

# Assessment of factors affecting adherence to antihypertensives in HIV clients at Chanyanya RHC, Kafue, Zambia.

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**Abstract:** *The Prevalence of hypertension is higher in people living with HIV in proportion to the general population. However, more than half of this population in Zambia do not have their blood pressure under control. The aim of this research was to assess the factors associated with poor adherence to antihypertensive treatment outcomes in HIV positive adults. We collected data from 29 respondents at Chanyanya Rural Health Centre via a semi structured questionnaire as an exploratory study design applying a quantitative approach. We determined the prevalence of medication adherence, patient-related and healthcare system related factors affecting adherence to antihypertensives. Overall, 64.3% of the respondents were non-adherent. We also noted that 82.1% of the respondents did not take their antihypertensives because they unavailable at their local clinic. They were only 17.9% of the healthcare providers spent more than 5 minutes explaining the disease to the clients on each visit. Riveting, 92.9% of the respondents preferred being attended to by the same clinician at every visit. On this basis, People Living with HIV and Hypertension should be attended to by the same trained clinician (in HIV and hypertension management) on every visit in rural healthcare settings to optimize effective client-provider relationships which can significantly improve the adherence outcomes. Further research should address policies to influencing brittle antihypertensives supply chains.*

**Key words:** *hypertension; HIV; adherence; blood pressure; Zambia*

## 1. INTRODUCTION :

High blood pressure (BP) is a major cause of death and disability worldwide causing an estimated 7.1 million deaths. Available data show that age-adjusted mortality, case fatality, and prevalence of disabling complications in Africa are similar to or higher than those measured in most high-income regions (Mensah, 2012)

Compared to the general population, the prevalence of hypertension is greater among those living with HIV. (Kearney et al., 2009). According to (Saman et al., 2013) medication adherence is the mainstay to good treatment outcomes while poor medication adherence has been established as a cornerstone contributor to morbidity and mortality in hypertensive patients. The World Health Organization (WHO, 2021) defines essential hypertension in adults using a systolic blood pressure threshold of 140 mm Hg and diastolic blood pressure of 90 mm Hg.

## 2. LITERATURE REVIEW :

### 2.1 HIV in Sub-Saharan Africa

The African region remains most severely affected, with nearly 1 in every 25 adults (3.4%) living with HIV and accounting for more than two-thirds of the people living with HIV worldwide (WHO, 2021). As of September 2020, Zambia attained the 90:90:90 UNAIDS HIV/AIDS Epidemic control targets. The percentage of viral load suppression amongst those on Anti-Retroviral Therapy (ART) is a strong reflection of good ART medication adherence. According to the ZAMPHIA 2021 report, the annual incidence of HIV among adults aged 15+ years in Zambia reduced to 0.31%, which corresponds to approximately 28,000 new cases of HIV per year among adults.

## 2.2 Hypertension in Sub-Saharan Africa

In 2019, over one billion people with hypertension (82% of all people with hypertension in the world) lived in low- and middle-income countries. Nearly half the people did not know they had hypertension and more than half of the people were not receiving the treatment that they need (WHO, 2021).

A meta-analysis and systematic review in sub-Saharan Africa highlighted a prevalence of hypertension at 30%. On average, 73% of hypertensive individuals were unaware of their hypertensive status; only 18% were receiving treatment; and only 7% had controlled blood pressure (Feven et al., 2015).

Data from the Zambia 2017 STEP wise Approach to non-communicable disease risk factor surveillance (STEPS) survey, 19% (which reflects 1.5 million) of the adult population have hypertension. Of the 1.5 million hypertensive adults 1.4 million do not have it under control. In a study from 46 rural government clinics in Zambia, the crude prevalence of hypertension by onsite measurement or reported use of antihypertensive medication was 23.1 % (Yan et al., 2015).

## 2.3 Hypertension in PLWHIV

HIV-infected adults on ART have a higher prevalence of hypertension when compared with HIV-uninfected individuals. A meta-analysis demonstrated that 35% of all HIV-infected adults on ART have hypertension, compared with an estimated 30% of HIV-uninfected adults. Among ART-experienced individuals >50 years, >50% have hypertension (Fahme et al., 2018).

