



Retention in Care and Associated Factors among Adult Anti-Retroviral Treatment Patients of Public Health Facilities in Hadiya Zone, Southern Ethiopia: A Cross Sectional Study

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ABSTRACT

Introduction: Individual patient and public health intervention related positive health outcomes are directly related to anti-retroviral treatment care retention. However, one to two thirds of people infected with human immune virus/acquired immune deficiency syndrome do not receive regular care. As a result, the purpose of this study was to determine the status of retention on care and associated factors among adult anti-retroviral treatment recipients.

Methods: From March to April 2015, a cross-sectional study was conducted on 305 patients. The participants were chosen using a systematic random sampling method. The checklist was used to retrieve data from the anti-retroviral treatment registration logbook, patient intake form, and anti-retroviral treatment follow up form. A logistic regression analysis was used to identify factors associated with anti-retroviral treatment retention. An odds ratio with a 95% confidence interval was also used to identify factors that were significantly associated with care retention.

Results: Study identified 75.7% of overall retention on anti-retroviral treatment care. Being female sex (AOR=4.04; 95% CI; 2.05, 8.00), higher educational status (AOR=2.75; 95% CI; 1.24, 6.10), human immune virus/ acquire immune deficiency syndrome status disclosure (AOR=9.26; 95% CI; 4.06, 21.12), low addiction in alcohol/tobacco (AOR=2.3;95% CI; 1.02, 5.21) and with history of drug regimen change (AOR=3.58;95% CI;1.59,8.09) was a significant positive relation with retention on anti-retroviral treatment care.

Conclusion: The study discovered a lower level of retention in anti-retroviral treatment care; whereas ongoing counseling on the importance of staying on care; disclosing one's self-human immune virus/acquired immune deficiency syndrome status to a family member and reducing substance abuse are all recommended.

Keywords: Anti-retroviral treatment; Patient; Retention care; Hadiya zone

Received:	04-May-2022	Manuscript No:	IPJHCC-22-13290
Editor assigned:	06-May-2022	PreQC No:	IPJHCC-22-13290 (PQ)
Reviewed:	20-May-2022	QC No:	IPJHCC-22-13290
Revised:	23-January-2023	Manuscript No:	IPJHCC-22-13290 (R)
Published:	30-January-2023	DOI:	10.36846/2472-1654-8.1.8001

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Citation Larebo Y, Erjino D, Arficho T (2023) Retention in Care and Associated Factors among Adult Anti-Retroviral Treatment Patients of Public Health Facilities in Hadiya Zone, Southern Ethiopia: A Cross Sectional Study. J Healthc Commun. 8:8001.

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Abbreviations: ART: Anti-Retroviral Treatment; HPV: Human Immune Virus; IRB: Institutional Review Board; NEMMCSH: Nigist Eleni Mohamed Memorial Comprehensive Specialized Hospital; OIs: Opportunistic Infection; RLS: Resource Limited Setting; SSA: Sub-Saharan Africa; WHO: World Health Organization

