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Assessment of the antiretroviral therapy adherence among PLHIV/AIDs in Anambra state, using implementing partners' supported comprehensive facilities in Anambra State, between 2018-2020

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Abstract
Adherence to antiretroviral therapy remains a challenge that has important implications for treatment success. The aim of this study was to assess the antiretroviral therapy among people living with HIV/AIDs in Anambra state between 2018-2020. Ex-post factor design was adopted for the study. The study was carried out in Anambra State of Nigeria. The population was made up of all confirmed HIV-positive clients currently accessing ART, in the 35 comprehensive facilities in Anambra state between 2018-2020 from 18 years and above. The sample size was 300 PLHIV/AIDs in Anambra state. Data that was collected from participants through response to the questionnaire questions as primary evidence and those collected from hospital ART registers by the researcher as secondary data was sorted, collated, compared, interpreted and analyzed for consistency with the application of relevant theories in the field of ART Adherence, mean was used to answer the research questions while t-test was used to test the hypothesis at 0.05 level of significance. From the results obtained based on the data collected and analyzed the following summary was reached. PLHIV/AIDs in Anambra state often adheres to ARV in terms of client pill count PLHIV/AIDs in Anambra state adheres very often to ARV in terms of client self-report. Percentage response to ART adherence by PLHIV/AIDs in terms physical assessment is high. There is an optimal level of adherence to ART by PLHIV/AIDs to laboratory investigation. There is an optimal level of adherence to ART by PLHIV/AIDs to pharmacy refill records. From the finding of the study, it can be said that there is an improvement in the level of adherence to ART by PLWHIV/AIDs in Anambra state. Though the level has increased, there has not been an optimal level of adherence by all the PLHIV/AIDs. There are patients who are not adequately adhering to ART in Anambra state. Therefore there is still need for proper sensitization on the need for adequate compliance to ART by PLHIV/AIDs in the state in other to achieve an optimal level of adherence.

Keywords: assessment, antiretroviral therapy adherence, PLWHIV/AIDs

Introduction

Nigeria reported the first case of HIV/AIDS in 1986. Since then, the National HIV prevalence increased exponentially from 1.8% in 1991 peaking at 5.8% in 2001 and progressively declining through 4.4% in 2005, 3% in 2014. Based on the report from NAIIS, the current prevalence of individuals aged 15 - 64 is 1.4%. As at 2019, Nigeria had an estimated HIV burden of 1.9 million people, the fourth largest in the world. The incidence of HIV in 2018 was estimated at 8 per 10,000 persons (NAIIS). The prevalence varied across Regions and States with the highest prevalence being in the South-South (3.1%) while the North-West had the lowest prevalence (0.6%). Akwa Ibom state had the highest prevalence (5.5%) while Katsina had the lowest prevalence (0.3%). (Federal Ministry of Health (FMOH), 2020). Antiretroviral therapy (ART) is the treatment of HIV infection using a combination of antiretroviral drugs (ARVs). All HIV infected persons irrespective of clinical stage and CD4+ cell count without contraindications should be initiated the same day or within 7 days of HIV diagnosis if possible. Pregnant and breastfeeding women, infants and children under 5 years, and patients with advanced HIV disease (AHD) should be prioritized for rapid initiation of ART. Antiretroviral therapy (ART) should be offered in a comprehensive manner that includes access to on-going adherence counselling, baseline and periodic clinical and laboratory monitoring, prevention and management of opportunistic infection (OIs), treatment monitoring and follow up. The goal of ART includes achievement of sustained virologic, immunologic, clinical, and epidemiologic control of HIV. Sustained viral suppression is necessary to prevent the development of ARV drug resistance, reduce morbidity from OIs and improve the quality of life of HIV infected individuals. In children, ART will promote and restore normal growth and development (FMOH,2020).

