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Adherence to Anti-Retroviral Therapy and its Associated Factors Among Women Living with HIV/AIDS in a Teaching Hospital in Ibadan, Nigeria

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Article history: Received 07 October 2024, Reviewed 21 February 2025, Accepted for publication 24 February 2025

Abstract

Background: Optimal adherence to antiretroviral therapy requires the collaboration of health care workers with health care receivers and a well-designed integration of several disciplines to ensure its success. This study determined the adherence to antiretroviral therapy and factors contributing to non-adherence among women living with HIV/AIDS. **Methods:** This study adopted a descriptive cross-sectional design. A standardized tool on adherence level by Morisky tool was used to collect data from 132 women of childbearing age. The data were coded and analyzed using the Statistical Package of Social Sciences (SPSS), version 20.0 at 0.05 level of significance.

Results: Majority of participants, 67 (50.8%), were secondary school graduates, 80.3% identified as Yoruba, and 63.6% were Christians. Their adherence to antiretroviral therapy (ART) 64.4%, was significantly below the international standard of 95%. Additionally, most respondents (87.9%) reported experiencing adverse effects from the medication. More than half of the respondents (58.3%) experienced mild psychological symptoms while 3% experienced severe psychological symptoms. There were no significant association between the participants' educational qualification and their adherence level, ($p \geq 0.34$), between marital status and their adherence to antiretroviral therapy, ($p \geq 0.23$) and between participants' family types and their adherence to antiretroviral therapy, ($p \geq 0.19$).

Conclusion: The findings of this study underscore the urgent need for multifaceted approaches to improve antiretroviral therapy adherence. Beyond targeted training programmes, there is a necessity for systemic interventions that could address the social, psychological, and cultural factors influencing adherence. Stakeholders, and support networks, must collaborate to create supportive environments to improve adherence.

Keywords: Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome, Women, Adherence, Childbearing age, Antiretroviral therapy



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How to cite this article:

Ibezimuoh GC, Ademuyiwa GO, Ojiegbe I, Ndikom MC Ndikom CM. Adherence to Anti-Retroviral Therapy and its Associated Factors Among Women Living with HIV/AIDS in a Teaching Hospital in Ibadan, Nigeria. The Nigerian Health Journal 2025; 25(1): 143 – 153. <https://doi.org/10.71637/tnhj.v25i1.929>



Introduction

The scourge in the global burden of Human immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) has remained a major threat to human lives and contributing to mortality, especially in low- and middle- income countries.¹ An estimated 36.9 million (31.1 million–43.9 million) people globally are living with HIV/AIDS, and there have been about 940,000 mortality records from AIDS related illness in Africa.¹ However, in sub-Saharan Africa in 2016, out of 19.4 million people that were infected with HIV, about 420,000 deaths were recorded and Nigeria had a total of about 160,000 deaths in this record.¹ Nigeria ranked the second highest HIV epidemic region in the world and one of the highest rates of new infection in Sub-Saharan Africa.¹ According to USAIDS report in 2018, more women were affected with HIV/AIDS as 1 in 4 people tested for the virus were women and once women are affected, they have about 6-8 times greater risk of dying before, during or after pregnancy. In Nigeria, it was also reported that more females were infected with the virus and living with HIV infection [2], hence the need to ensure maximal adherence to anti-retroviral therapies especially among females.

The use of Antiretroviral therapy (ART) effectively as prescribed delays the progression of HIV/AIDS significantly. The frequent use of the therapy has also resulted in a more sustained virology and immunologic response and improved survival rates.¹ Globally, appropriate use of antiretroviral treatments has helped improve the life expectancy of HIV positive patients. Optimal compliance with Antiretroviral therapy can be complicated and difficult to adhere for individuals living with HIV/AIDS because of certain associated factors in the management of the disease, poor adherence to treatment is seen to be the major deterring factor in the fight against HIV.³ Furthermore, widespread non-adherence to ART has been seen to have some associated factors responsible for non-adherence and these are forgetfulness, stigma, fear of discrimination. Also, the fact that HIV/AIDS has no cure really gives no hope to people with this disease.² These culminating effects of poor adherence to antiretroviral therapy are associated with poor treatment outcomes, emergence of resistance, patients' dissatisfaction, increased healthcare expenditure, and avoidable deaths which invariably add up to the rise in morbidity and mortality rates.

In Nigeria people living with HIV/AIDS have minimal access to antiretroviral therapy either because of distance, poverty, and stigma which all significantly promote the spread of the infection. Since access to

antiretroviral treatment is vital, it is imperative to ensure patients adhere to the prescribed regimen to enable long term social and psychological support.⁴ Therefore, it is important for health care providers to assess those factors that negatively affect adherence early enough as the treatment of non-adherence has globally resulted in huge expenditure by international organizations including the United States President's Emergency Plan for AIDS Relief (PEPFAR), the Global Fund and the World Bank.⁵ Thus, this study was aimed at finding out the level of adherence to ART, the socio-economic factors preventing optimal adherence, the physiological factors preventing optimal adherence and the social support system available to women living with HIV/AIDS.

