

Journal of the International Association of Physicians in AIDS Care (JIAPAC)

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Journal of the International Association of Physicians in AIDS Care (JIAPAC) 2010 9: 191
DOI: 10.1177/1545109710368722

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Journal of the International
Association of Physicians in AIDS Care
9(3) 191-195

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DOI: 10.1177/1545109710368722

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Abstract

Background: Good adherence to highly active antiretroviral therapy (HAART) is required for viral suppression and prevention of drug resistance. Patients' adherence to HAART has not been determined since the commencement of HAART at the University of Ilorin Teaching Hospital (UIH), Ilorin, Nigeria, over 5 years ago. **Objectives:** To determine the adherence level of people living with HIV/AIDS (PLWHA) to HAART and identify associated factors. **Methodology:** A semistructured questionnaire was administered to PLWHA, who were accessing treatment. Sociodemographic, lifestyle, HIV medical, and drug history were obtained from them. Adherence was self-reported. Good adherence was taking of 95% of the prescribed doses of HAART over the preceding 30 days before consultation. **Results:** Study participants were 253; majority, 58.5%, were females. About 70.8% of them had good adherence. Older age and male sex correlated better with adherence. **Conclusion:** People living with HIV/AIDS were quite adherent to HAART. Male sex and older age were positive predictors of adherence. Adherence among the young age and females needs strengthening.

Keywords

HIV, PLWHA, HAART, adherence, Ilorin

Introduction

The HIV pandemic has had a devastating effect on the world with sub-Saharan Africa being the worst affected because this region is home to 68% of the affected people worldwide.¹ Nigeria, the most populous nation in Africa, has 3.6% of her population consisting of people living with HIV/AIDS (PLWHA) based on the 2007 National HIV/AIDS and Reproductive Health Survey (NARHS Plus 2007).² However, according to the 2008 National HIV Sero-Prevalence Sentinel Survey among the antenatal clinic attendees, 4.6% of Nigerians are PLWHA,³ indicating an increasing trend despite government interventions including the provision of free highly active antiretroviral therapy (HAART) for the HIV-infected patients. Elsewhere, however, the introduction of HAART has led to a reduction in mortality and improvement in quality of life of PLWHA⁴⁻⁶ and the disease has been virtually transformed into a chronic treatable condition.

One of the recognized essential elements to improve the quality of life of PLWHA, prevent reinfection, and halt further spread of resistant strains is adherence to HAART.⁷ Adherence has been described as the "Achilles' heel" of a successful outcome in an antiretroviral therapy (ART) program.⁸ It is the second strongest predictor of delayed progression to AIDS and death after CD4 count; hence, it is now widely recognized as

critical health promotion behavior for PLWHA.^{9,10} Adherence is the extent to which a patient follows medical instructions including taking of medication.¹¹ Adherence to HIV treatment is defined as taking the prescribed pills at the right time, in the right doses, and in the right way.¹² There are a number of recognizable techniques for the assessment of adherence in HIV/AIDS treatment including pill count, diary keeping, self-report, and electronic monitoring each with its own merit and demerit. It is objectively measured by a minimum threshold of 95% of all doses and this has been shown to maintain suppression of viral load and replication; below this level, treatment failure rates increase.¹³

People living with HIV/AIDS have been accessing HAART at the University of Ilorin Teaching Hospital (UIH), Ilorin, Nigeria, for over 5 years under the Institute of Human Virology of Nigeria (IHVN) being sponsored by President's Emergency

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Plan for AIDS Relief (PEPFAR). Progress in monitoring these patients has been mainly immunological (through serial CD4 count determination) though epileptic due to recurrent faulty equipment and largely, but nonobjectively, clinical. Furthermore, adherence of PLWHA to HAART has not been assessed despite nonroutine determination of viral load and drug sensitivity test either at the commencement of therapy or part of follow-up at UITH, Ilorin, Nigeria. The objective of this study therefore is to determine and identify factors that may influence HIV-infected patients' adherence to antiretroviral (ARV) medication in our center.

Methodology

This study is a descriptive cross-sectional survey that was conducted at the HAART clinics of the UITH, Ilorin, Nigeria, in June 2009. Patients living with HIV/AIDS who had been on ARV drugs for at least 6 months were recruited into the study, having obtained their consent. The patients were always given counseling on their disease and the need to take their medications as prescribed at every clinic visit. Patients who have not been on medication for up to 6 months at our hospital were exempted from the study.