Global health initiatives such as the United States (US) President's Emergency Program for AIDS Relief (PEPFAR) and the Global Fund to fight AIDS, Tuberculosis and Malaria (GFTAM) have responded to the HIV pandemic by expanding the provision of Anti-retroviral Therapy (ART) to the increasing number of affected patients. This has resulted in the expansion of treatment and prevention programs that have increased ART access to previously un-served and underserved populations. Nigeria is one of the target countries for these international programs and is also a country with strong local political support for these initiatives. In Nigeria, Human Immunodeficiency Virus (HIV) and acquired immunodeficiency syndrome (AIDS) remains a significant problem. The concern is not only a major public health issue, but also a socio-economic and developmental crisis that affects all sectors of the population. In light of this, the Government began disseminating free antiretroviral therapy (ART) in 2000. (UNAIDS/WHO, 2008).

The Federal Government of Nigeria initiated the national ARV program in January 2002 as part of an expanded response to care and support for PLHIV/AIDs. Under this program, 10,000 adults and 5000 children were treated with a 3-drug ARV combination; 2 NRTI (lamivudine + stavudine) and 1 NNRTI (nevirapine). The program began in February 2002 involving 25 treatment centers across the 6 geopolitical zones of the country and was subsidized at a cost of US$10 a month for each patient. (FMOH, 2007). Unfortunately, in 2004 the program suffered a major setback when it was hit by a shortage of about US $3.5 million worth of drugs imported from India. During this time, many patients were off drugs for up to 3 months, which created a structurally-induced non adherence problem in the national ARV drug program. Eventually, the program was resumed when another US $3.8 million worth of drugs was ordered and received. (FMOH, 2007). Another program was started in 2006 with the goal of providing ARV drugs at no cost to about 250,000 HIV-positive patients. Although a total of 74 treatment sites were participating in this program by the end of 2006, only about 15% of PLHIV/AIDs needing ARV drugs in Nigeria had access to this treatment. Records indicated that 166,374 patients received free antiretroviral drugs and treatment in 2007, and in 2008, the number increased to 247,815. A further scale up to 309,800 patients were reported in 2009; which was increased to 380,182 patients in 2010 (Supply Chain Management System [SCMS]/FMOH, 2011). It was estimated that about 1.5 million people still require ART from an estimated 3.1 million Nigerians living with the HIV in 2010 (FMOH, 2010). The level of adherence to drug therapy has been reported to affect the outcome of treatment in the patients on ARV drugs. While good adherence results are effective in reducing viral loads and restoring a patient's immune system, non-adherence often leads to treatment failure. Studies conducted in both developed and developing countries have shown that adherence in developing countries is often equal to or higher than that in developed countries, but there is now research evidence that this may wane over time. The reason for these better adherence outcomes in sub-Saharan Africa has been attributed to the phenomenon of social capital. (World Health Organization (WHO), 2016).

While the government and other partners are determined to increase accessibility to ARVs, specific initiatives to promote adherence to ARVs need to be in place to ensure correct ARV use at all levels, including community levels in Nigeria (WHO, 2012). Thus, ART adherence remains a significant factor in the social and economic development of many countries, specifically many in Saharan Africa (SA). In Nigeria and Anambra state, the burden of HIV is second only to malaria with an estimated prevalence rate of 8.8% among adults. (FMOH, 2014). Only Adherence to ART can reduce the rate of transmission of the virus, it is important therefore, to assess the ART adherence among PLHIV/AIDs in Anambra state, using implementing partners' (Family Health International (fhi 360), Centre for Health Education and Economic Rehabilitation and Social society (CHEERS), AIDs Healthcare Foundation (AHF) supported comprehensive facilities in Anambra State, between 2018-2020.

Purpose of the study

The purpose of the study is to assess the ART adherence among people living with HIV/AIDS in Anambra state between 2018- 2020 in comprehensive health facilities supported by Family Health International (fhi360), Centre for Health education and Economic rehabilitation and Social society (CHEERS), and AIDs Healthcare Foundation (AHF) (1 facility each). Specifically, the study is to assess.