INTRODUCTION

Retention in care is defined as ending at some interval of time after a scheduled appointment. In Resource Limited Setting (RLS), patient retention on Anti-Retroviral Treatment (ART) care is receiving highly active antiretroviral treatment at the end of a follow up period [1,2]. The most commonly used methods of measurement for patient retention on ART care are missed visits, appointment adherence, visit constancy, and a gap in care [3]. Even though there are no gold standard measures, missed visits (a measure of no show) are widely used in literature as both a dichotomous and continuous measure [4,5]. Positive health outcomes of the individual patient and public health interventions are directly related to patient retention in ART care. It facilitates treatment adherence and clinical monitoring for an individual patient that leads to improved viral load suppression, reduced occurrence of Opportunistic Infection (OIs), and reductions in mortality [6-8]. Patients retained in ART care are also more likely to receive risk reduction counseling and on time management of OIs [9,10]. Furthermore, retained patients with biological suppression are less likely to transmit the virus to others, and this establishes retention as a key strategy for public Human Immune Virus (HIV) prevention [11]. Due to the aforementioned effects, retention in ART care has been accepted as a crucial step in patient care and public intervention. Therefore, emphasizing the importance of retention on care is recommended for primary care of HIV infection rather than focusing solely on adherence to medication [12,13]. Poor retention of available care is a major problem in RLS. In Sub-Saharan Africa (SSA), uptake of care is complicated due to poor retention needing a serious concern for ART programs in the region [14,15]. The study showed one third to two-thirds of persons with known HIV/AIDS infections are not following ART outpatient care regularly [16]. Evidence also showed patients with clinical AIDS who discontinue ART will likely die within a relatively short time [17]. But retention of patients in ART has received far less attention possibly due to most large scale treatment providers have few resources to track none retained patients [18]. In Ethiopia, nearly two thirds of the patients who have ever started ART remain in care at the end of June 2011 showing challenges of poor retention on the available care [19]. This study aimed to determine the status of retention on care and associated factors among adult ART patients in public health facility of Hadiya zone, Ethiopia. Therefore, findings from this study help evidence-based intervention to improve retention to ART by addressing factors affecting retention on ART care. Policymakers, program managers, and health facilities may use the result to develop or improve their program and service on ART retention. It also will be used as references for researches on similar topics.

MATERIALS AND METHODS

Study Design, Area, and Period

An institution based cross sectional study was conducted in public health facilities of the Hadiya zone from March to April 2015. The zone has 1,547,846 total populations with female predominance (50.53%). Nigist Eleni Mohamed Memorial Comprehensive Specialized Hospital (NEMMCSH) and 15 health centers are giving chronic HIV/AIDS care service for 2007 ART cases at a point in a time [20].

Study Population, Sampling Strategy, and Data Collection

The study population was adult ART patients whose registrations were sampled. The sample size was determined by the single population proportion formula; with assumptions of 68.6 % proportion of retention of adult on ART care; 5% desired precision and 95% confidence interval. A total sample size of 311 was calculated by using the correction formula and adding 10% for incomplete data. The sample was proportionally allocated in 8 ART sited health facilities having 12 or more adults alive on ART patients. All adult patients aged 15 or more years and who had been taking ART for at least 12 months were included. A systematic sampling method was used to identify participant's registration in each health facility by using the ART registration logbook as a sample frame. Accordingly, every 6th registration was taken after selecting the 1st sample by lottery method between 1st and 6th registration. Registrations with the outcome of death or transferred out were jumped to the next registration. The data extraction checklist was adapted from literature and tested for validity by pretest data. The content of tools was designed to obtain information on socio demographic characteristics, clinical characteristics, and status of retention on ART care. In the socio demographic part, there were items addressing age, gender, religion, employment status, marital status, level of education, the status of disclosure, and residence. The clinical characteristics also contain baseline CD4⁺ count, most recent CD4⁺ count, duration of time on ART, baseline WHO staging, ART regimen, and regimen change data. The last part of the checklist was retention on ART care. These data were recorded at the starting time of treatment and thereafter. Finally, an English language version checklist was used to retrieve secondary data from the ART registration log book, patient intake form, and ART follow up form. The data were collected by five diploma nurses who were working out of assignment health facility and trained on chronic HIV/AIDS care, and have experience in data collection. Two BSc nurses who had trained on chronic HIV/AIDS care and

experienced in supervision participated as a supervisor in the study.

Data Quality Control

Pretesting of the instrument was conducted before data collection in 15 (5%) ART client's registration and necessary modifications and corrections were undertaken. Data collectors and supervisors were trained on the study instrument, consent form, and data collection procedures for one day by the principal investigator. The data collection process had been supervised on daily basis for completeness and consistency of the filled questionnaires. The data were coded and entered on epi data 3.1 to minimize entry errors before being exported to SPSS version 21.0 for analysis purposes.

