



Factors Influencing Adherence to Antiretroviral Therapy among People Living With HIV/AIDS at ART Clinic in Jimma University Teaching Hospital, Southwest Ethiopia

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Abstract

Background: Ethiopia is one of the Sub-Saharan Africa countries highly affected by HIV epidemics. Antiretroviral therapy (ART) alters and reduces progression to AIDS and prolongs and improves the quality of life among HIV infected population. For ART, at least 95% adherence is required to prevent the development of drug resistant viral strains. Non-adherence to ART may result in regimen failure, immune suppression and emergence of resistant viral strains, limited future treatment options, and higher treatment costs.

Objective: The aim of this study is to assess factors influencing ART adherence among PLWHA on ART treatment in JUTH ART clinic.

Method: A cross-sectional study was conducted on a sample of 221 PLWHA who had follow-up at JUTH ART clinic from February to March 2015. Data was collected through interview using structured questionnaire by graduating nursing students. Data was cleared and checked for completeness and compiled on excel sheet for analysis. Chi-square test was calculated at 5% level of significance to see the association between independent and dependent variables and p-value of <0.05 was considered statistically significant. Finally the result was presented in text statement, figure and tables.

Results: Of the total 221 participants more than half 153 (69%) were greater than 30 years, 144 (65.15%) were females, 167 (75.56%) were urban dwellers, 169 (76.43%) were Oromo ethnic group. Overall from the study participants 80 (36.19%) had poor adherence and 141 (63.8%) had good adherence to their ART treatment. Factors like educational status, residence, occupation and alcohol addiction are significantly associated with the level of adherence to ART treatment.

Conclusion and recommendation: Although the prevalence of HIV/AIDS is reducing adherence remains as one of the challenges the control of HIV/AIDS where only around 2/3rd of PLWHA were well adhered to ART. Based on the finding of this study, JUTH should counsel patients about advantage of taking ART drugs properly, risk of not taking the medicines appropriately, the method how to remember the time of taking drugs and other factors that influence ART adherence.

Keywords: Adherence; Stigma; ART; HIV; PLWHA

Abbreviation

HIV: Human Immune Virus; AIDS: Acquired Immune Deficiency Syndrome; ART: Antiretroviral Therapy; PLWHA: People Living with HIV AIDS; PLHIV: People Living with HIV; ARV: Antiretroviral; WHO: World Health Organization; JUTH: Jimma University Teaching Hospital; CBE: Community Based Education

Introduction

Human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) is one of the leading health problem throughout the world. Approximately nearly 33.3 million people were living with HIV, 2.6 million were newly infected, and 1.8 million died of AIDS at the end of 2009. Majority (68%) of the global total HIV burden (22.5 million people) was in Sub-Saharan Africa, which is a greatest share. [1] Adherence to a medication regimen is defined by Cramer et al as "the act of conforming to the recommendations made by the provider with respect to timing, dosage, and frequency of medication taking" [2].

90.9% of the children on ART were optimally adherent. Experiencing ART-related adverse effects was significantly associated with suboptimal adherence. [3] India has estimated 2.4 million people living with HIV, of which 3.5% are children according to HIV sentinel

surveillance of 2008–2009. [4] Antiretroviral therapy (ART) alters and reduces progression to AIDS and prolongs and improves the quality of life among HIV infected population. The prevalence of HIV/AIDS in the general population is estimated to be 1.5% with the more than 800,000 patients living with Human Immunodeficiency Virus (HIV)/AIDS in Ethiopia. By the end of 2011, 249,174 adult patients (86% of eligible patients) were prescribed ART [5].

For ART, at least 95% adherence is required to prevent the development of drug resistant viral strains. [6] Non-adherence to ART may result in regimen failure, immune suppression and emergence of resistant viral strains, limited future treatment options, and higher treatment costs [7].

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Patients' beliefs regarding HIV can positively or negatively affect treatment. Poor knowledge of HIV and benefits of ART has been associated with non-adherence to ART [8] and withdrawal from care in both high-income settings [9-11] and sub-Saharan Africa [12-15]. Effective antiretroviral therapy (ART) has significantly reduced morbidity and mortality related to HIV/AIDS so that HIV is now a chronic rather than fatal disease [16-18]. However, currently HIV patients face two significant ongoing behavioral challenges, first the need to maintain high levels of adherence to ART and second need to engage in safer sex practices to protect themselves and the public health [19,20].