1. The level of ART adherence by male and female PLHIV/AIDs in terms pill count.
2. The level of ART adherence by male and female LHIV/AIDs in terms laboratory investigation
3. The level of ART adherence by male and female PLHIV/AIDs in terms pharmacy refill records
4. The level of ART adherence by male and female PLHIV/AIDs in terms client self- report.
5. The level of ART adherence by male and female PLHIV/AIDs in terms physician assessment.

Research questions

The research will be guided by the following research questions.

1. What is the level of ART adherence by male and female PLHIV/AIDs in terms of pill count in Anambra state?
2. What is the level of ART adherence by male and female PLHIV/AIDs in terms of laboratory investigation in Anambra state?
3. What is the level of ART adherence by male and female PLHIV/AIDs in terms pharmacy refill records in Anambra state?
4. What is the level of ART adherence by male and female PLHIV/AIDs in terms of client self- report in Anambra state?
5. What is the level of ART adherence by male and female PLHIV/AIDs in terms of physician assessment in Anambra state?

Research hypotheses

The following null hypotheses were formulated and will be tested at 0.05 statistical level of significance ($p > 0.05$).

1. There is no significant difference in the level of ART adherence by male and female PLHIV/AIDs in terms of pill count in Anambra state.
2. There is no significant difference in the level of ART adherence by male and female PLHIV/AIDs in terms laboratory investigation in Anambra state.
3. There is no significant difference in the level of ART adherence by male and female PLHIV/AIDs in terms pharmacy refill records in Anambra state
4. There is no significant difference in the level of ART adherence by male and female PLHIV/AIDs in terms client self-report in Anambra state.
5. There is no significant difference in the level of ART adherence by male and female PLHIV/AIDs in terms physician assessment in Anambra state.

Methods

Ex-post factor design was adopted for the study. The study was carried out in Anambra State of Nigeria. The population was made up of all confirmed HIV-positive clients currently accessing ART, in the 35 comprehensive facilities in Anambra state between 2018-2020 from 18 years and above. The sample size was 300 PLHIV/AIDs in Anambra state. Purposive sampling technique was employed in this

study to select 50 clients from the target population in each of the 6 selected facilities (General Hospital Onitsha, General Hospital Ekwulobia, General Hospital Ajalli, and St. Joseph Adazi, Amaokpala PHC, and General Hospital umueri) in Anambra state. Purposive sampling technique was used because the facilities are supported by implementing partners who provide all the HIV services, have accurate data for the services and the data accessible to the researcher. The instrument for data collection in this study is questionnaire on the Assessment of Anti-Retroviral Therapy (Art) Adherence among People Living with HIV/AIDS. Data that was collected from participants through response to the questionnaire questions as primary evidence and those to be collected from hospital ART registers by the researcher as secondary data was sorted, collated, compared, interpreted and analyzed for consistency with the application of relevant theories in the field of ART Adherence, mean was used to answer the research questions while t-test was used to test the hypothesis at 0.05 level of significance.

Results and discussion

Research question 1

What is level of ART adherence by PLHIV/AIDs in terms of client pill count in Anambra state?

Table 1: Means, standard deviation and grand mean of the responses by PLHIV/AIDs on level of ART adherence in terms of pill count in Anambra state

S/N	ITEMS	VO	O	R	N	X	S. D	D.R
	Pill count: In the past three months, how often have you done the following?							
1	Missed taking your drugs.	3	9	161	127	1.63	0.59	Never
2	Came for drug refill with pills for 2 days left in the container (monthly appointment).	2	173	75	50	2.42	0.77	Often
3	Came for drug refill with pills for 4days left in the container (bi-monthly appointment).	172	40	40	48	3.12	1.56	Often
4	Came to facility with empty container (no pill left).	17	51	92	140	1.82	1.82	Never
5	Forgot drug package or discarded them	17	43	79	161	1.72	0.91	Never
	GRAND MEAN					2.14		Adherence

Table 1 shows the mean responses of PLHIV/AIDs on their adherence to pill count as recorded. From the table it is paramount to note that with a grand mean of 2.14 PLHIV/AIDs often adhere to ART in term of pill count

Research question 2

What is level of ART adherence by PLHIV/AIDs in terms of client self-report in Anambra state?

