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Predictors of Art Adherence among People Living with Human Immune Virus Attending Treatment at Hospitals in West Shewa Zone, Oromia Region, Ethiopia, 2015

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Abstract
Back ground: Anti-retroviral therapy (ART) is a treatment for people living with HIV to help them to attain a maximal and durable suppression of the viral replication and prevention of the resistance. ARV regimens require adherence rate of at least 95.0% to achieve undetectable viral load, reduce the risk of drug-resistant HIV development and minimize recurrence of symptoms of AIDS. This study is aimed improve the information gap regarding adherence level and factors predicting the adherence of people to ART attending clinics of hospitals in west shoa zone of Oromia regional state, Ethiopia.***Objectives***: This is designed to identify predictors of ART adherence among people living with HIV and following ART treatment at hospitals in West Shewa Zone of Oromia Region, Ethiopia.***Methodology***: data for the study is conducted from January to March 2015. at public hospitals found in West Shewa Zone of Oromia Region. A cross sectional study design that includes quantitative and qualitative study type was employed. Participants were selected by computer generated simple random sampling method. The collected data was cleansed, edited, coded, entered to SPSS version 16.0 window and analyzed. Multiple logistic regressions model is used to identify the predicting factors of ART adherence. ***Result:*** A total of 326 people living with HIV/AIDS were participated in the study. From the participated clients, 66.2% of them achieved the recommended high level adherence. Being a jobless (has no job) (*AOR= 0.005, 95% CI= 0.035-0.559*), being on ART for 12-24 months (*AOR= 8.9, 95% CI=2.816-28.0556*), good knowledge of the importance of ART drug (*AOR= 0.039, 95% CI=0.019-0.079*) and being bored with drug consumption sometimes only (*AOR=2.718, 95% CI=1.077-6.860*) are factors significantly independently predicting ART adherence among people living with human immune virus. Traveling distance, felt depressed at dosing time, being busy with other work and long distance to facility were among the participants reason for not taking doses but these are not significantly associated with the adherence rate. ***Conclusion and Recommendation***: From this study it was seen that ART adherence is not satisfactory to achieve the intended treatment outcome. Occupational status, duration of ART usage, knowledge of ART benefit and being bored with drug consumption are the statically significant predictors of ART adherence. So that ART treatment adherence enhancing program should target the client's knowledge of the importance of the drugs, personal behaviors and work condition of the community.
Keywords: ART, PLHIV, drug adherence.

1. INTRODUCTION

HIV/AIDS prevention and control was recognized as a top priority health intervention from the start of health service development program one (HSDP I) in 1996/7 and the program is sustained up to health service development program four(HSDP IV) of 2010/11 in Ethiopia (1). Accessibility of ART drug was considered in the health sector development plan. Antiretroviral Therapy (ART) is treatment for AIDS that helps the body's immune system recover from the damage caused by infection with HIV. Although ART cannot cure AIDS, persons on ART will begin to feel better, eat more, and put on weight. Their bodies will recover the ability to fight infections (2, 3). As persons on ART treatment become well, they can care for their children and return to household activities and productive life, which benefits the household and national economies (4). It is seen in deferent studies that the general clinical stage of the patients on ART has shown an improvement (5).

For counteracting the impact of HIV on economy, WHO first produced global guidelines on the use of ARVs for HIV treatment in 2002, followed by guidelines on the use of ARVs for preventing mother-to-child transmission of HIV in 2004(6). Following this Ethiopia also developed guidelines for implementation of ART in Ethiopia in 2007, since that it is implemented by providing the drug free of charge despite the adherence challenges observed (7). Management of HIV disease includes prevention and treatment of opportunistic infections (OIs) and controlling viral replication with Anti Retroviral Drugs (ARVDs) as Highly Active Antiretroviral Therapy (HAART)(8).

In general the goal of anti-retroviral therapy (ART) is to attain maximal and durable suppression of the

viral replication. Effective ART should restore and/or preserve immunologic function. ARV regimens require optimal adherence to achieve undetectable viral loads and to avoid viral resistance. Adherence can be described as taking pharmaceuticals according to the medical standards after a voluntary agreement has been made between the patient and the health care provider (9). Adherence is a major predictor of the survival of individuals living with HIV (10). An adherence rate of at least 95.0% is necessary to maximize the benefits of antiretroviral therapy (ART) (11).

