

Knowledge and attitude towards antiretroviral therapy and adherence pattern of HIV patients in southwest Nigeria

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Abstract

Strict adherence to highly active antiretroviral therapy remains a challenge that has important implications for treatment success. The aim of this study was to assess the knowledge, attitude and adherence pattern of antiretroviral therapy (ART) among HIV patients attending an adult antiretroviral clinic in a tertiary health facility in Lagos, southwest Nigeria. Data was collected using an interviewer-administered questionnaire on 361 patients who were selected by systematic sampling method. This study showed that 83.1% of respondents had good knowledge about ART with the more educated having significantly better knowledge ($p < 0.05$), 98.1% had positive attitude towards ART and most of them had positive perception about their healthcare providers across most of the areas asked. The self-reported adherence level was 78.4% and older age was significantly associated with good adherence ($p < 0.05$). A third of the respondents who missed doses did so because they were away from home. Further emphasis on good adherence during counselling sessions especially to younger patients, continuous use of reminders and use of inconspicuous pillboxes when patients are away from home are recommended.

Keywords: Nigeria; Antiretroviral therapy, highly active; Medication adherence; HIV infections and drug therapy

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Introduction

Nigeria has an estimated HIV prevalence of 4.1% with 3.1 million people estimated to be living with HIV in 2010 out of which about 1.5 million people require antiretroviral therapy (ART).¹ ART, if used appropriately, can improve the health of HIV positive individuals and prevent early death.² To achieve effective treatment and realize the benefits of treatment, strict adherence to treatment instructions are very critical. Unlike other chronic diseases, the rapid replication and mutation rate of HIV means that very high levels of adherence (e.g. $\geq 95\%$) are required to achieve durable suppression of viral load³ and enhance CD4+ T-cell recovery.⁴ However, adhering to the treatment instructions for a long-term illness poses a great challenge to patients.³

Non-adherence to highly active antiretroviral therapy (HAART) can lead to drug resistance thereby limiting therapeutic options. Even when patients comprehend the consequences of non-adherence to medication, adherence rates are sub-optimal. The pill burden, the complicated dosing requirement, and the suboptimal tolerability of antiretrovirals (ARVs) make adherence difficult.³

A meta-analysis of 31 studies from North America and 21 studies across 12 sub-Saharan countries gave pooled estimates of adherence level of 55% for North America and 77% for sub-Saharan Africa implying better adherence in sub-Saharan Africa though still sub-optimal. The authors noted that this difference could possibly be explained by the greater complexity of treatment regimen in North America and the non-generalisable findings in the sub-Saharan African studies to the larger HIV epidemic in Africa since the patients in the analyses had early access to limited therapy.⁵ Recent studies in Nigeria have shown adherence rates ranging from 49% to 88% in different regions.⁶⁻¹⁰

A patient's knowledge and beliefs about disease and treatment can influence adherence.³ For instance, HIV positive women in Ghana with inadequate knowledge were more likely to default ART.¹⁰ Previous studies among HIV patients in treatment facilities in some south-western states of Nigeria have demonstrated good knowledge and positive attitude towards ART.^{11,12} This study aimed to assess ART knowledge, attitude and adherence in HIV patients in a treatment centre

in Lagos state. Apart from patient-related factors (such as knowledge and beliefs) and regimen-related factors (such as pill burden), the relationship between provider and patient and the system of care are also predictors of adherence.³ HIV patients who feel better understood by their providers are more likely to receive ART, adhere to it and have better health outcomes.¹³ This study also highlights the attitude of HIV patients towards their healthcare providers. The findings are important, as they would help in the design of intervention strategies in the care of HIV patients.

