

# Anti-retroviral therapy adherence and its determinants among adult patients living with HIV/AIDS in South West Ethiopia: a facility-based cross sectional study

Güney Batı Etiyopya'da HIV/AIDS'le yaşayan yetişkin hastalar arasında antiretroviral tedaviye uyma ve bunun belirleyicileri: olanak-tabanlı çapraz kesitli bir çalışma

Mekonnen Aragaw Ejigu<sup>1</sup>, Seid Mussa Ahmed<sup>2</sup>, Mohammed Adem Mohammed<sup>3</sup>

<sup>1</sup>Southern Nations, Nationalities, and Peoples Regional State of Ethiopia, Guraferda District Health Office, Guraferda, Ethiopia

<sup>2</sup>Jimma University, School of Pharmacy, Social and Administrative Pharmacy Course Team, Jimma, Ethiopia

<sup>3</sup>Jigjiga University, Faculty of Health Sciences, Department of Public Health, Pharmacology and Therapeutics Course Unit, Jigjiga, Ethiopia

## Abstract

Adherence to anti-retroviral therapy (ART) regimen is essential for successful treatment and sustained viral control. Optimal adherence is the compliance to ART that achieves a sustained plasma drug concentration that suppresses viral replication. The objective of this study is to assess ART adherence and its determinants at Agaro Health Center ART Clinic, South Western Ethiopia. Facility-based cross sectional study was conducted from June 9-29, 2011. Patients were interviewed to collect adherence related information by using pretested semi-structured questionnaire. Subsequent charts of prescribed medications were reviewed using a pretested data collection format. A total of 209 respondents were included in the study, of which 127 (60.8%) were females and 82 (39.2%) were males. The average adherence rate was 98.1% among males and 99.5% among females. The overall average adherence rate among the respondents was 98.8%. One hundred sixty one (77.0%) respondents had a 100% adherence rate, 15 (7.2%) patients had a 93.3% adherence rate and the remaining 33 (15.8%) patients had adherence rate between 95 and 98% on average. The common reasons for missing of the prescribed doses were forgetting 27 (39.7%), being too busy 20 (29.4%), away from home 17 (25.0%) and being extremely ill 4 (5.9%). Of all the variables, sex, living alone, monthly income, use of stimulants and medications in addition to ART were significantly associated with non-adherence. The adherence rate among the study participants was found to be optimal, and near perfect adherence need to be maintained to obtain the optimum therapeutic outcome.

**Keywords:** Adherence; antiretroviral therapy; Ethiopia; prevalence

## Özet

Başarılı tedavi ve kalıcı viral kontrol için antiretroviral tedaviye (ART) uyum esastır. Viral replikasyonu baskılayan sürekli plazma ilaç konsantrasyonuna ulaşan ART uyumlu optimal uyumdur. Bu çalışmanın amacı, Güney Batı Etiyopya'da Agaro Sağlık Merkezi ART Kliniği'nde ART'a uyma ve bunun belirleyicilerini saptamaktır. Olanak-tabanlı çapraz kesitli çalışma 9-29 Haziran 2011'de gerçekleştirildi. Ön testi yapılmış yarı-yapılandırılmış anket kullanarak uyuma ilişkin bilgileri toplamak için hastalarla görüşüldü. Reçetelenmiş ilaçların kayıtları ön testi yapılmış veri toplam formatı kullanılarak derlendi. Yüz yirmi yedisi (%60.8) bayan ve 82'si erkek (%39.2) olan toplam 209 cevap verenler bu çalışmaya alındı. Ortalama uyma oranı erkeklerde %98.1 ve bayanlarda %99.5 idi. Cevap verenlerin arasında ortalama uyma oranı %98.8 idi. Yüz altmış bir cevap verenin (%77.0) %100 uyma oranı vardı, 15 hastanın (%7.2) %93.3 uyma oranı ve kalan 33 hastanın (15.8%) uyma oranı ortalama %95-98 arasındaydı. Reçete edilen dozların alınmamasının genel nedenleri unutma 27 (%39.7), çok yoğun olma 20 (%29.4), evden uzakta olma 17 (%25.0) ve çok hasta olma 4 (5.9%) idi. Diğer bütün değişkenler, cinsiyet, tek başına yaşama, aylık gelir, ART'ye ilaveten stimulanların ve ilaçların kullanılması anlamlı olarak uymama ile ilişkiliydi. Çalışmaya katılanlar arasında uyma oranı optimal bulundu ve mükemmel yakın uyma optimum terapötik sonuç almak için sürdürülmesi gereklidir.

