

### STUDY TO ASSESS THE ADHERENCE TO ANTIRETROVIRAL THERAPY AMONG HIV POSITIVE PATIENTS ATTENDING ART CENTERS IN HARYANA AND ITS EFFECT ON THEIR QUALITY OF LIFE

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#### Abstract

**Background:** Human immunodeficiency virus (HIV) patients all over the world now have better quality of life thanks to anti-retroviral therapy (ART). To maximise the benefits of ART, patients must adhere to it religiously. The current study's goal was to assess how HIV-positive patients who visit ART clinics in Haryana's antiretroviral medication adherence affects their quality of life. **Materials and Methods:** This was a cross-sectional study, conducted in HIV/AIDS positive patients more than 18 years of age, registered for > 6 months, receiving ART. **Result:** 275 patients receiving ART participated in present study. Majority of participants were male (64.73 %), from age group of 19-45 years (73.09 %), from rural areas (53.82 %), Hindu by religion (73.83 %). Among study participants majority were skilled (47.64 %) & semiskilled (19.64 %), education wise educated upto 10th (36.73 %) & till primary education (25.82 %). Common reasons for nonadherence were forgot to take medicine (68.92 %), alcoholic consumption (60.81 %), loss of wages on the day visiting ART center (56.76 %), depressed due to lifelong treatment (45.95 %), low mood/depression due to illness (16.22 %), farther distance of the center (45.59 %) & unable to come all alone due to physical restraints (6.76 %). We noted that duration of ART more than 2 years, distance from ART centre > 25 km & compulsion to take ART were significantly related to nonadherence & difference was statistically significant. Physical quality of life scores was less in non-adherent group as compared to adherent group & difference was statistically significant. **Conclusion:** Counseling about typical potential obstacles to adherence, such as forgetting to take medication, drinking alcohol, losing earnings while visiting an ART centre, and depression, should be done as soon as feasible, with the proper answers offered.

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## INTRODUCTION

Anti- Retroviral Therapy (ART) has improved the quality of life of Human immunodeficiency virus (HIV) patients worldwide. Antiretroviral therapy has shown to inhibit viral replication, thereby decreasing viral load to an extent where viral particles in the blood of PLHIV remain undetected.<sup>[1]</sup>

To achieve optimal results from ART, high levels of patient adherence to ART is essential. High levels of adherence to ART (at least 95%) is needed to ensure optimal benefits.<sup>[2,3]</sup> Suboptimal adherence to ART regimens leads to inadequate inhibition of viral replication, immunological failure, emergence of drug-resistant strains, and transmission of resistant strains, which ultimately lead to primary regimen failure.<sup>[4]</sup>

Quality of life (QOL) is described as an individual's view of their place in life in relation to their objectives, expectations, standards, and worries, as well as the culture and value systems in which they live. With increased longevity of PLHIV, the ambit of care is evolving to address complex issues like quality of life (QOL) among them. There are multiple factors that influence adherence: patient factors (e.g. socioeconomic, education, literacy etc.), treatment regimen, disease characteristics, patient – provider relationship and clinical settings.<sup>[5]</sup> The goal of the current study was to evaluate how well HIV positive individuals receiving ART in Haryana adhered to their antiretroviral regimen and how that affected their quality of life.

## MATERIALS AND METHODS

This was a cross-sectional study, conducted at ART Centre Ambala of Haryana, under department of community medicine, at ART Centre Ambala of Haryana, India. Study duration was of 2 years (January 2020 to December 2021). Study was approved by institutional ethical committee.

### Inclusion Criteria

- HIV/AIDS positive patients more than 18 years of age, registered for > 6 months, willing to participate.

### Exclusion Criteria

- HIV positive patients who were not in a condition to give information.

Each subject provided written informed permission in their native tongue. Confidentiality for each patient was maintained throughout the study. General information such as age, gender, socioeconomic details were noted in case record proforma. Adherence to ART therapy were calculated by using Medication Adherence Scale, a self-reported questionnaire to assess medication adherence. Adherence was considered when composite score was > 80 %.

The World Health Organization Quality of Life (WHOQOL), which consists of 26 items split across four domains, was used to assess quality of life. The four domains of QOL are, Physical health and level of independence, Psychological well-being, Social relationships & Environment. Domain scores are scaled in a positive direction (Higher scores denote higher quality of life). The scores thus obtained were added for each domain and further transformed to a new score which ranged from 0 (minimum) to 100 (maximum), with a higher score indicating better quality of life, for every domain separately.

Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Frequency, percentage, means and standard deviations (SD) was calculated for the continuous variables, while ratios and proportions were calculated for the categorical variables. Difference of proportions between qualitative variables were tested using chi-square test or Fisher exact test as applicable. P value less than 0.5 was considered as statistically significant.

## RESULTS

275 patients receiving ART participated in present study. Majority of participants were male (64.73 %), from age group of 19-45 years (73.09 %), from rural areas (53.82 %), Hindu by religion (73.83 %).

**Table 1: Baseline characteristics.**

| Characteristics      | No. of cases (n=275) | Percentage |
|----------------------|----------------------|------------|
| Gender               |                      |            |
| Male                 | 178                  | 64.73%     |
| Female               | 97                   | 35.27%     |
| Age group (in years) |                      |            |
| <14                  | 3                    | 1.09%      |
| 15- 18               | 18                   | 6.55%      |
| 19-45                | 201                  | 73.09%     |
| >45                  | 53                   | 19.27%     |
| Residence            |                      |            |
| Rural                | 148                  | 53.82%     |
| Urban                | 127                  | 46.18%     |
| Religion             |                      |            |
| Hindu                | 203                  | 73.82%     |
| Muslim               | 36                   | 13.09%     |
| Christian            | 9                    | 3.27%      |
| Sikh                 | 16                   | 5.82%      |
| Jain                 | 11                   | 4.00%      |

Among study participants majority were skilled (47.64 %) & semiskilled (19.64 %), education wise educated upto 10th (36.73 %) & till primary education (25.82 %). According to Modified BG Prasad scale classification 2019, majority participants belonged to lower middle (36.73 %) & upper middle (23.64 %) class.

**Table 2: Sociodemographic Characteristics**

| Sociodemographic Characteristics | No. of cases (n=275) | Percentage |
|----------------------------------|----------------------|------------|
| Occupation                       |                      |            |
| Skilled                          | 131                  | 47.64%     |
| Semiskilled                      | 54                   | 19.64%     |
| Unskilled                        | 44                   | 16.00%     |
| Unemployed                       | 46                   | 16.73%     |
| Education                        |                      |            |
| Illiterate                       | 11                   | 4.00%      |
| Primary                          | 71                   | 25.82%     |
| Middle                           | 101                  | 36.73%     |
| Secondary                        | 60                   | 21.82%     |

|                      |     |        |
|----------------------|-----|--------|
| Graduation and above | 32  | 11.64% |
| Marital status       |     |        |
| Single               | 65  | 23.64% |
| Married              | 148 | 53.82% |
| Divorce/Separated    | 47  | 17.09% |
| Widowed              | 15  | 5.45%  |
| Type of family       |     |        |
| Nuclear family       | 201 | 73.09% |
| Joint family         | 19  | 6.91%  |
| Living alone         | 55  | 20.00% |
| Socioeconomic class* |     |        |
| Upper                | 51  | 18.55% |
| Upper middle         | 65  | 23.64% |
| Lower middle         | 101 | 36.73% |
| Upper lower          | 43  | 15.64% |
| Lower                | 15  | 5.45%  |
| Adherence            |     |        |
| Yes                  | 201 | 73.09% |
| No                   | 74  | 26.91% |

(\* - Modified BG Prasad scale classification 2019)

In present study common reasons for nonadherence were forgot to take medicine (68.92 %), alcoholic consumption (60.81 %), loss of wages on the day visiting ART center (56.76 %), depressed due to lifelong treatment (45.95 %), low mood/depression due to illness (16.22 %), farther distance of the center (45.59 %) & unable to come all alone due to physical restraints (6.76 %).

**Table 3: Reasons for non-adherence to ART.**

| Causes attributed to non-adherence*                 | No. of cases (n=74) | Percentage |
|---|---------------------|------------|
| Forgot to take medicine                             | 51                  | 68.92%     |
| Alcoholic consumption                               | 45                  | 60.81%     |
| Loss of wages on the day visiting ART center        | 42                  | 56.76%     |
| Depressed due to Lifelong treatment                 | 34                  | 45.95%     |
| Farther distance of the center                      | 33                  | 45.59 %    |
| Low mood/depression due to illness                  | 12                  | 16.22%     |
| Unable to come all alone due to physical restraints | 5                   | 6.76%      |

(\* - multiple causes may be present)

We noted that duration of ART more than 2 years, distance from ART centre > 25 km & compulsion to take ART were significantly related to nonadherence & difference was statistically significant.