In Zambia, hypertension prevalence among PLHIV was 15.1%. in 2022 and 62% had grade 2 hypertension and 27.9% had hypertensive urgency. Only 11.5% of PLWHIV with hypertension had an anti-hypertensive medication recorded in their electronic health record EHR, and of those, 64.6% were still hypertensive Jose et al., (2022). Data are scarce concerning the prevalence of hypertension in PLWHIV from rural areas in Zambia.

## 2.4 Factors influencing adherence in patients with chronic illnesses

Adherence is influenced by a variety of variables, which can be broken down into patient-related, drug-related, and healthcare-related variables. Age, gender, low socioeconomic status, the severity of the disease, the patient's inadequate understanding of the disease and the need for treatment, forgetfulness, the presence of psychological problems, particularly depression and co-morbid medical conditions, and a lack of social support are all factors that are related to the patient. Cost and medication side effects are two issues that are associated with drugs. It has been demonstrated that aspects of the healthcare system, including the type of medication prescribed, the number of pills taken daily, and the patient-provider interaction, have an impact on adherence in different populations (Ataman, 2015).

## 3. MATERIALS AND METHODS :

This was an exploratory study assessing factors affecting adherence to antihypertensives in People Living With HIV (PLWHIV) using a quantitative research approach. Briefly, this study was conducted at Chanyanya Rural Health Centre, a public-owned health facility in Kafue, Zambia. The population under study was above 18 years old People Living with HIV who were clinically diagnosed with hypertension receiving ART for 8 months or more. The study enrolled 28 participants using a census sampling method.

Data was collected in an interview with the respondents using a semi-structured questionnaire. The modified Hill Bone blood pressure compliance scale was used to measure adherence. Adherence on the modified Hill Bone scale will be defined as a score of less than 16, while non-adherence was scored as greater than or equal to 16.

Participants' socio-demographic characteristics including descriptive analyses were summarized in proportions, frequencies, graphs, means (standard deviation) tables, and charts depending on the distribution of data.

## 4. RESULTS :

### 4.1 Study population Baseline characteristics

**Table 1: sociodemographic characteristics of the study population**

Variable	Category	Frequency	Percent
Gender	Male	11	39.3
	Female	17	60.7
	Total	28	100.0

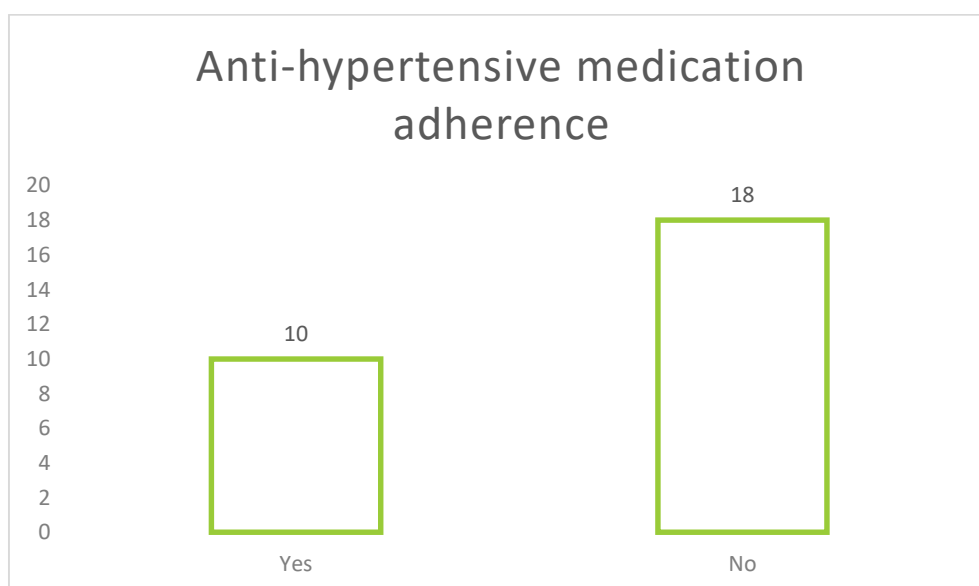
<b>Age in years</b>	35-44	6	21.4
	45-54	21	75.0
	>55	1	3.6
	Total	28	100.0
<b>Level of education</b>	Primary	22	78.6
	Secondary	5	17.9
	Tertiary	1	3.6
	Total	28	100.0
<b>Employment status</b>	Employed	11	39.3
	Unemployed	17	60.7
	Total	28	100.0

