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Adherence to Antiretroviral Therapy and Factors affecting among People Living with HIV/AIDS and Taking Antiretroviral Therapy, Dire Dawa Town, Eastern Ethiopia

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Abstract

Introduction: According to recent studies, ART regimens require 70-90% adherence in order to be effective. However, sustaining adherence to antiretroviral therapy (ART) over the long term requires accurate and consistent monitoring and this is a particular challenge. In Ethiopia different studies have done on adherence to ART in different region and reporting inconsistent findings across each region.

Methods: Cross sectional study design was used to assess the adherence and factors that affect adherence to ART in Dire Dawa. Simple random sampling technique was utilized to select the intended sample size and the sample size was calculated using single proportion formula considering the proportion of adherence p=0.74, which is taken from the study conducted in Yirgalem Hospital. Data was collected using structured questionnaire and interviewing the respondents included in the study after taking the unique ART number from the sampling frame. Data was entered and analyzed using SPSS Version 16 for windows.

Results: The study revealed that ART adherence level was suboptimal (65%); whereas, the rest (35%) were non adherent (missed one or more dose) in the last seven days (non-adherent). Family support (p=0.001), having regular follow up (p=0.012) and trust each other with clinicians (p=0.01) were found to be associated with ART adherence positively.

Conclusion: The assessment of ART adherence was relatively poor when compared to others studies done. It was in disagreement with optimal adherence level. The adherence to ART was (65%); whereas, the rest (35%) missed doses (one and more) of their drugs in the last seven days (non-adherent). Among female respondent 59% adhered to ART while among the male respondents 41% adhered to their treatment indicating good adherence among female.

Keywords: ART; HIV; AIDS; Ethiopia

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Introduction

HIV/AIDS is the greatest health problem in the world. At the end of 2009, an estimated 33.3 million people were living with HIV, 2.6 million people were newly infected, and 1.8 million lost their lives due to AIDS. Sub-Saharan Africa carries 68% of the global total HIV burden (22.5 million people), which is an inordinate share [1]. ART increases the length, quality of life, and productivity of the people living with HIV (PLWH) by improving survival and decreasing the incidence of opportunistic infections through reduction of the viral load and increase of the level of CD_4 cells [2].

Recognizing this, the government of Ethiopia has done a lot to introduce the treatment [3]. It was first offered in July 2003 through 12 government hospitals on a co-payment basis. In early 2005, 211.000 men, women, and children needed ART but only 16,400 received it. In January 2005, free ART through the Global Fund, World Bank, and US President's Emergency Plan for AIDS Relief (PEPFAR) became available in 22 hospitals [4]. There were

497 ART centers serving 167.271 HIV/AIDS patients in October 2009 [5]. The effectiveness of ART relies on a strict adherence to it. In other words, loose obedience, or non-obedience to ART can result in inadequate viral suppression, immunologic failure, rapid disease progression, and the development of drug resistance [6,7]. To avoid the emergence of the resistant strains of the virus, World Health Organization (WHO) recommends at least 95% of adherence to ART [8]. Based on these facts, the importance of adhering to ART has been widely publicized and accepted as a critical element in the success of ART. However, many of the reported adherence rates are below the recommendation. Among the patients in Soweto, South Africa, the magnitude of adherence was 88% [9]; in a community setting in Atlanta [10]. Twenty percent of the participants missed at least one dose of ART. In Ethiopia, an adherence rate of 83% was reported in two hospitals of Oromia Regional State [11], 88.3% in Yirgalem Hospital [12], and 81.2% in three hospitals in Addis Ababa [13].

