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Factors Associated with Antiretroviral Therapy Defaulting among Adult Patients Receiving Care at Chikankata Mission Hospital, Chikankata District, Zambia

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Abstract

Background: Defaulting on antiretroviral therapy has been identified as the most important factor contributing to the antiretroviral therapy failure rate. This study aimed to investigate factors associated with defaulting on antiretroviral therapy among adult patients receiving care at Chikankata Mission Hospital antiretroviral therapy clinic. **Method:** Cross-sectional analytical study on 385 participants selected by a computer generated random numbers technique of simple random sampling from among the patients receiving antiretroviral therapy at Chikankata Mission Hospital. Data collected were processed and analysed using Statistical Package for Social Science version 27. Univariate and backward multivariable logistic regression analysis was performed to identify factors associated with antiretroviral therapy defaulting. The level of significance was set at 5% with a confidence level of 95%. **Results:** Over half (58.4%) of the study participants defaulted on antiretroviral therapy. About 65.8% of study participants indicated improved health as the reason they defaulted on antiretroviral therapy. Most participants indicated that it was important to always go for antiretroviral therapy services (Adjusted Odds Ratio 1.95; 95% Confidence Interval: [1.14 - 3.33], p = 0.015). Very few participants indicated poor family support for antiretroviral therapy services (Adjusted Odds Ratio 4.08; 95% Confidence Interval: [2.02 - 8.23], p < 0.001). Most participants indicated long awaiting time at a facility (Adjusted Odds Ratio 2.08; 95% Confidence Interval: [1.06 - 4.07], p = 0.032). Participants who informed the antiretroviral therapy clinic when they had no money for transport were less likely to default on antiretroviral therapy (Adjusted Odds Ratio 0.47; 95% Confidence Interval: [0.27 - 0.82], p = 0.007). **Conclusion:** Defaulting on antiretroviral therapy continues to be a significant problem and

needs to be addressed as a matter of priority. More counselling and awareness-raising programmes are required to improve knowledge and understanding on the importance of attending scheduled antiretroviral therapy clinics and services as well as the consequences of defaulting on antiretroviral therapy.

Keywords

Defaulting, Antiretroviral Therapy, Human Immunodeficiency Virus, Acquired Immune Deficiency Syndrome

1. Background Information

Human immunodeficiency virus (HIV) remains a major global public health concern, with approximately 37.7 million people living with HIV in 2020 [1]. Approximately 680,000 people died from HIV globally in 2020. The Joint United Nations Programme on HIV/AIDS [1] established the 95-95-95 targets in 2014. By 2030, the goal is to diagnose 95% of all HIV-positive people, provide antiretroviral therapy (ART) to 95% of those diagnosed, and achieve viral suppression in 95% of those treated [1]. Despite the fact that ART reduces viral load to a very low level, there are cases of treatment failure in which viral load suppression is not achieved. ART defaulting has been identified as the key contributing factor to ART failure and there are factors contributing to defaulting: perceived good health, poverty, drug side effects; lack of family support, stigma, and distance to health facility, poor attitude of health care workers [2]. Defaulting from ART has serious consequences, including the development of viral resistance, treatment failure, and increased risks of disease progression, but little is known about the factors that contribute to ART defaulting. About 1,157,668 people living with HIV (PLHIV) in Zambia were taking antiretroviral medication by the end of March 2021 [1]. To achieve a 95 percent level of antiretroviral medicine dose adherence and maintain viral load suppression need to address factors associated with ART defaulting [1]. ART therapy has been found to reduce mortality and HIV transmission among individuals who remain on treatment and adhere on ART therapy all the time [3].

2. Specific Objectives

To determine the prevalence of defaulting from antiretroviral therapy among adult HIV patients receiving care at Chikankata Mission ART clinic and to identify factors associated with defaulting from antiretroviral therapy among adult HIV patients receiving care at Chikankata Mission Hospital ART Clinic.

3. Material and Methods

A cross-sectional analytical design was used in order to gain more information

about the characteristics within a particular field of study [4]. This study was conducted from November 2022-January 2023 at Chikankata Mission General Hospital, a public hospital located in a rural area in Chikankata district of Southern Province. The hospital serves a catchment population of over 100,000 people. The hospital is located 120 km east of Lusaka the capital city of Zambia. The study population consisted of adult HIV patients receiving ART at Chikankata Mission Hospital ART Clinic.

The 385 HIV participants on ART were calculated using a single population proportion formula considering the proportion of 50% if the true prevalence is unknown and a 5% margin of error formula by Cochran. Ethical clearance: The University of Zambia Biomedical Research Ethical Committee (REF. No. 3344-2022) and National Health Research Authority of Zambia (REF No. NHRAR-R-1237/17/10/2022), written permission from Chikankata Mission Hospital Management.

A computer generated random numbers technique of simple random sampling was used for the sample (385 participants) of HIV patients on ART. Participants were contacted and interviewed using a semi-structured interview schedule.

On validity, questionnaires and format was piloted-tested for clarity and ensured by asking simple clear and concise questions that were uniform to all the study respondents. The reliability was ensured by use of semi-structured interview schedule and researcher administered the questionnaire and physical interviews. The same interview schedule and method of collecting data were used on all study participants.

Eligibility: adult HIV patients who received ART at Chikankata Mission Hospital ART Clinic, were present at the time of study and consented to be in the study. Study participants who were not eligible: adult HIV patients on ART who were critically ill at the time of data collection and adult HIV patients on ART who were on ART treatment for less than 2 weeks.

Patients on ART therapy were contacted and interviewed in person. All PLHIV who met the inclusion criteria were informed and explained about the study's objective, methodology, and informed consent process. In this regard, prior to participating in the study, respondents provided their individual verbal and written informed consent.

Data collected was processed and analysed using SPSS version 27. Univariate and backward multivariable logistic regression analysis was performed to identify factors associated with ART defaulting. The level of significance was set at 5% with a confidence level of 95%. Therefore, a p-value < 0.05 was considered statistically significant and Hosmer-Lemeshow test.

4. Findings

This section outlines the results of the study. The results are presented according to the objectives. The sections include socio-demographic characteristics, identi-

fied factors associated with defaulting from antiretroviral therapy among adult HIV patients and prevalence of defaulting from antiretroviral therapy among adult HIV patients receiving care at Chikankata Mission ART clinic.

