

# Assessment of Factors Affecting Art Adherence among People Living with Human Immune Virus in Bale Robe Hospital, South East Ethiopia

Ahmed Yasin Mohammed\*, Muktar Beshir Ahmed, Tomas Benti Tefera

Department of Public Health, College of Medicine and Health Science, Madawalabu University, Bale Goba, Ethiopia

\*Corresponding author: [ahmedyassinmoha@yahoo.com](mailto:ahmedyassinmoha@yahoo.com)

Received December 20, 2014; Revised February 13, 2015; Accepted March 19, 2015

**Abstract** Human Immune Virus now a day is one of the devastating illnesses witnessed worldwide. It becomes a prevalent disease and presents a global public health concern without a cure. Among East Africa countries, Ethiopia is one of which Human Immune Virus becomes major public health emergency. Antiretroviral Treatment (ART) services are important and effective in prevention and palliative treatment of the virus. Non adherence is the risk for the development of drug resistance and failure of therapy. The objective of this study is to assess factors affecting ART adherence among People Living With Human immune virus. A facility based cross sectional study was conducted on 245 subjects on ART follow up at Bale Robe Hospital selected using systematic random sampling from March 18 to April 13/2013. A structured and pre- tested interviewer administered questionnaires were used for data collection. The item consists of socio demographic variables, psychosocial, Clinical, Behavioral factors and items measure level of ART adherence. Data were analyzed using SPSS version 20. Frequency and percentages were calculated. The  $\chi^2$  (chi – square) test and P values determined and associations were assessed.  $P < 0.05$  considered statistically significant association with ART adherence status. The rate ART dose adherence of the study subjects were 83.1%. The finding emphasize that important multiple psychosocial factors: patients disclosure status, types of social support, stigma, depression, social isolation and active substance use were significantly associated ( $P < 0.05$ ) with adherence level. Additionally other barriers like being too busy and attitude towards the drug has been significantly associated ( $P < 0.05$ ) with adherence. The adherence rate found in this study seems to be encouraging. However, focusing on strengthening psychosocial aspects affecting ART adherence behavior and appropriate monitoring of patients could potentially help them to maintain adherence and therefore improve the outcome.

**Keywords:** ART, adherence, associated factors, HIV, ethiopia

**Cite This Article:** Ahmed Yasin Mohammed, Muktar Beshir Ahmed, and Tomas Benti Tefera, “Assessment of Factors Affecting Art Adherence among People Living with Human Immune Virus in Bale Robe Hospital, South East Ethiopia.” *American Journal of Public Health Research*, vol. 3, no. 2 (2015): 60-67. doi: 10.12691/ajphr-3-2-5.

## 1. Introduction

Human immune virus or Acquired Immune deficiency Syndrome (HIV/AIDS) was initially recognized in United States of America among homosexual males in 1981. It was first identified on individuals with Pneumocystic Carnie Pneumonia (PCP) who were previously healthy but homosexual males. The disease was recognized in female and male injection drug users in haemophilia and blood transfusion recipients among female sexual partner of men with AIDS and infants born from mother with AIDS or with a history of injection drug used. HIV/AIDS nowadays is one of the devastating illnesses witnessed worldwide. An estimated 33.4 million people are living with HIV worldwide, 2/3 of these living in sub-Saharan Africa including our country Ethiopia [1]. The adjusted HIV prevalence for Ethiopia in 2005 was 3.5% (urban 10.5% and rural 1.9%). The situation of HIV epidemic in

Amhara, Oromia, Addis Ababa, and SNNPR is worse than other regions. Together these regions accounted for 86.6% of all PLWHA in Ethiopia [2].

Anti – retroviral therapy has shown to delay progression to Acquired Immune deficiency Syndrome (AIDS) resulting in a greater and more sustained virologic response and improve survival [3]. According to 2000 Survey, ART regimen requires 70 – 90% adherence in order to be effective [4]. However, sustained adherence to ART over long term requires accurate and consistent monitoring and this is a particular challenge for countries in sub-Saharan Africa. Various social and clinical obstacles further challenge it [5].

Adherence is defined as taking medication or intervention correctly according to prescription. There are different methods of assessing adherence and level of adherence is specific to not only places and patient groups but also has to the method of adherence measurement used. ART adherence is now crucial for HIV positive

individuals receiving therapy and an important measure for ART program to succeed intervention strategies to support adherence have been found to be important in the achievement of positive outcomes. Consistently high level of adherence is needed for reliable viral suppression and to prevent drug resistance, disease progression other complications and death [6].