Operational Definition

Retained in ART care: Adult HIV/AIDS patients taking ART return to care in an initial follow up health facility to get the care within 14 days after the last appointment date. Adult HIV/AIDS patient on ART who does not return to care in initial follow-up health facility to get the care within the 14 days after last appointment date and yet not classified inpatient clinical outcome as dead or transferred out were as not retained in ART care.

ART care: A clinical care and support services include ART provision, follow up services for people on ART, opportunistic infections treatment palliative care like pain management, and nutritional rehabilitation.

Data Processing and Analysis

Collected data were entered in epidata 3.1 software and exported to SPSS 21.0 statistical analysis software for further analysis. Descriptive tables and summaries were used to describe the study variables. All candidate independent variables in bivariate analysis with $p < 0.25$ were entered into multivariate analysis to identify the strength of association. Independent variables with a p-value less than 0.05 were considered as having a significant association with dependent variables and reported using both p-value and odds ratio in the multivariate analysis. The fitness of the model had been tested by Hosmer and Lemeshow model test with $p > 0.05$.

Ethical Consideration

Ethical clearance of the study was obtained from the Institutional Review Board (IRB) of Jimma university, college of

health science. A letter that requires collaboration for research from the department of health economics, management, and policy of Jimma University was submitted to Hadiya zone health department, all Woreda health offices, NEMMCS Hospital, and ART sited public health centers in the Zone. The purpose of the study was explained to the focal health professionals in the ART clinic to confirm cooperation by availing all necessary registration logbooks and patient intake forms at the time of data collection.

RESULTS

Data were extracted from 305 (98% of the sample) registrations of adult ART patients to assess the status of retention on care and associated factors among adult ART patients in the public health facility of Hadiya zone, Ethiopia. Sampled registrations were from 8 ART sited health facilities (facilities having 12 or more adults alive on ART patients). Two hundred fourteen (70.2%) samples were from Negist Elene memorial hospital and the remaining 91 (29.8%) were from different ART sited health centers in the zone. Six registrations were left due to data incompleteness.

Socio-Demographic Characteristics

From selected cases, 192 (63%) were females and 150 (49.2%) were in the age group of 25-34 years at ART initiation. More than half 213 (69.8%), 154 (50.5%), and 156 (51.1%) of the participants were married, protestant religious followers, and rural residents respectively. The majority (38.6%) of participants had attended primary education. One hundred thirty eight (45.3%) of the participants were unemployed and 34 (11.1%) were not working due to ill health. The majority (46.9%) of the respondents disclosed their status to partners (wife or husbands) and 41 (13.4%) doesn't disclose their status to anyone. Two hundred fifty nine (84.9%) had caregivers (treatment supporters) and husband/wife were treatment supporters for the majority of them (42%) ([Table 1](#)).

Table 1: Socio-demographic characteristics of the adult ART patients in the Hadiya zone, Ethiopia, may to April 2015 (n=305).

Characteristics of adult on ART care		Frequency (%)
Sex	Female	192 (63)
	Male	113 (37)
Age	16-24	33 (10.8)
	25-34	150 (49.2)

		>35	122 (40)
Marital status	Currently married		213 (69.8)
	Not married before		32 (10.5)
	Widowed		27 (8.9)
	Divorced		18 (5.9)
	Separated		15 (4.9)
Religion	Protestant		154 (50.5)
	Orthodox		110 (36.1)
	Muslim		28 (9.2)
	Other		13 (4.2)
Educational status	No education		104 (34.1)
	Primary education		118 (38.6)
	Secondary education		63 (20.7)
	Tertiary education		20 (6.6)
Employment status	Unemployed		138 (45.3)
	Employed	Working full time	99 (32.5)
		Working part-time	34 (11.1)
		Not working due to ill health	34 (11.1)
Place of residence	Rural		156 (51.1)
	Urban		149 (48.9)
Disclosure n=305	To wife/husband		143 (46.9)
	To own Daughter/son/parent		52 (17)
	To brother/s/sister/s		40 (13.1)
	To other		29 (9.5)
	Not disclosed at all		41 (13.5)
Caregivers n=305	Husband/wife		128 (42)
	Brothers/sisters		65 (21.3)
	Doughtier/son		30 (9.8)
	Father/mother		11 (3.6)
	Others		24 (8)
	No caregiver		46 (15.1)

