Factors Associated with Non-Adherence to Antiretroviral Therapy among Attendees of Federal Medical Centre, Gusau, Zamfara State, Nigeria, 2014

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Abstract

Background: HIV infection/AIDS remains a worldwide public health challenge. Globally, there were approximately 36.9 million people living with HIV (PLWHIV) at the end of 2017. We conducted this study to determine factors influencing non-adherence to antiretroviral therapy among PLWHIV attending Federal Medical Centre (FMC), Gusau, Zamfara State, Nigeria.

Method: We conducted a mixed-methods study (cross-sectional study and focus group discussions) 183 respondents were sampled from ART unit of FMC Gusau, using systematic random sampling technique. A semi-structured questionnaire was used to collect data on socio demographic and adherence related information. All HIV/AIDS patients who have been on ART for at least 30 days were included in the study. Adherence was self-reported (30 days recall), and those with at least 95% were classified as adherent. Bivariate and multivariate analyses were conducted. Qualitative data was analyzed using content analysis.

Results: of 183 respondents, 141 (77.05%) were females with mean age of 34.2 ±8.7 years. 155 (84.7%) had ≥95% adherence level. Fear of stigma (AOR 126.47; C.I: 12.06-1326.75), Forgetfulness (AOR 30.40; C.I: 7.61- 121.48), Being too ill (AOR 37.80; C.I: 5.00-287.25), Felt better (AOR 31.94; C.I: 1.86-547.93), Inability to pay for transport to clinic (AOR 31.84; C.I: 2.15-472.23), were significantly correlated with non-adherence to ART. Similarly, the FGDs also revealed stigma and discrimination, Forgetfulness, and side effects contributing to non-adherence.

Conclusion: The level of adherence to ART was slightly lower than the optimum desirable level. The decentralization of treatment centers to primary health care centers and intensification of public enlightment was recommended.
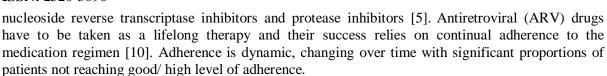
Keywords: HIV/AIDS, Adherence, Antiretroviral therapy, Nigeria.

Background

The human immune deficiency virus (HIV) infection epidemic continues to spread in the population making HIV one of the most important public health crises in the world. Globally, 36.9 million people were living with HIV at the end of 2017. An estimated 0.8% of adult aged 15-49 years worldwide were living with HIV, although the burden of the epidemic continues to vary considerably between countries and regions [7]. Sub-Saharan Africa remains most severely affected with nearly one in every 20 adults (4.9%) living with HIV and accounting for 71% of the people living with HIV worldwide [7].

Nigeria is one of the country's most affected in the region, with about 2% of the world's population, accounts for about 10% of people living with HIV (PLWHIV) globally with an estimated 3.3 million PLWHIV [18]. Of these, about a million are eligible for antiretroviral therapy (ART). Approximately 220,000 people die from AIDS in Nigeria in 2009 [19]. Nigeria has a national prevalence of 4.1% while the HIV prevalence in Zamfara State is 2.1% in 2010 [19]. The government with support of several partners such as global health initiatives, e.g., the United States (US) President`s Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFTAM) has rapidly scaled up ART enrollment and has steadily increased number of patients initiated on ART from 90,008 in 2006 [9], to an estimated 300,000 at the end of 2009 [17]. Highly Active Antiretroviral Therapy (HAART) is the gold standard in the management of HIV/AIDS. HAART is the combination of three or more drugs from at least two different classes of antiretroviral (ARV) therapy belonging to nucleoside analogue reverse transcriptase inhibitors, non-

nucleoside reverse transcriptase inhibitors and protease inhibitors [5]. Antiretroviral (ARV) drugs have to be taken as a lifelong therapy and their success relies on continual adherence to the medication regimen [10]. Adherence is dynamic, changing over time with significant proportions of patients not reaching good/ high level of adherence.