Methods

This study utilized a descriptive cross-sectional design to assess adherence to antiretroviral therapy (ART) and associated factors among women of childbearing age living with HIV/AIDS. The research was conducted at Adeoyo Maternity Teaching Hospital, Yemetu, Ibadan North LGA, Oyo State, Nigeria. Established in 1928, the hospital serves as a referral centre for many communities in southwestern Nigeria, offering comprehensive care services, including antenatal and postnatal care, family planning, immunization, and a PEPFAR clinic for HIV/AIDS management. The study targeted HIV-positive women of childbearing age (15–45 years), including pregnant women and nursing mothers attending the ART clinic at Adeoyo Maternity Teaching Hospital.

Sampling Techniques

Adeoyo Maternity Teaching Hospital was purposively selected due to its status as a referral center for HIV/AIDS cases, with a diverse patient population. The sample size was determined using the Cochran formula: $n = \frac{Z^2 P(1-P)}{d^2}$ $n = \frac{1.96^2 \times 0.47 \times (1-0.47)}{0.05^2}$

Where:

- $Z = 1.96$ (standard normal variance)
- $P = 0.47$ (adherence rate from a previous study [20])
- $d = 0.05$ (margin of error)

The calculated sample size was adjusted using a finite population correction factor and a 10% non-response rate, resulting in a final sample size of 145 participants. A proportional allocation method was used to select HIV-positive pregnant women and nursing mothers.

Inclusion Criteria



1. HIV-positive women of childbearing age (15–45 years) who had been on ART for at least three months.
2. HIV-positive women of childbearing age (15–45 years) attending the ART clinic.

Data Collection Instruments: Quantitative Data: A structured, self-administered questionnaire incorporating the Morisky Medication Adherence Scale (MMAS-8) to measure adherence levels.

Procedure for Data Collection: Ethical clearance was obtained from the Oyo State Ethical Review Board, and written consent was secured from participants. Data were collected over one month by the researcher and two trained research assistants. Quantitative data were gathered through face-to-face administration of the questionnaire.

Reliability of Instruments: The reliability of the questionnaire was tested with a pilot study involving 10 HIV-positive pregnant women at the University College Hospital (UCH), Ibadan. Cronbach's alpha coefficient of ≥ 0.8 was considered acceptable.

Ethical Considerations: Participants' confidentiality and anonymity were upheld. Questionnaires bore no identifiers, and participation was voluntary, with the right to withdraw at any stage. The study's purpose and relevance were explained to participants before obtaining informed consent.

Data Management and Analysis:

Quantitative Data: Data were analysed using SPSS version 20. Descriptive statistics (frequencies, percentages, and means) were used to summarize variables, while inferential statistics (correlation, regression, and t-tests) were employed to test hypotheses.

1. Objective 1: Level of ART adherence was assessed using the adherence index and MMAS-8 scale.
2. Objective 2: Physiological factors were analysed using frequency distributions.
3. Objective 3: Psychological factors were assessed with a scoring system.
4. Objective 4 & 5: Care and support levels were categorized as "good" or "poor" and analysed descriptively.

Hypotheses Testing

1. Educational qualification and adherence: Cross-tabulated using correlation and regression analysis.
2. Marital status and adherence: Analysed with t-tests.

3. Family types and adherence: Examined using t-tests.

This comprehensive methodology ensured rigorous and systematic data collection and analysis to provide reliable insights into ART adherence among women living with HIV/AIDS.

Results

Table 1: Socio-demographic characteristics of respondents (n= 132)

Socio-demographic Variables	Freq	Percent
Educational Qualifications		
No education	10	7.6
Primary	34	25.8
Secondary	67	50.8
Tertiary	21	15.9
Ethnicity		
Yoruba	106	80.3
Hausa	10	7.6
Igbo	16	12.1
Religion		
Christian	84	63.6
Islam	48	36.4
Gross income per month in Naira		
0 - 20,000	44	33.3
20,001 - 40,000	58	43.9
40,001 - 60,000	21	15.9
60,001 - 80,000	8	6.1
80,001 - 100,000	1	0.8
Marital Status		
Single	12	9.1
Divorced/Separated	9	6.8
Married	95	72.0
Windowed	16	12.1
Occupation		
Farming	8	6.1
Trading	84	63.6
Artisan	16	12.1
Schooling	4	3.0
Civil Servant	20	15.2

Results from the study indicate that the greatest proportion of the participants, 50.8% were secondary graduates, 80.3% were Yoruba and 63.6% were Christians. Also, the greatest proportion of them, 43.9% earn between 20,001 and 40,000. Besides, 72.0% were married, 72% and 63.6% were traders.