**Anahtar kelimeler:** Uyma; antiretroviral tedavi; Etiyopya; prevalans

## Introduction

HIV/AIDS is one of the most destructive epidemics the world has ever witnessed. In 2007 an estimated

33.2 million people were living with HIV (PLHIV) worldwide, while 2.5 million of these people were children under 15 years old (1). The advent of potent antiretroviral therapy (ART) in 1996 has changed the way people in the world view Human Immunodeficiency Virus and Acquired Immune

**Correspondence:** Mohammed Adem Mohammed, Jigjiga University, Faculty of Health Sciences, Department of Public Health, Jigjiga, Ethiopia  
Tel: +251 91 1357771 [mohzum@hotmail.com](mailto:mohzum@hotmail.com)

**Received:** 23.08.2013 **Accepted:** 12.11.2013  
ISSN 2148-3132 (print) ISSN 2148-2926 (online)  
[www.gaziantepmedicaljournal.com](http://www.gaziantepmedicaljournal.com)  
DOI: 10.5455/GMJ-30-43192



Deficiency Syndrome (HIV/AIDS). Though the treatment does not provide cure and free of side effects, it has dramatically improved rates of morbidity and mortality, improved quality of life, revitalized community and transformed perception of HIV/AIDS from a plague to a manageable chronic illness (2).

Adherence is described as engagement and accurate participation of informed patient in a treatment care plan. It includes entering into and continuing in a programmed treatment care plan such as meeting appointments and tests as scheduled. Adherence to treatment encompasses more than adherence to medications like ARV (2). Adherence to Antiretroviral Therapy (ART) is measured by a variety of methods with the most commonly used methods being self-reporting by patients, pill counts, review of pharmacy records and Medication Event Monitoring System (MEMS) caps. All methods have their shortcomings. No gold standard has as yet been found for evaluating adherence to medication to date. Measuring medication adherence in clinical settings has not always been easy because common methods such as pill counts are not objective enough and the more accurate measures of adherence such as drug-level monitoring are expensive, can be inconvenient, difficult to implement in resource poor settings and not very relevant since it can only practically be done intermittently and appears to be only sensitive for identifying very low levels of adherence. However, patients' clinic attendance for medication refills can easily be monitored by the health staff even in resource-constrained settings (3).

Adherence to medication has become a major issue in the treatment of HIV-infected individuals and an important determinant of the outcome of highly active antiretroviral therapy (HAART). Adherence to antiretroviral medication is believed to be a crucial component in maintaining therapeutic drug levels, ensuring virologic suppression, and reducing the risk of drug resistance (4). There is a significant correlation between adherence to medication and virologic suppression (5).

Antiretroviral Therapy (ART) is a combination of three or more antiviral drugs with at least one protease inhibitor or non-nucleoside analogue reverse transcriptase inhibitor. Treatment is initiated with a combination of three drugs (triple therapy); two nucleoside reverse transcriptase inhibitors (NRTIs) form the back bone, a protease inhibitor (PI) or if this is not possible, a non-nucleoside reverse transcriptase inhibitor (6).

Appropriate use of antiretroviral therapy (ART) has improved the health of many human immunodeficiency virus (HIV) positive individuals who otherwise may have died. Notably, the efficacy of any treatment depends on sustained high levels of adherence to ART. But ART regimens are often

complicated and can include varying dosing schedules, dietary requirements, and adverse effects. Adherence is a major predictor of the survival of individuals living with Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome (HIV/AIDS) and poor adherence to treatment remains a major obstacle in the fight against the virus (7).

Antiretroviral Therapy for HIV is increasingly being provided in diverse areas of the world, yet Adherence is one of the major challenges in the treatment process. This issue is particularly important in the context of various cultural settings, particularly in developing countries (8).

Adherence to ART is crucial to ensure viral suppression, decrease the risk of disease progression and drug resistance (9). Low levels of adherence lead to ARVs not working effectively and are linked to increase in the viral load, decreased CD4 count and an increased risk of the progression to AIDS. Resistance to ARVs in people living with HIV/AIDS (PLWHA) makes adherence very important as developing resistance to an ARV treatment regimen limits future treatment options. Assessment of adherence behavior is necessary for effective changes in health outcomes and effective treatment planning and for ensuring that changes in health outcomes can be attributed to the recommended regimen (10). Therefore, this study was intended to provide information about Antiretroviral Therapy (ART) adherence and its determinants among HIV/AIDS patients being attended at Agaro Health Center. The aim of this study was to assess Antiretroviral therapy adherence and its determinants at Agaro Health Center ART Clinic, South Western Ethiopia.