The patients were educated on the general purpose of the study and the need to respond correctly to questions in the questionnaire, which was anonymous. They were also told that their participation was voluntary and that they could withdraw from the study at any time if they so desire having assured them of the confidentiality of information supplied.

A semistructured, trained interviewer-administered questionnaire containing 40 items was used to collect information from the patients. The interviewers were medical doctors undergoing residency training in the hospital.

The questionnaire was divided into 3 parts:

- (a) sociodemographic and lifestyle history;
- (b) HIV medical history (time and reaction at diagnosis, third-party knowledge of the diagnosis, HIV serostatus of spouse, other medical diseases, keeping of clinic appointments, availability of doctors any time for complaints, and whether there was enough confidentiality during consultations); and
- (c) HIV medication and adherence (time of commencement of ART, treatment for associated illness, reactions to ARV drugs and its severity, whether spouse too is on ARV drugs, availability of ART and whether it is free and if not who pays the bill and how much per month, whether this price was considered fair or expensive, whether ART was regular, number of times ARV medication has been missed and factors responsible for that, and any benefit from ART and in what terms and whether current health status could be ascribed to the effect of ART). Adherence was self-reported and a patient was said to be adherent if he or she took at least 95% of the prescribed doses of ARV medications over the preceding 30 days before consultation.

All information obtained was input into Statistical Package for the Social Sciences (SPSS) software version 15 for statistical analysis and results are presented in tables. Adherence was correlated to a number of factors including age, sex, occupation, distance, and transport fare to the hospital by regression analysis using the Spearman correlation. Spearman coefficient value ranges between -1 and $+1$, with a positive value implying that with increase in the value of the variable there was an increased likelihood of adherence while a negative value implied that an increase in value of the variable connotes a reduced likelihood of adherence.

Results

A total of 253 patients participated in the study whose age ranged between 26 and 58 years. Majority, 148 (58.5%), were females while 105 (41.5%) were males. Most, 138 (54.5%), of the patients were married (Table 1) and gainfully employed, 242 (95.7%), as seen in Table 2. Many of the respondents have been diagnosed, 216 (85.4%), and are accessing HAART, 176 (69.6%), at UITH, Ilorin, for more than 1 year (Table 3).

Even though most, 157 (62.1%), of the respondents did not respond to the question on the HIV status of their spouses, 41 (16.2%) had an HIV-positive spouse, 40 (15.8%) had HIV-negative spouses, and 15 (5.9%) did not know their spouse's HIV status (Table 4). Similarly, majority, 153 (60.5%), of the respondents failed to disclose their HIV status to anybody while, 47 (18.6%) and 52 (20.6%), respectively, informed their spouses and other acquaintances (relatives, friends, coworkers), as seen in Table 5. However, the majority, 228 (90.1%), enjoyed confidentiality during consultations, while 15 (5.9%) did not.

Most, 179 (70.8%), respondents were adherent to medications. Reasons given by nonadherent patients, 74 (29.2%), included lack of money to purchase ARV drugs (66.2%) and long distance to the hospital, 21 (28.4%), while 4 (5.4%) gave no reason.

Adherence was higher among male patients (Spearman coefficient = .348, $P < .01$) and very low among the unemployed (Spearman's coefficient = .593, $P < .01$) but positively correlated with increasing distance to the hospital (Spearman's coefficient = .656, $P < .01$) and transport fare (Spearman's coefficient = .427, $P < .01$; Table 6).

Discussion

The adherence rate in this study was 70.8%. This is close to 62.6%¹⁴ recorded in Markurdi, north-central Nigeria, as against the low adherence of 25.0%¹⁵ in south-eastern Nigeria. Similarly, adherence of 70.8% in this study is comparable with what was obtained in a similar study in Uganda, 78.2%, but far lower than 96.0% found among Ethiopians on HAART¹⁶ though a meta-analysis of various African studies gave adherence of 77%.¹⁷ However, 55% adherence rates have been reported among the North Americans, indicating that Africans comply better to the HAART therapy compared with the North Americans.¹⁷

Table 1. Sociodemographic Characteristics of the Patients

Variables	Description, Frequency (%)
Age	
26-30	65 (25.7)
31-35	66 (26.1)
36-40	52 (20.6)
41-45	35 (13.8)
46-50	20 (7.9)
51-55	9 (3.6)
56-60	6 (2.4)
Sex	
Female	148 (58.5)
Male	105 (41.5)
Marital Status	
Married	138 (54.5)
Widowed	31 (12.3)
Single	60 (23.7)
Separated	24 (9.5)
Religion	
Christianity	98 (38.7)
Islamic religion	143 (56.5)
Others	12 (4.7)