According to Table 1, the majority of the patients were female, 17 (60.7%), aged between 45 and 54 years, 21 (75%) had up to a primary level of education, 22 (78.6%), and were unemployed, 17 (60.7%).

In addition, all 28 clients were enrolled in ART which denotes 100% of the population. 28 out of 29 were virally suppressed according to the criteria mentioned above. This denotes a 96.5% viral suppression prevalence. Viral suppression in HIV management is a reflection of good ART adherence. Viral suppression was defined as having <30 copies/ml. 89.2% which is 25 out of 28 are on antihypertensive Monotherapy and on 10.8% which is 3 individuals out of 28 are on antihypertensive combination therapy. 100% of the population on Monotherapy is on nifedipine retard 20mg once daily.

#### 4.2 Prevalence of anti-hypertensive medication adherence in HIV-positive adults

The prevalence of anti-hypertensive medication adherence in HIV-positive adults was assessed using the modified Hill Bone adherence scale. Only 10 (35.7%) of the total HIV total 28 positive patients were adhering to anti-hypertensive medication. The results are shown in the chart below.



**Figure 2: Anti-hypertensive medication adherence in HIV-infected adults**

#### 4.3 Healthcare system-associated factors in achieving patient adherence

**Table 2: Healthcare system-related factors affecting antihypertensive medication adherence**

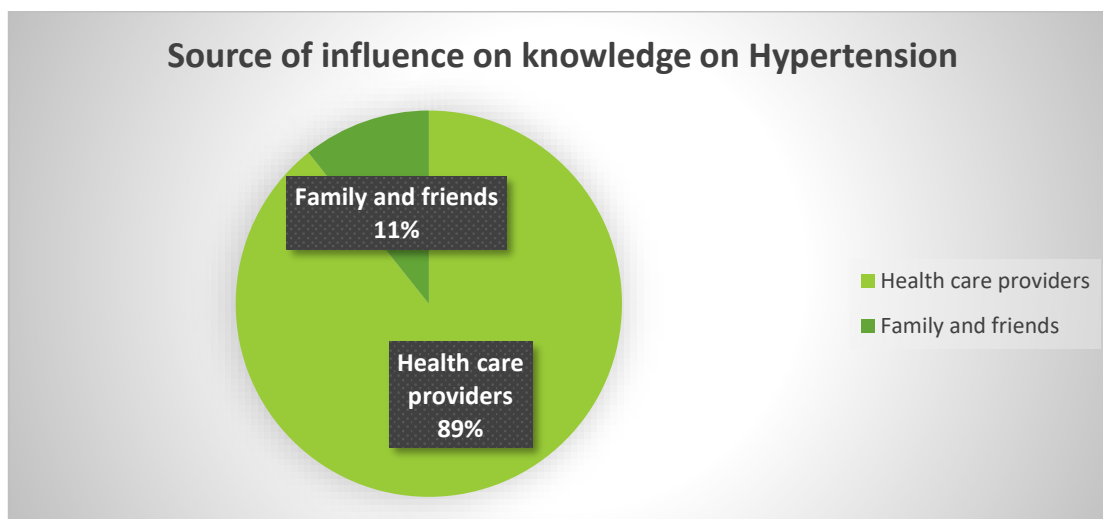
Statement	Response				Total
	Yes		No		
	N	%	n	%	
Necessity taking BP drugs for a lifetime	26	92.9	2	7.1	28