### **Participants and Methods**

#### *Study setting*

Agaro is one of the towns found in Jimma zone, located 45 km away from Jimma town, southwest Ethiopia. It is the second largest town in the zone next to Jimma town. According to the 2007 population and housing census report of Ethiopia the town has a total population of 25,719 people (11).

Institution-based cross sectional study was conducted by using semi-structured pretested questionnaire and information sheet from refill data to assess ART adherence and its determinants among HIV/AIDS patients attending Agaro Health Center ART clinic. In the town, there are 8 Rural Drug Vendors, 6 Drug Stores, 6 Clinics and one Health Center. The source population was all HIV/AIDS patients who were receiving ART care service in Agaro health center ART clinic and all HIV/AIDS adult patients who came for refill of ART drugs during data collection time fulfilling the inclusion criteria of 18 years and above, patients on Antiretroviral therapy at least for 3 months and patients

who were willing to participate in the study were considered as the study population. The sample size was determined to be 461 using single population proportion method assuming that 50% proportion of population possessing the characteristics of interest with 20% non-response rate. Therefore, using correction formula the study was conducted on a total of 209 HIV/AIDS adult patients who came to the Health Center ART clinic for refill during the study period June 9-29, 2011.

#### Data collection

A semi-structured Questionnaire was designed to collect information. It included basic demographic details, types of ART regimen, other medications written in each order sheet, relevant medical history, co-morbidities and common opportunistic infections, educational status, pre-conception and current substance use status and other factors associated with Anti-retroviral adherence. A face-to-face interview was conducted along with simultaneous review of medical charts. All the information about antiretroviral therapy use was collected from patients via interview and additional information was extracted from their medical charts. The questionnaire was pre-tested to assess the clarity, sensitivity, reaction, interview time to the study instrument and logistic materials. The questionnaire was pre tested on 5% of the patients to see the soundness of the questionnaire and to make necessary corrections prior to starting the study. All patients included in the pre-test procedure were excluded from participating in the study to avoid information contamination.

#### Statistics

The collected data was clearly categorized, entered in to software, edited, cleaned, and analyzed using Statistical Package for Social Sciences (SPSS) for Windows version 16. Descriptive statistics was performed to obtain summary values of the study variables, Chi square test was performed to observe the association between each dependent and independent variables. 95% confidence level was estimated and variables with significance P value <0.05 were considered for the final model as an independent predictor.

#### Ethical considerations

Before data collection started, permission was obtained from Jimma University Research review board and Agaro health center. The participants were also consulted and gave their written consent. Participation was on voluntary basis. Confidentiality was maintained by concealing the names of individuals and other distinguishing information.

#### Results

A total of 209 patients were included in the study and all of them consented and completed the interview. Of the total patients who were involved in the study 127 (60.8%) were females and 82 (39.2%) were

males. Majority 91 (43.5%) of the respondents were in the age group between 28-37 years old. Ninety two (44.0%) patients were Muslims and 126 (60.3%) were from rural areas. Majority 91 (43.5%) of the patients were married and 77 (36.8%) were divorced where only 8 (3.8%) were found to be single (Table 1).

**Table 1.** Socio-demographic characteristics of the study population at Agaro Health Center ART clinic, south west Ethiopia, June 9-29, 2011

| Characteristics                        | Frequency | Percentage (%) |
|--|-----------|----------------|
| <b>Sex</b>                             |           |                |
| Female                                 | 127       | 60.8           |
| Male                                   | 82        | 39.2           |
| <b>Age</b>                             |           |                |
| 18-27                                  | 60        | 28.7           |
| 28-37                                  | 91        | 43.5           |
| 38-47                                  | 43        | 20.6           |
| >47                                    | 15        | 7.2            |
| <b>Residence</b>                       |           |                |
| Rural                                  | 126       | 60.3           |
| Urban                                  | 83        | 39.7           |
| <b>Religion</b>                        |           |                |
| Islam                                  | 92        | 44.0           |
| Orthodox                               | 84        | 40.2           |
| Protestant                             | 33        | 15.8           |
| <b>Ethnicity</b>                       |           |                |
| Oromo                                  | 104       | 49.8           |
| Amhara                                 | 54        | 25.8           |
| Dawuro                                 | 18        | 8.6            |
| Gurage                                 | 17        | 8.1            |
| Others                                 | 16        | 7.7            |
| <b>Marital status</b>                  |           |                |
| Married                                | 91        | 43.5           |
| Divorced                               | 77        | 36.8           |
| Widowed                                | 33        | 15.8           |
| Single                                 | 8         | 3.8            |
| <b>Educational level</b>               |           |                |
| Illiterate                             | 101       | 48.3           |
| Primary school                         | 81        | 38.8           |
| Secondary School                       | 20        | 9.6            |
| Tertiary                               | 7         | 3.3            |
| <b>Occupational status</b>             |           |                |
| Housewife                              | 79        | 37.8           |
| Merchant                               | 30        | 14.4           |
| Daily labor                            | 29        | 13.9           |
| Jobless                                | 24        | 11.5           |
| Gov't Employ                           | 19        | 9.1            |
| Farmer                                 | 17        | 8.1            |
| Others                                 | 11        | 5.3            |
| <b>Monthly income</b>                  |           |                |
| <500                                   | 104       | 49.3           |
| 500-1000                               | 62        | 29.7           |
| 1000-1500                              | 23        | 11.0           |
| >1500                                  | 20        | 9.6            |
| <b>Living condition</b>                |           |                |
| With others                            | 170       | 81.3           |
| Alone                                  | 39        | 18.7           |
| <b>Distance from the health center</b> |           |                |
| <5 kms                                 | 83        | 39.7           |
| 5-10 kms                               | 4         | 1.4            |
| 10-15 kms                              | 11        | 5.3            |
| 15-20 kms                              | 24        | 11.5           |
| > 20 kms                               | 87        | 41.6           |