The commonly identified factors for non-adherence are forgetfulness, poor understanding of the relationship between non adherence and disease progression, side effects of drugs, alcohol and drug abuse, poor social support, poor health provider-patient relationships, being away from home, fear of disclosure, educational level, and others [12-15]. We, therefore, aimed at determining of adherence and identifying the factors that are related to non- adherence to ART among the patients attending at ART units in Harare National Regional State, eastern Ethiopia. With the introduction of ARV drugs, AIDS has been changed in to a treatable chronic disease. Even in a resource constrained setting with increasing people with AIDS accessing services, a decline in death rates has become clearly visible. In Ethiopia, the public health approach has been an overarching principle of the ART program which is actually recommended by WHO for resource-poor settings. By this approach, large numbers of people has been able to access ART and survival is maximized [16]. Free access to antiretroviral therapy was launched in Ethiopia in January 2005 in hospitals and rapidly expanded to the health centers in Ref. [17].

In order to ensure universal access great effort has been made in decentralization of comprehensive HIV care and treatment services including antiretroviral therapy to hospitals and health centers throughout the country. However, with rapid expansion of ART service the issue of adherence of patients has increasingly become a serious challenge.

Methods and Materials

Study design and population

Dire Dawa is located in the eastern part of the country enclosed by the State of Somalia and the State of Oromia. It is found at a distance of 515 Kilometers' from Addis Ababa. There are 9 urban and 38 rural kebeles. Dire Dawa is the capital city of the administrative council. The council has no administrative zones. The city was established with Ethio-Djibouti. Railway to be mid railway terminal in 1902 E.C. The 2008 Ec total population of Dire Dawa are 488,200. There are two governmental and 3 private Hospitals. This study was conducted in selected health facilities that are located in Dire Dawa Administration city from January 20 to May, 2016. Cross-sectional study was conducted. All adult population living with HIV /AIDS and started antiretroviral therapy in selected health facilities in Dire Dawa town. The study population consists of all adult HIV patients older than 18 years of age who were enrolled on ART in the selected health facilities at the time of study. Each member of the sample should take ARV treatment regimen for a minimum of six months prior to the commencement of the study at this particular Facility.

Inclusion and exclusion criteria

Patients who had been on ART for at least six months selected health facilities and willing to give their informed consent and to self-disclose information about the exact nature of their adherence to the dosage schedule of the ARV drugs that had been prescribed for them. They had to be at least 18 years old. All patients who suffered from any severe mental illness, poor general health or who were less than 18 years old. All HIV-positive patients who had taken the ARV medications for less than six months at the time of the study were excluded.

Sample size determination and sampling technique

Single proportion formula was used with the following formula $N=p(1-p) * (z^2)/d^2$ where p is the anticipated adherence proportion. For the purpose of this study to have adequate sample size, the least adherence report in Ethiopia 74% is taken as anticipated adherence proportion [18]. If P=0.74, d is the precision required on either side of the proportion (d=0.05), and z refers to the cut-off value of the normal distribution (z=1.96). Therefore the formula would provide the sample size of N=296. With consideration of non-response rate 10%, the total sample size was calculated to be 325. Simple random sampling method has been used to select the total number of patients that is required for the study. Each of the participants were randomly selected, and each of them had been informed by the clinic's service providers about the nature, scope and purpose of the study during their routine attendance at the clinic before they are invited to give their informed consent to participate in the study. The sampling unit for this study is the individual patient. This means that each individual in the population has an equal chance of being selected for the sample. In order to achieve this, the sample frame for the random sampling process had been obtained from the database of the hospital that registers all the patients who are on ART. A computer program had been then used to randomly generate the sample that is required for the study from those who are currently on ART and who had taken the prescribed medications for at least six months prior to the commencement of the study.

Study variables

The dependent variable was adherence to ART and the independent variables were: Socidemographic factors: age, sex, marital status, level of education, religion, residence, dependent children at home and employment status. Clinical factors: Past opportunistic illness, WHO clinical stage, regimen substitute, regimen and functional status. Medication related factors: too many pills, Side effect of the drugs, Scheduling problem, Access to medication, Frequency of daily doses, length of the treatment, need for daily administration. Health care delivery systems related

factors: healthcare providers experienced in HIV treatment, Patient-provider relationship, availability of counseling services, health education/information.