A rate of adherence of approximately 95% is required to avoid rapid development of drug resistance and treatment failure [16]. Patients with clinical AIDS who discontinue ART will likely die within a relatively short time. The commonest reasons for missing doses were forgetfulness, traveling far away from home, being too busy, and unclear dosage instructions Other reasons for missing doses were patients` education of HIV and ART, marital problems, Socio-demographic characteristics, HIV status disclosure, substance abuse and drug side-effects, missing of clinic day due to lack of transport fare [6]. Strategies used to increase ART adherence include: use of social support intervention, reminders, availability of ART services, home based care and patients' education.

In view of this, there is an urgent need to identify those significant factors associated with non-adherence to ART to mitigate the consequences. Furthermore, little is known about factors that are associated with adherence to ART in Zamfara State. Findings from this research will contribute to the overall knowledge base of key factors leading to non-adherence to ART within a local context.

We set out to conduct a mixed method study aimed at assessing the level of adherence to ART and also determine factors that are associated with non-adherence among attendees of FMC Gusau to provide the Zamfara State Ministry of Health, policy makers and donors to design ways of improving adherence to treatment and hence prevent development of drug resistance.

Methods

Setting

This study was a mixed-methods study (cross-sectional study and focus group discussions) conducted in ARV clinic of Federal Medical Center, Gusau which is the main referral center for Zamfara State; it also acts as the main treatment center for people living with HIV/AIDS in Zamfara central Zone.

Study design

A cross-sectional study design was employed in this study to determine factors that are associated with non-adherence to ART. In addition, a qualitative method was employed to gather information on factors associated with non-adherence to ART, three focus discussions (FGDs) was conducted in Hausa Language, audio and written records were obtained. Respondents were HIV/AIDS patients aged 15years and above. Each focus group discussion lasted 45minutes-1 hour facilitated by a moderator. Data were transcribed and translated into English and analyzed using a thematic approach.

Study population and data collection

This study was conducted among 183 HIV/AIDS patients aged 15 years and above who are on ART in FMC Gusau. A semi-structured questionnaire was used to collect data on socio demographic and adherence related information. Adherence was self-reported (30 days recall), and 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 the interview, while those with less than 95% were classified as non-adherent. Adherence was computed as the actual number of doses taken divided by the number of doses prescribed over a four-week period and expressed as a percentage.

Inclusion and exclusion criteria

All HIV/AIDS patients who have been on ART for at least 30 days, and aged 15 years and above. While HIV/AIDS patients who are critically ill and thus unable to respond and pregnant women on ART prophylaxis were excluded from the study.

Sampling technique

A total of 183 patients were sampled using Systematic random sampling technique. Samples were selected using the number of clinic attendees in the register as the sampling frame, an interval or fraction was generated which was used in the selection.

Sampling of FGD participants: Convenience Sampling was used in participant selection. And a homogenous group of people were used in each group of the discussion.

Ethical approval

Ethical approval was obtained from the Research and Ethics committee of Federal Medical Center, Gusau. Informed consent was sought from the respondents and confidentiality was assured and maintained.

Statistical Analysis: data analysis was performed using Epi-info version 3.5.3 statistical software (CDC Atlanta, Georgia, U.S.A). Univariate, bivariate and multivariate analysis was performed. Odds ratios and 95% confidence intervals were used to assess association between risk factors and non-adherence. A p-value of ≤ 0.05 was considered significant. Qualitative data was analyzed using thematic approach.

Results

A total of 183 people living with HIV/AIDS on HAART participated in the study. There were more females 141(77.05%) than males 42 (22.95%) and most of the participants were in the age group 25 to 34 years (44.81%), the mean age of respondents was 34.2 years (SD±8.7). Of the respondents, 118 (64.48%) were married, 44(24.04%) were divorced/Separated, 21 (11.48%) were single. Sixty-one (33.33%) had no formal education, and only 25 (13.66%) had Tertiary education. (Table 1).