Majority 101 (48.3%) of the respondents were illiterate and only 7 (3.3%) patients had completed secondary education. 104 (49.8%) had a monthly income level <500 Ethiopian Birr and only 20 (9.6%) respondents had a monthly income level >1500 Ethiopian Birr. Majority 170 (81.3%) of the respondents were living with-others (friends, family members, spouse, etc) and 39(18.7%) were living alone. Most 122 (58.4%) of respondents live within 20 kilometers distance from the health center and 87 (41.6%) come from >20 kilometers away from Agaro health center (Table 1).

**Table 2.** Anti-retroviral therapy side effects faced by the study population, Agaro Health Center ART clinic, South Western Ethiopia, June 9-29, 2011.

| Side Effect           | Frequency | Percentage (%) |
|-----------------------|-----------|----------------|
| Skin rash             | 48        | 30.4           |
| Peripheral neuropathy | 25        | 15.8           |
| Headache              | 19        | 12.0           |
| Fatigue               | 18        | 11.4           |
| Abdominal pain        | 5         | 3.2            |
| Depression            | 11        | 6.9            |
| Nausea and vomiting   | 32        | 20.3           |

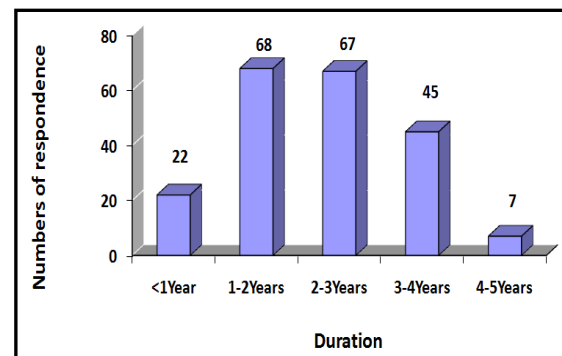
Skin rash 48 (30.4%), nausea and vomiting 32 (20.3%), and peripheral neuropathy 25 (15.5%) were the commonest side effects reported by the respondents (Table 2). Majority 111 (53.1%) of the respondents were on D4T/3TC/NVP followed by ZDV/3TC/NVP 27 (12.9%) and only 2 patients were on ZDV/3TC/EFV (Table 3). Among the 209 adult HIV/AIDS patients, 68 (32.5%) were on ART for 1-2years followed by 67 (32.1%) patients for 2-3 years and 7 patients were on ART for 4-5 years (Figure 1).

**Table 3.** Anti-retroviral drugs regimen used by the respondents in Agaro Health Center ART clinic, South Southern Ethiopia, June 9-29, 2011.