Forty four (14.4%) of the sample were abusing either alcohol or tobacco at registration and the majority (70.5%) of them were male ([Table 2](#)).

Table 2: Alcohol/tobacco abuse of art patients in Hadiya zone, Ethiopia, may 2015 (n=305).

Characteristics		Alcohol/Tobacco abuse	
		“Yes” in number (%) n=44	“No” in number (%) n=261
Sex	Female	13 (29.5)	179 (68.6)
	Male	31 (70.5)	82 (31.4)
Total (n=305)		44 (14.4)	261 (85.6)

Clinical and Follow up Condition of Adult Art Patients

For the majority, 129 (42.3%), of the samples WHO clinical staging was III during ART initiation. At that time, the functional status of working was recorded for 210 (68.9%) of the participants. Mean (SE) CD4 count was 245.1 (10.15), 211.56 (7.52), and 428.82 (12.09) at baseline, ART initiation, and at the recent time respectively. Thirty (9.8%) of the study subject have developed any type of OIs within the last 12 months. Pulmonary tuberculosis is frequently reported OI. Regimen change was recorded in 88 (28.9%) of cases during the follow up. Planned program switch of stavudine (d4t) is

the reason for the majority 39 (44.5%) of the changes. Two hundred seventy (88.5%) had documented referral information at the time of registration. Twenty one (6.9%) of participants didn't visit the health facility for unknown reasons in the last 12 months while 168 (55.1%) have experienced none retention on ART care at least once in this period. From the study subjects, 231 (75.7%) were retained in ART care at the time of data collection (**Table 3**).

Table 3: Clinical characteristics of ART clients in Hadiya Zone, Ethiopia, May 2015 (n=305).

Clinical characteristics		Frequency (%)
WHO clinical stage at baseline n=305	Stage I	69 (22.6)
	Stage II	73 (23.9)
	Stage II	129 (42.3)
	Stage IV	34 (11.1)
WHO clinical stage at ART initiation time n=305	Stage 1	56 (17.7)
	Stage 2	80 (26.2)
	Stage 3	137 (45)
	Stage 4	32 (10.5)
Functional status at the initiation ART n=305	Bedridden	19 (6.2)
	Ambulatory	76 (24.9)
	Working	210 (68.9)

History of TB treatment N=305 ART regimen change n=305	Yes	85 (27.9)
	No	220 (72.1)
	Yes	88 (28.9)
	No	117 (71.1)
Reason for regimen change n=88	Planned program switch of d4t	39 (44.3)
	Drug out stock	17 (19.3)
	Toxicity	3 (3.4)
	Virological failure	2 (2.3)
	No recorded reason	27 (30.7)
Experience of OIs in the last 12 months n=305	Pulmonary TB	16 (5.2)
	Bacterial pneumonia	3 (1)
	Zoster	6 (2)
	Oral/vaginal thrush	2 (0.7)
	Extrapulmonary TB	0 (0)
	Cryptococcal Meningitis	0 (0)
	Other	3 (1)
	No registered OIs	275 (90.2)
Referral information n=305	Have documented referral information	270 (88.5)
	Have no documented referral information	35 (11.5)
Appointment n=305	Have documented appointment for each visit of last 12 months	251 (82.3)

