

Original Article



# Level of Medication Adherence and its Associated Factors among Patients Receiving Antiretroviral Therapy at a Tertiary Care Hospital in South India

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## Abstract

**Introduction:** Anti-retro viral drugs are the corner stone of management of human immunodeficiency virus (HIV) infection. Anti-retro viral drugs have been consistently proven to reduce mortality due to HIV. The aim of this study was to identify the level of drug adherence and related challenges for adherence.

**Methods:** A cross-sectional study was conducted in the antiretroviral therapy (ART) clinic of a tertiary care teaching hospital. Patients who were above 18 years of age, on ART for at least six months and underwent counselling before starting ART were included in the study (n=143). Demographic variables and clinical profile were noted and level of drug adherence and associated factors were assessed using Morisky Green Levine test and check list respectively. Data was analysed in SPSS version 22.

**Results:** Most of the study subjects (89.5%) had high level of medication adherence and 10.5% had medium level adherence. Factors contributing to high adherence level were confidentiality and trust among health workers, concerned about their own health, understanding about the prescribed drugs, idea about disease progression, effectiveness and knowledge of anti-retro viral drugs.

**Conclusion:** Drug adherence was found to be high among HIV- infected patients in this study and various reasons contributed for the high adherence among the study subjects.

## Introduction

Over the last 5 years, there has been a rapid change in the treatment strategies for the human immunodeficiency virus (HIV) infection. Through the birth of newer antiretroviral drugs, treatment has been changed from single therapy and double therapy to triple-drug therapy or highly active antiretroviral therapy (ART) which consists of three or more antiretroviral drugs to be taken in combination.<sup>1</sup>

According to Indian National Health Policy 2017, the target global achievement of 2020 is also termed as a target of 90:90:90, for HIV/ AIDS i.e. 90% of all people living with HIV infection know their HIV status, 90% of all people living with HIV infection receive sustained ART and 90% of all people receiving ART will have viral suppression.<sup>2</sup>

According to National AIDS Control Organization (NACO), as per the HIV estimation 2015 report from India, the adult (15-45 years) HIV prevalence in India was

estimated at 0.26%, adult HIV prevalence was estimated to be 0.3% among males and at 0.22% among females. The total number of people living with HIV (PLHIV) in India was estimated to be 21.17 lakhs.<sup>3</sup>

ART became a turning point in the control and prevention of the AIDS epidemic. ART helps in improving the quality of life of people living with HIV infection and reduces morbidity and mortality. ART effectively suppresses viral replication when taken at the right time and also halts the onset and progression of opportunistic infections. ART has shown to be successful in decreasing the viral load and increasing the CD4 count. Treatment with ART does not cure HIV infection however, it can control the progression of the disease.<sup>4,5</sup>

According to the World Health Organization (WHO), drug adherence is defined as “the extent to which a person’s behaviour on taking medication, following a diet, and/or executing lifestyle changes corresponds with the agreed recommendations from a health care provider”.

The magnitude and impact of poor drug adherence in developing countries is more than developed countries. To ascertain the true extent of drug adherence, data in developing countries among important subgroups of the population such as adolescents, children and marginal populations are required.<sup>1</sup>

Petersen et al., found that, patients failed to adhere to their medication regimen for several reasons which may be intentional or unintentional.<sup>6</sup> Study conducted by Molloy et al., highlights that there was a significant increase in the level of medication non-adherence between the immediate discharge period and after six months of discharge.<sup>7</sup> Getting patients to take drugs daily is one of the greatest challenges for effective ART, as missing does can lead to drug resistance. The WHO has observed that patients with long term illnesses have problem with adherence to the treatment instructions. It has often been noticed that some of the patients fail to adhere to these treatment regimens. Compliance with therapy and adherence to drug is necessary for patients with HIV infection to optimize the effectiveness of ART. The studies that have been done have only focused on adherence to drugs and very few studies have explored the factors responsible for drug adherence. The present study aims to determine the level of medication adherence and factors affecting the level of medication adherence among patients receiving ART in a tertiary care hospital in southern India.