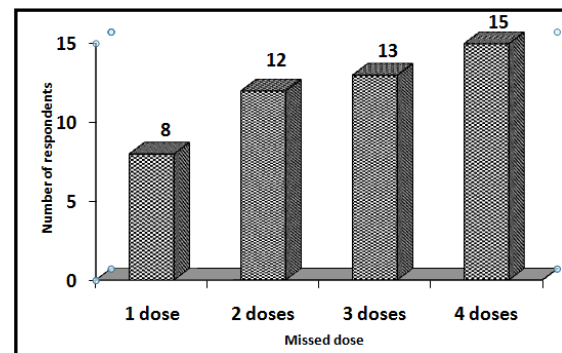
| Regimen     | Frequency | Percentage (%) |
|-------------|-----------|----------------|
| d4T/3TC/NVP | 111       | 53.1           |
| ZDV/3TC/NVP | 27        | 12.9           |
| d4T/3TC/EFV | 17        | 8.1            |
| ZDV/3TC/EFV | 2         | 1.0            |
| TDF/3TC/EFV | 52        | 24.9           |

Out of the 209 respondents, 48 (23.0%) missed their prescribed dose of medication in the previous 30 days of the study period of which 15 (31.3%) missed 4 doses and 13 (27.1%) missed 3 doses within the last one month (Figure 2). Forgetting 27 (39.7%), being too busy 20 (29.4%) and being away from home 17 (25.0%) were the commonest reasons for missing the prescribed doses.

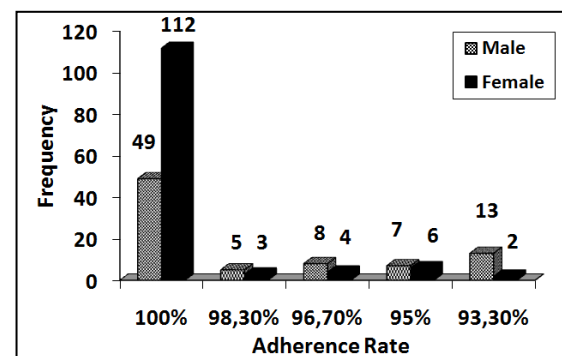
The average adherence rate among males and females was 98.1% and 99.5% respectively. The overall calculated average adherence rate of the respondents was 98.8%. It was found that 161 (77.0%) of the respondents had 100% adherence rate and the remaining [8 (3.8%)], [12 (5.7 %)], [13 (6.2%)] and [15 (7.2%)] had adherence rate of 98.3%, 96.7%, 95% and 93.3% respectively (Figure 3). Among all the variables, sex (P<0.001), living alone (P<0.001), low monthly income (P=0.021), stimulants and drinks nonuse (P=0.001) and medications other than ARV nonuse (P=0.013) were significantly associated with non-adherence (Table 4).



**Figure 1.** Distribution of the study population by their duration on antiretroviral therapy Agaro Health Center ART clinic, South western Ethiopia, June 9-29, 2011.



**Figure 2.** Distribution of the respondents based on missed prescribed dose of medication in the previous 30 days, Agaro Health Center ART Clinic, south western Ethiopia, June 9-29, 2011.



**Figure 3.** Percentage distribution of the respondents by their adherence rate to Anti retroviral therapy, Agaro Health Center ART clinic, South western Ethiopia, June 9-29, 2011.

**Table 4.** Association of different socio-demographic Variable with adherence rate in Agaro health center ART clinic, Agaro town, Jimma zone, Oromia regional state, south western Ethiopia, from June 9-29, 2011.