Table 2: Means, percentage, standard deviation and grand mean of the responses by PLHIV/AIDs on level of ART adherence in terms of client self-report in Anambra state

S/N	ITEMS	VO (%)	O (%)	R (%)	N (%)	X	S. D	D.R
	Self-report: which of this describe your adherence behavior in the past 3 months							
1	Disclosed my status to my partner.	176 (58.7%)	58 (19.3%)	27 (9.09%)	39 (13%)	3.24	1.10	Often
2	Missed appointment.	32 (10.7%)	45 (15%)	107 (35.7%)	116 (38.7)	1.98	0.98	Never
3	Had side effects of ARV medicine.	16 (5.3%)	25 (8.3%)	183 (61%)	78n (25.3%)	1.94	0.74	Never
4	Taken drugs off schedule or late by one hour or more.	24 (8%)	42 (14%)	46 (15.3%)	188n (62.7%)	1.67	0.99	Never
5	Know what to do if I miss a dose of any of my HIV medication.	49 (16.3%)	63 (21%)	70 (23.3%)	118 (39.3%)	2.14	1.11	Often
	GRAND MEAN					2.20		Adherence

Table 2 shows the responses of PLHIV/AIDs on the level of ART adherence in terms of self-report. It is imperative to note that 58.7% of the patience very often report their status to their partners, 19.2% often does that, 9.09% rarely tell their partner about their health status while 13% of the patience at recorded rarely report their status to their partners themselves.

Research question 3

What is the level of ART adherence by PLHIV/AIDs in terms physical assessment in Anambra state?

Table 3: Percentage adherence of PLHIV/AIDs on level of ART in terms of physical assessment, laboratory investigation and pharmacy refill

S/N	ASSESSMENT FACTORS	ADHERENCE STATUS		TOTAL
	Physical Assessment	Optimal *n* (%)	Suboptimal *n* (%)	N
1.	Weight	232(77.3)	68(22.7)	300
2.	Height	130(43.3)	170(56.7)	300
3.	Functional status	238(79.3)	62(20.7)	300
4.	Who clinical staging (<2)	204(68.0)	98(32.0)	300
		201(66.98)	99(33.02)	300
	Laboratory Investigation			
5	CD_4 count (>1500C/m)	204(68.0)	98(32.0)	300
6.	Viral load (<1000c/m)	240(80.0)	60(20.0)	300

		221(74.0)	79(26.0)	300
	Pharmacy Refill			
7.	Visit date	215(71.7)	85(28.3)	300
8.	Regimen	208(69.3)	92(30.7)	300
9.	Next appointment	239(78.7)	64(21.3)	300
10	Missed appointment	195(65.0)	105(35.0)	300
		214(71.2)	86(28.8)	300

From table 3, item 1 to 5 shows the level of adherence of PLHIV/AIDs based on the physical assessment. As observed from the table, 232(77.3%) has optimal level of adherence based on their based on their weight while 68(22.7%) of the patients had suboptimal level of adherence. Also item two in the physical assessment showed that those with optimal adherence level had 79.3% height and those with suboptimal level of adherence to ARV has 56.7% of height. 79.3% of the patients had optimal functional status, while 20.7% had suboptimal functional status. Also 68.0% of the patients had WHO clinical staging that is less than 2 while 32% of the patients had WHO clinical staging that is above 2. Overall the patience with optimal level of adherence from the table is 66.98% amount to 201 patients while those with suboptimal adherence level are 99 which is 33.02% of the patients.