There are 249,179 adult human immunodeficiency virus (HIV) patients in Ethiopia, who have been registered for the antiretroviral therapy (ART) medication according to the AIDS resource center statistics in 2011 [21]. Adherence to ART produces successful HIV outcomes to ensure ideal viral and CD4 control and prevention of further complications [22]. However, ART adherence often poses a special challenge and needs commitment from the patient and the health care team [23]. Due to fast replication and mutation of HIV, low adherence results in the development of drug-resistant strains of HIV. To achieve ideal CD4 count and long-term viral load suppression, adherence to ART must be >95.0%. ART adherence can be classified as "good" when the patient misses three or less doses, "fair" between three and eight doses, and "poor" missing more than eight doses per month.

Few patients believed that ART prevent sexual transmission and many believed Holy Water could cure HIV. Factors associated with lower odds of accurate beliefs included advanced HIV, lack of formal education, and Muslim religion (benefits of ART/clinical care); secondary or university education and more clinic visits (ART to prevent sexual transmission); and pregnancy and Orthodox Christian religion (Holy Water) [24].

Caregivers' knowledge about antiretroviral treatment, no current substance use of the care-givers, proximity to the health care facility, if the child knows HIV-positive status and caregiver's educational status were significantly and independently associated with adherence of children to antiretroviral therapy. [25] Caregiver-reported adherence in the past 7 days prior to interview was 93.3%. However, estimated adherence using unexpected home-based pill count was found to be 34.8%. Children with married and widowed/divorced caregivers, those who were not aware of their HIV sero-status, and those with baseline WHO clinical stage III/IV were more likely to adhere to their ART treatment while children on d4T/3Tc/EFV were less likely to adhere. Caregivers' forgetfulness and child refusal to take medication were reported as the major reasons for missing doses [26].

Among participants who had been sexually active, unprotected anal/vaginal sex was weakly associated with poorer ART adherence. HIV-infected heterosexual men who are having difficulty adhering to ART are also more likely to engage in risky sexual behaviours [27]. The overall ART adherence among children was 90.4%. Age of the child, disclosure of the child's HIV status to the child, and knowledge of caregivers about ART medication, were independently significantly associated with adherence [28].

Among the participants, 95.5% were taking their medication without missing a dose. Factors such as having emotional or practical support positively encouraged ART adherence. However, users of traditional, complementary, and alternative medicine (TCAM) (adjusted odds ratio 4.7 had nearly a five times higher risk for ART non-adherence than those not using TCAM. Adherence to ART

among PLWA is imperative and standard [29]. Economic constraints, perceived stigma and discrimination, fasting, holy water, medication side effects, and dissatisfaction with healthcare services were major reasons for non-adherence and lost to follow-up. Disclosure of HIV status, social support, use of reminder aids, responsibility for raising children, improved health on ART, and receiving education and counselling emerged as facilitators of adherence to ART [30].

96.9% patients agreed and strongly agreed that the use of ART is essential in their life, and approximately 93.2% disclosed their sero-status to family and the level of adherence was 80.9%. 97.2% respondents had good or fair adherence. forgetfulness 43.3%, missing appointments 20.9%, running out of medicine 13.4%, depression, anger, or hopelessness 6.0%, side effects of the medicine 3.0%, and not believing in the ART 3.0% were among the reasons for missing doses. Age, employment, HIV disclosure, and comfortability to take ART in the presence of others are variables found significantly associated with non-adherence [31].

Among the 239 study participants, the magnitude of adherence to ART in the week before interview was 87%. The main reasons for non-adherence were forgetting (47.2%), traveling (18.9%), and being busy (15.1%). Forgetfulness was the most common reason for the non-adherence [32]. Achievement of optimal medication adherence and management of antiretroviral toxicity pose great challenges among Ethiopian patients with HIV/AIDS. There is currently a lack of long-term follow up studies that identify the barriers to, and facilitators of, adherence to antiretroviral therapy (ART) in the Ethiopian setting. Therefore, we aim to investigate the level of adherence to ART and a wide range of potential influencing factors, including adverse drug reactions occurring with ART [33].

Objective

To assess factors influencing adherence of ART among people living with HIV/AIDS attending JUTH ART clinic.