| Variables   | Adherence rate |        |        | Total | Significance, test                          |
|---|----------------|--------|--------|-------|---|
|   | 100%           | 96-99% | 90-95% |       |   |
| <b>Sex</b>  |                |        |        |       |   |
| Male  | 49             | 13     | 20     | 82    | <b>P&lt;0.001</b><br>X <sup>2</sup> =26.153 |
| Female  | 112            | 7      | 8      | 127   |   |
| <b>Age</b>  |                |        |        |       |   |
| 18-27   | 43             | 7      | 10     | 60    | P=0.505<br>X <sup>2</sup> =11.275           |
| 28-37   | 71             | 8      | 12     | 91    |   |
| 38-47   | 35             | 4      | 4      | 43    |   |
| >47   | 12             | 1      | 2      | 15    |   |
|   |                |        |        |       |   |
| <b>Residence</b>                                    |                |        |        |       |   |
| Urban   | 66             | 8      | 9      | 83    | P=0.079<br>X <sup>2</sup> =8.375            |
| Rural   | 95             | 12     | 19     | 126   |   |
| <b>Living condition</b>                             |                |        |        |       |   |
| Alone   | 18             | 7      | 14     | 39    | <b>P&lt;0.001</b><br>X <sup>2</sup> =33.539 |
| With others   | 143            | 13     | 14     | 170   |   |
| <b>Educational status</b>                           |                |        |        |       |   |
| Illiterate  | 77             | 10     | 14     | 101   | P=0.916<br>X <sup>2</sup> =6.003            |
| Primary school                                      | 62             | 7      | 12     | 81    |   |
| Secondary School                                    | 15             | 3      | 2      | 20    |   |
| Tertiary  | 7              | 0      | 0      | 7     |   |
| <b>Monthly income (Ethiopian birr)</b>              |                |        |        |       |   |
| <500  | 70             | 11     | 23     | 104   | P=0.021<br>X <sup>2</sup> =23.927           |
| 500-1000  | 53             | 6      | 3      | 62    |   |
| 1000-1500   | 21             | 0      | 2      | 23    |   |
| >1500   | 17             | 3      | 0      | 20    |   |
| <b>Distance from the health center</b>              |                |        |        |       |   |
| <5kms   | 66             | 8      | 9      | 83    | P=0.087<br>X <sup>2</sup> =24.124           |
| 5-10kms   | 2              | 0      | 2      | 4     |   |
| 10-15kms  | 10             | 0      | 1      | 11    |   |
| 15-20kms  | 18             | 4      | 2      | 24    |   |
| >20kms  | 65             | 8      | 14     | 87    |   |
| <b>Duration on ART</b>                              |                |        |        |       |   |
| <1Years   | 21             | 1      | 0      | 22    | P=0.714<br>X <sup>2</sup> =12.424           |
| 1-2 Years   | 52             | 5      | 11     | 68    |   |
| 2-3 Years   | 47             | 8      | 12     | 67    |   |
| 3-4 Years   | 34             | 6      | 5      | 45    |   |
| 4-5 Years   | 7              | 0      | 0      | 7     |   |
| <b>Faced side effect</b>                            |                |        |        |       |   |
| Yes   | 118            | 16     | 24     | 158   | P=0.524<br>X <sup>2</sup> =3.206            |
| No  | 43             | 4      | 4      | 51    |   |
| <b>Use of reminder device</b>                       |                |        |        |       |   |
| Yes   | 147            | 19     | 26     | 192   | P=0.553<br>X <sup>2</sup> =3.028            |
| No  | 14             | 1      | 2      | 17    |   |
| <b>Service satisfaction on ART clinic</b>           |                |        |        |       |   |
| Yes   | 139            | 17     | 2      | 179   | P=0.305<br>X <sup>2</sup> =4.828            |
| No  | 22             | 3      | 5      | 30    |   |
| <b>Use of stimulants and local alcoholic drinks</b> |                |        |        |       |   |
| Yes   | 42             | 8      | 15     | 65    | <b>P=0.001</b><br>X <sup>2</sup> =19.820    |
| No  | 119            | 12     | 13     | 144   |   |
| <b>Medication in addition to ARV</b>                |                |        |        |       |   |
| No  | 30             | 0      | 0      | 30    | P=0.013<br>X <sup>2</sup> =25.383           |
| Cotrimoxazole                                       | 110            | 14     | 21     | 145   |   |
| Anti-TB   | 17             | 6      | 4      | 27    |   |
| Acyclovir   | 4              | 0      | 3      | 7     |   |
| <b>Regimen</b>                                      |                |        |        |       |   |
| d4T/3TC/NVP   | 86             | 9      | 16     | 111   | P=0.464<br>X <sup>2</sup> =15.849           |
| ZDV/3TC/NVP   | 22             | 3      | 2      | 27    |   |
| d4T/3TC/EFV   | 11             | 4      | 2      | 17    |   |
| ZDV/3TC/EFV   | 2              | 0      | 0      | 2     |   |
| TDF/3TC/EFV   | 40             | 4      | 8      | 52    |   |

### Discussion

In the present study, a total of 209 adult HIV/AIDS patients were involved in the study, of which 127 (60.8%) were females and 82 (39.2%) were males. Similar to our finding, in the study conducted in Addis Ababa and Togo females were more than males (12,13). From total respondents, majority 126 (60.3%) were from the rural area. This is may be due to the fact that some urban patients discontinue refill from Agaro Health Center and instead may attend in the nearby ART sites, either Jimma or Limmu Hospitals due to fear of stigma and discrimination in their residence areas.

Antiretroviral therapy adherence rate in the present study was relatively higher (98.8%) compared to findings from a study done on HIV-patients in Kenya (74%), Togo (89.8%) and Addis Ababa (93.1%) (12-14). The adherence rate (98.8%) in the present study was comparable with the finding of the study conducted in Jimma, which was greater than 95% (15). The higher rate of adherence in the present study may be due to the services provided at the ART clinic such as counseling on ART adherence and other services like ART drug information from Non-Governmental Organizations.

