*	0.227**	0.468*	
			2.050	1.662	0.228	0.113	1.357
Social-Economic Factors	-	-	-	0.325***	0.197*	0.208*	1.701
				3.080	0.216	0.262	
Environmental Factors	-	-	-	-	0.289**	0.197	1.431
					0.461	0.216	
Health Care Provider Factors	-	-	-	-		0.318**	1.032
						0.233	
R	0.357	0.447	0.459	0.547	0.586	0.632	-
R Square	0.127	0.199	0.211	0.300	0.344	0.400	-
Adjusted R Square	0.105	0.168	0.169	0.253	0.333	0.384	-

***sig < 0.001 (0.1 percent); **sig < 0.01 (1 percent); *sig < 0.05 (5 percent); VIF = Variance Inflation factor

For the purposes of evaluating the ability of the multiple regression model (where individual factors, social-cultural factors, social-economic factors, environmental factors, and health care provider factors are the explanatory variables) to forecast non-ART treatment adherence (outcome variable) when controlling for education level and marital status, hierarchical regression analysis was carried out. Table 3 gives a depiction of the results with non-ART

treatment adherence as a dependent variable. The preliminary checks from Table 3 entail that multicollinearity is not of concern for the values for the VIF, i.e., the variance inflation factor values were less than 5 for both the control and independent variables [19, 20].

In the first Model, i.e., model 1, the base model with two control variables only, i.e., education level and marital status, is depicted. The control variables make a significant contribution that is of collective nature of adjusted multiple coefficients of determination (R-Square) of 10.5 percent and multiple correlation coefficient of (R) 0.357 representing a collective effect size that is minimal.

In the second model (Model 2), individual factors are added to the control variables, and collective effect that is of significant nature happens (adjusted R^2 of 16.8 percent from 10.5 percent), with R = 0.447 demonstrating a medium effect size that is of collective nature.

The individual's factors contributing to non-adherence are attributed to the belief of patients and their behaviours. For instance, patients who believe in ART will follow the stipulated guidelines provided by the health care provider. However, others tend not to believe in the medication and feel the need to submit it for other medication such as herbs and also resorting to prayers. For behaviours, the patients tend to have multiple sexual partners and have sex without protection. Also, they tend not to stop drinking and smoking. These findings resonate with those of Fisher [21].

In some situations, patients tend to forget to take their medication at the stipulated times. The forgetfulness is attributed to alcohol prolong working hours (among others). Also, mental health, depression, self-stigmatization, self-pity, and blaming oneself contribute to non-adherence to ART treatment. As such, H1, which hypothesizes that individual factors contribute to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients, has been supported.

In the third model, i.e., model 3, Social-cultural factors is added to the control variables and individual factors. A collective effect that is of significant nature happens (adjusted R^2 of 16.9 percent from 16.8 percent), with R = 0.459 demonstrating a medium effect size that is of collective nature.

Stigmatization and disclosure of one's status were the major contributors to ART treatment non-adherence. Stigmatization still exists as such patients who come for ART refill at the health center often go back without refilling if they find someone they know for fear of facing stigmatization when they go back in the community. Also, patients who do not reveal their HIV-positive status to the people close to them find it hard to take the medication at the stipulated time, as such, they can only take the medication in secret, and if someone is present, they are not able to take the medication. This problem also occurs when patients travel to visit other places and find it hard to take medication because other people are present [22, 23, 24]. As such, H2, which hypothesizes that social-cultural factors contribute to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients, has been supported.

In model four, in addition to control variables, individual factors, and social-cultural factors, social-economic factors is added. A collective effect that is of significant nature happens (adjusted R^2 of 25.3 percent from 16.9 percent), with R = 0.547 demonstrating a medium effect size that is of collective nature.

The economic status of the patient affects adherence in that patients who are limited financially often timed miss to follow up appointments due to lack of finances and that they are held because they doing that is to give them money, hence they would rather postpone the hospital appointment than the work they are doing. Also, not being able to interact with other positive patients and health personnel tends to increase self-stigmatization. As such, H3, which hypothesizes that social-economic factors contribute to non-adherence to Ant-Retroviral

Therapy (ART) treatment among HIV patients, has been supported.

