Original Article

Adherence to Antiretroviral Therapy among Children and Adolescents with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome in the Federal Capital Territory, Nigeria

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Abstract

Abstract

Background: Adherence to antiretroviral therapy is a key strategy that is deployed to reduce resistance and prevent HIV infection among the population.

Materials and Methods: This study was conducted to examine the level of adherence to therapeutic regimens among children and adolescents living with HIV/AIDS in selected secondary and tertiary health facilities. A proportionate sampling technique was used to select 400 participants: 185 from ADH and 215 from UATH in Abuja, Nigeria. A Medication Adherence Questionnaire (MAQ) was used to collect data.

Results: The results show the mean age of the respondents as 12.0±3.9 in ADH, and 12.2±4.4 in UATH. The level of adherence was significantly higher ($p<0.05$) at the secondary facility (90.3%) compared to 80% at the tertiary centre. Participants whose caretakers had tertiary education (AOR=2.22; 95% CI=1.07 - 4.59) and those who were involved in administering medication themselves (AOR=2.59; 95% CI=1.36 - 4.93) were 2 and 3 times more likely to adhere to ART.

Conclusion/Recommendations: This study concluded that the level of adherence to antiretroviral therapy (ART) was generally good among children and adolescents across both secondary and tertiary; however, it was higher among those receiving treatment at the secondary health facility. This study therefore recommends that children and adolescents living with HIV/AIDs need to be given greater presence/involvement in decisions regarding their treatment and administration of drugs to promote adherence.

Keywords: Adherence, Children, Adolescents, Antiretroviral Therapy, HIV/AIDS

Introduction

Adherence to antiretroviral therapy is the key step for the elimination of HIV infection among people living with HIV.[1] Globally, adherence rate to ART is generally lower than the expected value of ≥95%.[2,3] An adherence level of more than 95% is needed to prevent replication and mutation of the virus, resulting in successful treatment outcomes, prolonged life, and reduced morbidity and mortality among the infected people.[1,4-6] The benefits of HIV/AIDs treatment can only be maximised when there is strict adherence to ART. Adherence means the behaviour of taking drugs correctly based on mutual agreement between the patient and health care provider. It is the act of taking the right drugs, at the right dose, at the right frequency, and at the right time.[7]

HIV/AIDs is one of the leading causes of Paediatric morbidity and mortality in Africa. Although measures have been put in place to reduce the global burden of HIV/AIDS among children, the epidemic is still high in children. In 2022, the worldwide burden of HIV/AIDS infection was 39.0 million people out of which 2.58 million were children aged 0-19 years, with about two thirds of those affected living in Sub-Saharan Africa.[1,2,4,5] Similarly, Nigeria has about 1.9 - 2.1 million people living with HIV/AIDs.[2] The prevalence of HIV in Nigeria in 2020 was 4.1%. North-Central region of Nigeria has the second highest prevalence (2.1%) of HIV infection, while the Federal Capital Territory (FCT) is 1.5 %.[2]

Despite the high burden of HIV/AIDS infection in

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Nigeria, only 17 % of children living with the disease have access to antiretroviral therapy (ART). Many supportive strategies have been adopted to ensure effective treatment of HIV/AIDS. These include directly administering antiretroviral drugs, health education, counselling, social support, financial incentives, as well as the use of pill boxes.[3,8] The common barriers that are usually encountered in resource-constrained countries that are responsible for poor adherence to ARV drugs include the cost of treatment, transportation, poor access to ARVs, stigmatization, ignorance, culture, and religious belief.[8]

There is a relative dearth of data on the level of adherence to ART between secondary and tertiary health facilities in most treatment centres located in FCT, especially among children and adolescents. More importantly, the data available are mainly on adults, living with HIV/AIDs in Tertiary hospitals, almost excluding the high-risk population of children under 19 years. Therefore, there is a need to examine the level of adherence and the factors that affect it in children under 19 years in both secondary and tertiary centres in FCT. The information obtained from this study will bridge the knowledge gap, as well as guide policymakers in this facility and the country in formulating policies in the treatment strategies of HIV/AIDS among children living with HIV/AIDS (CLWHA).

Materials and Methods

Research Design

A cross-sectional design was employed for the study.

