

## Knowledge and attitudes regarding HIV/AIDS and antiretroviral therapy among patients at a Nigerian treatment clinic

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### Abstract

**Introduction:** We assessed the knowledge of and attitudes toward HIV/AIDS and antiretroviral therapy (ART) in people living with HIV/AIDS (PLWHA).

**Methodology:** A descriptive, cross-sectional study design was employed. A structured interviewer-administered questionnaire was administered to consecutive, consenting PLWHA who had been receiving treatment for a minimum of three months. The level of ART adherence was calculated manually for each respondent.

**Results:** In total 318 PLWHA completed the questionnaire. The mean and median time on ART was 17.8 months and 19 months respectively. The mean age of the respondents was 39.1±9.6 years. The majority of these respondents (76.9%) had completed secondary education. Over 80% of the respondents reported knowing that HIV can be transmitted through blood transfusions and unprotected sexual intercourse. Seventy-six per cent of the respondents reported knowing that ART suppresses HIV activity. However, 33% of the respondents denied being HIV positive, while 22.6% reported that they felt that taking ART was shameful. Over 32% of the respondents reported that good adherence to ART would raise suspicions about their HIV status, and 66.7% had not yet disclosed their HIV status to anyone. Most (77.7%) respondents had good knowledge of HIV/AIDS while 75.2% had good knowledge of ART. Also 78.9% had positive attitude to HIV/AIDS while 73.9% had positive attitude to ART. Respondents with good knowledge about HIV/AIDS and a positive attitude about the disease tended to be more adherent to ART ( $p < 0.01$ ).

**Conclusions:** The majority of respondents had good knowledge of and a positive attitude toward HIV/AIDS and ART adherence.

**Key words:** HIV/AIDS; attitude towards HIV/AIDS; knowledge of ART; ART adherence knowledge

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### Introduction

The majority of people living with HIV/AIDS (PLWHA) currently live in sub-Saharan Africa [1]. The first case of HIV in Nigeria was reported in 1986, and cases were soon observed in virtually every community across Nigeria [2].

Nigeria, with the 2006 population and housing census figure of 140,431,790, has the tenth largest population in the world and is the most populous country in Africa. It has been estimated that approximately 70% of Nigeria's population is poor, and 55% is literate [1-3].

Of the more than 33 million people who live with HIV/AIDS (PLWHA) worldwide, approximately 3.1 million reside in Nigeria [4]. This disease is the leading cause of morbidity and mortality in sub-Saharan Africa and is known to affect all age groups.

However, young people between the ages of 20 and 29 are most often affected [4].

Knowledge about HIV/AIDS has been identified as a powerful tool to prevent the transmission of this disease. Currently, a large percentage of the Nigerian population has good and accurate knowledge about all aspects of the HIV/AIDS epidemic [5-7]. Unfortunately, this knowledge about the disease has not resulted in appreciable changes in attitude or in behaviour modifications in the population [7,8]. For example, a study conducted in 2005 by the University of Ibadan, Ibadan, in south-western Nigeria, reported that over 90% of students possessed a good knowledge about HIV/AIDS and its transmission but that only 16.6% of sexually active students who were interviewed used condoms for protection during intercourse in the three months before the study.

Eighty-eight per cent of these students knew that condoms could be used to prevent HIV transmission. Hence, although the students were knowledgeable about HIV/AIDS, many did not change their behaviour as a result of their knowledge [7]. Another study from the same institution found that students believed that condoms hindered their sexual satisfaction, caused health problems, and reduced their sexual interest; therefore, these students were not willing to use condoms [9].

Another study among pregnant women from Calabar, in the southern part of Nigeria, reported that they had good knowledge about HIV; however, their knowledge about mother-to-child transmission of HIV/AIDS was poor, as only 23% of the women knew that HIV could be transmitted via breast milk [10].

The issue of adherence to antiretroviral therapy (ART) is multidimensional. The potential of ART for long-term effectiveness is dependent upon the maximum and durable suppression of viral replication. To accomplish this suppression, patients must practice near-perfect adherence to a complex regimen that often includes three or more drugs [11]. Since 1996, an overwhelming amount of scientific evidence has been published that demonstrates the effectiveness of combination therapies for PLWHA. Substantial rates of decline in the number of opportunistic infections and in the prevalence of AIDS-related mortality have been observed [12,13]. A number of studies have reported reductions in the level of plasma HIV-1 RNA and increases in the number of the CD4 cell count, even among PLWHA with very low initial CD4 counts [14-18].