Those clients living with the virus are associated with different outcomes following ART follow up. Some of these may show improvement following adequate voluntary counselling and testing and ART service, some of the patients may be worsened conditions, and the others may not show change and the remaining patients may be died even if they are in ART. As a result of these, ART followers will either continue their ART or stop follow up status due to death, lost or drop out. Therefore, this study assessed factors associated with adherence to ART in Bale Robe Hospital South East Ethiopia, where no prior studies concerning adherence and associated factors conducted yet. The findings of the study help for health policy makers to layout the necessary strategies to strength efforts toward the prevention of HIV/AIDs. So in relation to this it also helps to indicate the area of focus on the factors affecting ART adherence and for appropriate HIV/AIDs care provision. It serves as source of information for practitioners' and it also helps for other researchers as a baseline data to conduct further study.

## 2. Methodology

### 2.1. Study Area and Period

The study was conducted on clients on follow up at Anti-retroviral Therapy (ART) clinic of Bale Robe Hospital from March 18 to April 13/2013. Bale Robe is found in Oromia Regional State, Bale Zone which is located 430 km South East of Addis Ababa. Ethiopia. The climate condition at the town is almost similar throughout the year and its weather condition is Dega. The town has many ethnic groups. The major ethnic group is Oromo. This Hospital was a health centre, started from 1984 to April 2011 after this it becomes a district hospital, which has a bed capacity of 56 and gives service for about 4499 patients per month as new and repeat out visit, in the public facility on average. The ART service of this hospital also provides service for PLHA started from 2006. It gives service for about 1288 pre ART and 529 ART patients [7].

### 2.2. Study Design

A facility based cross sectional study was conducted on a sample of PLWH in Bale Robe Hospital

### 2.3. Population

**Source population:** All ART clients in Bale Robe Hospital

**Study population:** Selected ART clients in Bale Robe Hospital

**Inclusion criteria:** Age greater than or equal to 18 years old during the study and fully conscious ART clients.

**Exclusion Criteria**

- Age below 18 Years old

- Un conscious ART clients
- Newly Adhered ART clients
- Newly transferred ART clients

### 2.4. Sample Size Determination

The final sample size was calculated on the basis of the 95% level of confidence and 5% level of precision. Since the studies was not done before in this area and it used the 'P' value of 50% then

$$n = \frac{(Z^x / 2)^2 P(1-P)}{d^2}$$

where n= sample size

Z= Standard proportion population at 95% confidence interval (1.96)

P= Estimated proportion of adherence

d= Margin of error

### 2.5. Sampling Technique

The sampling technique used for this study was systematic random sampling method. Then clients were selected systematically by  $K^{\text{th}}$  value.

$$K^{\text{th}} \text{ value} = \frac{N}{nf}$$

Were  $K^{\text{th}}$  value = interval at which to get the client

Then every second clients were interviewed. The first clients were selected by lottery method.

### 2.6. Study Variables

**Dependent variable:** Adherence status

### 2.7. Independent Variable

Socio – demographic characteristics

Barriers to ART adherence

Psychosocial factors

Behavioral and Clinical factors

### 2.8. Data collection Methods and Tools

The data was collected using structured questionnaire was used for data collection purpose, and face – face interview was employed. The Questionnaire contains socio – demographic variables, psychosocial items such as social support and depression, and clinical characteristics such as WHO clinical staging, CD4 count). To identify clinical marker medical record was reviewed.

### 2.9. Data Quality Control

To assure the quality of data the collected data was rechecked. A pre test was done on PLWHA (5%) the sample size i.e. 11 individual first and modification were incorporated to the Questionnaire and not included in the actual study. The interview was conducted in private space to create an atmosphere of empathy and confidence within asure environment. All completed questionnaire was examined for completeness and consistency during data management, storage and Analysis. The Advisor supervised the data collection process.

### 2.10. Data Processing and Analysis

The data was analyzed by SPSS version 20. Frequency and percentages were calculated. The  $\chi^2$  (chi – square) test and P values determined and associations were assessed. P value less than 0.05 considered statistically significant association with ART adherence status. The result presented by frequency tables and graphs.

### 2.11. Ethical consideration

Ethical approval was obtained from Mada Malabu University college of Medicine and Health science formal letter of cooperation was written to Bale Robe Hospital. Written consent was obtained from each respondent and they were told that they have the right not to participate in the study. The information from the client kept confidential.