**Table 4: Comparison of variables for adherence**

| Variables                   | Adherence (N=201) (%) | Non-adherence (N=74) (%) | P value |
|-----------------------------|-----------------------|--------------------------|---------|
| Duration of ART (in months) |                       |                          | 0.0001  |
| 12-24                       | 142 (70.65 %)         | 14 (18.92 %)             |         |
| 25-36                       | 43 (21.39 %)          | 41 (55.41 %)             |         |
| >36                         | 16 (7.96 %)           | 19 (25.68 %)             |         |
| Distance travelled          |                       |                          | 0.0001  |
| <25 Km                      | 172 (85.57 %)         | 41 (55.41 %)             |         |
| >25 Km                      | 29 (14.43 %)          | 33 (45.59 %)             |         |
| Motivation to take ART      |                       |                          | 0.0001  |
| Self-motivated              | 145 (72.14 %)         | 23 (31.08 %)             |         |
| Compulsion                  | 56 (27.86 %)          | 51 (68.92 %)             |         |

In present study, physical quality of life scores was less in non-adherent group as compared to adherent group & difference was statistically significant. Psychological, social & environmental quality of life scores were comparable among non-adherent group & adherent group, difference was not statistically significant.

**Table 5: Quality of Life scores**

| Type of Adherence | Physical      | Psychological | Social        | Environmental |
|-------------------|---------------|---------------|---------------|---------------|
| Adherent          | 68.12 ± 11.46 | 51.74 ± 11.56 | 55.33 ± 11.89 | 50.71 ± 13.24 |
| Non-Adherent      | 60.32 ± 13.93 | 49.85 ± 10.44 | 52.87 ± 10.75 | 48.98 ± 12.54 |
| Total             | 65.92 ± 7.65  | 50.52 ± 10.74 | 54.16 ± 11.54 | 50.09 ± 13.47 |
| P. Value          | < 0.001       | 0.083         | 0.064         | 0.13          |

## DISCUSSION

The goal of the National AIDS Control Programme is to attain ≥95% individual drug adherence rate. A very high level of adherence is an important determinant of virologic and immunologic outcome,

AIDS- related morbidity, mortality, hospitalizations, and to be effective on a long term to prevent the emergence of resistant viral strains. Non- adherence risks the development of drug resistance and failure of therapy.<sup>[6,7]</sup>

In the Achappa B et al study,<sup>[8]</sup> 63.7% of the 116 individuals indicated adherence of at least 95%. The average adherence score was 91.25%. Financial difficulties, forgetting to take medication, a lack of family support, depression, drinking, social stigma, and antiretroviral therapy side effects were obstacles to adherence.

163 participants were enlisted by Bandyopadhyay A et al,<sup>[9]</sup> and 152 of them finished the trial. 94 participants said that at least one ADR occurred during the study period. In 31.6% of patients, ART therapy was not followed up on. The most frequent cause was forgetting to take the medication (21.8%), which was followed by ADRs (18.3%). There was no statistically significant correlation between nonadherence and the chosen variables.

In study by Prajapati S et al,<sup>[10]</sup> mean age was 34.8 ± 9.2 years, average duration of the ART consumption was 14.5 months. About 6% interrupted their treatment commonly due to toxicity/side effects of ART (66.66%). Significant improvement was seen in clinical condition (p<0.01), functional status (p<0.01), weight gain (p<0.01) and CD4 count (p<0.01). Participants had either clinical or immunological failure (6.6%). Overall high adherence rate (>95%) was seen. About 17.3% of them missed one or more doses of ART in last month of interview due to simply forgetting (54.54%) and away from home (34.09%). Adherence rate found in this study seems to be encouraging. Adherence is a dynamic process which changes overtime and cannot reliably be predicted by few patients' characteristics that are assumed to vary with time.

In study by Yathiraj AB et al,<sup>[11]</sup> Among 409 PLHIV, 70.4% showed adherence to ART. Univariate analysis yielded many factor associated with adherence (P < 0.05). However, on multivariate analysis, PLHIV who do not forget to take ART and not consuming alcohol were the factors consistent with adherence to ART (P < 0.05). Regular patient education and counseling regarding the usage of memory aids and abstinence from alcohol could be useful for adherence and long term success of ART among PLHIV.