155 (84.7%) of the respondents had ≥ 95% adherence to HAART, and of the respondents, 143 (78.1%) had never missed their medication, that is, they have 100% adherence (Table 2).

In bivariate analysis, non-adherence was significantly associated with age ≥ 40years (OR 3.1; 95% C.I: 1.40 – 7.07), education level lower than secondary (OR 2.53; 95% C.I: 1.05 - 6.10), and inability to pay for transport to clinic (OR 11.84; 95% C.I: 1.04 – 135.40). Forgetfulness (OR 13.68; 95% C.I: 4.68 – 39.98), Fear of stigma/ Disclosure (OR 42.0; 95% C.I: 4.82 – 365.52), Felt better (OR 11.84; 95% C.I: 1.03 – 135.39) and Too ill or being too sick to retrieve the medication from Hospital (OR 12.75; 95% C.I: 2.21 – 73.45) (Table 3). After multivariate logistic regression analysis, Fear of stigma/ disclosure of HIV status, being too ill, inability to pay for transport to clinic, forgetfulness, and felt better or healthy remained independent factors that are associated with non-adherence to ART (Table 4).

Results from focus group discussions

The results of the FGDs complemented the study and shed further light on its findings. The thematic contents analysis suggested some factors that influence adherence to ART.

The main themes that emerged from focus group discussions were:

Patient related factors: Forgetfulness; this is one of the reported reasons for non-adherence to ART, for example, one female participant discussed that: *"Yes, I forgot my drugs when my child was sick; I left it for almost four days."* While a male participant discussed that "at *times, i forget because I am a human being."*

Stigma and discrimination: social or family stigmatization and fear of consequences of revealing HIV infection status is associated with poor adherence. Most of the participants have fear of stigma which influence adherence behavior especially among women for example, *"I take my drugs in private not in public, because of people and stigmatization"* (Female discussant- P5), while a male discussant said *"I take my drugs in private, i do not want people to know because of stigmatization."*

Disclosure of HIV status: Due to fear of being victimized and or rejected by family members, some PLWHIV were fearful of involuntary disclosure of their status, for example, "*None of my family members knows except me"* (P5. Male). *"I disclose only to my husband and sister."* (P6. Female).

Challenge in collecting drugs: access to medication at treatment centers is of great concern and one of the predictors of non-adherence, some of the discussants narrated that lack of transport fare is one of the challenges in collecting drugs, for example, *"Sometimes I do not have money to go to the hospital and to buy other drugs."* (P2. Male).

Perception on ARVs: A patient level of knowledge about ART has a positive impact on medication adherence [11]. Getting relieved from sickness, prevention and cure was the commonly mentioned use of ARVs. For example, "*I take ARV drugs for prevention, before I started drugs, I am week, but now very strong in doing my bricklayer work, I can carry nine inches block now."* (P5. Male).

Discussions

Our study found out that only 84.7% of the respondents had ≥ 95% adherence to HAART in the 30 days preceding the interview while 15.3% did not achieved this required level of adherence. The reported level of adherence in this study was significantly higher than that found in similar studies in Makurdi, Benue State [12], Keffi, Nasarawa State [13], Niger Delta region of Nigeria [14] and in Alakija et al. (2010) in Ilorin [15]. Similarly, our reported adherence is higher than that observed by and Uzochukwu et al (2009) in south east Nigeria [16]. However, our reported adherence was close to the findings of studies by Falang et al (2012) in Jos [10], and by Wasti et al (2012) in Nepal [17]. The various levels of adherence in different places might have been as a result of the fact that there is no gold standard in the measurement of adherence. For example, different studies used different period of recall time to determine adherence.

Forgetfulness is one of the most commonly reported reasons for non-adherence to ARV drugs. Various research on medication adherence reported similar findings [9, 18, 19, 20].