## 3. Result

### 3.1. Socio Demographic Characteristics

**Table 1. Frequency distribution of socio demographic characteristics of the study participant BRH South East Ethiopia. 2013**

Variable	Frequency	Percentage (%)
Age	15 -24	31 13.%
	25 -34	75 31.6%
	35 -44	81 34.3%
	45 -54	26 10.9%
	55 -64	19 7.9%
Sex	65+	5 2.1%
	Male	108 45.6%
Religion	Female	129 54.4%
	Orthodox	149 62.9%
	Muslim	64 26.9%
	Protestant	19 9.1%
	Catholic	4 1.7%
Ethnicity	Other	1 0.4%
	Amhara	63 26.6%
	Oromo	157 66.3%
	Tigre	6 2.5%
	Garage	7 2.9%
Marital status	Other	4 1.4%
	Married	140 59.1%
	Single	30 12.7%
	Divorced	40 17%
Educational status	Widowed	27 11.4%
	Not educated	82 34.6%
	1 <sup>o</sup> educated	93 39.3%
	2 <sup>o</sup> educated	55 23.6%
Occupational status	Higher education	7 2.9%
	Gov't employee	11 4.6%
	Merchant	46 19.4%
	Barbery	8 3.4%
	Driver	7 2.9%
	Farmer	46 19.4%
	Daily Lobuor	31 13.1%
	House wife	54 22.8%
	Unemployed	29 12.2%
Other	5 2.1%	
Residence	Urban	170 71.7%
	Rural	67 28.3%

The response rate was 96.7%, which actually included in the data analysis. The subjects age ranged from 19 to 75 years with a mean Standard Deviation (SD) age of 37.9 ( $\pm 4.5$ ) years. One hundred twenty nine (54.4%) of the study participants were females. Most of the study subjects were in the age group of 35-44 Year which accounts 81 (34.13%). Majority 140 (59.1%) were married followed by 40 (17%) divorced. One hundred fifty seven (66.3%) were Oromo by Ethnicity and 149 (62.9%) were orthodox by religion. Thirty nine percent (39.2%) hand attended primary education and 54 (22.8%) were house wife majority 170 (71.71) of the study subject were live in the town. (See Table 1).

### 3.2. Clinical Characteristic

#### 3.2.1. Clinical Marker

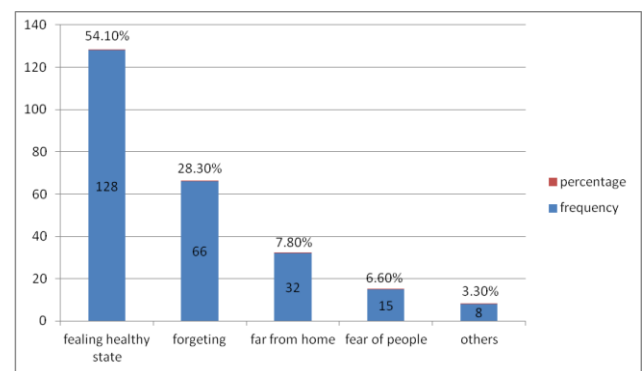
Majority 141 (59.5%) had WHO stage III disease classification and 147 (62%) had CD4 count between 200 cell/mm<sup>3</sup> – 499 cell/mm<sup>3</sup> (Table 2).

**Table 2. Frequency distribution of CD4 count and WHO staging of the study participant BRH, South East Ethiopia 2013 G.C**

Clinical character (markers)	Frequency (n=237)	Percentage (%)
CD4 count	< 200 cell /mm <sup>3</sup>	54 22.8%
	200 -400/ mm <sup>3</sup>	147 62%
	>500 cell/ mm <sup>3</sup>	36 15.2%
WHO staging	Stage I	16 6.8%
	Stage II	69 29.1%
	Stage III	141 59.5%
	Stage IV	11 4.6%

### 3.3. Reason for Missing Daily Dose

Out of the study participants majority 128 (54.1%) were miss their daily dose due to disappearance of symptom or feeling healthy state (Figure 1)



**Figure 1. Reasons for missing daily dose of the study subjects BRH, south East Ethiopia 2013**

### 3.4. ART Adherence Level (Dose Adherence)

From the total respondent 197 (83.1%) of them had good dose adherence, 34 (14.4%) had adhered fairly while 6 (2.4%) were adhered poorly (Table 3).