Necessity taking BP drugs every day	26	92.9	2	7.1
Knowledge of current BMI	2	7.1	26	92.9
Told how to take drugs	27	96.4	1	3.6
Preference seeing the same physician	26	92.9	2	7.1
Referred to a counselor/ nutritionist as part of hypertension management	1	3.6	27	96.4
Knows the name of the BP drug	8	28.6	28	71.4

The healthcare-related factors to hypertension drug adherence are shown in Table 2 above. According to the table, 26 (92.9%) of the patients understood the necessity of taking BP drugs every day and for a lifetime and also preferred seeing the same physician. 27 (96.4%) were told how to use drugs.

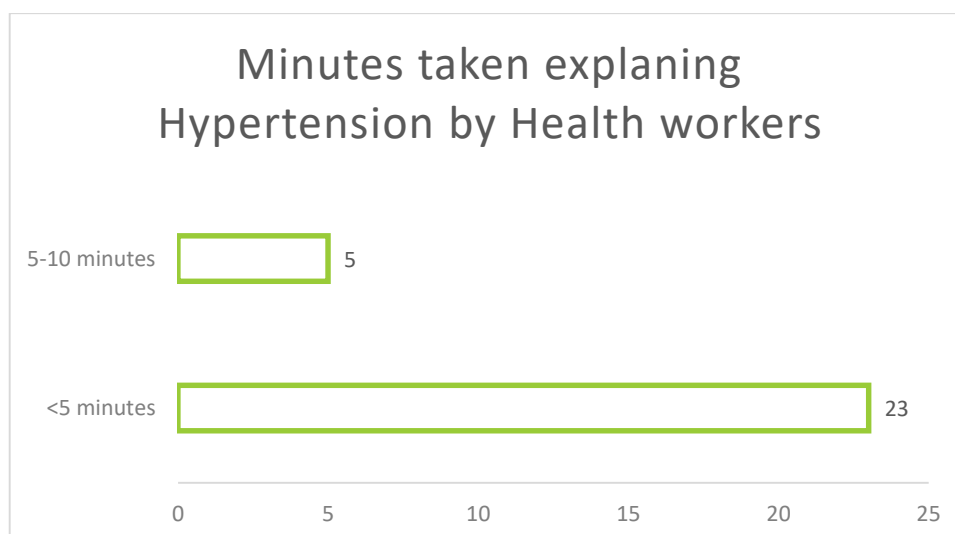
Only 2 (7.1%) knew their current BMI, 1 (3.6%) was referred to a counselor/nutritionist as part of hypertension management and 8 (28.6%) knew the name of the BP drug they were taking.

Regarding who influenced knowledge on taking hypertension drugs, healthcare providers had more influence, 25 (89%) compared to family and friends, 3 (11%) as shown in the pie chart below.



**Figure 3: Source of Influence on knowledge of hypertension**

The length of explanation by health care workers was assessed by asking the respondents how long it took for the health workers to explain taking BP drugs. The responses are shown in the chart below;



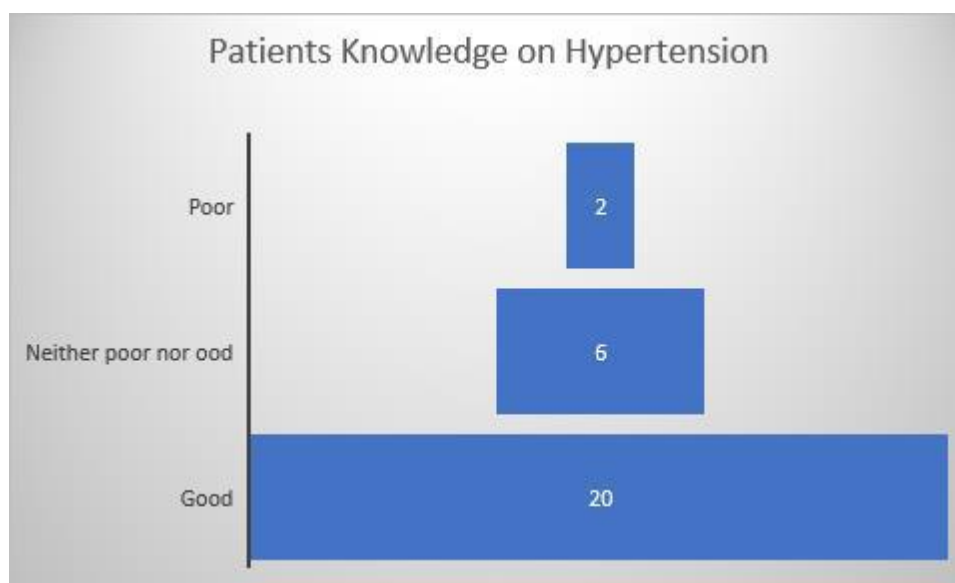
**Figure 4: Explanation of longevity of hypertension in People Living with HIV and Hypertension**