4.1. Socio-Demographic Characteristics of the HIV Patients

This section represents respondent's socio-demographic data which include gender, sex, marital status, religion, employment status and level of education for HIV clients on ART at Chikankata Mission Hospital ART Clinic (Table 1).

Table 1 presents a table with frequency and percentages on Socio-Demographic Characteristics of patients at Chikankata Mission Hospital ART Clinic. The study assessed 385 participants on socio-demographical factors contributing to HIV clients defaulting on ART and the above table presents results on frequency and percentages. Table 1 shows (60.5%, n = 223) of study participants were female. For age, (40.5%, n = 156) of study participants were between 40 and 49 years old and majority (55.3%, n = 233) of study participants were married. More than half (67.0%, n = 258) of study participants had gone up to primary school level. Majority (72.2%, n = 280) of study participants were unemployed and on the religion all the participants were Christians (100%, n = 385). Majority (71.9%, n = 277) of study participants had an estimated monthly income of less than K100.

4.2. Individual Factors of People Living With HIV

This section presents the information on the individual factors that includes transport costs and attitude of the participants towards ART services Chikankata Mission Hospital ART clinic. Attitude of people living with HIV towards ART services at Chikankata Mission Hospital ART Clinic include action taken by client when experiencing any adverse effects of ARVs, action taken by clients when no transport money to the health and importance of going for ART services all the time (Table 2).

Table 2 presents a table with frequency and percentages at Chikankata Mission Hospital ART Clinic on transport costs to the healthcare facility where participants received their ART services and attitude of PLWHA towards ART services (action taken when experiencing any of adverse effects of ARVs, action taken when there is no transport money to go for ART services and importance of going for ART services all the time). On transport costs to the health facility was expensive for most participants (70.40%, n = 271). Majority (71.9%, n = 276) of study participants returned to the ART clinic when experienced adverse effects of ARV while (68.3%, n = 263) of study participants informed the ART clinic when they did not have transport money for their ART services.

4.3. Interpersonal Factors of the HIV Patients

This section presents data on interpersonal factors on family support towards ART services at Chikankata Mission Hospital ART Clinic (Table 3).

Table 1. Socio-demographic characteristics of patients at Chikankata Mission Hospital ART Clinic (n = 385).

Characteristic	Frequency (n)	Percentage (%)
Sex		
Male	152	39.5
Female	233	60.5
Age of respondents		
20 - 29	30	7.8
30 - 39	79	20.5
40 - 49	156	40.5
Above 50	120	31.2
Marital status		
Married	213	55.30
Single	66	17.10
Divorced	55	14.30
Widowed	51	13.2
Level of Education		
Primary	258	67.0
Secondary	89	23.1
Tertiary	5	1.3
Never been to School	33	8.6
Occupation		
Formal employment	11	2.9
Self-employment	60	15.6
House wife	34	8.8
Unemployed	280	72.7
Religion		
Christianity	385	100
Estimated monthly income		
Less than K100 (low income)	277	71.9
Between K100 to K3000 (Medium income)	103	26.8
Above K3000 (High income)	5	1.3

Table 2. Transport cost to the health facility and attitude of people living with HIV towards ART services at Chikankata Mission Hospital ART Clinic (n = 385).

Characteristic	Frequency (n)	Percentage (%)
Transport cost to the health facility		
Affordable	114	29.6
Expensive	271	70.4
Action taken when experiencing any of adverse effects of ARVs		
Seeing traditional healer	38	9.9
Seeing a religious leader	70	18.2
Going back to the ART clinic	276	71.9
Action taken when there is no transport money to go for ART services		
Stay at home	116	30.1
Inform the ART clinic	263	68.3
Go for drinking alcohol	6	1.6
Importance of going for ART services all the time		
Very important	147	38.2
Somewhat important	172	44.7
Somewhat unimportant	59	15.3
Not important at all	7	1.8

Table 3. Family support on HIV clients towards ART services to prevent defaulting on ART at Chikankata Mission Hospital ART Clinic (n = 385).

Characteristic	Frequency (n)	Percentage (%)
Family support towards ART services		
Excellent	67	17.4
Good	131	34
Poor	187	48.6

Table 3 presents a table with frequency and percentages at Chikankata Mission Hospital ART Clinic on family support on HIV clients towards ART services to prevent defaulting on ART at Chikankata Mission ART clinic. Table 3 illustrates that less than half (48.6%, n = 187) had poor family support while as little as (17.4%, n = 67) hand excellent family support.

4.4. Institutional Factors of HIV Patients

This section presents the institutional factors such as time taken by HIV clients

to receive ART services and perceived attitude of health workers towards HIV clients at Chikankata Mission Hospital ART Clinic. Perceived attitude of health workers by HIV clients include: perceived reception by the health workers, pharmacist and nurses being rude on duty when HIV clients are accessing ART services. This section also presents results on health workers treating HIV clients with respect and provision of quality ART services perceived by HIV clients at Chikankata Mission Hospital ART clinic (Table 4).

Table 4 presents a table with frequency and percentages on time taken to be attended to at ART clinic and perceived attitude of health worker by clients at ART Clinic (perceived reception by the health workers at the ART clinic, pharmacists and nurses being rude on duty, health workers treating HIV patients

Table 4. Time taken for HIV Clients to be attended to for ART services and attitude of health workers towards HIV clients at Chikankata Mission Hospital ART Clinic (n = 385).