However there is limited documentation of adherence amongst patients on ART in the west shoa of west Oromia, Ethiopia. The current study will identify the adherence level of PLHIV with ART drug and personal factors predicting the ART adherence which will help care providers, HIV programmers and other stake holders to consider such factors in their programs and strategies. The study focuses self report-based adherence measures.

2. Objectives

General objectives

- To identify the factors predicting adherence to antiretroviral therapy among people living with HIV attending ART clinics of hospitals in west Shewa zone in Oromia region, Ethiopia 2015.

Specific objectives

- To determine the level of ART drugs adherence among PLHIV attending ART clinic in public hospitals
- To identify factors predicting ART adherence among PLHIV attending treatment at ART clinic in public hospitals

3. Methodology and materials

3.1. Study area and period

The study was conducted from January, 2014 to March, 2014 G.C. at hospitals found in West Shewa Zone, Oromia Regional state, Ethiopia. In west Shewa zone there are three hospitals that have ART clinic. These are Ambo hospital which is found in Ambo town the capital of west shewa zone, Gindeberet Hospital found in Gindeberet district at the northern part of west shewa and Gedo hospital which is found in the capital of chellia district to the west of west shewa zone.

Study design: Cross sectional study which includes both quantitative and qualitative data collection

Population: The source population is all people living with HIV (PLHIV) and attending follow up clinics whereas the study population is sampled clients living with HIV (PHIV) attending the clinics in the hospitals found in west shewa zone. For the qualitative data people living with HIV who were not participated in the quantitative study were interviewed.

Sample size and sampling technique: The sample size for the quantitative data was calculated by using a formula for estimating a single population proportion. An estimate of 72% is taken from the previous study result. By considering the non response rate 10% of the final sample is added. Totally 340 PLHIV will be selected.

Computer generated random sampling technique was used by using the registration book of ART clinic of each hospital. The qualitative data was collected from PLHIV working in the HIV related associations or organizations and attending ART clinics at the same study areas.

Data collection instruments are adapted from different literatures that have been used by different studies done both in Ethiopia and out of Ethiopia. The tools were edited according to the objectives of the study.

Health professionals who have taken a one day extensive training regarding the data collection conducted a self reported adherence exit interview.

3.2. Variables

- **Independent variables**
  - Socio demographic variables, Drug regimen related variables, Health problems related variables and Socio-cultural drug use related variables
- **Dependent variable**
  - ART drug dose adherence
  - Time of dose adherence

3.3. Operational definition

- ***Good adherence***: Clients those who take ≥ 95% of the prescribed drug as recommended by the health care provider within the last one week before the date of interview is categorized under good adherence.
- ***Poor adherence***: Clients those who take < 95% of the prescribed drug as prescribed by the health care provider within the last one week before the date of interview.

- ✓ ***Good knowledge***: Participants those who answer knowledge questions above the mean are considered to have good knowledge.
- ✓ ***Poor knowledge***: Clients those who answer below the mean of knowledge question are considered to have poor knowledge of the benefits of ART drug.

3.4. Data processing and analysis procedures

Data is processed by using SPSS soft ware version 16.0. Collected data was checked for the assumptions like normality and multi collinearly for all variables. Descriptive statistics was done first to understand the general distribution of the respondents. Binary logistic regression was used to check level of association between each dependent and independent variable. Variable which are associated at significant level of less than 0.25 ($p<0.25$) was taken to the multiple variable binary logistic regression to see the predictive tendency of the independent variables. The results were interpreted using odds ratios and confidence intervals.

The data collected for the qualitative study was analyzed after grouping the information under the focus areas primarily identified from the quantitative data analysis. The result of the analysis or the output was presented in narratives in triangulation to quantitative data using well- said verbatim of the study participants as illustrations.

Quality assurance: The data collection tool was pretested on ten percents of the sample size one month before the date of actual data collection on similar population. Reliability of the tool is checked by calculating cronbach alpha. The tools were edited and modified after pre test and reliability test according to the objectives of the study.