Out of the study participant 197 (83.6%) were missed their daily dose of less than three per day, 141 (59.5%)

were not miss their dose in one week and 193(81.4%) of them have never take double dose /month (Table 3).

**Table 3. Frequency distribution ART missed dose per day, per week and taking double dose /month of the study participant BRH south East Ethiopia 2013 G.C.**

Character		Frequency n=237)	Percentage %
Self reported missed dose /day	< 3 dose	197	83.6%
	3 -9 dose	34	14.4%
	> 9 dose	6	2.5%
Self reported missed dose per week	Not miss	141	59.5%
	Once/ week	26	11%
	Twice /week	48	20.25%
	3 or more	22	9.3%
Self reported taking double dose/month	Not take	193	81.4%
	Double dose Once /month	18	7.6%
	Twice /month	18	7.6%
	Three or more per month	8	3.4%

Majority 128 (54%) the study participant were take the medication based on right time, right dose (correct dose) with feeding, or 54% of the participant were take medication on correct time, dose with feeding that

adhere  $\geq$  95% adherence level. This is combined. (Three combined Adherence) measurement based on their self response (Table 4).

**Table 4. Patients habit of taking ART medication within the study subject BRH south East Ethiopia 2013 G.C**

Character	Frequency n= 237	Percentage (%)
Totally follow prescription protocol	128	54%
With same deviation of time and quantity	71	30%
Often modify time and quantity	24	10.1%
Almost never follow prescription	10	4.2%
Others (specify)	4	1.7%

### 3.5. Associated Factors to ART Adherence

#### 3.5.1. Problem Faced by ART Clients with in the Community

**Table 5. Distribution of problem faced with by ART clients within the community of the study participant BRH south East Ethiopia 2013 G.C**

Variable	Frequency	Percentage
Lost housing by family	26	10.4%
Lost respect	117	46.4%
Poor quality of service	20	8%
Lonely life	37	14.7%
Others	12	4.8%
No problem faced	39	15.5%

The study participant were responded that people of the community make the ART clients to be seen them as unnecessary for the community as well as their family and make lost respect 114 (46.4%) and put their life lonely 37 (14.7%) (Table 5).

#### 3.5.2. Association of Factors with Adherence (ART) (result)

A total of 237 clients were reviewed during the study and revealed that 197 (83.1%) had good adherence on the base of their response to dose -time adherence 34 (14.4%) were fairly adhered and 6 (2.5%) were poorly adhered. Out of 237 adhered ART clients to their medication 109 (46%) were female and 88 (37.2%) were male which has good Adherence or Adhered dose of  $\geq$ 90% dose adherence. Majorities 68(28.7%) were in the age group of 35-44 years with good adherence most of them having good adherence 117 (49.9%) were married, 126 (53.2%) were orthodox by religion. 130 (54.9%) were Oromo by Ethnicity most 80 (33.8%) of them were attended primary education and 45 (20%) were house wife one hundred and fourty seven (62%) were live in urban area (Table 6).

**Table 6. Distribution of ART adherence by socio demographic characteristics of the study subject BRH South East Ethiopia 2013 G.C**