Data collection procedures

The principal investigator would train the nurses at the ART clinic to conduct structured interview with patients who had given their informed consent to be part of the study. During these interviews, the ART nurses who had been trained as interviewers filled in the information that they had been given by the interviewees in response to the questions in the questionnaire. The nurses who had been trained as interviewers in the ART clinic only request to interview those patients whose unique ART number appeared in the list that the computer had generated by means of a simple random number-generation method. Before the interview begun, the respondents had been informed about the objective of the study. They would also asked to give their written consent after they had been told that they had the right to refuse to participate and be informed that the data would only be used for the purposes that had been explained to them. During this interview, each nurse would have a complete set of the drug samples in their boxes so that patients could identify the drugs that they were taking by pointing to the boxes concerned.

Data analysis

Data analysis had been carried out using SPSS version 16. After selecting important predictors, data cleaning, coding and recoding for all variables, categorization of continuous variables was done before any analysis is commenced. Descriptive statistics was conducted for categorical variables. Accordingly frequencies distributions, percentages, pie chart, figures and tables would be used to provide an overall and coherent presentation and description of data odd ratio were used to express the magnitude and association between the independent and outcome variables. The study was approved by School of nursing for ethical appropriateness.

Results

Socio-demographic characteristics of the participants

From the total of 325 study participants, 314 were interviewed with response rate of 96.6%. Out of 314 respondents in this study, 189 (60.2%) were females while the remaining 125 (39.8%) were male. From the total study participants, 125 (39.8%) were between 35-44 age group. Concerning religion, from the total 314 respondents 182 (58%) was orthodox religion followers and followed by Muslim religion 98 (31.2%). Regarding marital status of the respondents, 143 (45.5%) of the participant were married, 69 (22%) single, 47 (15%) widowed and the remaining 43 (13.7%) were divorced. Education status of the respondent showed that, 38 (12%) were high school, 38 (60.5%) primary school, 70 (25%) college and university level educational status and the reaming 45 (14.3%) were illiterate. Regarding ethnicity, 151 (48.1%) were Amhara, 121 (38.5%) were Oromo, 14 (4.5%) were Somali. In this study majority of participants 192 (61%) reported that their average monthly income was 600-1000 Ethiopian Birr, 73 (23%) were <500 birr and 11 (3.5%) get less than 1050 average monthly income.

Adherence rate of ART and associated factors

Medication related factors: From the total respondent, 65% of them had good dose adherence and the remaining 35% of them were not adherent to their ART drugs **(Figure 1).**

Many of the participants 133 (42%) had one or more side effects of ARV drugs. The most common side effects reported were nausea 83 (63%), headache 72 (54%), vomiting 66 (49%), gastrointestinal intolerance 25 (19%), anemia 32 (24%), depression 29 (22%) and rash 19 (14%) **(Figure 2).** After encountering drug side effect, 235 (74%) of them immediately reported for their clinician while 70(22%) of them withheld until the date of appointment.

Reason for missing regular appointment: Total number of participants 314, out of these 41 (13%) were missed their regular appointment out of them, 26 (63.4%) were missed their regular appointment, the main reasons for forget, 9 (22%) being too busy and 6 (14.6%) were long distance from home **(Figure 3).**