Materials and Method

Study setting and period

The study was conducted in JUTH, located in Jimma town, Oromia regional state from February to March, 2015. Jimma town is found at 357 km from Addis Ababa, capital city of Ethiopia in the southwestern part of the country. JUTH is the only teaching and referral hospital in southwestern part of the country and providing specialized clinical services to about 15 million people in the catchment. JUTH ART clinic is one the units of the hospital currently serving for over 2500 HIV/AIDS patients.

Study design

Health institution based cross-sectional study was conducted.

Population

Source population: All people living with HIV/AIDS (PLWHA) who are registered for ART in JUTH ART clinic.

Study population: PLWHA attending JUTH ART clinic during the study period.

Inclusion criteria: Adult people (15 years and above) who were HIV positive and registered for ART follow up at ART clinic to take medication during data collection.

Exclusion criteria: People who are on pre-ART but registered for

drug follow up and children less than 15 years are excluded from the study.

Sample size and sampling procedure

Sample size determination: Sample size is determined using single population proportion formula by considering 50% proportion, 95% confidence level and 0.05 margin of error.

After calculating for population correction and adding 10% for non-response the final sample size become 221

Sampling techniques: The patients were selected conveniently during the study period to obtain the desired sample size.

Operational definition and definition of terms

Adherence: The extent to which the patient continues the agreed upon mode of treatment under limited supervision when faced with conflicting demands as distinguished from compliance or maintenance.

Good adherence: Those who took 95% or more of the drug as prescribed by the doctor or nurses.

Poor adherence: Those who took less than 95% of the drug as prescribed by the doctor or nurses.

Stigma: is apperceived negative attribute that cause someone to devalue or think less of the whole person.

Data collection tools and procedure: Structured closed ended questionnaire was prepared after review of relevant literatures. The data was collected through interview by using structured questionnaire from PLWHA attending ART clinic in JUTH. The data collection was carried out by three graduating nursing students on patients' appointment days.

Data quality assurance: To maintain the quality of data two weeks before the actual data collection period pre-test was done on 5% of the sample and amendments were made accordingly. The data collectors were trained for one day before actual data collection. The collected data was checked daily for completeness and consistency before data processing and analysis.

Data processing and analysis: After collecting the data it was cleared, checked and analyzed by using SPSS 20 statistical package. Finally the analyzed data was presented by using frequency tables, graphs and narrative texts. Chi-square test was calculated at 5% level of significance and p-value was used to observe whether there is difference statistical significance or not.

Ethical consideration

Ethical clearance letter was obtained from Jimma University College of Health Science institutional review board (IRB) through department of nursing and additionally permission was obtained from JUTH. Further, for each study participant the objective of the study was stated by data collectors. In addition participants were informed that they have full right to refuse participating in the study and can interrupt the interview if not comfortable with it, but they were informed that their participation in the study is very important. Confidentiality of the information was assured and privacy of the study population was respected and kept as well.

Results

Socio demographic characteristics of the respondents

The study was conducted on 221 patients giving the response rate

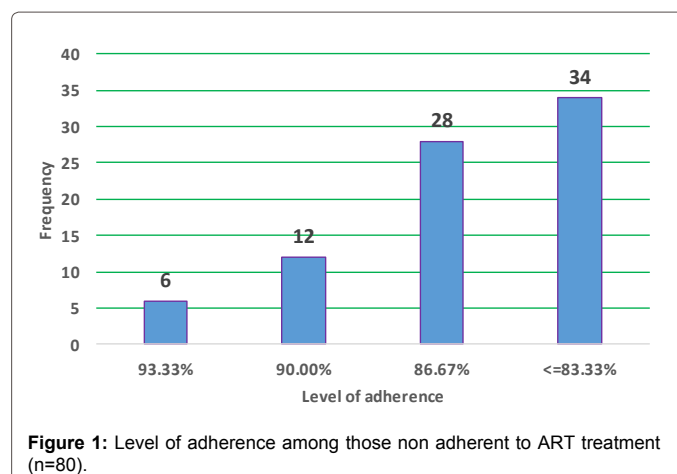
of 100%. More than half 153 (69.23%) of the study participants were greater than 30 years, while 54 (24.43%) were between 25-29 years of age. Among the study participants 144 (65.16%) were females and 167 (75.57%) were urban dwellers. Concerning their ethnicity most of the respondents 169 (76.47%) were Oromo followed by Amhara 20 (9.05%). Regarding their religion 90 (40.72%) were Muslims followed by orthodox 85 (38.46%). Concerning educational status 90 (40.72%) have learnt less than 8 grade while 43 (19.46%) were not able to read and write. Concerning the occupational status employer 53 (23.98%) and others account 17 (7.69%). Their current marital status indicates 113 (51.13%) were married and 41 (18.55%) widowed. Most of the participants 148 (66.97%) live in less than 5 family members (Table 1).