Furthermore, in the United States, a nonadherence rate range of 33% to 88%¹⁸ has been reported while 36.9%¹⁹ and 13.7%,²⁰ respectively, were obtained among Brazilians and Chinese. The wide margin in adherence to HAART among US patients is believed to be related to the different methods of estimation used in the various studies. Despite concerns however that self-reporting, the technique used in this study, may be prone to patient's overestimation of adherence, it has been shown in several studies to demonstrate a strong association to virologic, immunologic, and clinical outcomes in HIV treatment.²¹⁻²⁵ Self-reported adherence has also been shown to correlate with plasma concentrations of ARV drugs²⁵ and quality of life.²¹ Furthermore, the usefulness of other methods such as electronic monitoring, pill counts, medication refill rate, monitoring for an expected therapeutic outcome (such as therapeutic drug level determination and biologic markers assay), and direct observation have been flawed because most are expensive, laborious, or impractical for routine use in clinical settings.^{26,27} It is important to note however that adherence as measured in this study is essentially dose adherence. However, a successful treatment with HAART also requires adhering to dose scheduling and dietary instructions that may accompany many ARV medications.^{25,28} The use of other methods is therefore necessary for correct determination of adherence among HIV-infected patients assessing medication in Ilorin, Nigeria. One such method is the CASE Adherence Index developed by the Centre for Adherence Support Evaluation, which has been compared to a standard 3-day self-reported adherence measurement in 12 adherence programs in the United States.²⁹ It was found not only to correlate with the self-reported adherence but to be more strongly associated with HIV outcomes including a decline in viral load and predictability of CD4 count status.²⁹

Table 2. Occupational Distribution of the Patients

Occupation	Frequency	%
Civil servants	30	11.9
Security	15	5.9
Trading	58	22.9
House wife	25	9.9
Students	13	5.1
Artisans	31	12.3
Driving	13	5.1
Nursing	4	1.6
Media	2	0.8
Unemployed	11	4.3
Farming	7	2.8
Teaching	33	13.0
Clergy	11	4.3
Total	253	100

Table 3. Distribution of the Patients Based on the Year of Diagnosis and Highly Active Antiretroviral Therapy (HAART) Commencement

Year	Diagnosis Frequency (%)	HAART Commencement Frequency (%)
≤1	37 (14.6)	77 (30.4)
2	54 (21.3)	37 (14.6)
3	60 (23.7)	47 (18.6)
4	50 (19.8)	55 (21.7)
≥5	52 (20.6)	37 (14.7)
Total	253 (100)	253 (100)

Table 4. Knowledge of HIV Status of Sexual Partner

HIV Status of Sexual Partner	Frequency	%
HIV-positive sexual partner	41	16.2
HIV-negative sexual partner	40	15.8
Do not know HIV status of sexual partner	15	5.9
Do not want to respond to question	157	62.1
Total	253	100

Table 5. Disclosure of HIV Status by Respondents

Disclosure Type	Frequency	%
To spouse	47	18.6
Other acquaintances	53	20.9
Nondisclosure	153	60.5
Total	253	100

In this study, increasing age positively correlated with adherence in line with an earlier study in which drug adherence generally increased with age up till the age of 75 years.³⁰ However, this is contrary to the findings in a prospective study among the same category of patients living with HIV.³¹ Adherence in this study was also higher among men than women (89.5% vs 57.4%). This may be related to sociocultural factors because our society is male dominated and disclosure of HIV status

Table 6. Factors Influencing Adherence to Highly Active Antiretroviral Therapy (HAART) Based on Spearman Correlation

Variables	Spearman Coefficient Correlation Value	P Value	Remark
Age	-.229	.000	Significant at .01
Sex	.348	.000	Significant at .01
Religion	-.099	.116	No significant association
Occupation	.589	.000	Significant at .01
Distance to hospital	.363	.000	Significant at .01
Cost of transport to hospital	.313	.000	Significant at .01
Duration of treatment	.352	.000	Significant at .01
Reaction to HAART	.225	.000	Significant at .01
Concurrent diseases	.109	.215	No significant association
Additional medication	-.121	.058	No significant association
Hospital charges	-.384	.000	Significant at .01
Confidentiality	-.153	.017	Significant at .05
Marital status	.095	.131	No significant association

especially to an HIV-negative husband may come with dire consequences. This finding is similar among US HIV-infected patients, where men were more likely to adhere to medications than women.³² It was interesting to note that having an HIV-positive spouse or a spouse on HAART did not positively correlate with adherence. This may be related to the high rate of nondisclosure of HIV status among Nigerians.