The present study found that females (99.5%) were more adherent to ART than males (98.1%). This may be due to the fact that males used stimulants and other social drugs which will affect adherence negatively than females. In line with our finding, the study done in Kenya revealed that one of non-adherence factor was the use of stimulants and local alcoholic drinks (14) and out of non-adherence patients, most men missed doses. Thus, significant association between sex of respondents and adherence to ART was observed ( $p < 0.05$ ).

Our study found that majority 158 (75.6%) of the respondents had faced one drug side effect in the last month before this study and 51 (24.40%) respondents were with no drug side effects. Skin rash was the most 48 (30.40%) common side effect as reported by the respondents.

In the present study, majority 179 (85.6%) of the respondents were taking medications in addition to ART such as cotrimoxazole 145 (69.4%), antitubercular drugs 27 (12.9%) and Acyclovir 7 (3.3%). Out of the respondents who were taking additional medications, 131 (73.2%) patients were adhered 100% and adherence was found to be between 90-95% in 20 (11.2%) patients.

The present study found that the main reasons for missing the doses were forgetting 27 (39.7%), being too busy 20 (29.4%), being away from home 17 (25.0%) and being extremely ill 4 (5.9%). This finding is consistent with the study conducted in Addis Ababa which indicated being too busy or forgetting (33.9%) and being away from home

(27.5%) were the commonest reasons for missing medications. Similarly, a study done in Southwest Ethiopia also revealed that being away from home (21.2%) and being busy (21.2%) and feeling ill (30.3%) were the common reasons for missing medications (14-16). On the other hand, study done in Jimma showed that in more than 75% of the cases the most common reasons of missing the medications were running out of medications, simply forgetting, feeling ill and being busy (17).

In the present study, the mean adherence rate in the previous 30 days was found to be 98.8% and majority 161 (77.0%) of the respondents had 100% adherence, 28 (13.4%) had 96-99% adherence, and only 20 (9.6%) were found to have between 90-95% adherence. Contrary to our finding, the study conducted in Southwest Ethiopia revealed 94.3% of self-reported dose adherence (17). Similarly, a study done in South Africa revealed 93.5% of adherence among the study participants (18). The adherence rate in the present study is higher than the study in Southwest Ethiopia and South Africa. This difference in findings may be attributed to the continued awareness creation and public education about the merits of ART adherence that is being conducted by health professionals and other stakeholders in the study area. Moreover, the variation in the study areas and methodology might also partly explain the disparity in the reported rates of adherence.

In the present study, the assessment done in determining the correlates of adherence revealed that sex ( $P$ ), living alone ( $P$ ), monthly income ( $P=0.02$ ), medications in addition to ARV ( $P=0.01$ ), use of stimulants and local drinks ( $P=0.01$ ) were significantly associated with non-adherence. This finding different from the study conducts in Kenya (14), which revealed that sex and monthly income were not significantly associated with adherence ( $p > 0.05$ ) but age and level of education significantly associated with adherence ( $p < 0.05$ ). The reason may be due to age restriction, since this study done on only adult people. Here again the variation in the study areas and methodology might also partly explain the disparity in the factors affecting adherence.

The major limitation of this research was lack of availability of more objective measures of adherence like Medication Event Monitoring System (MEMS) devices and other devices to follow more accurate method of measuring adherence, shortage of time and budget constraint. The other limitation is that respondents might respond ideally rather than what practically exercise. However, despite this limitations, it is an explanatory study in an area where scare information is existing, therefore it adds to facts already known on the topic by providing the magnitude of adherence and information on adherence level and factors significantly associated with non-adherence.

Adherence rate to ART of Adult HIV/AIDS patients was found to be high. The main reasons for missing of the doses were forgetting, being too busy, being away from home and being ill. Socio-demographic characteristics (sex, living alone, monthly income) were significantly associated with non-adherence. Since over 95% adherence to HAART is required for adequate virological, immunological response and optimum therapeutic outcome, long term adherence

strategies should take these factors into consideration.

#### Acknowledgements

We are grateful to Agaro health center staff, all patients who participated, nurses and others who cooperated in this study. And Jimma University for financially sponsoring this research project.