### Materials and Methods

A cross-sectional descriptive study was done. The study was conducted in a tertiary care teaching hospital in south India between 23/03/2018 and 11/04/2018 for period of 12 days. Patients who were attending the ART clinic of the institute were considered as the sample population. Inclusion criteria were patients aged between 18-60 years, patients on ART for at least six months from the hospital and attending ART clinic during the period of data collection. Patients who were reluctant to participate and patients aged less than 18 years were excluded. Based on a previous study,<sup>8</sup> the prevalence of drug adherence was found to be 94.3% and with an absolute precision of 5% and confidence interval of 99%, the sample size was calculated to be 143 using OpenEpi version 3.01. Data collection proforma was used to capture data. All the HIV infected patients who are receiving follow-up treatment in ART clinic and who met the inclusion criteria were included in the study.

A personal interview was conducted from the eligible study subjects who met the inclusion criteria. Informed consent was obtained after explaining the risk and benefit of this study in their local language. The data collection proforma contained four sections. Section-1 contained the socio-demographic data of the subjects, Section-2 contained the clinical profile of the subjects, Section-3 contained four items from the Morisky Green Levine test which focuses on the level of medication

adherence.<sup>9</sup> Section-4 contained a checklist to identify the factors responsible for medication adherence. Study was evaluated by two Nursing experts and one Medical expert through an external peer review process for the purpose of validation of the self-structured questionnaire. After getting the contents of the data collection proforma validated, a pilot study was conducted among 15 patients to check the feasibility and data collection proforma was administered for all subjects. Parameters studied were the level of medication adherence and factors responsible for medication adherence.

The distribution of categorical data such as socio-demographic profile and clinical data was expressed as frequency and percentage. Continuous data such as level of medication adherence was expressed as mean with standard deviation. The level of medication adherence and its association with their factors was analysed with a Pearson correlation coefficient test and  $P < 0.05$  was considered as significant. Data was analysed in SPSS version 22.

### Results

The majority of the subjects (56.6%) were female, 27.3% were illiterate, 44.8% were unemployed and 74.1% of them were from a rural area (Table 1).

The study revealed that a majority (53.8%) of subjects got HIV infection by unprotected sexual intercourse, 8.4% of received ART before coming to the hospital, 67.1% of subjects did not have HIV infected members in the family, 86% of subjects were regular in follow-up to the ART clinic. About 80.4% of the subjects were not affected with any of the opportunistic infections, 86.7% did not take medication for any other disease, 96.5% did not receive any benefit from the government and 98.6% were not a member of the positive network (Table 2).

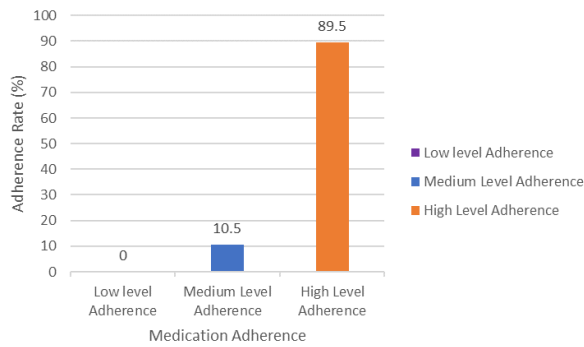
Factors such as confidentiality and trust among health care workers ( $P=0.04$ ), concern about their own health ( $P=0.006$ ), understanding about the prescribed drugs ( $P=0.022$ ), idea about disease progression, effectiveness and knowledge of antiretroviral drugs ( $P=0.05$ ) were found to be statistically significant with the level of medication adherence in this study and the mean (SD) score of level of medication adherence was 3.55 (0.71) (Table 3).

Figure 1 depicts that 89.5% of subjects had a high level of medication adherence, 10.5% had a medium level of medication adherence and none of the subjects had low-level medication adherence.