Characteristic	Frequency (n)	Percentage (%)
Time taken to be attended to at ART Clinic		
Within 45 minutes	55	14.3
More than 45 minutes	330	85.70
Perceived reception by the health workers at the ART clinic		
Excellent	75	19.5
Good	218	56.6
Bad	92	23.9
Pharmacists on duty are rude		
Yes	66	17.1
No	319	82.80
Nurses on duty are rude		
Yes	72	18.7
No	313	81.3
Treated with respect by Staff members at ART clinic		
Yes	271	70.4
No	114	29.6
Perceived quality of ART services		
Excellent	105	27.3
Good	226	58.7
Poor	54	14.1

with respect at the ART clinic and perceived quality of ART services at Chikankata Mission Hospital ART clinic). On waiting time at the health facility more than three quarters (85.7%, n = 330) of the study participant had to wait for more than 45 minutes to receive ART services at Chikankata Mission Hospital's ART clinic. On perceived attitude of Health Worker by clients at ART Clinic participants were asked how they felt about the reception they received from the health workers at the ART clinic when using their ART services and (56.6%, n = 218) of study participants described the services as good. Table 4 also indicated (82.8%, n = 319) of study participants disagreed that the pharmacists on duty were rude to them, (81.3%, n = 313) of study participants disagreed that the nurses on duty were rude. Over half (70.4%, n = 271) of study participants agreed that staff treated them with respect when receiving ART services at their clinic. Majority (58.7%, n = 226) of the study participants rated the establishment of ART services at Chikankata Mission Hospital's ART Clinic as good.

4.5. Community Factors of HIV Patients

This section presents data on the distance covered by people living with HIV when coming for ART services, perceived family/community support on people living with HIV on ART and perceived community treatment (societal stigma) on HIV clients on ART at Chikankata Mission Hospital ART Clinic (Table 5).

Table 5 outlines the findings on the table with frequencies and percentages on distance to the health facility, family support and perceived community treatment (societal stigma) on HIV clients at Chikankata Mission Hospital ART clinic. More than three quarters (76.1%, n = 293) of study participants stayed more than 10 km away from the health facility. On family member know the HIV status

Table 5. Distance to the health facility, family support and perceived community treatment (societal stigma) on HIV clients at Chikankata Mission Hospital ART clinic (n = 385).

Characteristic	Frequency (n)	Percentage (%)
Distance from home to the ART clinic		
Less than 5 km	92	23.9
Over 5 km	293	76.1
Family member know the HIV status		
Yes	251	65.2
No	134	34.8
Community Treatment of people on ART (societal stigma)		
Excellent	65	17
Good	200	52.2
Bad	120	30.8

of their HIV client (65.2%, n = 148) of study participants indicated that relatives and partners knew that they were on ART. Half (52.2%, n = 200) of study participants were treated well by the community upon knowing that they were HIV positive.

4.6. Prevalence of HIV Clients Defaulting on Antiretroviral Therapy

This section presents results on the prevalence of HIV clients defaulting on ART and reasons for defaulting on ART at Chikankata Mission Hospital ART Clinic. Among the reasons presented include: perceived improved health, self-stigma and mobility (Table 6).

Table 6 shows frequency and percentage of HIV clients defaulting from antiretroviral therapy and reasons for HIV clients defaulting on ART (perceived improved health, self-stigma and mobility) at Chikankata Mission Hospital ART clinic. This table shows (58.4%, n = 225) of study participants had previously defaulted on ART at Chikankata Mission Hospital ART clinic. Majority (65.8%, n = 148) of study participants indicated that their health had improved.

4.7. Factors Associated with Defaulting from Art among Adult HIV Patients

This section presents results on logistic regression analysis at both univariate and multivariable levels. All the independent variables were included in the model regardless of the significance level (Table 7).

Univariate and backward multivariable logistic regression analysis was performed to identify significant factors associated with defaulting from antiretroviral therapy among adult patients. Results from the univariate analysis show that transport cost, family Support, waiting time, distance to ART clinic, action when experiencing adverse effects, action when no transport money, important of going for ART services and perceived reception by the health workers at the ART clinic were associated with defaulting on ART among participants ($p < 0.05$).

Table 6. Prevalence of defaulting from antiretroviral therapy among adult patients at Chikankata Mission Hospital ART Clinic (n = 385).

Characteristic	Frequency (n)	Percentage (%)
HIV Clients defaulting from antiretroviral therapy		
Yes	225	58.4
No	160	41.6
If defaulted on ART please give reasons for defaulting on ART		
Perceived Improved Health	148	65.8
Self-Stigma	26	11.6
Mobility	51	22.7

Table 7. Factors associated with defaulting on ART among adult HIV patients at Chikankata Mission Hospital ART Clinic (n = 385).

Variable	Univariate estimates			Multivariable estimates		
	cOR	95% CI	P-value	aOR	95% CI	P-value
Sex						
Male	**Ref**			**Ref**		
Female	0.87	0.57, 1.32	0.503			
Age of the respondents						
20 - 29	**Ref**			**Ref**		
30 - 39	1.39	0.59, 3.28	0.448			
40 - 49	1.29	0.59, 2.85	0.526			
Above 50	0.74	0.33 - 1.66	0.463			
Marital status						
Married	**Ref**			**Ref**		
Single	1.78	0.99, 3.22	0.055			
Divorced	1.08	0.59, 1.97	0.806			
Widowed	0.87	0.47, 1.61	0.661			
Level of Education						
Primary	Ref					
Secondary	1.24	0.76, 2.03	0.428			
Tertiary	1.15	0.19, 7.00	0.109			
Never been to School	1.34	0.63, 2.84	0.379			
What do you do for a living (Employment)						
Formal employment	**Ref**			**Ref**		
Self-employment	0.56	0.14 - 2.34	0.428			
House wife	0.30	0.07 - 1.31	0.109			
Unemployed	0.55	0.14 - 2.10	0.379			
Estimated monthly income						
Less than K100 (low income)	**Ref**			**Ref**		
Between K100 to K3000 (Medium income)	0.81	0.51, 1.28	0.362			
Above K3000 (High income)	2.72	0.3, 24.61	0.374			