Methods

Study Area and population

This descriptive cross-sectional study was conducted at the adult antiretroviral clinic of the AIDS Preventive Initiative in Nigeria (APIN) centre located in the Lagos University Teaching Hospital (LUTH), Idi-Araba, Lagos State, southwest Nigeria. The centre is currently receiving support from the United States President's Emergency Plan for AIDS Relief (PEPFAR) and has developed into one of the leading HIV/AIDS control systems in Nigeria. At the time of the study, the clinic was caring for about 13000 HIV/AIDS patients, out of which 9500 of the patients were on ART, while the remaining 3500 patients are ineligible for ART according to the national guideline for the treatment of HIV;¹⁴ the average monthly clinic attendance was 7000 patients according to clinic records. The study population comprised adult patients of 18 years and above who had been on ART for at least one month prior to the study and who consented to participate in the study.

Sampling methodology

A sample size of 361 was calculated using formula $N_f = n/(1+n/N)$ for study population less than 10,000. n was generated from formula for descriptive studies $n = z^2pq/d^2$, using a proportion (p) of adherence to ART in HIV/AIDS patients in a previous study of 58%.⁸ Systematic random sampling method was used to select respondents. A sampling interval of 10 was calculated by dividing the average number of patients that attend clinic per day (350) by the number of patients to be interviewed per day (36) over 10 clinic days. Every 10th patient upon arrival at clinic was recruited for the study after balloting between the first ten patients to get the first respondent.

Data Collection and analysis

Quantitative data was collected over a period of ten days using a pre-tested, structured interviewer-administered questionnaire, which was developed from previous literature.⁷⁻¹² The information collected included: socio-demographic and economic details, family and health care providers' support for ART, knowledge and attitude towards ART and adherence pattern of respondents.

Data collected was entered and analyzed using EPI info 2002 software statistical package. Significant differences were evaluated using Chi-squared test and level of significance was set at 0.05.

Table I. Socio-demographic characteristics

Variables	Frequency (%) n = 361
Sex	
Male	143 (39.6)
Female	218 (60.4)
Age group (years)	
Less than 25	34 (9.4)
26 - 35	178 (49.3)
36 - 45	116 (32.1)
46 - 55	23 (6.4)
56 - 65	10 (2.8)
Mean \pm SD	35.3 \pm 7.9
Marital status	
Single	86 (23.8)
Married	235 (65.1)
Separated	16 (4.4)
Divorced	7 (1.9)
Widowed	15 (4.2)
Co-habiting	2 (0.6)
Education	
None	11 (3.0)
Primary	34 (9.4)
Secondary	185 (51.2)
Tertiary	131 (36.3)
Religion	
Christianity	291 (80.6)
Islam	70 (19.4)
Ethnicity	
Yoruba	159 (44.0)
Ibo	158 (43.8)
Hausa	11 (3.0)
Other	33 (9.1)

Each respondent's level of knowledge was determined with a scoring system developed by the researchers. Eight (8) questions on knowledge of ART were scored, each right answer attracting one point. Those who scored 0 to 3 points were classified as having poor knowledge; those who scored between 4 to 5 points were classified as having fair knowledge and those who scored 6 to 8 points were classified as having good knowledge. The respondents' attitude to ART was assessed using 5 point Likert scale for 10 questions, and the overall attitude scores were graded as positive attitude for aggregate of 50% and above and negative attitude for less than 50%. The patients' adherence to anti-retroviral therapy was assessed, using self-report. Good adherence was defined as taking at least 95% of prescribed doses over the previous month which was equivalent to missing no more than one dose in a 10-day period (in a twice daily dosing regimen), one dose per week (in a thrice daily regimen) or one dose per day (in a once daily regimen).⁷

Ethical considerations

Ethical approval was obtained from the Health Research and Ethics Committee in LUTH and written informed consent was obtained from all the study participants.

Results

The modal age group was 26-35 years, and the mean age was 35.3 years \pm 7.9 SD. Most of the respondents were female (60.4%), married (65.1%), with secondary education (51.2%), Christians (80.6%) and Yoruba (44.0%) [Table I].