Research question 4

What is the level of ART adherence by PLHIV/AIDs in terms of laboratory investigation in Anambra state?

Table 3 shows the percentage responses of PLHIV/AIDs on the level of adherence to ARV based on laboratory investigation. From the table CD_4 count and viral overload of the patients were considered to determine their level of adherence to laboratory investigation as regards to the ARV. From the table it 221 of the patients which is 74.0% had optimal adherence level to laboratory investigation while 79 of the patients which is 26.0% had suboptimal level of adherence to laboratory investigation. From the percentage obtained it is imperative to note that there is an optimal level of adherence to ARV to laboratory investigation within the period under study.

Research question 5

What is the level of ART adherence by PLHIV/AIDs in terms of pharmacy refill records in Anambra state?

Table 3 shows the percentage level of adherence to ARV by PLHIV/AIDS in terms of pharmacy level records. From the table the responses of the patience based visiting date, regimen, next appointment and missed appointments were considered. A cumulative percentage of 71.2% for 214 patients were found to have optimal level of adherence to ARV based on pharmacy refill records while a percentage of 28.8% was obtained for 86 patients with suboptimal performance. From the percentage level of responses obtained it is imperative to note that people with optimal level of performance to ARV based on pharmacy refill records is higher than the number of patience with suboptimal level of adherence to ARV within the period under study.

Hypothesis 1

There is no significant difference in the level of ART adherence by male and female PLHIV/AIDs in terms of pill count in Anambra state.

Table 4: T-test on the means responses of male and female PLHIV/AIDs on the level of adherence to ARV in terms of pill count at α =0.05 N=300

S/N	PLHIV/AIDs	N	Mean X	DF	t	SIG	Decision
1	Male	177	10.51				
2	Female	123	10.99	298	2.09	0.037	Sig

Table 4 shows the t-test on the on the difference in the means responses of on the level of adherence of male and female PLHIV/AIDs in terms of pill count. From the table at t_{298}= 2.09, p=0.037> α=0.05 shows there is a significant difference in the mean responses of male and female PLHIV/AIDs in terms of pill count in favour of female clients. Therefore the null hypothesis is not accepted.

Hypothesis 2

There is no significant difference in the level of ART adherence by male and female PLHIV/AIDs in terms client self-report in Anambra state.

Table 5: T-test on the means responses of male and female PLHIV/AIDs on the level of adherence to ARV in terms of client self-report at α =0.05 N=300

S/N	PLHIV/AIDs	N	Mean X	DF	t	SIG	Decision
1	Male	177	11.40				
2	Female	123	10.34	298	4.74	0.01	Sig

Table 5 shows the t-test on the mean responses of male and female PLHIV/AIDs on the level of adherence based on client self-report. At t_{298}= 4.74, p=0.01> α=0.05 shows there is a significant difference in the level of adherence to ARV by male and female PLHIV/AIDs in favour of male clients. Therefore the null hypothesis that there is no significant difference in the level of ART adherence by male and female PLHIV/AIDs in terms client self-report in Anambra state is not accepted.

Table 6: Chi-Square on the level of adherence to ARV by PLHIV/AIDs in terms of physical assessment, laboratory investigation and pharmacy rill record

Adherence status	Physical Assessment		X^2	P-value
Gender	Adherence (N)	Non adherence (N)		
Male	113	64		
Female	97	26	7.79	0.005
Laboratory Investigation				
male	87	90		
Female	66	57	0.59	0.44
Pharmacy Refill Record				
Male	99	78		
Female	73	50	0.35	0.56

Hypothesis 3

There is no significant difference in the level of ART adherence by male and female PLHIV/AIDs in terms physical assessment in Anambra state

Discussion of findings

This study investigated the level in which PLHIV/AIDs responds to ART therapy. The level of adherence to Antiretroviral Therapy was study based on pill count, client self-report, laboratory investigation, pharmacy refill record, and physical assessment.