Variables		Level of Adherence						Frequency	Test	
		Good		Fair		Poor		n=237	X2	P- Value
		No	%	No	%	No	%			
Age	15 -24	22	9.3	6	2.5	3	13	31	10.3	p>0.05
	25 -34	64	27	9	3.8	2	0.8	75		
	35-44	68	28.7	12	5.1	1	0.4	81		
	45-54	21	8.9	5	2.1			26		
	55-64	17	7.2	2	0.8			19		
	65+	5	2.1					5		
Sex	Male	88	37.2	18	7	2	0.8	108	1.13	p>0.05
	Female	109	46	16	6.8	4	1.6	129		
Marital status	Married	117	49.4	20	8.4	3	1.3	140	3.7	p>0.05
	Single	26	11	3	1.3	1	0.4	30		
	Divorced	30	12.7	8	3.2	2	0.8	40		
	Widowed	24	10.1	3	1.3			27		
Religion	Orthodox	126	53.2	21	8.7	2	0.8	149	4.46	p>0.05
	Muslim	50	21.1	11	4.6	3	1.3	64		
	Protestant	16	6.8	2	0.8	1	0.4	19		
	Catholic	4	1.7					4		
	Other(specify)	1	0.4					1		
Ethnicity	Amhara	53	22.4	9	3.8	1	0.4	63	4.6	p>0.05
	Oromo	130	54.9	23	9.7	4	1.6	157		
	Tigre	4	1.6	1	0.4	1	0.4	6		
	Garage	6	2.5	1	0.4			7		
	Other(Specify)	4	1.7					4		
Educational status	Not educated	65	27.4	15	6.3	2	0.8	82	7.4	p>0.05
	10 education	80	33.8	12	5	1	0.4	93		
	20 education	47	19.8	5	2.1	3	1.3	55		
	Higher education	5	2.1	2	0.8			7		
Occupational status	Gov't Employee	9	3.8	2	0.8			11	6.96	p>0.05
	Merchant	36	15.2	9	3.8	1	0.4	46		
	Barber	7	3	1	0.4			8		
	Driver	6	2.5	1	0.4			7		
	Farmer	39	16.5	6	2.5	1	0.4	46		
	Daily worker	25	10.5	5	2.1	1	0.4	31		
	House wife	45	20.1	7	3	2	0.8	57		
	Unemployed	25	10.5	3	1.3	1	0.4	29		
Other	5	2.1					5			
Residence	Urban	147	62	19	7.6	4	1.6	170	5.25	p>0.05
	Rural	50	21	15	3	2	0.8	60		

### 3.5.3. Association of Socio Demographic Characteristics of Patients with their ART Adherence

In the above table  $\chi^2$  (chi – square) test was used to test whether there is significant association (significant difference) in the ART adherence level as dependent variables and age, sex, marital status, religion, Ethnicity, educational status, occupational status and place of residence as independent variables. The result revealed that, there is not statistically significant difference in ART adherence level related to age, sex, marital status, occupational status, religion, ethnicity, educational status and place of residence as ( $P > 0.05$ ) for those variables.

Therefore, they have no statistically significant association with their ART adherence status. Thus, according to the result socio demographic characteristics of the patient are not determinants of ART adherence level.

### 3.6. Psychosocial Barriers, Disease Characters and other Factors with ART Adherence

From the total 237 respondents, most 140 (59.1%) had got social support such as financial 89 (50%), occupational 15 (8.4%), psychological (Advice) 65 (36.5%). (see Table 7).

**Table 7. Distributions of psycho-social and disease characteristics of the study participants in BRH, South East Ethiopia 2013 G, C**

Variables		Level of Adherence						Frequency	Total %
		Good		Fair		Poor			
		N <sub>0</sub>	%	N <sub>0</sub>	%	N <sub>0</sub>	%		
Participant response of social support (n = 237)	Had social support	116	48.9	22	9.3	2	0.8	140	59
	Had not social support	81	34.2	12	4.4	4	1.7	97	40.3
Types of social support (n2 = 178)	Financial	72	40.4	10	5.6	7	3.9	89	49.9
	Occupational	7	3.9	5	2.8	3	1.7	15	8.4
	Advice	52	29.2	7	3.9	6	3.4	65	36.5
	Others *	5	2.8	4	2.3	0	0	9	5.1
Pts disclosure of information to the community about HIV status (n3 = 237)	Pt known by community about HIV/ART status	175	73.8	26	10.1	2	0.	203	84.7
	Pt not knowingly known by community about HIV /ART status	22	9.3	8	3.4	4	1.7	34	15.3
Stigma related to disclosed information (n4 = 203)	Stigmatized by community	54	26.6	12	6	0		66	32.2
	Non stigmatized	121	59.6	14	7	2	1	137	67.8
Depression related to HIV/ART n5=237)	Depressed	30	12.6	6	2.5	1	0.4	37	15.6
	Non depressed	167	70.5	28	11.8	5	2.1	200	84.4
Other barriers to follow ART (n6=273)	Being too busy	90	33	8	2.9	9	3.3	107	39.2
	Attitude to drug	40	14.7	12	4.4	5	1.8	57	20.7
	Multiple pills	23	8.4	8	2.9	5	1.8	36	13.1
	Running out of medication	36	13.2	13	4.8	6	2.2	55	20.2
	Others **	10	3.7	4	1.5	4	1.5	18	6.7
social isolation on ART client (n7=263)	Wedding	10	3.8	6	2.3	5	1.9	21	8
	Idir	12	4.6	8	3	5	1.9	25	9.5
	Party	13	4.9	8	3	6	2.3	27	10.2
	Community (CAG)	61	23.2	23	8.7	7	2.7	91	34.6
	Family Avoidance	17	6.5	6	2.3	5	1.9	28	10.7
	Other ***	20	7.6	0		0		20	7.6
	No isolation	40	15.2	7	2.7	4	1.5	51	19.4
Active substance use (n8=248)	Alcohol	37	15	15	6	7	2.8	59	23.8
	Chat	25	10.1	6	2.4	14	5.6	45	18.1
	Cigarette	38	15.3	9	3.9	5	2	52	21.2
	Shisha	9	3.6	0		2	0.8	11	4.4
	Not taking	70	28.2	0		1	0.4	71	28.6
	Other ****	10	4	0		0		10	4