Antiretroviral drugs must be taken as a lifelong therapy and their success relies on continual adherence to the medication regimen. A rate of adherence of approximately 90% to 95% is required to avoid rapid development of drug resistance and treatment failure [19]. Large-scale adherence studies have been conducted in African countries demonstrating mixed results on patient faithfulness to ART. With the rapid increase in patient access to ART in Nigeria, it has become vital to continuously monitor treatment adherence and identify interventions that can encourage its sustainability [19,20].

Systematic reviews have indicated that the most important and frequent factors that negatively impact adherence in developing countries are cost, stigma, alcohol abuse, and structural barriers such as lack of transportation and pharmacy stock-outs [19,21]. An analysis of the barriers that affect adherence should be viewed as a dynamic interaction of biologic and social

factors. The main biosocial variables needed to understand non-adherence can be defined within eight categories: socioeconomic factors, health-care system factors, social capital, cultural methods of health and disease, personal characteristics, psychological factors, clinical factors, and antiretroviral regimen [19,22]. Based on this framework, addressing adherence may require providing social support to patients, lowering or eliminating user fees, bringing health-care workers closer to the patients, improving drug procurement strategies, and/or creating mechanisms for lowering the cost of drugs and laboratory tests [19,22]. In other settings, addressing adherence may require investing in and improving primary health care, public hospital and referral networks, or recruiting and retaining human resources [19]. An understanding of the complex interplay of the biosocial factors is necessary to understand non-adherence, which can help in guiding the designs of more effective non-adherence intervention programs [19].

The ART clinic at the University College Hospital, Ibadan, South-western Nigeria, was established in 2002 as one of the 25 ART Clinics funded by the Federal Government of Nigeria [23]. Since 2004, the Harvard School of Public Health, with the support of the President's Emergency Plan for AIDS Relief (PEPFAR), has provided support for the scaling up of the antiretroviral treatment programme. The ART Clinic has consultant family physicians among other medically qualified specialists, medical officers, nurses, pharmacists, record officers, and PLWHA counsellors attending to these patients. The staff undergo regular training in management, hospital- and home-based care, support of PLWHA, and ART adherence counselling. The ART Clinic is open daily from 8:00 a.m. to 5:00 p.m., Monday through Thursday [23]. PLHIV are usually given monthly appointments to obtain antiretroviral drugs (ARV) at the clinic. PLWHA undergo ART adherence counselling at every point of contact in the clinic, including the Records department, Pharmacy, and during consultation with the Doctors. The PLWHA also have individual and group ART adherence counselling on every clinic day. Home visitors also counsel the patients on ART adherence at home during home visits.

Since 2002 when the ART Clinic was established, no studies about the level of knowledge and the attitudes of PLWHA to HIV/AIDS and ART at the clinic have been conducted. Therefore, the present study aimed to improve patient care by investigating

**Table 1.** Sociodemographic characteristics of HIV/AIDS patients on antiretroviral therapy in Ibadan

Sociodemographic characteristics	Frequency N=318 (%)	ART adherence 95% and above (%)	p value
<b>Age group (years)</b>			
15-29	45 (14.1)	29 (64.4)	
30-39	130 (40.9)	86 (66.2)	
40-49	93 (29.2)	62 (66.7)	
50 and above	50 (15.7)	23 (46)	0.06
<b>Sex</b>			
Male	145 (45.6)	95 (65.5)	
Female	173 (54.4)	105 (60.7)	0.37
<b>Education</b>			
None	15 (4.7)	8 (53.3)	
Primary	56 (17.6)	36 (64.3)	
Secondary	144 (45.3)	96 (66.7)	
Tertiary	103 (32.4)	60 (58.3)	0.48
<b>Marital status</b>			
Single	43 (13.5)	29 (67.4)	
Married	212 (66.7)	127 (59.9)	
Divorced	31 (9.7)	22 (71)	
Widowed	32 (10.1)	22 (68.8)	0.47
<b>Occupation</b>			
Trader	131 (41.2%)	80 (61.1)	
Civil servant	95 (29.9%)	58 (63)	
Artisan	42 (13.2%)	27 (69.2)	
Soldier/police	20 (6.3%)	13 (65)	
Unemployed	30 (9.4%)	22 (61.1)	0.92

the level of knowledge and the attitudes of the PLWHA about the disease and its treatment.