Messed doses in last one month: A bout 22 (33.6%) of the participants missed their dose due to substance, 90 (32%) due to irregular follow up and 87 (27.7%) the patients their monthly income less than <1000 ETB. Majority of respondents, 94 (30%) had history of substance abuse, 90 (96%) were used cigarette smoking, more than three fourth of the respondents have emotional and practical support 258 (82%) and most of them were 214 (83%) supported their family and almost all of the patients 283 (90%) had trust relationship with their clinician. From total respondents, 274 (87%) missed their follow up regular appointment, main reason for missed appointment 26 (65%) due to forget. Majority of respondents 128 (40.8%) took their ARV drug side effect were faced, the most common side effect was 83 (26.4%) nausea followed by 72 (23%) headache. The measure taken of patients after develop drug side effect 235 (74%) were immediately reported for their clinician followed by 70 (22%) was withheld until the date of appointment. Regular follow up was positively associated with ART adherence (p=0.011). Trust each other with clinician relationship (P value <0.01) and those clients who have regular follow up (p=0.012) were associated with ART adherences positively **(Table 1).**

Discussion

This study assessed the ART adherence level and its associated factors among adult PLWHA who were on anti -retro viral therapy

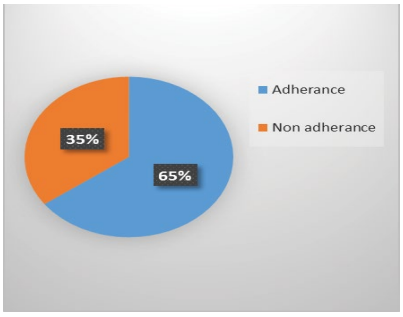

Figure 1 ART adherence in last one month at Dilchora referal Hospital, Addis ketema and Dechatu health center in Diredawa town, Eastern Ethiopia 2016.

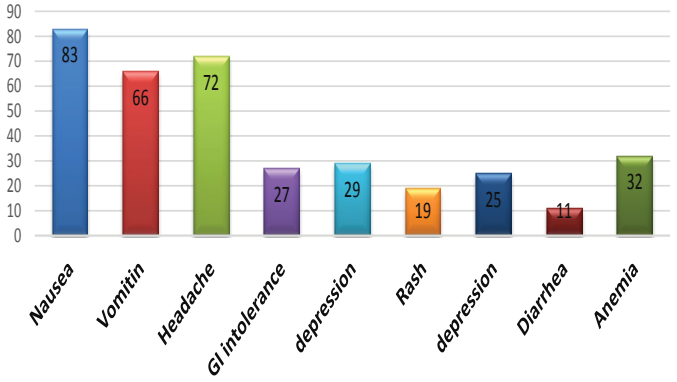

Figure 2 Side Effects of ART Reported by the Respondents among People living with HIV/AIDS at Dire Dawa, Eastern Ethiopia 2016.

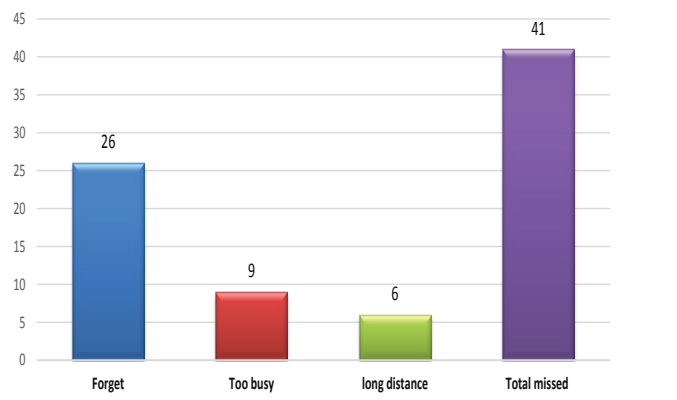

Figure 3 Reason for missed their regular appointment among People living with HIV/AIDS at Dire Dawa, Eastern Ethiopia 2016.

in selected health facilities Dire Dawa town (Dechatu, Addis ketema and Dilchora Hospital. ART adherence was assessed by patients self-report within the past seven days prior to interview. Based on this, the prevalence of ART adherence level in selected health facilities were (65%). This result is comparable with study done in Yirgalem hospital with the prevalence of ART adherence level (74%) [18], similar study in Felegehiwot hospital in Gonder town show that level of adherence among HIV infected patients were (82.7%) [19]. This result show that the prevalence of art adherences level is smaller when compared with study done in Gonder and ART patients in Dire Dawa may use different substance abuse like chat which is one of the factors that contribute for forgets and ignorance to take medicine on time. Another study Wolayta sodo prevalence of ART adherence is (67%) this is almost similar with this study, this is because of similar sample size, study methodology and similar questionnaires [20]. Study conducted in Harar town also show that the prevalence of ART adherence level is (87%) which is higher than what is in Dire Dawa this may be due to sample size and study design they use [21].