\*Physical care, \*\* feeling sick, \*\*\* Working isolation, Iqub,\*\*\*\*Tobacco

#### 3.6.1. Association of Psychosocial barriers, disease characters and other factors with ART adherence.

Majority 203 (85.6%) of the study subject were known by the community that they have HIV/AIDs and take

medication to their life time (the patient had disclose information to the community about themselves having the disease). Among patients who disclose information to the community 66 (32.6%) were stigmatized related to ART. This is statistically significant as indicated by



( $P < 0.05$ ). 37 (15.5%) of the participant were depressed. In other psycho-social factors of the study subject reported 107 (39.2%) being too busy, ( $P < 0.05$ ) to adhere to ART.

Majority respond that they were isolated from different community Association group ( $P = 0.05$ ) and most 59 (24.3%) of them reported alcohol uses as ( $P = 0.05$ ).

**Table 8. psycho-social and disease characteristics of the study participants in BRH, South East Ethiopia 2013 G, C**

Variables		Level of Adherence						Frequency	X <sup>2</sup>	P-Value
		Good		Fair		Poor				
		No	%	No	%	No	%			
Participant response of social support (n=237)	Have had social support	116	48.9	22	9.3	2	0.8	140	1.98	P>0.05
	Have had not social support	81	34.2	12	4.4	4	1.7	97		
Types of social support (n2 = 178)	Financial	72	40.4	10	5.6	7	3.9	89	16.4	P<0.05
	Occupational	7	3.9	5	2.8	3	1.7	15		
	Advice	52	29.2	7	3.9	6	3.4	65		
	Others *	5	2.8	4	2.3	0	0	9		
Pts disclosure of information to the community about HIV status (n3 =237)	Pt known by community to have HIV/ART	175	73.8	26	10.1	2	0.	203	16.26	P<0.05
	Pt not knowingly community to have HIV /ART	22	9.3	8	3.4	4	1.7	34		
Stigma related to disclosed information (n4 =203)	Stigmatized by community	54	26.6	12	6	0		66	3.45	P<0.05
	Non stigmatized	121	59.6	14	7	2	1	137		
Depression related to HIV/ART n5=237)	Depressed	30	12.6	6	2.5	1	0.4	37	6.18	P<0.05
	Non depressant	167	70.5	28	11.8	5	2.1	200		
Other barriers to follow ART (n6=273)	Being to busy	90	3.3	8	2.9	9	3.3	107	14.7	P<0.05
	Attitude to drug	40	14.7	12	4.4	5	1.8	57		
	Multiple pills	23	8.4	8	2.9	5	1.8	36		
	Rerolling out of medication	36	13.2	13	4.8	6	2.2	55		
	Others **	10	3.7	4	1.5	4	1.5	18		
social isolation on ART client (n7=263)	Wedding	10	3.8	6	2.3	5	1.9	21	64.6	P<0.05
	Idir	12	4.6	8	3	5	1.9	25		
	Party	13	4.9	8	3	6	2.3	27		
	Community	61	23.2	23	8.7	7	2.7	91		
	Family Avoidance	17	6.5	6	2.3	5	1.9	28		
	No isolation	40	15.2	7	2.7	4	1.5	51		
Active substance use (n8=248)	Alcohol	37	15	15	6	7	2.8	59	51.6	P<0.05
	Chat	25	10.1	6	2.4	14	5.6	45		
	Cigarette	38	15.3	9	3.9	5	2	52		
	Shisha	9	3.6	0		2	0.8	11		
	Not taking	70	28.2	0		1	0.4	71		
	Other ****	10	4	0		0		10		

\*Physical care, \*\* feeling sick, \*\*\*Working isolation, Iqub,\*\*\*\*Tobacco

## 4. Discussion

This study has attempted to assess the factors that affect ART adherence among ART clients mainly focused on dose adherence level. Time adherence is taken as additional independent factor for the occurrence of poor, fair and good adherence. Thus, factors included under this are socio demographic, psychosocial and disease related characteristics, clinical characters and other community barriers affecting mainly dose adherence. Dose adherence indicators were made to determine the rate of adherence in the study area.