Continued

Transport cost to the health facility						
Affordable	**Ref**			**Ref**		
Expensive	2.00	1.28, 3.12	**0.002**			
Family Support						
Excellent	**Ref**			**Ref**		
Good	1.63	0.88, 3.01	0.122	1.13	0.56, 2.25	0.74
Poor	7.06	3.82, 13.06	**<0.001**	4.08	2.02, 8.23	**<0.001**
Time taken to be attended to						
Within 45 minutes	**Ref**			**Ref**		
More than 45 minutes	3.15	1.73, 5.73	**<0.001**	2.08	1.07, 4.07	**0.03**
Distance from home to the ART clinic						
Less than 5 km	**Ref**			**Ref**		
Between 5 and 10 km	1.62	0.92, 2.85	0.96			
Over 10 km	2.03	1.22, 3.36	**0.006**			
Action taken when experiencing adverse effects						
Seeing traditional healer	**Ref**			**Ref**		
Seeing a religious leader	1.03	0.42 - 2.54	0.946			
Going back to the ART clinic	0.36	0.18 - 0.83	**0.015**			
Action taken when there is no transport money						
Stay at home	**Ref**			**Ref**		
Inform the ART	0.29	0.18, 0.48	**<0.001**	0.47	0.27, 0.82	**0.007**
Go for drinking alcohol	0.29	0.06, 1.52	0.142	0.18	0.03, 1.03	0.054
Importance of going for ART services all the time						
Very important	**Ref**			**Ref**		
Somewhat important	3.01	1.90, 4.76	**<0.001**	1.95	1.14, 3.33	**0.02**
Somewhat unimportant	4.38	2.23, 8.57	**<0.001**	1.63	0.74, 3.58	0.23
Perceived reception by the health workers at the ART clinic						
Excellent	**Ref**			**Ref**		
Good	2.96	1.70, 5.13	**<0.001**			
Bad	6.36	3.23, 12.54	**<0.001**			
Pharmacists are rude						
Yes	**Ref**			**Ref**		
No	0.35	0.19, 0.65	<0.001			

Continued

Nurses on duty are rude				
Yes	**Ref**			**Ref**
No	0.70	0.41, 1.20	0.193	
Treated with respect by Staff members at ART clinic				
Yes	**Ref**			**Ref**
No	1.47	0.93, 2.31	0.96	
Perceived quality of ART services				
Excellent	**Ref**			**Ref**
Good	2.63	1.64, 4.24	**<0.001**	
Poor	3.80	1.86, 7.76	**<0.001**	
Family/community member know the HIV status				
Yes	**Ref**			**Ref**
No	1.92	1.24, 2.99	0.004	
Treatment from community member				
Excellent	**Ref**			**Ref**
Good	1.72	0.98, 3.03	0.061	
Poor	3.95	2.08, 7.50	**<0.001**	

cOR = Crude Odds Ratio, aOR = Adjusted Odds Ratio, CI = Confidence interval.

After adjusting for other variables, adults who informed the ART clinic when they had no money for transport were 0.47 times less likely to default on ART than adults who simply stayed at home when they had no money for transport (AOR 0.47; 95% CI: [0.27 - 0.82], p = 0.007). Adults who thought it was somewhat important to always go to ART services were 1.95 times more likely to default on ART than adults who thought it was very important to always go to ART services (AOR 1.95; 95% CI: [1.14 - 3.33], p = 0.015). Participants who reported poor family support for ART services were 4.08 times more likely to default on ART compared with those who reported excellent family support for ART services (AOR 4.08; 95% CI: [2.02 - 8.23], p < 0.001). In addition, participants who reported taking more than 45 minutes to be seen at the ART clinic were 2.08 times more likely to default on ART than those who were seen within 45 minutes (AOR 2.08; 95% CI: [1.06 - 4.07], p = 0.032) (Table 7).

5. Discussion

The findings were discussed according to the set objectives of the study to determine the prevalence of defaulting from antiretroviral therapy among adult

HIV patients and to identify factors associated with defaulting from antiretroviral therapy among adult HIV patients receiving care at Chikankata Mission Hospital ART Clinic.

5.1. Socio-Demographic Characteristics

This study revealed that women made up the majority of the study participants on ART defaulting among adult HIV patients receiving care at Chikankata Mission Hospital ART clinic. Out of 385 participants (60.5%, n = 233) were women while (39.5%, n = 152) were men. These findings are similar with studies conducted in different parts of the world. For instance, Stephen *et al.* (2021) [5] conducted a study on defaulting from antiretroviral therapy and their prevention in Nigeria and found that the majority of the respondents in their study were women while the minority were males. Another study by Mekonnen, N. *et al.* (2019) [6] in Ethiopia on Incidence and predictors of lost to follow up among HIV infected (HIV patients defaulting on ART) revealed that out of 569 participants (60.1%, n = 324) were females while (43.1%, n = 245) were males. Another similar research conducted by Kalayu, G. and Tomas, Z. (2021) [7] in Ethiopia on Antiretroviral Therapy Default and Associated Factors among PLWHA revealed that (54%, n = 130) were females while (46%, n = 130) were males. However, these findings revealed contradict those of another Chinese study which found that males made up the majority of study participants. Liao, B. *et al.* [8] conducted a study on Analysis of factors associated with dropping-out from HIV antiretroviral therapy (Defaulting on ART). The study showed that out of total 439 participants (75%, n = 189) were males while (25%, n = 63) were females. These disparities in the results could be due to population where there are more males than females in China.

This study revealed that (7.8%, n = 30) of study participants were in the age range of 20 - 29 years old, (20.5%, n = 79) were in the age range of 30 - 39 years old, (40.5%, n = 156) of study participants were in the age range of 40 - 49 years old and (31.2%, n = 120) of study participants were above 50 years old. Therefore, this study showed that the majority of study participants were in the range of 40 - 49 years old. Contrary to the study by Ayele, G. *et al.* [8] China on Analysis of factors associated with dropping-out from HIV antiretroviral therapy (Defaulting on ART) which showed that out of 451 participants, 63.3% were young than 35 year old. Another study by Ayele, G. *et al.* [9] Ethiopia on Prevalence and associated factors of treatment failure and Defaulting among HIV AND AIDS Patients showed that out of a total 423 participants, 169 (40%) were within the age of 30 - 39 years old. The discrepancy in the age distribution could be attributed to differences in sample cultural and regional differences in the populations being studied. This study revealed more than half (55.3%, n = 213) of the study participants were married while a smaller percentage (17.1% n = 16) of study participants were single, (14.3%, n = 55) of study participants were divorced, (13.2%, n = 51) of study participants were widowed. This is in line with