In this study so many factors were considered to observe their association with ART adherence level. But some factors like, presence of family support, trust clients and clinical each other and clients with regular follow up were associated with ART adherence level [16].

In this study, ART family support was significantly associated with ART adherence level (p=0.001) this result is in line with study done in Bale Goba [22]. This is true that patient with ART are exposed for forgetting but when they are supported by their families or friends they were restricted with treatment protocol and this may lead to then to have good adherence level to their ART medication than those do not have nearby support. ART patient with Regular follow up were also associated with ART adherence level (p=0.012). This is comparable with study done in Gondar (p=0.001) [23]. This may be they may got good concealing from their health professionals and also when they regularly follow up they may get support from adherence supporter employee. Good interaction with clinicians and ART patient also associated with ART adherence level (p=0.01) this finding is similar with study done in Bale gobal hospital (p=0.019) [23]. The possible justification is when they trust their clinician they develop confidence on advice that he/she provide for them and follow the order of their clinician advice and this may create to increase the adherence level of the patient on ART.

Conclusions

The adherence to ART was (65%) whereas, the rest (35%) missed doses (one and more) of their drugs in the last seven days (non-adherent). Among female respondents 59% adhered to ART while among the male respondents 41% adhered to treatment by direct interview indicating that there is slight difference in ART adherence with higher rate in female. The assessment of ART adherence was relatively poor when compared to others studies done in our countries. It was in disagreement with optimal adherence level (>95%). The major reasons for missing doses were simple forgetfulness, away from home (travel) and being busy with other things. The level of adherence was significantly associated with variables, family support, relationship with clinician and regular clinical follow up. Health care providers should provide accessible information to patients on their treatment plan to ensure patients keep their regular follow up, improve their patient's confidence and to avoid drug abuse. The clinicians need to improve relationship with their patients and counsel their patients on the regular follow up of the appointments and avoiding drug abuse. Finally, further study should be done with inclusion of different adherence measures and advanced statistical tests using large.

Competing Interests

The authors declare no competing interest.

Authors' Contributions

Lemma Negesa - took the lead through the development of the proposal, data collection supervision, check up of the collected questionnaire and analysis as well as through write up of the paper. Ephrem Demeke - also had main contribution in analysis and write up of the paper. Wubshet Mekonnin - had a great contribution in cleaning and analysis of the data by statistical software.

Table 1 Factors associated with ART Adherence among People living with HIV/AIDS at Dire Dawa, Eastern Ethiopia 2016.

Variable			Adherence		P=value
			Yes	No	
Interaction with clinician		Trust	188	95	0.01*
		Ignorant/neglect	13	11	0.054
Regular follow up appointment		Yes	184	90	0.012*
		No	23	17	0.32
History of drug abuse		Yes	72	22	0.081
		No	135	85	0.071
Do you have emotional support		Yes	165	93	0.57
		No	42	14	0.065
Who support you	family	Yes	135	79	0.001*
		No	22	92	0.72
	friend	Yes	29	15	0.055
		No	179	92	0.89
	community	Yes	12	11	0.99
		No	190	114	0.78
	other	Yes	165	95	0.88
		No	204	105	0 .99
Do you feel comfortable of taking medication in front of others		Yes	125	85	0.057
		No	81	47	0.069
Do you have any side effects when you take medications?		Yes	85	43	0.77
		No	118	63	0.61

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