Ethical issues: Official letter of support was written to the study areas before the actual data collection date. Furthermore oral consent was obtained from the respondents immediately before the interview started. The participants' right to refuse or interrupt the interview was secured.

4. Result

4.1. Socio demographic characteristics of PLHIV

From the total 326 ART attendants have participated in the study which shows a response rate of 95.9% among which 210(64.4%) female. Majority 143(43.9%) and 85(26.1%) of them fall in 35-44, 26-34 years age group respectively. Regarding the marital status, 187(57.4%) were married whereas, 36(11%), 53(16.3%), and 50(15.3%) were single, divorced and widowed respectively. Majority of the study participants, 172(52.8%) were orthodox religion followers followed by protestants 138(42.3%). Oromo 287(88%) and Amhara 35(10.7%) ethnic group are dominant in number. Majority 134(41.1%) of the participants have attended elementary school and only 24(7.4%) were learned at college and above. From the total 159(48.8%) of the participants has no job. Regarding the living arrangements 270(82.2%) of the study participants live with families. The average monthly income of 188(57.5%) of participants is less than 500 Ethiopian birr. 183(56.1%) relied on self for living where as 106(32.5%) were dependent on family. 212(65%) of participants live in urban area where as the rest of the participants live in rural area.

***ART Drug related information about PLHIV in the study area*:** Around half, 165(50.6%) have been on ART drug for more than 24 months. The CD_4 count of 136(41.7%) of the participants during study period was greater than $500mm^3$ and it is less than $200mm^3$ for 51(15.6%) of them. The CD4 count at which the ART started was $>=500mm^3$ for 14(4.3%) and $<200mm^3$ for 199(61%) of the participants. Again when the ART started 60(18.4%) of participants fall in WHO clinical stage I and 15(4.6%) of them fall in clinical stage IV. During the data collection period, 138(42.3%) of the study participants fall in WHO clinical stage I where as 2(0.6%) fall in clinical stage IV. Study participants who first disclosed their HIV status to their spouse were 173(53.1%). Others 20(6.1%), 34(10.4%), 23(7.1%), and 76(23.3%) first disclosed their serum HIV status to their mother/father, brother/sister, friends and others respectively. Majority 229(70.2%), of the study participants obtained emotional support from the person for whom they disclosed their HIV status. Regarding the source of support, 241(73.9%) of the study participants relied on their own selves 50(15.3%), 24(7.4%) and 11(3.4%) dependent on family, government and NGOS respectively.

***ART drugs behaviors from self report**:* Regarding drug related behaviors from the self report, 320(98.2%) of participants continue use of drug always, 271(83.1%) go to see their care provider for health check up and receive the drug on time always, 281(86.2%) take ART drug with every meal as prescribed always, 311(95.4%) of participants never increase or decrease ART drug dose when feeling better or bad, 315(96.6%) of the clients never stop taking ART drug when having adverse effect without consulting their health care provider, 7(2.1%) of the study participants always forget to take their drugs with them when traveling distance, 323(99.07%) clients never take ART drugs with herbal medicine, 171(25.2%) never read the label of the container before taking the drug, 285(87.4%) use clock always, 225(69%) never bored to comply the drug fully, 13(4%) forget to take the drug within half an hour of the intended time, 94(28.8%), counts the pills after taking always.

Socio-cultural drug use: Concerning the use of behavioral drug, 45(13.8%) of the study participants use alcohol where as chat is used by only 4(1.2%).

Knowledge of ART drug among PLHIV: From the total participants 183(56.1%) scored more than mean score of the knowledge questions and considered to have good knowledge The specific questions and the participants response is indicated in the following table.

***Adherence to ART drug*:** From the total participants 127(39.9%) have missed at least one doses of drugs in the last two weeks prior to date of data collection among which majority, 80(62.99%) missed three ART doses. Concerning the dose time, 259(79.4%) took the tablets on time where as only 67(20.6%) took the drug without considering the scheduled time for the specific drug.