Population and Sampling

The study population was children and adolescents aged 0-19 years living with HIV/AIDs who received antiretroviral therapy at the University of Abuja Teaching Hospital (UATH), Gwagwalada and Asokoro District Hospital (ADH) in Abuja Metropolis, Nigeria. A proportionate allocation based on the sample size was made. The number of subjects selected per clinic day in each of the centres was 185/12= 15 at ADH and 18 (215/12) at UATH. On each clinic day, the first subject was selected by simple random sampling (balloting) between the 1st and 2nd subjects to arrive at the clinic. Thereafter, every second subject was selected, until 15 and 18 subjects were recruited, respectively, per clinic day from each clinic. Each selected subject was immediately examined for eligibility. When a selected subject did not meet the inclusion criteria, the next subject was selected. Hence 185 and 215, subjects were recruited from each centres over the 12 clinic days.

Data collection

Data was collected using the Morisky Medication Adherence Scale (MMAS-8), an 8-item self-reported questionnaire commonly used in both research and clinical practice to assess and monitor adherence to prescribed medication among patients on therapeutic regimens. It has high internal consistency, with Cronbach's alpha ranging from 0.65 to 0.83 across diverse populations and diseases.[9] For participants who could read, understand, and write in English, the questionnaire was self-administered; for those who could not, it was administered by the researcher. Parents, guardians, or caregivers provided information for study participants who were minors. Data collection took place across the facilities over 12 clinic days spanning three months.

Statistical Analysis

Data collected was analysed using IBM SPSS V 27. Results were presented using frequency tables and charts. Chi-square (x^2) was used to determine the factors associated with adherence to ART, while multiple logistic regression was used to identify the predictors of adherence to ART. Data was interpreted using the criteria below.

Interpretation Criteria

S. No	Level	Score (%)
1.	High Adherence	90-100
2.	Medium Adherence	75-89
3.	Low Adherence	0-74

Ethical consideration

Ethical clearance and permission for the study were obtained from the Ethics Committee of UATH (FCT/UATH/HREC/9335), the Health Research Ethics Committee of FCT for ADH (FHREC/2023/01/84/26-05-23), and the ethical committee of ADH (FCTA/HHSS/HMB/ADH/143/23). Informed consent/assent was obtained from participants and where they werent eligible to give consent, it was obtained from parents/ guardians. Participants' rights, including rights to voluntary participation were enforced, and all information obtained was treated as confidential while ensuring the anonymity of the participants.

Results

Socio-demographic characteristics of the study Participants

From Table 1, the largest proportions of the participants were between the ages of 11-15 years in both secondary and tertiary health facilities 48.1%-39.5% respectively. Females (50.8%) dominated the study population in secondary health facilities (ADH) while males (60.0%) predominated in tertiary facilities (UATH). Mothers were the primary caregivers for the majority of the participants, 79.5% in ADH and 85.1% in UATH. Only

Table 1. Socio-demographic characteristics of the study participants

Variable	Frequency (%)	
Age (year)	ADH (n=185)	UATH (n=215)
0-5	13 (7.0)	23 (10.7)
6-10	46 (24.9)	47 (21.9)
11-15	89 (48.1)	85 (39.5)
16-19	37 (20.0)	60 (27.9)
Mean ± SD	12.0 ± 3.9	12.2 ± 4.4
Gender		
Male	91 (49.2)	129 (60.0)
Female	94 (50.8)	86 (40.0)
Ethnicity		
Hausa	26 (14.1)	31 (14.4)
Igbo	39 (21.1)	44 (2.5)
Yoruba	9 (4.9)	12 (5.6)
Others	111 (60.0)	128 (59.5)
Education		
No formal/Dropped out	7 (3.8)	16 (7.4)
Primary	68 (36.8)	55 (25.6)
JSS Classes	68 (36.8)	87 (40.5)
SSS Classes	19 (10.3)	32 (14.9)
Secondary completed/Tertiary	23 (12.3)	25 (11.6)
Religion		
Christianity	154 (83.2)	165 (76.7)
Islam	31 (16.8)	50 (23.3)
Primary caregiver		
Mother	147 (79.5)	183 (85.1)
Father	19 (10.3)	16 (7.4)
Relative	19 (10.3)	16 (7.4)
Marital status of the caregiver		
Married	150 (81.1)	181 (84.2)
Not married	35 (18.9)	34 (15.8)
Education of caregiver		
No formal	42 (22.7)	49 (22.8)
Primary	45 (24.3)	32 (14.9)
Secondary	53 (28.6)	97 (45.1)
Tertiary	45 (24.3)	37 (17.2)
Education of caregiver's spouse		
No formal	30 (16.2)	24 (11.2)
Primary	39 (21.1)	28 (13.0)
Secondary	52 (28.1)	116 (54.0)
Tertiary	64 (34.6)	47 (21.9)
Relationship of primary caregiver		
Biological parents	164 (88.6)	203 (94.3)
Non-Biological parents	21 (11.4)	12 (5.6)

24.3% and 17.2% of the caregivers had tertiary education in ADH and UATH respectively.