From Figure 3 above, the respondents indicated that most of the health workers, 23 (82.1%) spent less than 5 minutes explaining to the patients about hypertension.

**Table 3: Number of antihypertensive tablets taken by the patient daily**

Number of BP tablets	Frequency	Percent
1	25	89.3
2	2	7.1
3	1	3.6
Total	28	100.0

Table 3 above shows that 25 (89.3%) of the patients indicated that they took hypertensive drugs once a day.



**Figure 5: Participants' knowledge of hypertension**

Figure 5 above shows that the knowledge of People Living with Hypertension on hypertension stood at 71.4%.

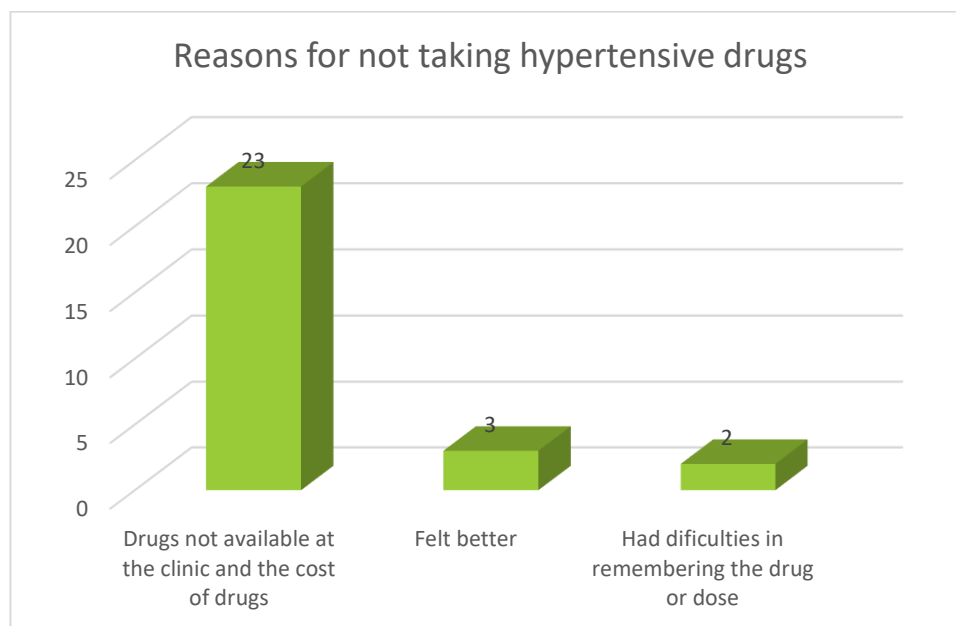
**4.4 patient-related and healthcare system-related factors associated with poor adherence to anti-hypertensive drugs in HIV-positive adults**

Patient-related and healthcare system-related factors associated with poor adherence to anti-hypertensive drugs in HIV-positive adults included the ability to BP buy drugs not available at the clinic, the Reason for not taking anti-hypertensive drugs, alcohol consumption, and smoking.