Regarding the adherence, 216(66.3%) of the PLHIV have achieved the high level dose adherence where as 67(20.6%) of the total participants took the drug without considering the schedule of the dose. The following table shows the distribution of the dose and time adherence.

Reasons for not taking the drug as scheduled: Forgetting to take the doses of drug 33 (10.1%), being busy with other work 30(9.2%), felt depressed 29(8.9%), long distance to facility 28(8.6%) and have no enough food to take the drug were the identified reasons to not consider the dose schedule.

4.2. Predictors of ART adherence among PLWH

Predictors of dose adherence

From the identified variables being a jobless (has no job) (*AOR= 0.233, 95% CI= 0.086-0.633*), being on ART for 3-12 months (AOR= 4.920, 95% CI=2.199-11.012), having good knowledge of the importance of ART drug (AOR= 0.039, 95% CI=0.019-0.079) and being bored with drug consumption sometimes only (AOR=2.718, 95% CI=1.077-6.860), are the independent factors significantly associated with ART adherence.

This result is also supported by the qualitative information's. According to the response it is obvious that many of the PLHIV consume the drug because of its health benefits. As an example a 54 years mothers supportive group member at Ambo health center said that, *I can practically tell you that many of the people are benefitted from the drugs, when people comes and linked to the ART most of them are chronically sick but after some months, their AIDS symptoms disappears.*

Factors affecting ART drug time adherence

Forgetting to take drug when traveling distance (AOR=0.124, 95% CI=0.028-0.533), having good knowledge of ART importance, (AOR=0.247, 95% CI=0.127-0.482), and increasing or decreasing ART dose without consulting care provider when having disease symptoms (AOR=0.134, 95% CI=0.021-0.852) are the independent factors affecting adherence to ART dose time. This finding is supported by most of in-depth interview discussants, for instance: − as one discussant explained that *"those who knows the benefits of the drug adheres themselves to the dose schedules, but in contrary to this there are reluctant(gidiyelesh) people who take the drug only when their conditions are worsened, even they discontinue".*

5. Discussion

From the finding it is understandable that 66.3% (95% CI=62- 71.5) of the study population has achieved the recommended (95% or more) adherence rate. That means that 66.3% of participants missed not more than one (1) does during their recall time or 7 days before the date of data collection. This finding is lower when compared to studies conducted in Jimma university specialized teaching hospital and Yirgalem hospital in Ethiopia (12,13) and in Senegal(14) from abroad, it is similar with findings from studies conducted in Togo(15) but significantly higher when compared to findings from south Nigeria, Zambia and Benin(16,17,18). This findings justifies the reality that the ATR adherence rate among Sub Saharan African countries have more of less similar picture and still it needs an attention to achieve the intended goal of ART provision in all areas(19).

Regarding the factors predicting adherence to ART regimen the study have identified that, being jobless, having good knowledge of the benefits of ART and being bored with ART dose only sometimes are statistically significantly associated with ART adherence. In other way a study conducted at Jimma University specialized teaching hospital, west Ethiopia, and Yirgalem district hospital(12,13), have revealed that support obtained from family and being dependent on family was significant factor related to ART dose, time and food adherence. This means that more or less socioeconomic factors similarly predicts ART adherence rate in different parts of Ethiopia. In addition outside Ethiopia, the study from West Africa Togo has also identified some similar factors affecting ART drug adherence. These all insures that, the barriers to ART adherence and follow up identified in the study conducted at India which includes unemployment, economic dependent and behavior towards medication (20).

The current study participants have different reasons for non adherence to both dose and time adherence, such as simply forgetting to take the doses of drug 10.1%, being busy with other work 9.2%, felt depressed 8.9%, long distance to facility 8.6% and have no enough food to take the drug were the identified reasons orderly. These reasons were almost similar with the findings of the studies western Ethiopia specifically Jimma University specialized teaching hospital and Yirgalem hospital, and from other African countries (12, 13, 16). The similarity may be because of the socioeconomic characteristics of the participants or similarity of the study

area set up as both the current and previous studies used hospitals. A field based observational longitudinal study conducted in Zambia identified long distance to health facilities, food insufficiency, and being busy with other activities (18) but in the current study distance was not an issue to not adhere to the drug schedule. Despite the difference in method of study, this may show success in the HIV/AIDS service decentralization plan of health care system in Ethiopia. A study conducted in south Nigeria also identified forgetting and other as a common reason of non adherence in addition to what is identified above (16). The similarity may be from the socioeconomic characteristics of the PLHIV.