The rate of dose adherence in this study was 83.1%. Greater than 90% adherence was recorded in 57.6% in Madrid, Spain [8] and 55.7% in North West Spain study [9]. A study in Brazil showed the cumulative incidence of non-adherence to be 36.9% [10] while higher adherence reported among patients in Soweto, South Africa was 88% [11]. Nearly similar to this study, two studies in Ethiopia reported 81.2% and 82.8% adherence to more than 95% of doses [12,13].

High adherence in this study may be justified by the fact that free ART access with close monitoring from health care provider to achieve optimum adherence, good patient counseling by trained personnel and integrated HIV tests and other service as Tuberculosis, sexually transmitted infection and other women health part. The high adherence status report in our study confirms that patients in developing countries can achieve good adherence despite limited resource.

The findings of this study emphasize that important multiple psychosocial factors: patients disclosure status, types of social support, stigma, depression, social isolation and active substance use were significantly associated ( $P < 0.05$ ) with adherence level. Additionally other barriers like being too busy and attitude towards the drug has been significantly associated ( $P < 0.05$ ) with adherence status of the HIV patients. Similarly many factors have been cited as reasons for non-adherence in studies of Western countries. In African settings, patients have achieved excellent rates of adherence with subsidized ART [14,15]. Reasons reported for non-adherence in African studies include forgetting and fear of disclosure [16]. In two studies in Addis Ababa, being too busy/forgetting, travels,

depression, drug adverse effects, treatment fitting to daily routine, relationship with health care providers, patients' perceptions of their doctors' capacities, perceived access to support from their ART unit, and reliable pharmacies, keeping clinical appointments, using memory aids, and educational levels were associated with ART adherence.

Consistent factors for poor adherence include patient reported symptoms, stress, lack of social support, substance use, and depression. Gender, race, age, ethnicity and literacy have showed inconsistent results in predicting adherence [17]. This is in line with our study in which psychosocial factors including social support and depression as well as active substance use were associated with adherence status while none of socio demographic factors were predictors of non-adherence.

Recent study in Nigeria reported Sixty-six participants (21.3%) had significant depressive symptoms. Overall, 73% of participants had good adherence to HAART. 63.6% of participants with depressive disorder had poor adherence to HAART compared to 21.1% of participants without depressive disorder ( $p < 0.05$ ) and finally the study concluded depressive disorder in patients with HIV/AIDS is associated with poor adherence to antiretroviral medication [18].

Study conducted in Ethiopia in Yirgalem hospital reported main reasons of non-adherence cited by the patients were; being busy or simply forgetting (51%), change in daily routine (9.4%), and being away from home (8.3%). Non-adherence was commoner among patients reporting symptoms in the past four weeks (Adj. OR=6.41, 95% CI: 2.41 to 17.08), who lived more than 47 km away (AOR= 2.48, 95%CI: 1.24 to 4.98), or who had dependents (Adj. OR=1.95, 95%CI: 1.06 to 3.57 [19]. While another study conducted in the antiretroviral therapy unit of Jimma University Specialized Hospital reported the social support (OR, 2.42, 95%CI, 1.29, 4.55) and the use of memory aids (OR, 3.29, 95%CI, 1.44, 7.51) were found to be independent predictors of adherence. The principal reasons reported for skipping doses in this study were simply forgetting, feeling sick or ill, being busy and running out of medication in more than 75% of the cases [20].

Stigma as a psychosocial barrier to adherence has been shown in this study to manifest itself in either subtle behaviour or overt acts of discrimination, harassment and violence. PLWHAS often face stigma and discrimination from the community including their own family members'. Fear of stigma may force PLWHAS to conceal their HIV status even to close members of the family. The result of this study showed that patients who were not stigmatized had more likely adherent than stigmatized as ( $p < 0.05$ ) which shows statistically significant association with adherence.