**Table 4: Patient-related factors of adherence**

Statement	Response				Total
	Yes		No		
	n	%	n	%	
Always able to buy drugs not supplied by the clinic	3	10.7	25	89.3	28
Alcohol Consumption	5	17.9	23	82.1	
Tobacco Smoking	1	3.6	27	96.4	

The reasons why People Living with HIV and Hypertension were not taking their anti-hypertensive drugs as prescribed are shown in the chart below;



**Figure 6: Reasons for not taking antihypertensive drugs**

Most of the respondents 23 (82.1%) recorded that the major reason for not taking hypertensive drugs was that the drugs were not available at the clinic and the cost of the drug.

## 5. DISCUSSION:

Compared to the general population, the prevalence of hypertension is greater among those living with HIV (Kearney et al., 2009). The results from this study indicate that there was poor adherence to antihypertensives among PLWHIV; 64% (non-adherent) and only 36% (were adherent). Because of a small sample size, the researcher was limited in applying the analytic measures of association to critique the results. Nonetheless, the descriptive statistics and discrepancy reflect an essential amount of data on the factors affecting adherence in this study population.

Studies including one done by Kerse et al., (2014) have concluded that primary consultations with higher levels of patient-reported physician-patient concordance were associated with one-third greater medication compliance. An emphasis on understanding and facilitating agreement between the physician and the patient may benefit outcomes in primary care. This study found that the longer time taken to explain the condition (> 5 minutes) to the client reflected 100% adherence.

In addition, this analysis reviewed that 82.9% of the clients responded that the health care providers took less than 5 minutes to explain to them their condition (hypertension). Moreover, it is important to note that Despite a large population of 89.3% of the correspondents claiming their impact on hypertension knowledge was influenced by the health care practitioners, 53.6% (of the 89.3%) were non-adherent. Hypertension, just like HIV/AIDS is a chronic condition requiring lifelong treatment, and good adherence fostered by good patient education and healthcare provider-to-client interactions and relations is a vital part of the mainstay to good treatment outcomes (Saman et al., 2013). This is a gap that may need in service and pre-service training of healthcare practitioners.

Of note, this study found that 96.4% of the respondents were never referred to a nutritionist or an adherence counselor. a study by Hovell et al., (2013) concluded that lay counseling was associated with a reduction of -10mmgh in systolic blood pressure and of -7mmgh in diastolic blood pressure (p less than 0.05) and medication adherence increased from 68% to 84%. The main goal of promoting adherence to (and in) hypertension management is to achieve hypertension control. Lifestyle changes to achieve hypertension control include but are not limited to reduction in body weight, adopting a DASH diet, reduction in dietary salt intake, exercise, and increased intake of leafy green vegetables, which are of high affinity to the work of a nutritionist. However, as in other SSA countries, there are shortages of healthcare workers Kolie et al., (2023) in Zambia and more particularly the rural healthcare centers. Consequently, studies and recommendations from studies such as this are crucial to strengthening health management systems in Zambia.

Results from this study highlighted that all of those participants who knew their BMI which was 7.1% of participants under this category were adherent. 64.3% of the total study population who did not know their BMI or waist circumference were non-adherent. These results contradict the claims of Victoria et al., (2019) that concluded that there was no significant correlation between knowledge of the disease and adherence scores after the intervention. Therefore, a more plausible explanation for this finding would be that more care was shown and more time was spent in explaining the disease to the client. Knowledge of the BMI requires height measurement which is an extra anthropometry as compared to the other variable required, weight, which is part of the mandatory physical examination (vital signs) for every client at every clinic visit. This also reflects a 100% rate of adherence in the population in which the health care providers spent >5 minutes explaining the disease to the client.

In addition, knowledge of one's BMI and/or waist circumference informs the client on how much weight or abdominal fat they must lose to reduce the cardiovascular risk. Consequently, this gives the client a commitment and a goal to achieve which may ultimately translate into good hypertension management adherence.

On the other hand, this finding showcases a gap in the healthcare system. Only 7.1% were aware of the BMI, and weight loss is a very important lifestyle change to adopt in hypertension management. According to Neter et al., (2003), each kilogram of weight reduces both the systolic and diastolic blood pressure by 1 mm Hg.