In conclusion, adherence to HAART is high among PLWHA assessing ARV medications from UITH, Ilorin, Nigeria. However, it was lower than elsewhere in Africa based on self-reporting technique with males and the elderly patients being more adherent to HAART. There is therefore the need to strengthen adherence among all the HIV-infected patients generally but in particular female and young patients, while the use of other adherence assessment techniques other than self-reporting is recommended for comparison.

Declaration of Conflicting Interests

The author(s) declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The author(s) received no financial support for the research and/or authorship of this article.

References

- UNAIDS/WHO: AIDS epidemic update. 2007. "UNAIDS/07.27E/JC1322E." www.data.unaids.org/Pub/EPISlides/2007/2007_epiupdate_en.pdf. Accessed February 24, 2009.
- Businessday. Access to ARVs crucial to checking HIV/AIDS scourge. http://www.businessdayonline.com/index.php?option=com_content&view=article&id=8172:access-to-arvs-crucial-to-checking-hiv-aids-scourge&catid=126:health. Accessed February 24, 2009.
- Virtual Hospital. 2008 National HIV Sero-Prevalence Sentinel Survey among the antenatal clinic attendees. <http://www.virtualhospitalng.com/2008ANC%20Survey%20findings.htm>. Accessed February 24, 2009.
- Friedland G. Quality of life in HIV-infected individuals receiving antiretroviral therapy is related to adherence. *AIDS Care*. 2005; 17(1):10-22.
- Tadios Y, Davey G. Antiretroviral treatment adherence and its correlates among people living with HIV/AIDS on highly active antiretroviral therapy in Addis Ababa, Ethiopia. *EMJ*. 2006; 44(3):237-244.
- Hogg RS, O'Shaughnessy MV, Gataric N, et al. Decline in deaths from AIDS due to new antiretrovirals. *Lancet*. 1997;349(9061):1294.
- Remien RVV, Raxach JC, Parker R, Berkman A, Hacker MA, Bastos FI. Assessing non-adherence to highly active antiretroviral therapy (HAART) in a context of universal access, in Rio de Janeiro, Brazil. *Int Conf AIDS*. 2002;14:abstract no. B10445. Available at www.gateway.nlm.nih.gov/MeetingAbstracts/102252798.html. Accessed February 24, 2009.
- Rabkin JG, Chesney MA. Treatment adherence to AIDS medications: the Achilles heel of the new therapeutics. In: Ostrow D, Kalichman S, eds. *Psychosocial and Public Health Impacts of New HIV Therapies*. Kluwer/Plenum; New York: Kluwer/Plenum; 1999:61-68.
- Hogg RS, Heath K, Bangsberg D, et al. Intermittent use of triple-combination therapy is predictive of mortality at baseline and after 1 year of follow-up. *AIDS*. 2002;16(7):1051-1058.
- Amico K, Rivet J, Harman J, Johnson BT. Efficacy of antiretroviral therapy adherence interventions—a research synthesis of trials, 1996 to 2004. *J Acquir Immune Defic Syndr*. 2006;41(3):285-297.
- Sabate E. WHO adherence meeting report. Geneva: World Health Organization; 2001. <http://www.who.int/chp/knowledge/publications/adherencerep.pdf>. Accessed February 24, 2009.
- Carter M. *Adherence-Information Series for HIV-Positive People: HIV and Children*. 2nd ed. London: NAM; 2005. <http://aids-map.com/en/docs/pdf/hivchildren.pdf>. Accessed February 24, 2009.
- Paterson DL, Swindells S, Mohr J, et al. Adherence to protease inhibitor therapy and outcomes in patients with HIV infection. *Ann Intern Med*. 2000;133(1):21-30.