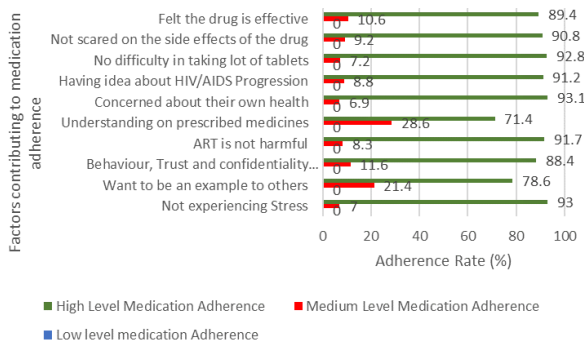
Figure 2 shows the factors associated with the level of medication adherence among the study subjects.

### Discussion

This study aimed to assess the level of medication adherence and the factors associated with medication adherence among patients receiving ART. The present study showed that among 143 HIV infected subjects, 89.5% had high-level medication adherence and 10.5%



**Figure 1.** Level of medication adherence.



**Figure 2.** Factors influencing medication adherence

had medium-level medication adherence. These results were supported by a study done by Gokarn et al., in the ART centre of a tertiary care hospital in Aurangabad where it was found that 96.6% of subjects had more than 95% of medication adherence.<sup>10</sup>

The level of medication adherence was high in other studies also. In a study conducted by Wutoh et al., 55 patients reported 100% antiretroviral drug adherence, whereas 25 patients reported less than 100% adherence. This variation may have been due to the sample and the setting of the study conducted.<sup>11</sup> Another study done by Yu et al., showed that of the 207 study participants, 85% were categorized with good adherence and only 14.5% with poor adherence.<sup>12</sup>

Age, sex and marital status did not affect the level of medication adherence in this study. This is supported by studies conducted by Campbell et al.,<sup>13</sup> and Talam et al.,<sup>14</sup> in which age, sex, marital status did not affect the level of medication adherence.

Subjects who disclosed their HIV status to the family members were more adherent to drugs than those who did not reveal HIV status to their family members. In a study conducted by Mitiku et al., 87.2% of the subjects revealed their HIV status to the family members and were more adherent to drugs than those who did not disclose HIV status (66.3% of subjects).<sup>15</sup>

In our study, patients without any opportunistic infection had a high level of adherence to medication. A study done by Banagi et al., showed that patients with

the absence of opportunistic infection had shown good adherence to ART.<sup>16</sup> Another study by Joshi et al., also showed that participants without opportunistic infections had good medication adherence.<sup>17</sup>

In this study, behaviour, trust and confidentiality among health care workers were significantly associated with medication adherence. This is supported by a study conducted by Negesa et al., in which trust in the clinician was found to be positively associated with ART adherence<sup>18</sup> and in another study conducted by Wang and Wu, patient's trust and confidence in their treating physician were independently associated with adherence.<sup>19</sup>

In this study, patient's idea and knowledge regarding the disease were found to be significantly associated with medication adherence. This study is supported by a study conducted by Anuradha et al., in which one of the main facilitators of medication adherence was patient's knowledge and idea about the disease.<sup>20</sup>

Limitations of this study were that it relied completely on the patient's self-reported drug adherence. Side effects reported was purely based on the interview process. No efforts were taken to examine the patients. Study

**Table 1.** Baseline characteristics of study subjects (N = 143)

Demographic variables	No. (%)
Age (y)	
18-29	8 (5.6)
30-44	55 (38.5)
45-59	63 (44.1)
>60	17 (11.8)
Marital status	
Married	116 (81.1)
Never married	11 (7.7)
Widowed	16 (11.2)
Gender	
Male	62 (43.4)
Female	81 (56.6)
Education	
Illiterate	39 (27.3)
Primary school	16 (11.2)
Middle school	32 (22.4)
High school	33 (23.1)
Intermediate	18 (12.6)
Graduate and post graduate	5 (3.4)
Occupation	
Unemployed	64 (44.8)
Unskilled	33 (23.1)
Semi-skilled	16 (11.2)
Skilled	9 (6.3)
Farmers	18 (5.5)
Semi-professional	0 (0)
Professional	3 (2.1)
Domicile	
Urban	37 (25.9)
Rural	106 (74.1)