Furthermore, this was supported by findings of focus group discussion in which forgetfulness is one of the reported reasons of missing ARVs, for example; a discussant states that *"Yes I forgot to take my drugs when my child was sick, I left it for almost four days"*. Fear of stigma or disclosure cause patients to skip doses if privacy is unavailable at a scheduled dosing time. In this study, patients who missed their drugs because of fear of stigma or disclosure are more likely to be non-adherent to ARV drugs, A similar findings was reported by Uzochukwu et al [16] , Wasti et al in Nepal [17] and Ekama et al in Lagos [21] Similarly, in our FGD, most of the participants have fear of stigma and disclosure especially among women, for example a female participant states that *"I take my drugs in private not in public, because of people and stigmatization"* while a male participant states on disclosure that *"None of my family members knows except me"* These observations suggest that although treatment is available, people living with HIV/AIDS are likely to stay away from taking drugs or going to hospital to refill their drugs when feel stigmatized.

Other reason being reported for missing ARVs in this study were patients feeling that they are well or healthy and therefore no longer need to take their medication, and this was an independent risk factor for non-adherence in this study, this observation was similar to findings of Potchoo et al [19] and Olowookere et al [22]. Even in the context of free drugs, the cost of transportation to obtain ARVs was a reason given for non-adherence. People who live far away from hospital or those that were poor or economically disadvantaged may be more likely to be inconsistent in keeping follow-up to ARV clinics. A similar finding was reported by Pennap et al [13], Uzochukwu et al [15] and Wasti et al [16]. This was corroborated in our FGDs in which some of the discussants narrated that lack of transport fare was one of the challenges in collecting drugs; a male participant states that *"Sometimes I do not have money to go to the hospital and to buy other drugs."*

This study, has some limitations, first, as with any interview study, the data was subject to recall bias. Although an effort was made to limit recall of medication to 30 days before the interview, it was possible that subjects over- or underestimated their adherence to ART. Non-use of virological and immunological laboratory investigation to corroborate self-reports in assessing adherence. However, the use of focus group discussions helped in revealing information that would not have been elicited by Quantitative instrument and lastly, the study being cross sectional made causality difficult. The study recommended that Public health department of Zamfara state MOH and ZAMSACA should sponsor public enlightenment on HIV/AIDS through the media which may help reduce stigma and encourage voluntary HIV status disclosure. And Reminders such as alarm and stickers (plain) should be used by patients to remind them when their medication is due.

Conclusions

The level of adherence to ART is high, but has not reached the optimum desirable level. The patient-related factors that were associated with adherence to HAART include: fear of stigma/ Disclosure of HIV status, being too ill, inability to pay for transport to clinic, forgetfulness and felt better or healthy. However, Provider related factors were not associated with adherence. We recommended that Reminders such as alarm and stickers (plain) should be used by patients to remind them when their medication is due, decentralization of treatment centers to primary health care centers which are usually within the reach of the communities and intensification of public enlightment and respondent`s counseling was also recommended.

What is known on this topic?

- Adherence of approximately 95% is required to avoid rapid development of drug resistance and treatment failure.
- Non-adherence to strict antiretro viral drugs regimen is common for many reasons related to forgetfulness, drug side effects, fear of stigma/disclosure, economic and drug supply problems.

What this study adds

- Knowledge on proportion of people adhering to ART at Federal Medical Centre, Gusau, which is previously not known.
- Information on specific risk factors associated with non-adherence within a local context.
- Perception and understanding of Patients on antiretro viral drugs.