the findings of a similar studies conducted by Mpinganjira, S. *et al.* [10] on factors associated with loss-to-follow-up (Defaulting on ART) of HIV-positive patients and findings revealed that majority of study participants were married (73%) while minority of study participants were not married (23%). Contrary, Mpinganjira, S. *et al.* [10] on Prevalence and associated factors of treatment failure and Defaulting among HIV AND AIDS Patients showed that out of a total 423 participants, 49.4% were married while 50.6% participants were not married. The observed variation may be as a result of difference in geographical area, study design and sample size. Liao, B. *et al.* [8] conducted a study on Analysis of factors associated with dropping-out from HIV antiretroviral therapy (Defaulting on ART) on marital status showed 69% participants were mainly single or divorced while 31% participants were married. Mekonnen, N. *et al.* [6] on incidence and predictors of loss to follow-up (defaulting on ART) among HIV infected adults showed a total of 569 study participants, (54.8%, n = 312) participants were not married while (45.2%, n = 257) participants were married. The observed variation may be as a result of difference in geographical area. Being married may have some positive effects on the prevention of defaulting on ART as they have a supportive partner who can provide emotional and physical support during their antiretroviral therapy. Married individuals also have a greater sense of social support and belonging, which can positively impact their quality of life on ART. However, it is important to note that being single or divorced does not necessarily mean that one has a poor quality of life, as this can be influenced by other factors such as financial stability and access to healthcare facilities.

This study showed that (67%, n = 258) of study participants attained primary education, (23.1%, n = 89) of study participants attained secondary education, (1.3%, n = 5) of study participants attained tertiary education and (8.6%, n = 33) of study participant have never been to school. This finding was in agreement with research done in Malawi by Mpinganjira, S. *et al.* [10] on factors associated with loss-to-follow-up (Defaulting on ART) of HIV-positive patients and findings revealed that majority of study participants (68%) had primary education while minority of study participants (32%) hand tertiary education or never been to school. A study done by Liao, B. *et al.* (2019) [8] on Analysis of factors associated with dropping-out from HIV antiretroviral therapy (Defaulting on ART) indicated that nearly 40% of study participants had attained a university level or higher education. This variation where most stopped school at primary level is as a result of poor financial status and education policies to enable a lot of people have access to school. Contrary to the study by Deribe *et al.*, (2017) [11] on defaulters from antiretroviral treatment showed 56% had gone up to secondary and tertiary. This finding suggests that education is a barrier to seeking ART services at a health facility in Zambia. In fact, it is likely that those with low levels of education may be less knowledgeable on ART services and its consequences like high viral load, low CD4 counts, and drug resistance when they

continue defaulting on ART.

This study showed that the unemployment rate among the participants was high, with 72.7% being unemployed. This finding is consistent with other similar study conducted in China which also found high unemployment rates among PLWHA defaulting on ART. Liao, B. *et al.* [8] found that 70.2% of his study participants in China were unemployed while Malama, 2020 found that 53% of their study participants in Malawi were unemployed. The high unemployment levels is related to fast growing population in most of the countries. Contrary to the study by Kaara, F. (2021) [12] on factors Associated with Loss to Follow Up (Defaulting on ART) of HIV Patients Living with HIV showed that 63.3% had employment which was self -employment and formal employment. The variation is as a result of the target group and the sample size in the study conducted in Kenya.

5.2. Prevalence of Defaulting from Antiretroviral Therapy among Adult Patients

5.2.1. HIV Patients Defaulting on ART

The results showed that over half (58.4%) of the study participants defaulted on ART and reasons for defaulting on ART was perceived improved health (65.8). Similar studies have been done in the world on PLWHA defaulting on ART. A study conducted in China by Liao, B. *et al.* [8] showed that, out of a total of 439 HIV participants (57.4%, n = 252) defaulted on ART. Another study done in South Africa by Simelane P. *et al.* [13] on barriers and facilitators to adherence for antiretroviral therapy (defaulting on ART) revealed that 50% of study participantsdefaulted on ART. Another study done on PLWHA defaulting on ART showed defaulting on ART were low. A study done in Cameroon by Djouma Nembot, F. *et al.* [14] on time of the First Antiretroviral Treatment (ART) Default and Factors Associated to Early ART Defaulting showed that (28.3%, n = 629) participants defaulted on ART. Another study done in Ethiopia by Kalayu, G. and Tomas, Z. (2021) [7] on antiretroviral treatment default and associated factors among people living with HIV AND AIDS showed that, out of the 240 ART patients, (24.16%, n = 58) had defaulted ART. Another study done in India by Sangeeta *et al.* [15] on Factors affecting default among pre-ART patients showed that out of a total 1532 patients registered in pre-ART care, (24%, n = 367) participants defaulted on ART. Another study done Ghana by Abban EF *et al.* [16] on impact of default rate of antiretroviral use on viral load among HIV AND AIDS patients revealed that 10% of study participants defaulted on ART for more than three months in the year. The variation is on implementation of 95-95-95 established by The Joint United Nations Programme on HIV and AIDS and scarce funding on HIV programs. The findings of this study suggest that defaulting continues to be a serious problem in health facilities (ART Clinics) providing HIV care services. This is a major concern because it disrupts the HIV care trajectory and can lead to serious health complications and an increase in HIV and AIDS-related mortality. Furthermore, failure to adhere to antiretroviral

therapy or defaulting on antiretroviral therapy has been associated with first-line antiretroviral treatment failure [17]. This is likely going to lead to high viral load making it difficult to reach the target of 95-95-95. The findings of this study are consistent with those reported in the literature, where the prevalence of defaulting to ART is reported to be over 50% in [18] [19].

5.2.2. Reasons for Defaulting on ART

This study showed that (65.8%, n = 148) of study participants had perceived health, (22.7%, n = 51) of participants were mobile and (11.6%, n = 26) of study participants had self-stigma as reasons for defaulting on ART. Similar findings emerged from a qualitative study which was conducted in Malawi, which showed that, defaulting on ART occurs after experiencing a positive change in one's health, especially when virally suppressed [20].