#### References

- UNAIDS/WHO: AIDS epidemic update 2007. Geneva, Switzerland, 2007. [http://data.unaids.org/pub/epislides/2007/2007\\_epiupdate\\_en.pdf](http://data.unaids.org/pub/epislides/2007/2007_epiupdate_en.pdf) (Accessed on 20 November 2013)
- Irunde H, Ngemera M. A Study on adherence to antiretroviral therapy in Tanzania a Pre-intervention study, Dare-salaam, Tanzania. Tanzanian Food and Drug Authority Research, 2004; 5-26. <http://archives.who.int/prduc2004/FinalProposalARVAdherenceStudyTanzania.pdf> (Accessed on 20 November 2013)
- Kunutsor S, Walley J, Katabira E, Muchuro S, Balidawa H, Namagala E, et al. Clinic Attendance for Medication Refills and Medication Adherence amongst an Antiretroviral Treatment Cohort in Uganda: A Prospective Study. *AIDS Res Treat* 2010;2010:872396.
- Altice FL, Friedland GH. The era of adherence to HIV therapy. *Ann Intern Med* 1998;129(6):503-5.
- Mannheimer S, Friedland G, Matts J, Child C, Chesney M. The consistency of adherence to antiretroviral therapy predicts biologic outcomes for human immunodeficiency virus-infected persons in clinical trials. *Clin Infect Dis* 2002;34(8):1115-21.
- Drug Administration and Control Authority (DACA). Standard treatment guideline for primary hospitals. Addis Ababa, Ethiopia. Drug Administration and Control Authority of Ethiopia Contents, 2010; 4-41. <http://apps.who.int/medicinedocs/documents/s17820en/s17820en.pdf> (Accessed on 20 November 2013)
- Erah PO, Arute JE. Adherence of HIV/AIDS patients to antiretroviral therapy in a tertiary health facility in Benin city. *Afr J Pharm Pharmacol* 2008;2(7):145-52.
- Kumarasamy N, Safren SA, Raminani SR, Pickard R, James R, Krishnan AK, et al. Barriers and facilitators to antiretroviral medication adherence among patients with HIV in Chennai, India: a qualitative study. *AIDS Patient Care STDS* 2005; 19(8):526-37.
- Rougemont M, Stoll BE, Elia N, Ngang P. Antiretroviral treatment adherence and its determinants in Sub-Saharan Africa: a prospective study at Yaounde Central Hospital, Cameroon. *AIDS Res Ther* 2009;6:21.
- World Health organization (WHO), Adherence to long-term therapies. Evidence for action. Geneva. 2003;17-21. <http://whqlibdoc.who.int/publications/2003/9241545992.pdf> (Accessed on 20 November 2013)
- Summary and statistical report of the 2007 population and housing census. Population size by age and sex. United Nations Population Fund (UNFPA), Addis Ababa, Ethiopia; 2008. <http://www.scribd.com/doc/28289334/Summary-and-Statistical-Report-of-the-2007> (Accessed on 20 November 2013)
- Beyene KA, Gedif T, Gebre-Mariam T, Engidawork E. Highly active antiretroviral therapy adherence and its determinants in selected hospitals from south and central Ethiopia. *Pharmacoepidemiol Drug Saf* 2009;18(11):1007-15.
- Potchoo Y, Tchamdja K, Balogou A, Pitche VP, Guissou IP, Kassang EK. Knowledge and adherence to antiretroviral therapy among adult people living with HIV/AIDS treated in the health care centers of the association "Espoir Vie Togo" in Togo, West Africa. *BMC Clin Pharmacol* 2010;10:11.
- Nyambura A. Factors that influence non-adherence to antiretroviral therapy (ART) among human immunodeficiency virus and acquired immune deficiency syndrome (HIV/AIDS) patients in Kenya, Kenyatta University, Kenya. Department Of Public Health, 2009;68-71.
- Tiyou A, Belachew T, Alemseged F, Biadgilign S. Predictors of adherence to antiretroviral therapy among people living with HIV/AIDS in resource-limited setting of southwest Ethiopia. *AIDS Res Ther* 2010;7:39.
- Tadios Y. Antiretroviral treatment adherence and its correlates among people living with HIV/AIDS on highly active antiretroviral therapy, Addis Ababa, Ethiopia. Research paper, 2005; 57-62. <http://etd.aau.edu.et/dspace/bitstream/123456789/2728/1/YONAS%20TADIOS%2c.pdf> (Accessed on 20 November 2013)
- Amberbir A, Woldemichael K, Getachew S, Girma B, Deribe K. Predictors of adherence to antiretroviral therapy among HIV-infected persons: a prospective study in Southwest Ethiopia. *BMC Public Health* 2008;8:265.
- Orrell C, Bangsberg DR, Badri M, Wood R. Adherence is not a barrier to successful antiretroviral therapy in South Africa. *AIDS* 2003;17(9):1369-75.

#### How to cite:

Ejigu MA, Ahmed SM, Mohammed MA. Anti-retroviral therapy adherence and its determinants among adult patients living with HIV/AIDS in South West Ethiopia: a facility-based cross sectional study. *Gaziantep Med J* 2014;20(1):52-58.