**Table 2.** Clinical profile of study subjects (N = 143)

Clinical Profile	No. (%)
Mode of infection	
Unprotected sexual route	77 (53.8)
Blood transfusion	15 (10.5)
Pre-natal	1 (0.7)
Probable unsafe injection	12 (8.4)
Unknown	38 (26.6)
Did you receive ART before being referred to ART Clinic, JIPMER?	
Yes	12 (8.4)
No	131 (91.6)
Are there any known HIV infected members in the family?	
Yes	47 (32.9)
No	96 (67.1)
Regular in coming to the ART clinic for the past six months	
Yes	123 (86)
No	20 (14)
Are you affected by any opportunistic infection?	
Yes	28 (19.6)
No	115 (80.4)
Do you take medicine for any other disease?	
Yes	19 (13.3)
No	124 (86.7)
Do you receive any benefit from the government for taking ART?	
Yes	5 (3.5)
No	138 (96.5)
Are you a member of a positive network?	
Yes	2 (1.4)
No	141 (98.6)

Abbreviation: ART, antiretroviral therapy.

participants were predominantly from rural areas and so we have very little information about the practices prevailing in the urban areas.

Regarding further studies, a follow-up study can be planned to assess the impact of drug adherence in HIV infected patients in reducing the presence of opportunistic infections (clinical response) and also in documenting a rise in CD<sub>4</sub> count (immunologic response). Further studies can establish the association between multiple rounds of counselling to the patients and adherence to treatment.

### Conclusion

HIV/ AIDS is a communicable disease, the prevalence of which is rising worldwide. Adherence to ART is necessary to reduce morbidity and mortality among HIV infected individuals. To promote medication adherence, nurses and other health care workers working in the ART clinic need to counsel patients before initiation of ART also at each regular follow-up visit. This will help in minimizing the stigma associated with the disease and also help

**Table 3.** Correlation between the level of medication adherence and factors facilitating medication adherence (N = 143)

Factors	Mean (SD)	Level of medication adherence <sup>a</sup>
Felt the ART drug is effective	0.21(0.40)	r =0.53 P=0.528
Not scared about side effects of the drug	0.17(0.37)	r =-0.11 P=0.895
Concerned about the health	0.19(0.39)	r =-0.227 P=0.006*
Behaviour, trust, confidentiality of the health care workers	0.10(0.29)	r =0.170 P=0.042*
Have an idea about HIV/AIDS	0.20(0.39)	r =-0.164 P=0.050*
Not experiencing stress	0.40(0.49)	r =-0.157 P=0.060
Understood about the prescribed medication	0.90(0.29)	r =0.192 P=0.022*
ART is not harmful	0.92(0.27)	r =-0.081 P=0.339
Want to be an example to others	0.20(0.40)	r =-0.054 P=0.522

Abbreviations: ART, antiretroviral therapy; SD, standard deviation.

\* Significantly associated with medication adherence; <sup>a</sup> Pearson correlation test.

in creating awareness among patients and their family members.

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### Ethical Issues

Approval was obtained from the Nursing Research Monitoring Committee (NRM/C) and Institute Ethics Committee (JIP/IEC/2018/007).

### Research Highlights

#### What is the current knowledge?

Getting patients to take lifelong treatment for HIV infection is a challenging task for healthcare workers. Due to social stigma, physical constraints, repeated follow up treatment and stress, some of the patients are non-adherent to ART. This study highlights the role of proper counselling and guidance to be given on medication adherence for both patients and family members at each visit to the hospital so that they remain regular in follow up with the treatment.

#### What is new here?

Counselling was given to patients coming for follow-up to the ART clinic as part of this study by the nursing team. This was done along with the regular counselling being provided to the patients by the counsellor at the ART clinic



### Conflict of Interest

The authors declare no conflict of interest in this study.

### Authors' Contributions

Study conception and design: VS and all research group members. Acquisition of data: VS and all research group members. Definition of intellectual content: VS, VK, and VM. Literature search: VS Data analysis and interpretation: VS, VK, VM. Initial draft of the Manuscript: VS. Revision of the Manuscript: VS, VK and VM. All the authors have read and approved the manuscript.

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