Adherence to Therapeutic Regimen

Table 2 shows that while adherence to the therapeutic regimen is high among the patients in both facilities, it is significantly higher (X^2= 8.115, P-value 0.004%) in Asokoro District Hospital, the secondary health facility (90.3%), compared to the University of Abuja Teaching Hospital, the tertiary level facility (80.0%).

Association of Socio-demographic characteristics and level of adherence to ART

Table 3 shows a significant association between the level of education of spouses of caregivers and the

Table 2: Adherence to ART at ADH and UATH

Adherence	Frequency (%)	
	ADH (n = 185)	UATH (n = 215)
Good	167 (90.3)	172 (80.0)
Poor	18 (9.7)	43 (20.0)
*χ^2 = 8.115; df = 1; p = 0.004**		

persons responsible for the administration of ART (p-0.022 and 0.013).

Predictors of Good Adherence to Therapeutic Regimen

As shown in Table 4, Participants whose caretaker had tertiary education were 2-3 times more likely to adhere to medication than those whose spouse did not have tertiary education (OR = 2.22; 95% CI = 1.07 to 4.59). Participants who were involved in administering medication were 3 times more likely to adhere to medication than those who were not involved (OR = 2.59; 95% CI = 1.36 to 4.93).

Discussion

The finding that medication adherence is significantly higher in Asokoro District Hospital compared to the University of Abuja Teaching Hospital, despite the latter being a tertiary facility. Challenges the common expectation that higher-level healthcare centres always yield better adherence by being equipped with specialists and more advanced medical technologies, which ideally offer better medication management and adherence outcomes[10]. This could be due to factors such as more personalised care and stronger patient-provider relationships in secondary-level facilities, where smaller patient volumes allow for greater attention and follow-up. In contrast, tertiary facilities often manage more complex cases with higher patient loads, further compounded by the emigration of skilled manpower from Nigerian tertiary health facilities to the diaspora, which may complicate adherence. Previous studies have similarly suggested that secondary and primary healthcare settings, with more focused care, can lead to better medication adherence outcomes, even when tertiary facilities are better equipped[11] The rate of adherence across both facilities, however is below the WHO recommended rate of ≥95%[10]. The findings from this study are lower than what was reported from studies across other parts of the world.[11-12] However, the findings are still slightly higher than what was reported by many studies in Nigeria[13-16] .By these findings, further investigation into patient perspectives, healthcare provider practices, and specific barriers to adherence in the tertiary setting is warranted to understand these findings more comprehensively.

Table 3: Associations between socio-demographic characteristics and level of adherence to ART