### Methodology

A descriptive, cross-sectional study that aimed to document the level of knowledge and the attitudes

toward HIV/AIDS and ART of PLWHA who had been on ART for at least three months in the clinic was conducted between June and August of 2007. Consecutive PLWHA were recruited into the study after informed consent was obtained. A pretested interviewer administered a 48-item questionnaire that

**Table 2.** Knowledge level and attitude of respondents about HIV/AIDS

<b>Knowledge of HIV/AIDS (Expected answer)</b>	<b>Yes</b>	<b>No</b>
HIV/AIDS is a disease without a cure (Yes)	191(60.1%)	127 (39.9%)
HIV/AIDS is an invention to scare people (No)	89 (28.0%)	229 (72.0%)
A healthy looking person cannot have HIV/AIDS (No)	53 (16.7%)	265 (83.3%)
Proper condom use can be protective against HIV/AIDS (Yes)	261(82.1%)	57 (17.9%)
HIV transmission can occur from mother to child (Yes)	264(83.0%)	54 (17.0%)
A unscreened blood transfusion can result in HIV/AIDS (Yes)	290(91.2%)	28 (8.8%)
Unprotected sexual intercourse between a man and woman can result in HIV/AIDS (Yes)	258(81.1%)	60 (18.9%)
Multiple sexual partners increases the risk of HIV infection (Yes)	264(83.0%)	54 (17.0%)
<b>Attitude toward HIV/AIDS</b>	<b>Yes</b>	<b>No</b>
A person with HIV/AIDS has no hope (No)	51 (16.0%)	267 (84.0%)
A person with HIV should have sexual intercourse without a condom (No)	61 (19.2%)	257 (80.8%)
Having HIV is not the end of one's life (Yes)	264(83.0%)	54 (17.0%)
A person with HIV can get married and have children (Yes)	272(85.5%)	46 (14.5%)
A person with HIV should not aspire to be an achiever (No)	64 (20.1%)	254 (79.9%)
HIV/AIDS is a punishment for immoral behaviour (No)	76 (23.9%)	242 (76.1%)
It is shameful to have HIV/AIDS (No)	116(36.5%)	202 (63.5%)

included questions about the patients' socio-demographic status which included age at last birthday, sex, level of education, and occupation. Occupation was classified into trading (buying and selling), civil servants (those working for government establishments), artisans, military/paramilitary workers, and unemployed. Level of education was classified into no formal education, primary education, secondary education, or tertiary education. It also included questions on ART adherence, knowledge and attitude about HIV/AIDS and ART, and their perception of stigma associated with HIV/AIDS. This questionnaire was completed by each study participant with the assistance of the investigators. Level of ART adherence was calculated manually using the respondent's self-report and pharmacy pick-up records. The calculated ART adherence level was derived using the following formula [24]:

$$\% \text{ adherence over 7 days} =$$

$$\frac{\# \text{ expected dose taken} - \# \text{ missed doses}}{\# \text{ expected dose taken}} \times 100\%$$

The level of ART adherence for each respondent was classified into those with 95% or greater

adherence and those with less than 95% adherence. The ART adherent patients were defined as those with an adherence of greater than or equal to 95%. The responses to the questions that were related to the respondent's knowledge about HIV/AIDS (8 items), his or her attitude toward HIV/AIDS (8 items), his or her knowledge about ART (10 items), his or her attitude to ART adherence (6 items) and his or her perception of stigma associated with the disease (6 items) were also scored and summed. One point was given for each question that was answered correctly. The scores were then categorized as follows: for the respondent's knowledge of HIV/AIDS, a score in the range of 0-4 was considered to be poor, whereas a score in the range of 5-8 was considered to be good. A respondent's attitude toward HIV/AIDS was categorised as negative (0-4) or positive (5-8). A respondent's level of knowledge about ART was categorised as poor (0-5) or good (6-10). For the respondent's attitude toward ART adherence, scores ranging from 0-3 indicated a negative attitude, whereas scores from 4-6 indicated a positive attitude. The perception of stigma was categorised as either the lack of stigma (0-3) or as the presence of stigma (4-6).