Acknowledgement

List of tables

Table 1. Socio-demographic characteristics of respondents at FMC Gusau, Nigeria, 2014

Variable	Frequency	Percent (%)
Age group (years)		
15-24	16	8.74
25-34	82	44.81
35-44	55	30.05
45-54	27	14.75
≥55	3	1.64
Sex		
Male	42	22.95
Female	141	77.05
Marital status		
Single	21	11. 8
Married	118	64.48
Divorced/separated	44	24.04
Educational level		
No formal education	61	33.33
Primary	36	19.67
Secondary	61	33.33
Monthly income		
<₦6000	130	71
₦6000 - ₦18000	45	24.6
₦18000 - ₦36000	6	3.28
>₦36000	2	1.09

Table 2. Level of adherence to HAART at FMC Gusau, Nigeria, 2014

Variable	Frequency (n=183)	Percent (%)
Level of adherence		
< 95%	28	15.3
>95%	155	84.7

Ever missed (skipped)	40	21.9
Never missed	143	78.1

Table 3: Bivariate analysis of patient-related factors associated with non-adherence to ART, Gusau, Nigeria, 2014

Variable	Non-adherent (%) (n=28)	Adherent (%) (n=155)	OR (95% C.I)
Forgetfulness			
Yes	11 (39.29)	7 (4.52)	13.68 (4.68-39.98)
No	17 (60.71)	148 (95.48)	
Fear of stigma/Disclosure of HIV status			
Yes	6 (21.43)	1 (0.65)	42.0 (4.82-365.52)
No	22 (78.57)	154 (99.35)	
Side effect			
Yes	2(7.14)	2 (1.29)	5.90 (0.79-43.64)
No	26 (92.86)	153 (98.71)	
Felt better or healthy			
Yes	2 (7.14)	1 (0.65)	11.84 (1.03-135.39)
No	26 (92.86)	154 (99.35)	
Too ill			
Yes	4 (14.29)	2 (1.29)	12.75 (2.21-73.45)
No	24 (85.71)	153 (90.71)	
Inability to pay for transport to clinic			
Yes	2 (7.14)	1 (9.65)	11.84 (1.84-135.40)
No	26 (92.86)	154 (99.35)	
Educational level			
Lower than secondary	20 (71.43)	77 (49.68)	2.53 (1.05-6.10)
Secondary and above	8 (28.57)	78 (50.32)	

Table 4. Unconditional logistic regression of factors associated with non-adherence to ART at FMC, Gusau, Nigeria, 2014

Variable	Adjusted OR	95% CI	P-Value
Fear of stigma/ Disclosure	126.47	12.06-1326.75	0.39
Being too ill	37.8	5.00-287.25	0.0004
Felt better or healthy	31.94	1.86-547.93	0.0169
Inability to pay for transport to clinic	31.84	2.15-472.23	0.0119
Forgetfulness	30.4	7.61-121.48	0

| Education lower than Secondary | 2.18 | 0.61-7.80 | 0.2 |
| Age ≥ 40 years | 0.59 | 0.18-1.97 | 0.3891 |

References

[1].Alakija KS, Abayomi F, James AO, Olufemi D. Factors influencing adherence to antiretroviral medication in Ilorin, Nigeria. *Journal of the International Association of Physicians in AIDS Care* (JIAPAC) 2010; 9:191.

[2].Ekama SO, Herbertson EC, Addeh EJ, Gab-Okafor CV, Onwujekwe DI, Tayo F, et al. Pattern and Determinants of Antiretroviral Drug Adherence among Nigerian Pregnant Women. *Journal of pregnancy* 2012 Jan 2012:851810.

[3].Chijioke AN, Osaro E, Oseikhuemen AE, Chris IA. Adherence to ART among HIV-Infected Subjects in a Resource-Limited Setting in the Niger Delta of Nigeria. *Afr J Health Sci*. 2006; 13:3–4.

[4].Campbell JI, Ruano AL, Samayoa B, Estrado Muy DL, Arathoon E, Young B. Adherence to antiretroviral therapy in an urban, free-care HIV clinic in Guatemala City, Guatemala. *Journal of the International Association of Physicians in AIDS Care* (Chicago, Ill.: 2002). 2010 Jan 1 9(6):390–5.