Variable	Adherence			χ^2	df	p-value
	Good	Poor	Total			
	n = 339	n = 61	n = 400			
Age (year)						
0-5	28 (77.8)	8 (22.2)	36	2.029	3	0.566
6-10	79 (84.9)	14 (15.1)	93			
11-15	151 (86.8)	23 (13.2)	174			
16-19	81 (83.5)	16 (16.5)	97	$\chi^2_T = 0.315; p = 0.574$		
Sex						
Male	187 (85.0)	33 (15.0)	220	0.024	1	0.878
Female	152 (84.4)	28 (15.6)	180			
Ethnicity						
Hausa	47 (82.5)	10 (17.5)	57	1.470	3	0.689
Igbo	68 (81.9)	15 (18.1)	83			
Yoruba	19 (90.5)	2 (9.5)	21			
Others	205 (85.8)	34 (14.2)	239			
Education						
No formal/Dropped out	19 (82.6)	4 (17.4)	23	5.214	4	0.236
Primary	98 (79.7)	25 (20.3)	123			
JSS Classes	137 (88.4)	18 (11.6)	155			
SSS Classes	42 (82.9)	9 (17.6)	51			
Secondary completed/Tertiary	43 (89.6)	5 (10.4)	48	$\chi^2_T = 1.915; p = 0.166$		
Religion						
Christianity	270 (84.6)	49 (15.4)	319	0.015	1	0.903
Islam	69 (85.2)	12 (14.8)	81			
Primary caregiver						
Mother	277 (83.9)	53 (16.1)	330	1.401	2	0.496
Father	30 (85.7)	5 (14.3)	35			
Relative	32 (91.4)	3 (8.6)	35			
Marital status of caregiver						
Married	280 (84.6)	51 (15.4)	331	0.037	1	0.847
Not married	59 (85.5)	10 (14.5)	69			
Education of caregiver						
No formal	76 (83.5)	15 (16.5)	91	1.779	3	0.619
Primary	63 (81.8)	14 (18.2)	77			
Secondary	127 (84.7)	23 (15.3)	150			
Tertiary	73 (89.0)	9 (11.0)	82	$\chi^2_T = 1.113; p = 0.291$		
Education of caregiver's spouse						
No formal	49 (90.7)	5 (9.3)	54	9.590	3	0.022*
Primary	51 (76.1)	16 (23.9)	67			
Secondary	138 (82.1)	30 (17.9)	168			
Tertiary	101 (91.0)	10 (9.0)	111	$\chi^2_T = 0.783; p = 0.376$		
Relationship of primary caregiver						
Biological parents	311 (84.7)	56 (15.3)	367	0.000	1	0.987
Non-Biological parents	28 (84.8)	5 (15.2)	33			
Person responsible for medication						
Primary caregiver	194 (80.5)	47 (19.5)	241	8.617	2	0.013*
Study participant	53 (89.8)	6 (10.2)	59			
Both	92 (92.0)	8 (8.0)	100			

* Statistically significant χ^2_T =*Chi-Square for Trend*

The findings highlight the significant impact of caregiver education and patient involvement on medication adherence. Participants whose caregivers had higher educational levels were more likely to adhere to their medication, suggesting that educated caregivers may offer better support and guidance, potentially due to their greater access to healthcare information and understanding of the importance of adherence which is consistent with what was reported from previous studies involving children with chronic

Table 4: Predictors of High Level of Adherence to ART

Predictor variable	β	SE	Wald	p-value	Adj. OR	95% CI Lower	95% CI Upper
Constant	*0.402*	*0.425*	*0.893*	*0.345*			
Caregiver having tertiary level education	0.795	0.372	4.579	0.032*	2.22	1.07	4.59
Participants involved in administering medication	0.953	0.328	8.43	0.004*	2.59	1.36	4.93

* Statistically significant β = Regression coefficient; SE = Standard error; Adj-OR = Adjusted Odds ratio

illnesses where caregivers with higher education levels were found to be better at managing medication schedules and providing consistent care, leading to higher medication adherence.[17-20] Additionally, participants who were actively involved in administering their medication showed notably higher adherence rates, indicating that personal involvement in the process enhances motivation and adherence. These results underscore the importance of both empowering caregivers through education and engaging patients in their own care to improve medication adherence outcomes. This is also consistent with findings from previous studies that examined the impact of patient involvement on medication adherence and reported that patients who were actively engaged in managing their treatment, such as participating in decisions about their medication regimen and understanding the purpose of each medication, were more likely to adhere to their treatment plans. However, these factors were reported as non-significant influencers of ART adherence in other African and non-African patients[20,22]

Conclusion

Although the study documented a significant difference in the level of adherence to therapeutic regimens among children and adolescents living with HIV/AIDs in the secondary and tertiary hospitals in FCT, the level of adherence is still suboptimal and below the recommended global standard of ≥ 95%. The higher level of educational attainment of caregivers and patients participating in administering their medications is the predictor of good adherence to the therapeutic regimen. Despite the good level of adherence documented in both secondary and tertiary health facilities in this study, there is a need for improvement to meet the recommended global standard.

Recommendation

Based on the findings of the study, it was recommended that;

1. Antiretroviral therapy providers, especially physicians and nurses need to intensify efforts in educating clients and their caregivers on the need and benefits of adherence to ART.
2. Children and adolescents living with HIV/AIDs need to be given greater presence/involvement in decisions regarding their treatment and administration of drugs to promote adherence.

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Conflict of Interest

There is nothing to declare.

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