**Table 3.** Knowledge and attitudes about antiretroviral therapy in PLWHA

<b>Knowledge of ART (Expected answer)</b>	<b>Yes</b>	<b>No</b>
ART consists of drugs to cure HIV/AIDS (No)	68 (21.4%)	250 (78.6%)
ART consists of drugs to suppress the activity of HIV (Yes)	241(75.8%)	77 (24.2%)
CD4 count is the number of HIV viruses in the blood (No)	80 (25.2%)	238 (74.8%)
CD4 count is the number of the body soldiers (Yes)	174(54.7%)	144 (45.3%)
Viral load is the number of HIV viruses in the blood (Yes)	177(55.7%)	141 (44.3%)
Viral load is the number of the body soldiers (No)	69 (21.7%)	249 (78.3%)
ART increases the viral load (No)	50 (15.7%)	268 (84.3%)
ART increases the CD4 count (Yes)	161(50.6%)	157 (49.4%)
ART reduces the viral load (Yes)	186(58.5%)	132 (41.5%)
ART reduces the CD4 count (No)	45 (14.2%)	273 (85.8%)
<b>Attitude to ART</b>	<b>Yes</b>	<b>No</b>
I do not need ARV drugs because I am not convinced that I have HIV/AIDS (No)	105(33.0%)	213 (67%)
Because there is no cure for HIV, taking the drugs is a waste of time (No)	15 (4.7%)	303 (95.3%)
Taking ARV drugs for one's life time is tiring (No)	111(34.9%)	207 (65.1%)
ARV drugs help to prolong lives (Yes)	266(83.6%)	52 (16.4%)
You should take ARVs only when you feel sick (No)	26 (8.2%)	292 (91.8%)
It is shameful to be on ARV therapy (No)	72 (22.6%)	246 (77.4%)

The data were entered and cleaned, and statistical analyses performed using the Statistical Package for Social Sciences (SPSS, version 12 (IBM, Chicago, USA). The data were summarized using mean and standard deviation (SD) for continuous variables and frequencies/percentages for categorical variables. Tests of significance were conducted using the Chi-square with the probability value less than 0.05 accepted as being statistically significant.

## Results

The questionnaire was completed 318 PLWHA. The mean and median time on antiretroviral therapy by the respondents was 17.8 months and 19 months respectively (SD = 7.5 months). Their mean age was 39.1 years (SD 9.6 years). The majority (54%) of the PLWHA were females, had completed secondary education (79.6%), and were married (67%). Thirty per cent of the PLWHA were civil servants, 41.2% were traders, 13.2% were artisans, 6.3% were soldiers/police and 9.4% were unemployed (Table 1).

Table 2 shows the levels of knowledge and the attitudes of the respondents about HIV/AIDS. Almost all of the respondents (91.2%) agreed that unscreened blood transfusions could result in HIV/AIDS; a majority of the respondents (81.1%) stated that unprotected sex with an infected partner could result in transmission of the virus; and 83% believed that having multiple sexual partners could increase the risk

of infection. The majority of the respondents had a positive attitude toward the disease: 84.0% believed that a person with HIV/AIDS has the hope of a better future compared with 16% who believed there is no hope of a better future for an HIV-positive person. Also 86% reported that they believed that a PLWHA should be able to get married and have children compared with 14% who believed PLWHA should not marry and have children. However, approximately a 24% of the participants thought that HIV/AIDS was a punishment for immoral behaviour and 36.5% felt that it is shameful to be infected with HIV. Also, 33% of the respondents believed they were not HIV positive despite being informed of their HIV status before commencing ART.

Table 3 shows levels of knowledge and the attitudes of the respondents about ART. A total of 241 (75.8%) respondents stated correctly that ART consists of drugs that suppress the activity of HIV, whereas 68 (21.4%) respondents reported that they thought that ART cured AIDS. However, a significant number of the respondents displayed a lack of understanding of technical terms, such as viral load and CD4 lymphocyte count. Over 34% of the respondents thought that taking antiretroviral drugs for their lifetime would lead to fatigue, whereas 22.6% reported that they felt that it was shameful to be on ARV. However, 83.6% of the respondents reported believing that ART helps to prolong life.

**Table 4.** Knowledge and attitude of PLWHA about HIV/AIDS, ART adherence and stigma

	Total (N=318)	<u>ART adherence level</u>		p value
		≥95% n=200	<95% n=118	
<b>Knowledge of HIV/AIDS</b>				
Good	247 (77.7%)	193 (78.1%)	54 (21.9%)	<0.01
Poor	71 (22.3%)	7 (9.9%)	64 (90.1%)	
<b>Attitude to HIV/AIDS</b>				
Positive	251 (78.9%)	193 (76.9%)	58 (23.1%)	<0.01
Negative	67 (21.1%)	7 (10.4%)	60 (89.6%)	
<b>Knowledge of ART</b>				
Good	239 (75.2%)	186 (77.8%)	53 (22.2%)	<0.01
Poor	79 (24.8%)	14 (17.7%)	65 (82.3%)	
<b>Attitude to ART</b>				
Positive	235 (73.9%)	183 (77.9%)	52 (22.1%)	<0.01
Negative	83 (26.1%)	17 (20.5%)	66 (79.5%)	
<b>Perception of stigma</b>				
No	251 (78.9%)	193 (76.9%)	58 (23.1%)	<0.01
Yes	67 (21.1%)	7 (10.4%)	60 (89.6%)	

Chi square test used

On the PLWHA's perceptions of stigma, 108 participants (34.0%) reported that they felt upset when they had to be seen in the antiretroviral clinic, and more than half (52.5%) would have liked to avoid visiting a clinic because of their concern that their HIV status would become public knowledge. Approximately two thirds of the participants (66.7%) would prefer to hide their HIV status, even though drug treatment is now available. Approximately one third of the participants believed that taking drugs would raise suspicions about their HIV status.