Clients pill count record that were obtained showed that the responds effectively to ART within thse period of study. Most of the client sampled agreed to adhere to taking of their pills as at when due. Most of them hardly miss their pills as prescribed, often go for drug refill when it is due and also responds to timely responses to refills their drugs when it is due. Though there are others who do not follow their pill count religiously as ought to be but the number of people who seriously adhere to pill count outnumbered the people that are not taking pill refill serious within the period under study. This level of adherence to pill count may be as a result of different level of sensitization giving to PLHIV/AIDs as observed by Ogbuefi, Ugochukwu, Onubogu, Edokwe and Okeke (2022) that monthly adherence support counseling was offered to the subjects and caregivers when adherence level fell below 95% this help to increase their level of awareness to the consequences of non-adherence especially to the pill given to them. Anyaike, Atoyebi, Musa, Bolarinwa, Durowade, Ogundiran and Babatunde (2019) noted that improvement in ART by clients based on response to pills could be associated with the increased access to antiretroviral drugs in the hospital, regular training of the treatment adherence counselors and the shift from multiple pills therapy to combined pills therap. There is a significant difference in the level of adherence to pill count by male and female PLHIV/AIDs in favour of female clients. Suleiman and Momo (2016) noted in their study that only 31.4% of the subjects reported 100% adherence which implied that they have never missed any dose of drug since they started ART. There were more females (56.1%) in this category than males (43.9%). Possible reason could be that the females understood the importance of adherence better than the males. This result is in contrast to the findings of Ogbuefi, etel (2022) whose finding showed that there was no significant difference in adherence level of male and female clients in response to ART.

Also clients' response to self-report showed there is an improved level of adherence to pill count. The number of clients who are responding to ART increased optimally. Self-recall based on was used to assess the level of adherence by PLHIV/AIDs. The report showed that clients properly respond to self-monitoring which help them respond effectively to ART. However the clients also report side effects of ARV medicine had not also been an issue to cause them to stop taking their pills. However this is in contrast to the work of Suleiman and Momo (2016) who observed that missing of doses resulting from "wanting to avoid side effects" which was the third most common reason clients avoid taking their ART pills. This may be as a result of increased enlightenment on the need to take drugs as at when scheduled because minor effect of ART drugs is far preferred to the debilitating conditions of well-being in full blown HIV/AIDS patients, which must be avoided at all costs. There was also a significant difference in the adherence level of male and female clients in favour of male clients.

Laboratory investigation was also taking into consideration. 74.0% of the clients were observed to have optimal adherence to ART while 26.0% was at the suboptimal level. This showed that the number of clients who have this virus cause more harm to their body is lower than those who are prone to dangers of the virus in line with their level of adherence to ART. This is in line with the study of Ogbuefi, etel (2022) who observed that subjects with OA had significantly higher adequate CD4 cell count recovery than subjects with sub-OA. This shows that the majority of PLHIV/AIDs are adhering to ART pills. The pharmacy refill record showed that 71.2% of the total client achieved and optimal level of adherence while 28.8% had suboptimal level of adherence. There was no significant difference in the level of adherence to ART of male and female PLWHIV/AIDs based on laboratory investigation. Also the physical assessment record showed that 66.98% of the patience have high adherence level while 33.02% are not properly adhering to ART. However the adherence level of PLWHIV/AIDs to ART had increased in this study compared to previous studies.

Conclusion

The study examined the adherence level to Antiretroviral Therapy, among People Living with HIV/AIDs in Anambra State. From the finding of the study it can be said that there is an improvement in the level of adherence to ART by PLWHIV/AIDs in Anambra state. Though the level has increased, there has not been an optimal level of adherence by all the PLHIV/AIDs. There are patients who are not adequately adhering to ART in Anambra state. Therefore there is still need for proper sensitization on the need for adequate compliance to ART by PLHIV/AIDs in the state in other to achieve an optimal level of adherence.

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