However other studies were done on the reasons for PLWHA defaulting on ART and the numbers were low compared to the reasons in this study. Study done in China by Liao, B. *et al.* [8] on Analysis of factors associated with dropping-out from HIV antiretroviral therapy (Defaulting on ART) indicated that 15.5% of study participants had perceived improved health, 23.8% participants were mobile and 5.5% participants had self-stigma. A study done in Cameroon by Djouma Nembot, F. *et al.* [14] on time of the First Antiretroviral Treatment (ART) Default and Factors Associated to Early ART Defaulting showed that 7.8% participants had improved and 6.8% were mobile. However, there are a variety of explanations for defaulting on ART that have been reported in the literature, and they differ between studies [7] [8] [20]. For example, self-referral to other ART sites and lack of food were found to be the most common reasons for defaulting on ART in a study in Ethiopia [7]. A Chinese study found that the top three reasons for defaulting on antiretroviral therapy in HIV-infected patients were: serious side effects, the need to continue taking medicine on a regular basis, and medication interruption due to incarceration [8]. The reasons for ART defaulting highlighted in this study clearly indicate a lack of understanding of the importance of continued ART use, even in situations where an individual's health has improved. These findings underscore the importance of ongoing counselling about the importance of adherence to ART in everyday practice. Therefore, it is essential to offer counselling to patients with better health outcomes and those whose viral loads have been suppressed in order to promote and encourage consistent use of ART since they may feel more at ease taking medication as a result of their better health.

5.3. Individual Factors

5.3.1. Transport Costs

On transport costs this study revealed that transport cost was expensive for the majority of the participants on ART. Out of 385 participants (70.4%, n = 271) indicated that transport cost was expensive while (29.6%, n = 114) of participants indicated that transport cost was affordable. These findings are similar

with studies conducted in different parts of the world. For instance, a study in Ghana by Ashby C. *et al.* [21] on Factors Contributing to ART Defaulting shows that 62.4% of study participants defaulted on ART as they could not afford transport costs to the health facility. The participants had problems to meet transport cost because of poverty and most of the participants were unemployed. Contrary to a study in South Africa by Faturiyele, I. *et al.* [22] on Access to HIV care and Treatment for Migrants shows 35.7% had no transport cost to the health facility for ART services. Another study in Ethiopia by Deribe *et al.*, [11] on Defaulters from antiretroviral treatment revealed that out of 173 participants who defaulted on ART 7.4% could not afford transport costs to the health facility for ART services. The discrepancies are due to low employment levels experiences in some parts of the countries. Impassable roads (poor road networks) in some parts of rural areas and study setting could have influenced the high transport costs contributing to HIV clients defaulting on.

5.3.2. Attitude of People Living with HIV/AIDS towards ART Services

On perceived attitude of PLWHA towards ART services at Chikankata Mission Hospital ART clinic showed good attitude for most of the participants. Action taken when experiencing any of adverse effects of ARVs (71.9%, n = 276) of study participants went back to the health facility. A study done in Asia by Ahmed *et al.* 2021 on Reasons for Defaulting from ART Treatments showed (24%, n = 6) participants had adverse-effects of the drugs and went to ART facility to be attended.

On perceived attitude and actions taken when experiencing adverse effects of drugs at Chikankata Mission Hospital ART clinic revealed that some clients seek local medicines from traditional healers and results showed that (9.9%, n = 38) of study participants hand gone for traditional medicine. A study done in Tanzania by Metta E. *et al.* [23] on I Feel Healthy Like Any Other Person, 24% participants had used local herbs at least once while defaulting on ART. Another study done in Asia by Ahmed *et al.*, 2021 on Barriers and Enablers for Adherence to Antiretroviral Therapy showed that from 25 participants on ART (20%, n = 5) of participants indicated that they were taking traditional medicines. Traditional medicines are still being used in some parts in the world. This is as a result of lack of education in health facilities providing ART services.

On perceived attitude and actions taken when experiencing adverse effects of drugs at Chikankata Mission Hospital ART clinic, this study showed that (18.2%, n = 70) of study participants went to see religious leaders for help. A study done in Asia by Ahmed, A. *et al.* [24] on Barriers and Enablers for Adherence to Antiretroviral Therapy showed that from 25 participants on ART 96.4% participants of the Pakistani population practices Islam, and they do not take medication properly and usually skip the morning dose and going for appointment at a health facility because of prayers. Some participants also seek the spiritual healing to permanently end the HIV and AIDS rather than to take ART throughout the life.

5.4. Interpersonal Factors

Family Support

On family support towards ART services to prevent defaulting on ART among patients receiving ART at Chikankata Mission Hospital ART clinic, this study showed that out of 385 participants (51%, n = 198) indicated that they were supported by their relatives and partners towards ART services to prevent defaulting on ART. A study done in Asia by Perera, P. *et al.* [25] Factors affecting defaulting from services among people living with HIV showed 30.7% lack of partner support was a reason for defaulting on ART while 69.3% supported their partners and relatives on ART to prevent defaulting on ART. Another report done in Ghana by Addis A. [26] on Reasons for defaulting ART 95% participants supported their partners and relatives on ART to prevent PLWHA defaulting ART while 5% participants showed a lack of social support accounting for reasons for PLWHA defaulting on ART. Contrary to the study done in Asia by Ahmed, A. *et al.* [24] on Barriers and Enablers for Adherence to Antiretroviral Therapy from a total of 25 participants, (48%, n = 12) participants supported their partners on ART to prevent defaulting while 52% never showed support to their partners on ART to prevent defaulting on ART. Discrepancy on family support has been observed in a study in Asia as a result of traditional culture and beliefs on extend extended families in some countries. Culture and traditional beliefs have an influence on pro-social behaviours.

5.5. Community Factors

5.5.1. Distance to Health Facility

This study revealed that HIV clients covered long distances to access ART services at Chikankata Mission Hospital ART Clinic and results showed that, (76.1%, n = 293) of study participants covered more than 5 km while (23.8%, n = 92) of study participants covered less than 5 km. These results are in agreement with a study conducted in India by Sangeeta *et al.* [15] on Factors affecting default among pre-ART patients in Eastern Uttar Pradesh showed that 61% participants covered long distances to access ART services while 39% participants did not cover long distances to access ART services. In agreement with this study's results a similar study in South Africa by Faturiyele, I. *et al.* [22] on Access to HIV care and treatment for migrants showed that out of 126 participants (59.5%, n = 75) covered long distances to access ART services. Contrary to the study in Ethiopia by Kalayu, G. and Tomas, Z. [7] Antiretroviral treatment default and associated factors among people living with HIV AND AIDS showed 6.5% participants covered long distances to access ART services at the health facility. Distance has been observed in some studies and discrepancies is as a result of geographical locations and periodization of political will to build more facilities as close to the people as possible.