## 5. Conclusion and Recommendation

Generally the study concluded that good adherence found among the HIV clients of Bale Robe Hospital. Additionally several psychosocial factors has statistically significant association with adherence which could be modified through comprehensive psychosocial and behavioral interventions of people living with HIV. Further studies might consider on consistency of

evidences and feasibility of implementing psychosocial and behavioral interventions so as to improve further the adherence status of the HIV clients.

## Competing Interest

We declare that no any types of competing interests

## References

- [1] Anthony's. Hauser, Dennis L. Kasper et al, Allianf Human immune Deficiency Virus Diseases. In. *Harrison's Principles of Internal medicine*, 2012, 2695.
- [2] EDHS, (2005), Ethiopia Demographic and Health Survey reports.
- [3] Ministry of Health Ethiopia and Federal HIV/AIDS prevention and control office single point HIV prevalence estimate. Addis Ababa, Ethiopia, 2007.
- [4] Chesney MA, Factors affecting adherence to ART. *Clin Infec Dec* 2000, 30; 5171-5176.
- [5] Wright MT, The old problem of adherence research on treatment adherence and its relevance for HIV/AIDS: *AIDS care*, 12 (6), 2000, 703-710.
- [6] Carter M, Adherence. Information service for HIV positive people, 2005.
- [7] Bale Robe Hospital second quarter report, 2013.
- [8] Gordillo V, del Amo J, Soriano V, Gonzalez-Lahoz J. (1999). Socio demographic and psychological variables influencing adherence to antiretroviral therapy. *PMED AIDS*; 13 (13): 1763-9.
- [9] Carballo E, Suarez CC, Carrera I, et al. (2004). Assessing relationships between health-related quality of life and adherence to antiretroviral therapy. *Qual Life Research* Apr; 13 (3): 587-99.
- [10] Bonolo, Palmira de Fae, Casar, Cibele Cb, Acurio, Fransisco A ac, et al. (2006). Non-adherence among patients initiating antiretroviral therapy: a challenge for health professionals in Brazil. *JAIDS*; 19 Sppl 4: S5-S13.
- [11] Nachea Jean B, Michael Hislop, Dowdy David W, et al., (2006). Adherence to Highly Active Antiretroviral Therapy Assessed by Pharmacy Claims Predicts Survival in HIV Infected South African Adults. *J Acquir Immune Defic Syndr*; 43 (1): 1-7.
- [12] Tadios Y & Davey G. (2006): Antiretroviral treatment adherence and its correlates among people living with HIV/AIDS on highly active antiretroviral therapy in Addis Ababa, Ethiopia. *EMJ*; 44 (2): 237-244.
- [13] Mengesha A & Worku A. (2005), Assessment of antiretroviral treatment among HIV infected persons in the Ministry of Defense Hospitals. AAU.
- [14] Byakika-JusiimeJ, et al. (2003). Ability to purchase & secure stable therapy are significant predictors of nonadherence to antiretroviral therapy in Kampala Uganda (abstract). 10<sup>th</sup> conference on Retroviruses and Opportunistic Infection, Boston, February
- [15] Lawent, et al. (2003). Long-term follow up of a cohort of patients on HAART in Senegal (abstract). 10<sup>th</sup> Conference on Retroviruses & Opportunistic Infections, Boston, February
- [16] Day J, Godoka N, Nyamafeni P, Chigwanda M et al. (2002). Adherence to ART in clinical trial settings in Zimbabwe and Uganda: lessons learned; *Int. Conf. AIDS* Jul 11-16; 15 Bangkok Thailand.
- [17] Adriana A, Paola TM, Rita M et al. (2002), Correlates and predictors of adherence to Highly Active Antiretroviral Therapy. *JAIDS*; 31 supplement 3: s123-s127.
- [18] Olisah, VO Baiyewu O & Sheikh TL, (2010). Adherence to highly active antiretroviral therapy in depressed patients with HIV/AIDS attending a Nigerian university teaching hospital clinic. *Afr J Psychiatry*; 13: 275-279.
- [19] Endrias Markos, Alemayehu Worku & Gail Davey. (2008). Adherence to ART in PLWHA at Yirgalem Hospital, South Ethiopia *Ethiop.J.Health Dev*; 22 (2).
- [20] Alemayehu Amberbir, Kifle Woldemichael, Sofonias Getachew, et al. (2008). Predictors of adherence to antiretroviral therapy among HIV-infected persons: a prospective study in Southwest Ethiopia. *BMC Public Health*; 8: 265.