Regarding the dose time adherence the current study have identified adherence rate of 79.4%, which is higher when compared to what was identified in the study conducted in western Ethiopia at Jimma university specialized teaching hospital (12). Similar reasons were identified as in the case of dose adherence above. Having good knowledge of the benefits of ART drug again statistically significantly predicts drug dose time adherence and is similar with the findings of other studies from Jimma which is because of the similarities in terms of different characteristics.

Generally the adherence rate finding of the current study falls in the range of the findings from the previous studies in different African countries. The reasons for non adherence are also somewhat similar with the report of those studies. Regarding the factors affecting ART drug adherence among PLHIV the current study have identified factors that almost overlap with the previous studies conducted in other parts of Ethiopia specifically Jimma and Yirgalem western Ethiopia (12,13).

6. Conclusion and recommendations

1. The current study have identified poor ART drug adherence rate among people living with HIV in comparison with the recommended adherence rate to suppress viral load and prevent drug resistance. Zonal health department, hospitals, regional health bureau and concerned bodies to the HIV prevention and control should make an effort to enhance the ART adherence rate.
2. Work conditions, knowledge about the benefits of ART were the significant factors in affecting ART adherence. So that to improve the current drug adherence level among PLHIV, the district health offices, zonal health departments and other concerned NGOs should attempt to improve ART provision that target the socioeconomic condition of the PLHIV. In addition the health care team of the hospitals should intensify their information to improve the client's knowledge of the benefits of ART drug adherence.
3. Duration of ART consumption and personal behaviors related to drug consumption were among the factors significantly affecting the drug adherence rate. This is also true in other documents that Good adherence frequently wanes over time, and patients may need significant support the longer the duration of therapy. This also needs the attention of the health care team. Health care providers should use different strategies such as maintain open discussion with their clients and helping clients to have an informed decision about the drug adherence.
4. As a limitation this study did not included social/community and or health facility related predictors, doe to this the next research should attempt to address this issues.
5. Finally other researchers should work to identify the trends of ART adherence and its outcome in relation to the different factors identified and convince the users and health care workers that the identified factors contribute to the adherence rate.

7. Reference

1. Federal Democratic Republic of Ethiopia, Ministry of Health: Health Sector Development Programme IV, 2010/11 – 2014/15
2. USAID/ETHIOPIA, HIV health profile: http://transition.usaid.gov/our_work/global_health/aids/
3. Patrick O Erah and John E Arute, Adherence of HIV patients to antiretroviral therapy in a tertiary health facility in Benin City, vol 2(7), September 2008. http://www.academicjournals.org/ajpp
4. Federal HIV Prevention and Control Office Federal Ministry of Health, Guidelines for management of opportunistic infections and anti retroviral treatment in adolescents and adults in Ethiopia, March 2008.
5. USAID HEALTH POLICY INTIATIVES, Equity and Access to Art in Ethiopia, June 2010.
6. Federal Ministry of Health, Manual for the implementation of Prevention of Mother Federal Ministry of Health, Mother-to-Child Transmission of HIV in Ethiopia, August 2011
7. Federal Ministry Of Health/National HIV Prevention and Control Office, AIDS IN ETHIOPIA, SIXS REPORT, 2010.
8. Mekonnen, Yared, Rachel Sanders, Senait Tibebu, and Priya Emmart. 2010. *Equity and Access to ART in Ethiopia*. Washington, DC: Futures Group, Health Policy Initiative, Task Order I.
9. National Department of Health, National Antiretroviral Treatment Guidelines. South Africa 2004.
10. Drug Administration and Control Authority of Ethiopia, Good Prescribing Manual For Ethiopia