Over half of the respondents (56.0%) were self-employed, while 31.6% were in salaried jobs and 12.5% were unemployed. Three hundred and forty-eight respondents (96.4%) were always able to access treatment and 8 (61.5%) of those that were not always able to access treatment stated financial difficulties for transport as the reason for treatment inaccessibility. Less than half (47.9%) had financial support for treatment from family members and most (57.2%) of this financial support came from their spouses. All of them had disclosed their HIV status to at least one person, most commonly to their spouse (56.8%). Two hundred and ninety-six (82%) respondents received encouragement from family or community members to use medications in the last one month, mostly from their spouses (56.6%).

Most (65.9%) of the respondents knew that ARV drugs are used for reducing progression of HIV, 66.2% knew that ARV drugs can prevent mother to child transmission of HIV, 55.1% knew that ARV cannot cure HIV, while 75.1% believed that HIV positive patients placed on ART can give birth to a child without HIV infection, 84.2% mentioned percentages between 95 to 100% as required for optimal adherence in an open-ended question, while 75.6% believed that missing ARV can lead to disease progression. Respondents that were aware of CD4 and viral load tests were 78.1% and 79.8% respectively (Table II).

Table II. Knowledge of antiretroviral therapy

Variables	Frequency(%) n = 361
What ARV drugs are used for	
Curing HIV	97 (26.8)
Reducing pain	5 (1.4)
Reducing progression of HIV	238 (65.9)
Don't know	21 (5.8)
ARV can prevent mother to child transmission of HIV (PMTCT)	
Yes	239 (66.2)
No	44 (12.2)
Don't know	78 (21.6)
ARV drugs can cure HIV	
Yes	86 (23.8)
No	199 (55.1)
Don't know	76 (21.1)
HIV positive patient placed on ARV drugs can give birth to a child without HIV infection	
Yes	271 (75.1)
No	24 (6.6)
Don't know	66 (18.3)
Percentage of ART adherence required	
Less than 95%	57 (15.8)
95 - 100%	304 (84.2)
Missing ARV doses can lead to disease progression	
Yes	273 (75.6)
No	27 (7.5)
Don't know	61 (16.9)
Awareness of CD4 test	
Aware	282 (78.1)
Unaware	79 (21.9)
Awareness of viral load test	
Aware	288 (79.8)
Unaware	73 (20.2)

Overall, 83.1% of respondents had good knowledge, 6.9% had fair knowledge and 9.9% had poor knowledge about ART. There was a statistically significant association between education and level of knowledge as higher proportions of respondents with at least a primary education had good knowledge of ART ($p = 0.032$).

Most respondents strongly agreed that ART had a positive effect on health (54.6%), had more benefits than harm (47.6%), reduces frequent sickness (46.8%) and assists in fulfilling family obligations (45.4%). Several agreed that ART causes less financial difficulties (34.1%), makes one feel forced to take medications (31.6%), prolongs life (45.2%), enhances quality of life (50.7%), and helps one to gain more weight/energy (46.8%) [Table III]. Overall, 98.1% had a positive attitude while 1.9% had a negative attitude towards ART.

Majority (62.0%) of the respondents were told the importance of completing ART by healthcare providers, 84.8% were told about the side effects and interaction of the drugs given, while almost all (93.1%) reported receiving counselling during the treatment, 92.2% stated that privacy was maintained during consultation. Most respondents reported the healthcare providers to be friendly (85%), supportive (95.8%) and able to keep confidence (97%); while 16.6% said they were judgmental.

Seventy-eight respondents (21.6%) had <95% adherence to prescribed doses. The most common reason for missing their doses was being away from home (33.3%). Most (53.5%) used cellular phone alarms for reminder to take their medications. Forty-eight respondents (13.3%) did not always adhere to clinic schedules for prescription refills mostly because of long waiting time in the clinic (45.8%) [Table IV]. There was a statistically significant association between age and adherence to ART. A higher proportion of respondents in the older age range of 56 to 65 years were adherent ($p = 0.043$) [Table V].