Among 257 participants, Singh A et al,<sup>[12]</sup> noted that 88.3% patients were adherent, patients adherent to ART therapy and ambulatory had better QOL (p < 0.05) than their counterparts from other socio-clinical strata. Mean scores of physical (70.89±7.384), psychological (47.37 ± 9.174), social (51.97 ± 11.119) & environmental domains (52.33 ± 9.081), were having highest in patients those who were adherent (adherence rate >95%) to ART therapy. Similar findings were noted in present study.

Bhagat VK et al,<sup>[13]</sup> studied 256 cases, all the respondents knew that unprotected sexual contact, contaminated Blood transfusion and infected syringes were the major modes of transmission of HIV. About 60 (41.96%) in 143 patient with CD4 count <200 improved to >350. Majority of

respondents 195 (76.17%) missed the dose often and 61 (23.83%) did not miss the dose at all. The major reasons for missing dose of ART regimen were forgot to take medicines (57.95%), alcoholic state (26.15%) and long duration of treatment (47.17%). Similar findings were noted in present study.

HIV patients can have many social challenges apart from medical such as stigma, poverty, depression, substance abuse, and cultural beliefs which can affect their QOL not only from the physical health aspect, but also from mental and social health point of view making it necessary to routinely assess the effects of treatment and quantifying the return on health-care investment.<sup>[14,15]</sup>

The second objective of National AIDS Control Program Phase-4 of India aims to provide comprehensive care to people living with HIV/AIDS (PLHIV).<sup>[16]</sup> The development of combined ART has shifted the perception of HIV/AIDS from a fatal to a chronic and potentially manageable disease. ART is capable of improving survival, reducing the occurrence of HIV-related opportunistic infections, and improving the patients' QOL.<sup>[17]</sup>

Sreeranga A et al,<sup>[18]</sup> investigated 148 HIV-positive individuals receiving antiretroviral medication and evaluated QOL using the WHOQOL HIVBREF. The average age was 37.69 years, majority were males (54.7 %), from rural areas (87.8%). The educational status of the subjects was poor with 33.8% of them being illiterates. The mean QOL score was highest for spirituality and social relationships domain and least for psychological domain. Age, education and socioeconomic status did not have any influence on the QOL. There was significant difference between QOL scores and clinical stages. Individuals in stage I and II had better scores compared to stage 3 and 4. QOL scores decreased with decreasing CD4 count.

Anuradha S and colleagues conducted research on 109 PLHIV attending an ART facility in New Delhi.<sup>[19]</sup> PHS had a QOL score of 48.04, whereas MHS had one of 42.43 and 8.79. PHS scores were higher in PLHIV who were older (P = 0.04), had more formal education (P = 0.022), were HIV-positive earlier in life (P = 0.006), had higher CD4 counts (current, peak, and nadir: P = 0.024, 0.008, and 0.001, respectively), were on ART (P = 0.05), had better social support (P = 0.012), and were not depressed (P 0.001). Similar to this, PLHIV had higher MHS ratings when they had more formal education (P = 0.009), had early HIV illness (P = 0.046), and did not have depression (P 0.001). Depression and social support systems have emerged as two important QOL factors. Better QOL was predicted by advanced age, greater education, less advanced disease, and ART.

The urgent need is for thorough study to evaluate nonadherence to ART therapy. To increase the longevity and quality of life of people living with HIV/AIDS, policy formulations should be created to evaluate and encourage effective adherence.

Even though the provision of inexpensive, less toxic, and highly effective ART is critical to saving lives, the overall care must include other dimensions such as expanding social support, providing sustainable employment/income, and improving mental health. Improvement of QOL of PLHIV is now a well-recognized goal, although strategies to attain it are still nascent. To continue promoting initiatives, government coordination and cross-sector cooperation are also required.

## CONCLUSION

High level adherence requires continuous counseling to all patients, should started before initiation of antiretroviral therapy. Common potential obstacles to adherence, such as forgetting to take medication, drinking alcohol, losing earnings when visiting an ART centre, and depression, should be mentioned as soon as possible during counselling and addressed with the proper solutions. Overall, patients who take their ART medications consistently have better quality of life.