11. Internal briefing and questions and answers kit On the launches of WHO "consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection, 2013" and "global update on HIV treatment 2013.
12. Ayele Tiyou, et.al, Predictors of adherence to antiretroviral therapy among people living with HIV/AIDS in resource limited setting of southwest Ethiopia, AIDS Research and Therapy 2010, 7:39; available on: http://www.aidsrestherapy.com/content/7/1/39
13. Endrias Markos, Alemayehu Worku, Gail Davey, Adherence to ART in PLWHA at Yirgalem Hospital, South Ethiopia. Ethiop.J.Health Dev 2008;22(2)
14. P.G.Sow et.al, Determinants of medication adherence among people living with HIV/AIDS in Senegal: Universal Journal of Education and General Studies Vol. 1(6) pp. 174-179, June, 2012.
15. Yao Potchoo et al. Knowledge and adherence to antiretroviral therapy among adult people living with HIV/AIDSHIV treated in the health care centers of the association in Togo, West Africa: BMC Clinical Pharmacology 2010, 10:11.
16. Oku et al, Prevalence and Determinants of Adherence to Highly Active Anti-Retroviral Therapy Amongst People Living with HIV/AIDS in a Rural Setting in South-South Nigeria. African Journal of Reproductive Health March 2014; 18(1)
17. Gretchen L. Birbeck et al, Antiretroviral Adherence in Rural Zambia: The First Year of Treatment Availability, *Am. J. Trop. Med. Hyg.,* 80(4), 2009, pp. 669–674
18. Patrick O Erah and John E Arute, Adherence of HIV/AIDS patients to antiretroviral therapy in a tertiary health facility in Benin City, African Journal of Pharmacy and Pharmacology Vol.2(7). pp. 145-152, September, 2008
19. Ayalu A. Reda and Sibhatu Biadgilign, Determinants of Adherence to Antiretroviral Therapy among HIV-Infected Patients in Africa: Hindawi Publishing Corporation, AIDS Research and Treatment Volume 2012.
20. Joglekar *et al*, Barriers to ART adherence & follow ups among patients attending ART centres in Maharashtra, India Indian J Med Res 134, December 2011, pp 954-959.

Tables

Table: Distribution of ART adherence among PLHIV attending ART clinic at hospitals in west shoa zone, Oromia 2015.

		Frequency	Percent (%)	95% CI	
				Lower	Upper
Level of adherence	Poor	110	33.7	28.5	39
	Good	216	66.3	62	71.5
	Total	326	100.0	100.0	100.0
Doses taken un timely	Yes	67	20.6	16	25.2
	No	259	79.4	74.8	84
	Total	326	100	100	100

Table 2: Factors associated with ART adherence in PLHIV attending ART clinic at hospitals in west shoa zone, oromia region 2015

Variables		**Sig.**	**AOR**	**95.0% C.I.**	
				Lower	Upper
Occupation	Others	.003			
	Employed	.477	.590	.138	2.526
	Daily laborer	.771	.840	.259	2.720
	Has no job	.004	.233	.086	.633
Source of income	Government	.658			
	Relied on self	.796	1.229	.257	5.868
	Family	.455	1.913	.348	10.504
	NGO	.692	.590	.043	8.041
Duration ART	>24 months	.000			
	3- 12 months	.000	4.920	2.199	11.012
	12.1-24 months	.612	1.241	.539	2.858
Bored with drug	Never	.101			
	Always	.511	1.421	.498	4.056
	Some times	.034	2.718	1.077	6.860
KNOWLEDGECAT	Good knowledge	.000	.039	.019	.079
	Poor knowledge	.000			

Table 3: Factors affecting ART drug time (schedule) adherence time among PLHIV attending ART clinic at hospitals in west shoa, oromia, 2015.

Variables		P value	AOR	95.0% C.I.	
				Lower	Upper
Bored with drug consumption	Never	.238			
	Always	.090	2.640	.859	8.120
	Some times	.936	1.050	.318	3.469
Take ART on time as scheduled	Never	.416			
	Always	.185	.083	.002	3.301
	Some times	.261	.118	.003	4.915
Forget ART when traveling distance	Never	.014			
	Always	.253	.338	.053	2.168
	Some times	.006	.124	.028	.553
Knowledge of ART benefit	Good knowledge	.000	.247	.127	.482