	No documented appointment on at least one visit	33 (10.8)	
	Doesn't attend any follow up in the last 12 month	21 (6.9)	
Retention status at the time of data collection	Retained in ART care	231 (75.7)	
	Not retained in ART care	74 (75.7)	
Retention status in the last 12 months	Retained in ART care	168 (55.1)	
	Not retained in ART care	137 (54.9)	
CD4 count	Time	Mean	SE
	At baseline	245.1	10.15
	At ART initiation	211.56	7.52
	At resent follow-up	428.82	12.09

In multivariate logistic regression sex, educational statuses, self-disclosure of HIV/AIDS status, alcohol/tobacco abuse, duration of the month on ART, and regimen change were identified as independent risk factors for retention on ART care at $p < 0.05$. Females were 4.04 times more likely retained as compared to males with 95% CIs; (2.05, 8.00). Patients with secondary and above educational status were 2.75 times more likely retained than primary or less educational status with 95% CIs; (1.24, 6.10). Patients who disclosed their HIV seropositivity status were 9.26 times more likely to be retained as compared to patients who don't disclose with 95% CI (4.06, 21.12). Patients with an addiction level of less than

+++ in either Alcohol or tobacco use were 2.3 times more likely retained than patients with an addiction level +++ in alcohol or tobacco. Patients whose drug regimen was changed during the follow up period were 3.58 times more likely retained than patients without regimen change with 95% CIs;(1.59,8.09). For a unit increase in the month on ART, log odds of retention on ART care decreases by 0.8 times with 95% CI;(0.67, 0.96) (Table 4).

Table 4: Factors affecting HIV/AIDS patient retention on art care in Hadiya zone, Ethiopia, May, 2015 (n=305).

Variable	Retention Status		COR (95% CI)	AOR (95% CI)
	Retained	Not retained		
sex				
Female	161 (83.9)	31 (16.1)	3.20 (1.86, 5.48)	4.04 (2.05, 8.00)*
male	70 (61.9)	43 (38.1)	1	1
Educational status				
Secondary/above	72 (86.7)	11 (13.3)	2.59 (1.20, 5.39)	2.75 (1.24, 6.10)*
Primary/below	159 (71.6)	63 (28.4)	1	1
Disclosure status				
Disclosed	218 (82.6)	46 (17.4)	10.21 (4.92, 21.12)	9.26 (4.06, 21.12)*
Undisclosed	13 (31.7)	28 (68.3)	1	1

Alcohol/tobacco level of addiction

<+++	209 (80.1)	52 (19.9)	4.02 (2.07, 7.81)	2.3 (1.02, 5.21)*
+++	22 (50)	22 (50)	1	1

Drug regimen change

Yes	75 (85.2)	13 (14.8)	2.26 (1.17, 4.36)	3.58 (1.59, 8.09)*
No	156 (71.9)	61 (28.1)	1	1

Where * indicates significant at $p < 0.05$.

DISCUSSION

Non-retention on ART care poses challenges to the successful implementation of HIV/AIDS prevention and control programs in developing countries. Patients who discontinued ART care had developed a rapid increase in viral load and depletion of CD4 T lymphocytes that exposes them to opportunistic infections and early death. Therefore, uncovering the affecting factors of retention on ART care is important to maintain retention on the care. This study finding indicated that overall retention on ART care is 75.7% which is nearly similar to the finding of 73.3% from Mizan-Aman general hospital in SNNPR of Ethiopia. But it is less than 95% of Malawi, 79% Urban Africa ART clinics, and 87% of Jimma University specialized hospital in Ethiopia. The reason for the discrepancy in retention may be due to differences in study settings. This study showed a significant association between retention on ART care and female sex. Accordingly, females are 4.04 times more likely retained than males. A similar finding was reported from a study done in Urban African ART clinics, Zambia, and Nigeria. None retention of male adults on ART care might be due to more labor migration of male adults than that of female. This study disclosed patients were more likely to be retained in ART care. A similar finding was reported from the study done in Felege Hiwot hospital and Gonder university hospital, and Nigeria. Disclosed patients might not fear stigma and discrimination to come to a health facility to take drugs, and get social support from the community that may help the patients to be retained in ART care. Patients who attend secondary and above educational level were more likely retained in ART care than those with primary level education and less/none. This finding is in line with the study done in Urban African ART clinics, in Zambia, and Nigeria. People with higher levels of general education might have a better awareness of ART and more exposure to discuss human biology and other areas of knowledge that are important to value ART care. Patients alcohol or tobacco addiction level of less than +++ is significantly associated with ART care retention. A similar finding was also reported from Jimma university specialized hospital and the university of Alabama at Birmingham. The less addiction level of alcohol/tobacco may help the patients to make an appropriate judgment on follow up. Drug regimen change is positively associated with patient ART care retention but contradicting finding was reported from Mizan-Aman general hospital. In