Weight control in the population is of the utmost importance to prevent an increase in the prevalence of hypertension and consequently, of cardiovascular morbidity and mortality (Neter et al., 2003). This is where knowledge of BMI and waist circumference is critical, it advises the client how many kilos they must lose. As a result, this study suggests that all hypertensive PLWHIV must have their height measured and made known to them at least on one visit by their healthcare providers as part of the integration of hypertension management into HIV care (then, the BMI can always be calculated with their corresponding weight).

In addition, 89.3% of the respondents agreed that antihypertensive drugs are only found some of the time (very rare) at the local facility and the remaining population agreed that their drugs are not found at all. None of the respondents recorded that their antihypertensive drug is available clinically all the time or at least, most of the time. This is not surprising as literature has shown that some of the reasons for poor hypertension control in Sub-Saharan Africa are lack of access to medicines. The corresponding challenge is, 89.3% of the correspondents were unable to buy the clinically unavailable drugs all the time, consistently.

We also note that 96.4% of the participants received instruction on how to take their medication and only 60.7% of this population were adherent. 92.8% of the respondents claimed that they believe it is essential to take their blood pressure medications every day for the rest of their lives and 60.7% of this population were non-adherent, 71.4% of participants claimed that their knowledge of hypertension was good and over half of this category was non-adherent. These findings from this research are consistent with a study by Victoria et al., (2019), which concluded that there was no significant correlation between knowledge of the disease and adherence scores after the intervention.

This study found that 89.3% of the population took only one drug per day. When counterchecked with the patient files, these clients only took one drug type too which reflected 96% of the patients taking Monotherapy. No one recorded missing doses because of the drug(s) side effects. Previous research has indicated that adherence is influenced by the side effects, dosing frequency, and routes of administration (Tedesco, 2016). Regardless of the viability of the above-mentioned factors affecting adherence, this study found no significant correlation of these variables with the adherence outcome in this study population.

Though our study only focused on the association of drug intake frequency and side effects with adherence, a large percentage of the study population on monotherapy raises. This is because, research has shown that poor hypertension control is prevalent with Monotherapy (Tedesco, 2016). Therefore, this may imply that monotherapy drugs are the only drugs available at rural healthcare centers, and/or the healthcare providers are unaware of the benefits of combination therapy in achieving hypertension control. Henceforth, future research must amplify the effectiveness of antihypertensive monotherapy in PLWHIV in Zambia.

We also note that 92.9% of the respondents preferred being attended to by the same clinician at every visit. This is vital information to serve as an action point as in some studies more than 63% of patients reported high adherence when drugs were prescribed by their family physician Natarajan et al., (2007).

The major limitation of this study is that there is limited generalizability. The data was collected from a small sample size, and therefore the findings may not be applicable on a larger scale. The sample was drawn from a single clinic. However, the examination of the intersection of HIV management and comorbidity management was a major strength of this study.

## 6. CONCLUSION:

In summary, this study found that there is poor adherence and poor integration of hypertension care in HIV management at Chanyanya Rural Health Centre as 64% of the study population were non-adherent to antihypertensives.

The main barriers to adherence are a lack of constant medication availability at the rural health center, ineffective client-provider relationships, and knowledge gaps on hypertension management from the side of the healthcare providers.

## 7. RECOMMENDATIONS :

We recommend that future studies must amplify the extent of the public-owned facility's antihypertensive brittle supply chain on adherence. Such studies help inform public health policy aimed at making anti-hypertensives readily available for People Living with HIV and Hypertension.

It is also critical that People Living with Hypertension and HIV should be attended to by the same trained clinician (in HIV and hypertension management) on every visit and that Non-Communicable Diseases lifestyle changes, hypertension management Standard Treatment Guidelines, and patient education posters should be stuck in the reception consultation rooms. This will enable our clients to experience the family doctor kind of care and optimize effective client-provider relationships which can significantly improve the adherence outcomes.

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