14. Shaahu VN, Lawoyin TO, Sangowawa AO. Adherence to HAART: the role of health care workers in Makurdi, Nigeria. *Afri J Med Med Sci*. 2008;37(1):29-36.
15. Uzochukwu BSC, Onwujekwe OE, Onoka AC, Okoli C, Uguru NP, Chukwuogo OI. Determinants of non-adherence to subsidized anti-retroviral treatment in southeast Nigeria. *Health Policy Plan*. 2009;24(3):189-196.
16. Alemayehu A, Kifle W, Sofonias G, Belaineh G, Kebede D. Predictors of adherence to antiretroviral therapy among HIV-infected persons: a prospective study in Southwest Ethiopia. *BMC Public Health*. 2008;8:265. <http://www.biomedcentral.com/1471-2458-8-265>. Accessed February 24, 2009.
17. Mills EJ, Nachega JB, Buchan I, et al. Adherence to antiretroviral therapy in sub-Saharan Africa and North America: a meta-analysis. *JAMA*. 2006;296(6):679-690.
18. Mills EJ, Nachega JB, Bangsberg DR, et al. Adherence to HAART: a systematic review of developed and developing nation patient reported barriers and facilitators. *PLoS Med*. 2006;3(11):e438. <http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0030438>. Accessed February 24, 2009.
19. Bonolo PF, César CC, Acúrcio FA, et al. Non-adherence among patients initiating antiretroviral therapy: a challenge for health professionals in Brazil. *AIDS*. 2005;19(suppl 4):S5-S13.
20. Molassiotis A, Nahas-Lopez V, Chung WY, Lam SW, Li CK, Lau TF. Factors associated with adherence to antiretroviral medication in HIV-infected patients. *Int J STD AIDS*. 2002;13(5):301-310.
21. Mannheimer S, Matts J, Telzak E, et al., for the Terry Bein Community Programs for Clinical Research on AIDS. Quality of life in HIV-infected individuals receiving antiretroviral therapy is related to adherence. *AIDS Care*. 2004;17(1):10-22.
22. Wagner G, Miller LG. Is the influence of social desirability on patients' self-reported adherence overrated? *J Acquir Immune Defic Syndr*. 2004;35(2):203-204.
23. Fischl M, Ribaud H, Collier A, et al. A randomized trial comparing 24-drug antiretroviral regimens with a 3-drug regimen in advanced HIV disease. Paper presented at: 9th Conference on Retroviruses and Opportunistic Infections; 2002; Seattle, WA. <http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102263665.html>. Accessed February 24, 2009.
24. Fletcher CV, Testa MA, Haubrich R, et al. Relationships among four measures of medication adherence and virologic response in ACTG 359 (abstract 577). Paper presented at: 10th Conference on Retroviruses and Opportunistic Infections; 2003; Boston, MA. <http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102261199.html>. Accessed February 24, 2009.
25. Nieuwkerk PT, Sprangers MA, Burger DM, et al., for the ATHENA project. Limited patient adherence to highly active antiretroviral therapy for HIV-1 infection in an observational cohort study. *Arch Intern Med*. 2001;161(16):1962-1968.
26. Arnsten J, Demas P, Farzadegan H, et al. Antiretroviral therapy adherence and viral suppression in HIV-infected drug users: comparison of self-report and electronic monitoring. *Clin Infect Dis*. 2001;33(8):1417-1423.
27. Bangsberg DR, Hecht FM, Charlebois ED, et al. Adherence to protease inhibitors, HIV-1 viral load and development of drug resistance in an indigent population. *AIDS*. 2000;14(4):357-366.
28. Nilsson Schönnesson L, Diamond PM, Ross MW, Williams M, Bratt G. Baseline predictors of three types of antiretroviral therapy (ART) adherence: a 2-year follow-up. *AIDS Care*. 2006;18(3):246-253.
29. Mannheimer SB, Mukherjee R, Hirschhorn LR, et al. The CASE adherence index: a novel method for measuring adherence to antiretroviral therapy. *AIDS Care*. 2006;18(7):853-861.
30. Fedders DO. Drug use in the elderly: issues of noncompliance. *Drug Intell Clin Pharm*. 1984;18(2):158-162.
31. Singh N, Squier C, Hayes P, et al. Determinants of compliance in patients with HIV: prospective assessment with implications for enhancing compliance. Paper presented at: 34th Interscience Conference on Antimicrobial Agents and Chemotherapy; 1994; Orlando [abstract I170]. <http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102213792.html>. Accessed February 24, 2009.
32. Sorensen SJ, Klinge HA, Mravca-Wilkey VL, Elzey J, Fife KH. Gender-related factors influencing medication and clinic visit adherence in HIV/AIDS patients. *Int Conf AIDS*. 2002;14: abstract no. WePeB5856. <http://gateway.nlm.nih.gov/MeetingAbstracts/ma?f=102254422.html>. Accessed February 24, 2009.