the Mizan Amin general hospital study toxicity (Staudinger induced peripheral neuropathy) was responsible for the majority of drug change. In the current study, toxicity is the cause for only 3 (3.4%) of change whilst planned program switch for Staudinger (d4t) is the reason for 39 (44.3%) of drug change. The planned program "switch off" for Staudinger (d4t) might prevent much of the side effects caused by drug regimens containing d4t. Therefore, in this study drug regimen change has been associated with retention on ART care, and it might be due to prevented stavudine induced drug toxicity. After the 12th month on ART, log odds of the retention on ART care and time duration on ART care were associated inversely in this study. A similar finding was reported from a study of Mizan-Aman general hospital, in which retention on ART care was reduced as the duration of care increases. This might be in part due to a lack of information on the lifelong treatment of ART. In another way, patients may have false understandings of complete cure from HIV/AIDS by the antiretroviral and this might be due to poor counseling on the use of the drug. The following limitations should be considered when interpreting the results of this research. Some baseline socio demographic data that are registered at baseline may be changed over time. The transferred outpatients that are considered as they retain on ART care in the receptor health facility may not be always a case since some of the transferred cases may fail to go to the new health facility. The real outcome of the non-retained patient is not ascertained in this study.

CONCLUSION

The study identified a comparatively lower level of retention on ART care from other Ethiopian and African ART clinics. Being female, attending more than primary education, disclosure of self HIV/AIDS status to other and regimen change was found to be a positive predictor of retention on ART care; whereas staying a long time on ART care and having alcohol/tobacco to the addiction level of +++ were found affecting retention indirectly. The full benefit of the scale-up ART services cannot be realized without achieving patients' long term retention in ART care. Accordingly, policymakers should work on job opportunities to minimize male adult labor migration. On the other hand, the use of emergency drug refill cards at the national level increases ART care retention of migratory male adult patients. In this case, drug

refill information will be accessed by using a telephone communication method for the original health facility. Policymakers are also recommended to work on the affordability of secondary and above education for the People Living with HIV/AIDS (PLWH). This might raise information exposure about ART and human biology. The educational affordability will be improved by sponsored distance or night educational programs. Case managers and adherence supporters are recommended for continuous counseling and encouraging the patients to disclose their HIV status to others. The disclosure should be for the relatives who can provide social support and reminders about the appointments. Adherence supporters at the clinics have to facilitate this activity by giving emotional support and solving patient's problems by sharing their experiences on the importance of disclosure for families. Caregivers have to provide Continuous and ongoing counseling to reduce abuse of alcohol/tobacco, and teaching the expected benefit of lifelong ARV drug taking and the importance of retention on ART care. Further studies have to be done on the outcome of non-retained patients on ART care in association with the contributing factors for non-retaining in the care.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

ACKNOWLEDGMENTS

The authors would like to acknowledge Jimma University for funding this research project. Our gratitude also goes to the ART sited public health facilities and woreda health offices in the Hadiya zone, and Hadiya Zone health department for their support by providing us relevant inputs for the accomplishment of the study. Finally, we would like to acknowledge Tadele Daniel Huntamo who provides us fruitful comments on grammar, usage, and overall readability of the manuscript.

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