5.5.2. Family Members Knowing the Client's HIV Status

On family member know the HIV status, Clients receiving ART services at Chi-

kankata Mission Hospital ART clinic showed that (65.2%, n = 251) of study participants disclosed their HIV status to their partners or relatives while (34.8%, n = 134) of study participants never disclosed their HIV status to their partners or relatives. A study in Ethiopia by Abadiga, M. *et al.* [27] on Adherence to antiretroviral therapy and associated factors among Human immunodeficiency virus positive patients accessing treatment showed (67.9%, n = 207) of participants had disclosed their HIV status to their family for continued care so to prevent defaulting on ART. Contrary to a study in Asia [25] on Factors affecting defaulting from services among people living with HIV at two treatment showed 64.9% participants defaulted PLHIV did not disclose their HIV status to partners or relatives. When there is no self-disclosure about HIV status, the persons may fear to go for ART services hence defaulting on ART. Disclosing the HIV status to families enable PLWHA to seek information, express feelings and access support group for continued support so that there is no defaulting on ART.

5.5.3. Societal Stigma

The HIV clients on ART at Chikankata Mission Hospital ART clinic showed that (69.2%, n = 265) of study participants never received any stigma or discrimination when receiving ART services while (30.8%, n = 120) of study participants received stigma or discrimination. Similar studies conducted in different parts of the word had similar results on stigma or discrimination on HIV patients receiving ART. A study in Ghana by Addis A. [26] on Reasons for defaulting ART showed that 6% participants had Stigma and discrimination towards client on ART while 94% had no stigma or discrimination towards client on ART. Another study in Ethiopia by Kalayu, G. and Tomas, Z. [7] on Antiretroviral treatment default and associated factors among people living with HIV AND AIDS showed that 13% participants received stigma and discrimination while 87% never received any stigma or discrimination. A study in South Africa by Faturiyele, I. *et al.* [22] on Access to HIV care and treatment for migrants showed that 15.8% participants had stigma making them defaulting on ART 84.2% participants never received any stigma on ART by community member. Despite continued counselling in the communities and health facilities stigma and discrimination is still there. Intensified community counselling and psychosocial counselling in health facilities need to continue to prevent HIV patients defaulting on ART because of stigma and discrimination.

5.6. Institutional Factors

5.6.1. Waiting Time

On waiting time spent for ART services Chikankata Mission Hospital ART clinic the study showed out of 385 participants (85.7%, n = 330) had to spend more than 45 minutes at the facility while (14.3%, n = 55) of study participants had to spend less than 45 minutes at the facility. Similar studies in South Africa by Simelane P. *et al.* [13] on Barriers and facilitators to adherence for antiretroviral therapy showed that out of a total 20 participants (90%, n = 18) had to spend for

more than 45 minutes at the facility. The participants expressed dissatisfaction with the long waiting time before being attended to by the medical staff. They expressed that it was better before lunch when the medical staff was still energetic, but the service was poor after lunch. Waiting time has been observed as one of the factors contributing HIV clients defaulting on ART. This is as a result of shortage of health workers in health facilities to attend HIV patients. The poor road network and rural areas also contribute to shortage of health workers because some health workers opt to leave rural areas making patient ratio to clients go up hence influence patients wait for long hours at the health facility.

5.6.2. Attitude of Health Workers towards HIV Patients

On perceived attitude of health worker towards HIV patients on ART at Chikankata Mission Hospital ART Clinic client reception by the health workers at the ART clinic showed that (76.1%, n = 293) of study participants mentioned attitude of health workers was excellent or good while (23.9%, n = 92) of study participants mentioned bad. Similar studies in South Africa by Simelane P. *et al.* [13] on Barriers and facilitators to adherence for antiretroviral therapy showed that the majority (75%, n = 15) of the participants cited service providers' attitudes to clients on ART to prevent clients to default on ART was good. Generally, patients reported that service providers at the facility had a positive attitude towards them. They are caring and very helpful in supporting them to prevent them defaulting ART.

On pharmacists on duty being rude at Chikankata Mission Hospital ART Clinic when providing ART services (82.8%, n = 319) of study participants indicated that the pharmacists were not rude while (17.1%, n = 66) of study participants indicated pharmacists were rude when providing ART services.

Nurses on duty being rude at Chikankata Mission Hospital ART Clinic when providing ART services (81.3%, n = 313%) of study participants indicated that nurses were not rude when providing ART services to the clients on ART while (18.7%, n = 72) of study participants indicated that nurses on duty were rude when providing ART services to HIV patients on ART. It was observed that the attitude of health workers towards HIV clients receiving ART services has been good. This is as a result of advanced changes in teaching curriculum in training institutions on upholding professionalism when providing health services. However, professional adjustments is still important when providing health services to prevent HIV clients continuing defaulting on ART leading to high viral loads, decreasing CD4 counts and drug resistance.

5.7. Factors Associated with Defaulting from ART

An analysis was carried out to determine whether there were any significant associations between default on ART and socio-demographic characteristics. Age, sex, occupation, education and marital status were all taken into account and none were associated with default on ART. Despite the fact that males were slightly more likely to default than females, this study found no significant asso-