In the fifth model i.e., model 5, in addition, to control variables, individual factors, social-cultural factors, and social-economic factors, environmental factors is added. A collective effect that is of significant nature happens (adjusted R^2 of 33.3 percent from 25.3 percent), with R = 0.586 demonstrating a medium effect size that is of collective nature.

The notable environmental factors include distance to the hospital weather conditions such as rainfall. It was notable that the patients who stay far from the hospital were most of the time non-adherent. In most of situations, they miss hospital appointments. Further, in the rain season, patients find it hard to travel and access medication at the hospital. As such, H3, which hypothesizes that environmental factors contributing to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients, has been supported.

In model six, in addition to control variables, individual factors, social-cultural factors, social-economic factors, and environmental factors, health care provider factors is added. A collective effect that is of significant nature happens (adjusted R^2 of 38.4 percent from 33.3 percent), with R = 0.632 demonstrating a medium effect size that is of collective nature.

The health care provider factors include unavailability of adequate health facilities and in the even that they are available, they are not well equipped. For instance, hospitals have to rely on much bigger hospitals for test results like viral load and liver function, which leads to test results taking long to come out. This tends to be difficult to convince the patients on the importance of ART since their VL results are not available to support the fact that ART is important for one's health. As such, some patients may decide to do away with ART and turn to traditional medicine. Also, it turns out to be a common norm for hospitals like NNGH for medical personnel to share a consultation room as such two or more patients are consulted simultaneously. This makes patients uncomfortable, and as a result, they shun appointments.

Also, health facilities rarely make follow ups on patients, which make patients feel they are not cared for, as such, they tend not to adhere to medication. These findings are in line with those of Wang and Wu [25]., such H5, which hypothesizes that health care provider factors contribute to non-adherence to Ant-Retroviral Therapy (ART) treatment among HIV patients have been supported.

Discussion

The study results give an indication that male respondents were more non-adherent than females from the demographics information were it is depicted that 63.1 percent were male while 36.9 were female. With regards to the factors influencing non-adherence, they were significantly and positively correlated i.e., individual factors (r = 0.599), social-cultural factors (r = 593), social-economic factors (0.308), environmental factors (r = 0.328) and health care provider factors (r = 0.327).

Individual factors were highly correlated with regard to other factors. The noted factors are attributed to self-stigmatization, forgetting to take medication, getting involved in risky behaviours. For instance, individuals tend to look down on themselves and blame themselves for being positive. As such, when they go for appointments and see the person they know, they turn back and miss the appointment, it being a refill. Others, due to having a lot of things to do and overworking, they end up forgetting to take the medication. For the behaviours, the patients tend to live a reckless life with multiple sexual partners, a life of over drinking, and drug abuse. These findings are similar to those of [26]. Altice and others pointed out that the major contributor to non-adherence are the personal factors of the patients.

With regards to social-cultural factors, stigmatization was noted to be a contributing factor as the respondents claimed that it still

existed. In addition, not all family members are understanding, one who is HIV positive is labeled to be a person who used to be promiscuous. As such, in the event that the patients are not able to access the medicine privately, they end up not taking the medication [27].

The social-economic factors mainly regard the patients' financial status as the patients having financial difficulties tend to have difficulties reaching the health facility, as such, they do not make it on the review stipulated dates. In addition, they are not able to afford the recommended meals. The weather, like rainfall especially, hinders the patients from reaching the health facility. Further, the medical personnel attitude and behaviour affect the adherence levels of the patients [28].

Conclusions

From the findings, it is concluded that that non-adherence of ART treatment at Nchanga North General Hospital in Chingola, Zambia is related to individual factors, social-cultural factors, social-economic factors, environmental factors, and health care provider factors. As such, the factors should not be worked on individually by all of them together. HIV-positive patients need care not just from friends and family members but also from the health personnel. Caring for patients has a likelihood of increasing ART adherence.

It is recommended that community adherence supporters should be trained, which had better include family members to promote ART adherence. Community adherence health education programmes should be developed to increase awareness. In addition, the ministry of health should ensure that antiretroviral (ARV) drugs are always available and for enough supply to the end-user to all public health facilities in Zambia to prevent non-adherence related to the short supply of the drugs.

Conflict of interest

Acknowledgement

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