Table 4 illustrates the level of ART adherence in the study group with association between the levels of knowledge and attitudes about HIV/AIDS and ART, and perceptions of stigma. This table shows that the portion of the study population who possessed good knowledge and attitudes about HIV/AIDS and ART exhibited good ART adherence compared to those with poor knowledge ( $p < 0.01$ ). The respondents who did not experience feelings of stigma tended to be more adherent to ART when compared with those who experienced feelings of stigma ( $p < 0.01$ ).

## Discussion

This study reports that most of the respondents had at least secondary education, were females, and were married. A previous study at the centre reported similar findings [25]. This observation could be a result of high literacy in the catchment population [3] and the fact that the antenatal clinic of the hospital and nearby hospitals serve as a source of HIV-positive clients from the ART Clinic programme for the

prevention of maternal-to-child transmission (PMTCT) of HIV/AIDS.

The majority of the respondents had good knowledge and attitudes about HIV/AIDS and ART. However, a fair proportion of the respondents had poor knowledge about this disease and ART. For example, approximately one fifth (18.9%) of the study group did not know that unprotected heterosexual intercourse with an infected partner could result in HIV/AIDS, and 17% did not know that having multiple sexual partners increases the risk of infection. These findings indicate that there is an urgent need to educate PLWHA on the modes of transmission of HIV/AIDS. Previous studies have shown that the level of knowledge about the mode of transmission of HIV/AIDS affects attitudes about HIV/AIDS transmission [19,26]. This lack of knowledge about HIV/AIDS and ART is probably a concern not just for the PLWHA but for the general population and perhaps a reason for continuing HIV transmission in our population.

The patients in the present study generally had a positive attitude toward the disease. However, almost one fourth (24%) of the PLWHA believed that HIV/AIDS is a punishment for previous immoral behaviour and that PLWHA should not have sexual relationships (19.2%) or marry (14.5%). In addition, 16% of the respondents believed that PLWHA had no hope. This belief could seriously hinder the ability of PLWHA to look into the future with a positive attitude and may affect their adherence to therapy, as positive

attitude has been shown in several studies to contribute to good adherence to therapy [17,19].

Although a majority of these respondents have a positive attitude toward ART, a substantial proportion had a negative attitude. For example, one third (33.0%) of the respondents were not convinced of their HIV status and did not think ART was necessary. This negative attitude toward ART is expected to affect adherence because patients need to accept their HIV status to take their medication. Approximately one third (34.9%) of the study population reported feeling that taking ART for their lifetime will cause fatigue. A positive disposition about HIV status and adherence to ART are critical to achieve the expected clinical and virological responses and to prevent drug resistance. Effective counselling is needed to ensure that patients adhere to their drug regimen. PLWHA need to be constantly reminded of the lifelong nature of ART and that there is no need to experience shame while on ART because various studies and publications have demonstrated ART to be the only available effective form of therapy for HIV/AIDS [12,13].

The perceptions of stigma by PLWHA showed that an unacceptably high proportion of patients were upset by people seeing them in the antiretroviral clinic (34.0%), preferred to keep to themselves (52.5%), or believed that taking drugs would expose their HIV status (32.7%). These findings suggest that, although treatment is available, people living with HIV/AIDS might not benefit from this treatment because of self-stigmatisation. These people are likely to stay away from treatment when they feel stigmatised. Hence clinics need to be made more patient-friendly and conducive to treatment, which can be done by involving more PLWHA in their own care and ongoing counselling. In addition, the majority of PLWHA had a large amount of knowledge about ART, but an unacceptable proportion did not have the basic knowledge of the purpose of therapy, which is to improve the quality of life of patients by increasing their CD4 count and reducing their viral load [19].

## Conclusion

In conclusion, the present study revealed that a majority of the PLWHA who were interviewed possessed a large amount of knowledge and a positive attitude about HIV/AIDS and ART adherence. Self-stigmatisation was a problem among these PLWHA, which could be reduced by making the clinic more patient-friendly and conducive to treatment by involving more PLWHA in their own care and

ongoing counselling. As we move into the second decade of antiretroviral therapy in Nigeria, we need to re-evaluate the current treatment approaches using available evidence. The involvement of PLWHA is critical in this regard.

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