ciation between sex and defaulting on ART which is consistent with the findings from previous studies [5]. Furthermore, previous research has found that age and marital status are not associated with defaulting on ART, which is consistent with the results of the current study [27]. The study found no association between the level of education and defaulting on ART which contradicts the findings of a study conducted in Sri Lanka which found that defaulting on ART services was significantly associated with having a lower educational level [25]. The reason for the different results in this study is unclear. Although the results appeared to indicate that participants in formal employment were more likely to default on ART, this finding was not significant and is in line with findings from earlier studies that found no significant association between occupation and ART defaulting [5]. In terms of factors associated with ART default, the study found that participants who informed the ART clinic when they did not have money for transport were less likely to default on ART than adults who simply stayed at home when they did not have money for transport. Given that nearly half of the participants lived more than 10 kilometres from the ART clinic, and that transportation to health facilities (ART Clinics) was expensive for the majority of participants, it is important to consider the implications of this for defaulting on ART. In this study, transport costs and distance to the health facility were not associated with defaulting on ART which is in line with findings reported in a previous study from Ghana [7]. However, other studies have found that distance to health facilities (ART Clinics) and transport costs are associated with default on ART [13] [25]. It is because of distance to health facilities (ART Clinics) and transport costs that people stay at home and miss their appointments. Instead of waiting until a patient defaults on ART before making contact, health facilities should follow up with patients who miss their ART early to find out why they missed the appointment. Follow-up calls would provide an opportunity for additional counselling sessions. They would also provide a platform for identifying the underlying issues leading to defaulting on ART [20]. The study found that among study participants, defaulting on ART was associated with the perceived importance of always going to ART services. Participants who thought it was somewhat important to always use ART services were more likely to default on ART than participants who thought it was very important to always use ART services. This finding may lead to a better understanding of how important it is to educate patients about the importance of always attending ART services and taking ARVs consistently. Given that almost half of the participants consider it somewhat important to attend ART services, there is a need for more counselling and education to improve their knowledge of this. In previous studies, it was revealed that having sufficient knowledge of HIV and its treatment was associated with a lower risk of defaulting on ART [5] [27]. Therefore, there is need to improve the knowledge of the people on ART to reduce defaulting on ART. Most studies have shown that people who have family support are less likely to default on ART [19] [28], which is consistent with the findings of this

study. Findings from the qualitative study in Pakistan revealed that the lack of support from family members makes it difficult for them to take their medication because they felt less important, anxious or sometimes forgot to take their medication [24]. According to the results of this study, participants who reported poor family support for ART services were more likely to default on ART than those who reported excellent family support for ART services. With almost half of study participants reporting poor family support for ART services, there is a need to develop strategies such as community awareness programmes and sensitisation of close family members to improve family and community support for people living with HIV AND AIDS. However, encouraging family support may be difficult if the person has not disclosed their HIV status to the family. In the case of this study, it is unclear whether the participants' poor support was simply a result of discrimination and stigma, or because HIV AND AIDS status was not disclosed.

The findings also showed that the length of time participants had to wait to be seen at an ART clinic was significantly associated with defaulting on ART. Participants who reported waiting more than 45 minutes to be seen at the ART clinic were twice as likely to default on ART as those who were seen in less than 45 minutes. A number of studies have consistently found a strong association between ART defaulting and the time spent waiting for treatment [7]. The results of a qualitative study showed that waiting time was viewed as a barrier to ART defaulting because people who lived far away could not afford to be in line for a longer period of time for fear of missing their transportation back home and also due to their work schedules because they could not be off for a longer period of time [13]. More than three quarters of study participants (85.7%) in this study had to wait more than 45 minutes for ART services, which is worrying given that long waiting times are associated with defaulting on ART. Much more work needs to be done in these health facilities (ART Clinics) to reduce waiting times, as they will continue to be a problem and contribute to defaulting on ART. As we strive to reduce ART default among people living with HIV AND AIDS, it is critical to identify the root causes of longer waiting times and address these issues.

More than half of the participants thought that the ART services were good, and the majority indicated that the pharmacists and nurses on duty were rude to them when they picked up ARVs at the ART clinic. However, among the study participants, defaulting on ART was not associated with the perceived quality of the service received. This finding contradicts the results of a Nigerian study, which found that respondents who perceived poor service quality had a 2.6 times greater risk of defaulting on ART [5].

6. Conclusion

The findings of this study have demonstrated that (58.4%, n = 225) of the study participants defaulted on ART and (65.8%, n = 148) of study participants indi-

cated that their health had improved as reasons for defaulting on ART. Defaulting on ART has continued among people living with HIV and AIDS, which needs to be addressed as a matter of priority as it has the potential to undermine the progress made in the fight against HIV and AIDS. More counselling and awareness-raising programmes are therefore needed to improve knowledge and understanding of the importance of adherence to ART services and the consequences of defaulting on ART. In addition (76.1%, n = 293) of study participants indicated that distance to the health facility was one of the factors contributing to defaulting on ART. The study also revealed that (85.7%, n = 330) of participants had long waiting time and (70.4, n = 271) indicated that there was high transport costs to the health facility. These factors have been identified as being associated with defaulting on ART and should be taken into account in the design of programmes that aim to reduce defaulting on ART among people living with HIV and AIDS.

7. Study Limitations

Given that the defaulting on ART was self-reported by the study participants, it may be affected by recall bias and others may not disclose despite assurances of anonymity, leading to under-reporting of defaulting on ART. Since this is an across-sectional analytical study, cause and effect cannot be established, and conclusions may be biased as a result.

8. Recommendations

The following recommendations were made based on the findings of this study:

Ministry of Health

Distance to the health facility was one of the factors contributing to PLWHA defaulting on ART, the ministry of health to consider opening ART clinics in rural health centres so that clients can access ART services to their nearby facilities than cover long distance to Chikankata Mission Hospital ART clinic.

Chikankata Mission General Hospital

The prevalence of PLWH defaulting on ART was high (58.4%), more education about ART services and its importance is needed among the people living with HIV AND AIDS at the Chikankata Mission Hospital ART clinic. Providers need to conduct more adherence counselling from time to time, even with patients who have been on ART for some time, to encourage patients to continue coming for ART services even when they feel their health has improved after being on treatment for some time.

Neighbourhood Health Committee

The prevalence of PLWHA defaulting on ART was high, instead of waiting until an HIV patient default on ART, Chikankata Mission Hospital ART clinic to intensify early community outreach programs to ensure close relations between patients and health facility (ART Clinic) hence prevent PLWHA defaulting on ART.

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Authors' Contribution

Paundi Fred developed the study design and drafted the manuscript. Mr. Musenge Emmanuel and Nankamba Namayipo guided the development, supervised and provided critical feedback and helped shape the study.

Ethical Approval

This study was approved by the Institutional Review Board/IRB of University of Zambia Biomedical Research Ethics Committee (UNZABREC) (REF. No. 3344-2022) and National Health Research Authority (NHRA) (REF No. NHRAR-R-1237/17/10/2022). Further approval was sought from Chikankata General Mission Hospital.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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