Drug related results

Out of the total respondents 219 (99.10%) remember the time they start taking ART. Majority 171 (77.38%) of the respondents took antiretroviral therapy (ART) treatment for greater than one year. 80 (36.20%) missed at least two doses of ART medication because of different reasons like forgetting, being away from home, being busy and other factors like fasting, sleeping etc. On the other hand 21 (26.25%) of the participants miss the drug for at least two consecutive days because of related reasons like being away from home being busy and others. 207 (93.67%) of the respondents were satisfied to care and support given from health personnel and they know the disadvantage of discontinuing the drug. 31 (14.03%) of the respondents complain the blame rejection of families and friends and 81 (36.65%) fear of stigma and discrimination of the society. 171 (77.38%) of the participants were taking other medication(s) with ART treatment and 50 (22.62%) were using alcohol and other addictive substance like cigarette and chat. 141 (63.80%) of the respondents spent their time on working 8-10 hours per day (Table 2).

Adherence level and factors associated with it

From the total study participants, 6 (2.71%) of the respondents had 93.33% adherence and 34 (15.38%) of the respondents had 83.33% or less level of adherence (Figure 1). Overall 80 (36.19%) of the respondents had poor adherence (less than 95%) and 141(63.8%) had good adherence (greater than or equal to 95%). We have done chi-square test to see the association between socio-demographic characteristics and level of adherence. Accordingly factors like residence, educational status, substance use and occupation had significant association with the level of adherence whilst sex, age, marital status and distance from the hospital had no significant association (Table 3).



Discussion

The study intended to identify factors influencing adherence to ART treatment among adult PLHIV on treatment, in order to advise for appropriate strategies to improve adherence. The study explored several factors through interview with ART users. In this study 36.19% of the respondents had poor adherence (less than 95%) which is lower than WHO recommendation which was 95% or more and study done on the levels of adherence required for virologic suppression (6) but it is better than study done by unannounced home-based pill count in which adherence level is 34.8% (27).

In the recent study factors like residence, educational status, substance use and occupation had significant association with the level of adherence whilst sex, age, marital status and distance from the hospital had no significant association. This finding is slightly different from study done in University of Gondar Hospital and Gondar Poly Clinic in which age, disclosure of the HIV status, and knowledge of caregivers about ART medication, were independently significantly associated with adherence [29] and study done in Debrebrihan Referral Hospital and Health Center which indicates that factors such as having emotional or practical support positively encouraged ART adherence [30]. It also differs from the finding of study conducted on determinants of non-adherence to antiretroviral therapy which reported age, employment, HIV disclosure, and comfortability to take ART in the presence of others are variables found significantly associated with non-adherence [32].

This study shows that 80 (36.19%) of the respondents missed at least two doses of ART medication and 34 (42.50%) of these missed greater than three doses this finding is different from the finding of study conducted in Debrebrihan Referral Hospital and Health Center which shows 95.5% of the respondents took their ART treatment without missing doses [30].

Our study identified that 31 (14.03%) of the respondents complain the blame rejection of families and friends and 81 (36.65%) fear of stigma and discrimination of the society. This finding is somewhat similar with a meta-analysis which shows those patients' beliefs regarding HIV can positively or negatively affect treatment. Poor knowledge of HIV and benefits of ART has been associated with non-adherence to ART [8].

Conclusion

In general the level of adherence found in this study is low/poor when compared with other studies. The level of adherence may be related to different socio-demographic factors like occupation, marital status, residence, sex and other factors that affect ART adherence such as forgetting of taking drugs, being away from home, being busy and alcohol addiction as reported by the study participants. Educational status, occupation, residence and substance use are factors statistically associated with the level of adherence. These problems also existed in other related researches conducted in Ethiopia and other countries with the same factors even if their severity were different.