Table III. Attitudes towards antiretroviral therapy (n = 361)

Statements about ART	SD	D	U	A	SA
	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)
Has positive effect on health	3 (0.8)	5 (1.4)	14 (3.9)	142 (39.3)	197 (54.6)
Gives more benefits than harm	8 (2.2)	7 (1.9)	30 (8.3)	114 (39.9)	172 (47.6)
Causes less financial difficulties	15 (4.2)	66 (18.3)	56 (15.5)	123 (34.1)	101 (28.0)
Makes one feel forced to take medications	68 (18.8)	65 (18.0)	64 (17.7)	114 (31.6)	50 (13.9)
Side effects can lead to organ damage	35 (9.7)	68 (18.8)	107 (29.6)	96 (26.6)	55 (15.2)
Prolongs life	3 (0.8)	11 (3.0)	40 (11.1)	163 (45.2)	144 (39.9)
Enhances quality of life	1 (0.3)	10 (2.8)	19 (5.3)	183 (50.7)	148 (41.0)
Helps one to gain more weight/energy	4 (1.1)	10 (2.8)	21 (5.8)	169 (46.8)	157 (43.5)
Reduces frequent sickness	2 (0.6)	9 (2.5)	16 (4.4)	165 (45.7)	169 (46.8)
Assists in fulfilling family obligations	7 (1.9)	16 (4.4)	25 (6.9)	149 (41.3)	164 (45.4)

Key= SD: Strongly disagree, D: Disagree, U: Undecided, A: Agree, SA: Strongly agree

Table IV. Adherence pattern of respondents

Variables	Frequency(%) n = 361
Adherence to ART in past one month	
Good	283 (76.4)
Poor	78 (21.6)
Reasons for missing dose(s) n = 78	
Developed side effect	12 (15.4)
Forgot to take ARV	10 (12.8)
Felt better	2 (2.6)
Too busy	13 (16.7)
Fear of stigma	5 (6.4)
Stock was finished	3 (3.8)
Too many pills	2 (2.6)
Away from home	26 (33.3)
Reminder to take ARV	
Cellular phone alarm	193 (53.5)
Watch/clock alarm	136 (37.7)
Medication manager	7 (1.9)
Family member	5 (1.4)
None	20 (5.5)
Always adheres to clinic schedules for prescription refills	
Yes	313 (86.7)
No	48 (13.3)
Reasons for missing clinic schedules n = 48	
Clinic schedule not convenient/too busy/travelled	11 (22.9)
Waiting time usually long	22 (45.8)
Inability to disclose to boss at work	9 (18.9)
Hostility portrayed by service providers	5 (10.4)
Financial difficulty	1 (2.1)

Table V. Factor associated with adherence to antiretroviral therapy

Variables	Good adherence (%)	Poor adherence (%)	Total (%) n = 361	X ²	p value
Age group (years)					
< 25	23 (67.7)	11 (32.4)	34 (100)	9.85	0.043*
26-35	148 (83.1)	30 (16.9)	178 (100)		
36-45	89 (76.7)	27 (23.3)	116 (100)		
46-55	14 (60.9)	9 (39.1)	23 (100)		
56-65	9 (90.0)	1 (10.0)	10 (100)		

*Statistically significant p value

Discussion

Comparing the socio-demographic characteristics of respondents in this study with the national demographic data revealed similar proportions of married respondents. However, there was an almost equal proportion of Muslims and Christians in the national survey whereas there were mostly Christians in this study; also higher proportions of respondents in this study had secondary and tertiary education compared to the national survey.¹⁵

The average age of respondents in this study was 35.3 years and the male to female sex ratio was 0.7; it was observed during data collection that in every clinic appointment, women were usually more than the men. Other African studies among adult HIV patients in clinic settings also had higher proportions of female respondents and similar average ages.^{16,17}

Poor knowledge of ART has been shown to pose a barrier to adherence.¹⁸ In this study, most of the respondents had good knowledge about ART. Previous studies in Africa also showed good knowledge about ART.^{10,19,20} This could be as a result of the counselling about ART, its benefit and the importance of adherence that the respondents are exposed to by health care providers in the clinic.