## REFERENCES

- Stone VE. Strategies for optimizing adherence to highly active antiretroviral therapy: lessons from research and clinical practice. *Clin Infect Dis*. 2001;33(6):865-72. doi: 10.1086/322698.
- Sahay S, Reddy KS, Dhayarkar S. Optimizing adherence to antiretroviral therapy. *Indian J Med Res*. 2011;134(6):835-49. doi: 10.4103/0971-5916.92629.
- DiMatteo MR. Variations in patients' adherence to medical recommendations: a quantitative review of 50 years of research. *Med Care*. 2004;42(3):200-9. doi: 10.1097/01.mlr.0000114908.90348.f9.
- Mhaskar R, Alandikar V, Emmanuel P, Djulbegovic B, Patel S, Patel A, et al. Adherence to antiretroviral therapy in India: a systematic review and meta-analysis. *Indian J Community Med*. 2013;38(2):74-82. doi: 10.4103/0970-0218.112435.
- Sarna A, Pujari S, Sengar AK, Garg R, Gupta I, Dam Jv. Adherence to antiretroviral therapy & its determinants amongst HIV patients in India. *Indian J Med Res*. 2008;127(1):28-36.
- Weidle PJ, Wamai N, Solberg P, Liechty C, Sendagala S, Were W, et al. Adherence to antiretroviral therapy in a home based AIDS care program in rural Uganda. *Lancet* 2006;368:1556-7.
- Günthard HF, Saag MS, Benson CA, del Rio C, Eron JJ, Gallant JE, et al. Antiretroviral Drugs for Treatment and Prevention of HIV Infection in Adults: 2016 Recommendations of the International Antiviral Society-USA Panel. *JAMA*. 2016;316(2):191-210. doi: 10.1001/jama.2016.8900.
- Achappa B, Madi D, Bhaskaran U, Ramapuram JT, Rao S, Mahalingam S. Adherence to Antiretroviral Therapy Among People Living with HIV. *N Am J Med Sci*. 2013;5(3):220-3. doi: 10.4103/1947-2714.109196.
- Bandyopadhyay A, Chaurasia RC, Palepu S, Yadav RK. A study of adherence to antiretroviral therapy in a tertiary care hospital at Allahabad, India. *Indian J Sex Transm Dis AIDS*. 2019;40(1):46-50. doi: 10.4103/ijstd.IJSTD\_81\_17.
- Shailesh P, Kantharia SL, Mamta V, Hitesh S. A study to determine factors affecting the adherence to Anti Retroviral Therapy (ART) among the patients attending ART Center, New Civil Hospital Surat (NCHS), India. *Int J Res Med*. 2015; 4(3):1-7
- Banagi Yathiraj A, Unnikrishnan B, Ramapuram JT, Kumar N, Mithra P, Kulkarni V, et al. Factors Influencing Adherence to Antiretroviral Therapy among People Living with HIV in Coastal South India. *J Int Assoc Provid AIDS Care*. 2016;15(6):529-533. doi: 10.1177/2325957416661424.
- Singh A, Mittal A, Kaur V. To assess the adherence to antiretroviral therapy among HIV positive patients attending ART centers in Haryana and its effect on their quality of life. *Indian J Comm Health*. 2021;33(2):314-318.
- Bhagat VK, Vinoth GCD, Kumar G, Bhatnagar A, Adhikary M. Anti retroviral therapy adherence and its determinants among patients attending ART center, Bhopal. *Int J Community Med Public Health* 2018;5:4566-72.
- Basavaraj KH, Navya MA, Rashmi R. Quality of life in HIV/AIDS. *Indian J Sex Transm Dis AIDS*. 2010;31:75-80.
- Mannheimer SB, Matts J, Telzak E, Chesney M, Child C, Wu AW, et al. Quality of life in HIV infected individuals receiving antiretroviral therapy is related to adherence. *AIDS Care*. 2005;17:10-22.
- Neupane S, Dhungana GP, Ghimire HC. Adherence to antiretroviral treatment and associated factors among people living with HIV and AIDS in CHITWAN, Nepal. *BMC Public Health*. 2019;19(1):720. doi: 10.1186/s12889-019-7051-3.
- Marins JR, Jamal LF, Chen SY, Barros MB, Hudes ES, Barbosa AA, et al. Dramatic improvement in survival among adult Brazilian AIDS patients. *AIDS*. 2003;17:1675-82.
- Sreeranga A, Pavithra P, Meundi AD. Assessment of quality of life among HIV infected people on antiretroviral therapy in a tertiary hospital, Karnataka. *Int J Community Med Public Health*. 2021;8(6):2779-2784.
- Anuradha S, Makkar AM, Nandi PK, Rajeshwari K. Quality of life and its determinants among people living with HIV attending an antiretroviral treatment center in Delhi, India. *Indian J Public Health*. 2020;64(2):148-153. doi: 10.4103/ijph.IJPH\_400\_19.