[5].Federal Ministry of Health Abuja Nigeria. *National Guidelines for HIV and AIDS Treatment and Care in Adolescents and Adults. October* 2010.

[6].Falang KD, Akubaka P, Jimam NS. Patient factors impacting antiretroviral drug adherence in a Nigerian tertiary hospital. *Journal of pharmacology & pharmacotherapeutics* [Internet]. 20*12 Apr [ci*ted 2013 Feb 3]; 3(2):138–42.

[7].HIV/AIDS Fact sheet N*360 available at www.int/mediacentre/factsheet/fs360/en/.

[8].Iliyasu Z, Kabir M, Abubakar IS, Babashani M, Zubair ZA. Compliance to antiretroviral therapy among AIDS patients in Aminu Kano Teaching Hospital, Kano, Nigeria. Nigerian journal of medicine: *journal of the National Association of Resident Doctors of Nigeria*, 14(3):290–4.

[9].National Agency for the Control of AIDS (NACA) (2007) Nigeria UNGASS Report. In: Strategic planning and research, editor. Abuja: NACA. pp. 20.

[10]. Monjok E, Smesny A, Okokon IB, Mgbere O, Essien EJ. Adherence to antiretroviral therapy in Nigeria: an overview of research studies and implications for policy and practice. *HIV/AIDS* (Auckland, N.Z.) 2010; 2:69–76.

[11]. Olowookere SA, Fatiregun AA, Adewole IF. Original Article Knowledge and attitudes regarding HIV / AIDS and antiretroviral therapy among patients at a Nigerian treatment clinic. *Jinfect Dev Ctries*. 2012: 6(11): 809-816.

[12]. Olowookere SA, Fatiregun AA, Akinyemi JO, Bamgboye AE, Osagbemi GK. Original Article Prevalence and determinants of non-adherence to highly active antiretroviral therapy among people living with HIV / AIDS in Ibadan, Nigeria. *J Infect Developing countries* 2008; 2(5):369-372.

[13]. Pennap GR, Abdullahi U, Bako IA. Adherence to highly active antiretroviral therapy and its challenges in people living with human immunodeficiency virus (HIV) infection in Keffi, Nigeria. *Journal of AIDS and HIV Research* 2013; February 5(2):52–8.

[14]. Potchoo Y, Tchamdja K, Balogou A, Pitche VP, Guissou IP, Kassang EK. Knowledge and adherence to antiretroviral therapy among adult people living with HIV/AIDS treated in the health care centers of the association "Espoir Vie Togo" in Togo, West Africa. BMC *clinical pharmacology* 2010 Jan 10:11.

[15]. Shaahu VN, Lawoyin TO, Sangowawa AO. Adherence to highly active antiretroviral therapy (HAAT) at a Federal Medical Centre. *African journal of medicine and medical sciences*. 2008 Mar 37(1):29–36.

[16]. Sullivan PS, Campsmith ML, Nakamura GV, Begley EB, Schulden J, Nakashima AK. Patient and regimen characteristics associated with self-reported non-adherence to antiretroviral therapy. *PloS one* [Internet]. 2007 Jan [cited 2013 Feb 3]; 2(6):e552.

[17]. UNAIDS (2009) *Epidemiological factsheet. Nigeria.* Geneva: UNAIDS.

[18]. UNAIDS (2009) HIV and AIDS estimates (Nigeria). Geneva; UNAIDS. Available at www.unaids.org.

[19]. UNAIDS: Global Report: UNAIDS Report on the global aids epidemic 2010.

[20]. 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 and Planning*. 2009 Mar 10 24(3):189–96.

[21]. Wasti SP, Simkhada P, Randall J, Freeman JV, van Teijlingen E. Factors influencing adherence to antiretroviral treatment in Nepal: a mixed-methods study. *PloS one* 2012 Jan 7(5):e35547.

[22]. Zamfara State Ministry of Health. *State strategic health development plan 2010-2015, 2010. Pp 15.*