Worthy of specific mention is the improved awareness of CD4 and viral load testing in this study compared to a previous study in India where 57% and 80% of HIV patients had not heard of CD4 and viral load testing respectively.²¹ The good knowledge reflected in our study implies that they are more likely to take ART correctly. However, specific knowledge areas

still need health education intervention; for instance, higher proportions of HIV positive women in Ghana¹⁰ knew that ART is not a cure for HIV (62%) and requires optimal adherence (97.6%) compared to our study (55.1% and 83% respectively).

Almost all the respondents (98.1%) had a positive attitude towards ART and this proportion was higher than those found in similar studies in Southwest Nigeria; 73.9% in Ibadan¹¹ and 77% in treatment centres in Ilesha and Ile-Ife.¹² HIV control programs in Nigeria (including cosmopolitan cities like Lagos) have over time succeeded in increasing awareness about HIV not being a death sentence because of the use of ARTs. This, alongside the continuous counselling given to the patients in this study in order to encourage adherence to their medications could explain the very high proportion with positive attitude compared to previous studies in the region. However, some respondents expressed some negative views such as feeling forced to take drugs (36.8%) and ARTs causing organ damage (28.3%) but this is less compared with a study in China, where more 40% of respondents who felt that ART could be harmful to the human body.²²

The perception about healthcare providers in this study was positive across most of the areas asked. Research has shown that satisfaction with one's healthcare provider is related to better medication adherence in patients with HIV/AIDS.²³ We recommend continuous training of healthcare providers to further improve their attitudes towards HIV patients.

The self-reported adherence level of 78.4% in this study was higher than that of HIV patients attending another tertiary facility in Benin city,⁷ south-south Nigeria (which reported a rate of 58.1%) and lower than 87.9% in a tertiary facility in Jos,⁹ north-central Nigeria. These two facilities are also funded by PEPFAR and provide free ART and similar services thus the variations in adherence may be as a result of cultural differences in the various regions as culture has been shown to influence ARV adherence,²⁴ thus we recommend further investigation into this using qualitative methods. Our findings are similar to the average adherence rates of African patients of 77% in a meta-analysis.⁵ A third of the respondents who missed doses did so because they were away from home similar to findings among HIV patients in Kenya.¹⁷ Only 12.8% of the respondents gave the reason that they forgot possibly because majority of the patients used reminder systems. There remains a crucial need for health care workers to emphasize on 100% adherence during counselling sessions to improve low adherence among the study population.

In addition, bivariate analyses showed that higher education was significantly associated with good knowledge about ART as previously documented in Nigeria.¹² Also, older age was significantly associated with good adherence as was also evident in studies in Nigeria and UK.^{9,25} Older HIV patients tend to be familiar with medication usage and the need for optimal adherence to ART even when using alternative therapies.²⁶

A high proportion of respondents in this study had encouragement from family members to take their medications and this may have contributed to the level of adherence although there was no statistically significant association between this support and adherence. In contrast, social support from family and friends was associated with optimal adherence in India²⁷ and Nigeria.²⁸ Another study among pregnant women enrolled in the PMTCT program in another centre in Lagos state demonstrated that HIV status disclosure and having treatment support were significantly associated with good adherence.²⁹

A limitation to this study is that it used purely self-reported means to determine adherence, which is subject to patient forgetfulness or patient's desire to provide socially desirable answers.³⁰

Conclusion

Although this study documented good knowledge and positive attitude towards ART, adherence remains sub-optimal. Higher education was associated with good knowledge while older age was associated with good adherence. Further emphasis on good adherence during counselling sessions especially to younger patients, continuous use of reminders and use of inconspicuous pillboxes when patients are away from home are recommended.

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