Recommendation

Health education should be given by health professionals (caregivers) for the patients to increase awareness about the importance of ART for PLWHA and problems of non adherence. Health professionals (care givers) should advise patients to use different reminding techniques (such as an alarm clock), how to keep their drug with them during they move away from home, the effect of alcohol on

Demographic characteristics	Frequency	Percent	
Age group	15-19	2	0.90
	20-24	12	5.43
	25-30	54	24.43
	Above 30	153	69.23
Sex	Male	77	34.84
	Female	144	65.16
Place of residence	urban	167	75.57
	Rural	54	24.43
Religion	Orthodox	85	38.46
	Muslims	90	40.72
	Protestant	43	19.46
	Wakefeta	2	0.90
Ethnicity	Catholic	1	0.45
	Oromo	169	76.47
	Amhara	20	9.05
	Gurage	8	3.62
	Tigre	2	0.90
Education	Others*	22	9.95
	Illiterate	40	18.10
	1-8	90	40.72
	9-12	51	23.08
	Certified	33	14.93
Occupation	Degree	4	1.81
	Farmer	38	17.19
	Merchant	49	22.17
	Daily laborer	34	15.38
	House wife	24	10.86
	Government employee	53	23.98
	Student	6	2.71
Marital Status	Others\$	17	7.69
	Single	19	8.60
	Married	113	51.13
	Divorced	48	21.72
Family Size	Widowed	41	18.55
	<5	148	66.97
	>5	73	33.03

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\$ Daily laborer, house wives, 'tella' saler

Table 1: Socio-demographic characteristics of the population living with HIV/AIDS attending ART in ART clinic in JUTH (n=221).

Variables	Categories	Frequency	Percent
Remember the time they start taking ART	Yes	219	99.09
	No	2	0.91
Number of missed days	Two days 93.33	6	2.71
	Three days 90	12	5.43
	Four days 86.67	28	12.67
	Above four days	34	15.38
	Total	80	36.19
Perceived Reason for missing doses (n=80)	Drug side effect	9	11.25
	Forgetting	17	21.25
	Away from home	20	25.00
	Being busy	30	37.50
	Others*	4	5.00
Satisfaction with care and support given from health personnel	Satisfied	207	93.67
	Not satisfied	14	6.33
taking other medication(s) with ART treatment	Yes	171	77.38
	No	50	22.62

Using alcohol and other addictive substance like cigarette and chat	Yes	50	26.62
	No	171	77.38

*sleeping, fasting

Table 2: Patients who missed doses and perceived reasons for missing by self-report at JUTH in ART clinic (n=221).

ART adherence and the like.

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Variables	Dependent	Adherence level		Chi-square	p-value
Independent	Categories	Good adherence	Poor adherence		
Sex	Male	25	52	0.7125	0.3986
	Female	55	89		
Age	15-19	2	0	5.4566	0.14126
	20-24	5	7		
	25-29	23	31		
	>30	50	103		
Marital status	Single	5	14	5.1222	0.16306
	Married	35	78		
	Divorce	22	26		
	Widowed	18	23		
Educational status	Illiterate	24	18	24.4643	0.000064*
	1-8	36	56		
	9-12	15	35		
	Certificate	26	7		
	Degree	3	1		
Presence of Stigma and discrimination	Yes	25	56	1.5757	0.209379
	No	55	85		
Use of alcohol and other addictive medication	Yes	32	18	21.6252	<0.00001*
	No	48	123		
Occupation	Farmer	18	20	11.3797	0.022613*
	Merchant	21	28		
	Student	2	4		
	Government Employee	23	30		
	Other\$	16	59		
Residence	Urban	51	116	9.4809	0.002076*
	Rural	29	25		
Other medications with ART drug	Yes	31	55	0.0014	0.9694
	No	49	86		
Satisfaction with health providers	Yes	75	132	0.0015	0.968889
	No	5	9		

\$daily laborer, house wives, 'tella' saler,

*Significantly associated

Table 3: Factors associated with the level of ART adherence among HIV/AIDS patient attending JUTH ART clinic, West Ethiopia 2015 (n=221).

Conflict of Interest

The authors declare that there is no conflict of interest in publishing this study.

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Authors' Contribution

AA: contributed a lot in title selection, proposal development, data collection, data analysis, interpretation, and report write-up. BF contributed a lot to the designing of the study starting from title selection through the methodology preparation, data collection and data analysis and report write-up. TT and FB equally contributed in the development of methodology, analysis and report write up.

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