Table 2 Adherence to antiretroviral therapy of the respondents

Skipped any medicine (in last 30 days)		
	Frequency	Percent
Yes, I have skipped	40	30.3
No, I haven't	92	69.7
Frequency of Missed Clinical appointment in last one month		
None	99	75
Once	18	13.6
Twice	15	11.4

Results from the study show that 30.3% have skipped any of their medicine in the last 30 days, and 36.4%. More so, 69.7% have never missed clinical appointments in the last one month.

Table 3: Regularities of Adherence to ART

Regularities of ART Adherence	Frequency	Percent
Levels of Adherence to ART		
Poor Adherence	5	3.8
Moderate Adherence	42	31.8
High Adherence	85	64.4
How often do you find difficult in remembering taking ART Medication?		
All the time	10	7.6
Sometimes	6	4.5
Once a while	20	15.2
Never	96	72.7

Results from the study indicates that 31.8% of the participants have moderate adherence to ART's, while 15.2% find it difficult to remember taking the ART medication occasionally.

Table 4: Causes of Missed ART pills by Participants in the Last 1 Month

Causes	Never		Rarely		Sometimes		Often	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
You wanted to avoid side effect	85	64.4	37	28	10	7.6	0	0.0
Sharing of ART with other family and friends	86	65.2	39	29.5	0	0.0	0	0.0
Religious beliefs	92	69.7	36	27.3	3	2.3	1	0.8
Not fully understanding ART and its requirements	91	68.9	34	25.8	6	4.5	1	0.8
Being away from home	87	65.9	38	28.8	6	4.5	1	0.8
Transportation problems of getting to clinic	87	65.9	31	23.5	13	9.8	1	0.8
Your pill was lost or stolen, or you were in transit	94	71.2	34	25.8	3	2.3	1	0.8
You had too many pills	88	66.7	40	30.3	3	2.3	1	0.8
You had a bad event that you felt was related to the antiretroviral pills	83	62.9	45	34.1	4	3	0	0.0
You forget	74	56.1	39	29.5	18	13.6	1	0.8
You ran out of pills	82	62.1	43	32.6	7	5.3	0	0.0
You did not have enough food to eat to take your pill	86	65.2	38	28.8	12	9	3	2.3
Concerned that ART will work so well that you will lose public financial support	91	68.9	37	28	3	2.3	1	0.8
You felt ART was toxic and harmful	92	69.7	33	25	6	4.5	1	0.8
Your pills got damaged by heat or by getting wet	89	67.4	40	30.3	3	2.3	0	0.0



Causes	Never	Rarely	Sometimes	Often
You were too ill to attend clinic visit to collect medication	88	66.7	42	31.8
You were bothered by your dreams	89	67.4	39	29.5

Results from the study indicates that 7.6% of the respondents sometimes miss their pills because they wanted to avoid side effects, 4.5% of the participants respectively, missed their pills because they had to share ART with other family and friends, they do not fully understand ART and its requirements, and they were away from home. Also, 9.8% had transportation issues and could not get to the hospital. However, forgetfulness was the most common reason for missing the pills, at 13.6%.

Table 5: Experience of Side Effects as contributing to Physiological factor to non-adherence to ART of the respondents.

Side Effects experienced by Clients	Yes		No	
	Freq.	%	Freq.	%
Skin rash	64	48.5	68	51.5
Nausea	64	48.5	68	51.5
Diarrhea	42	31.8	90	68.2
Depression	41	31.1	91	68.9
Anemia	72	54.5	60	45.5
Fatigue	75	56.8	57	43.2
Headache	44	33.3	88	66.7
Fever	40	30.3	92	69.7
Restlessness	40	30.3	92	69.7

Results from the study show that 48.5% of the participants experienced skin rash and nausea, 31.8% experienced diarrhea, and 54.5% experienced anemia, while 56.8% experienced fatigue.

Table 6: Psychological Factors contributing to non-adherence of the respondents to ART.

Psychological Factors	Always		Sometime		Never	
	Freq.	%	Freq.	%	Freq.	%
Fears about other people knowing your HIV status	13	9.8	68	51.5	51	38.6
In the past month, had persistent feelings of sadness that you can't just control	6	4.5	59	44.7	67	50.8
In the past month, had persistent feelings of hopelessness in past month	0	0.0	53	40.2	79	59.8
Do feel like being alone	0	0.0	51	38.6	81	61.4
In the past month, have lost interest in your pleasurable things	0	0.0	48	36.4	84	63.6
Felt confused in the past month	0	0.0	49	37.1	83	62.9
Feel that life is too difficult	5	3.8	37	28	89	67.4
Felt quite unimportant	5	3.8	38	28.8	89	67.4
Been a victim of discrimination due to HIV status	0	0.0	39	29.5	93	70.5

Results from the study indicates that 51.5% of the respondents sometimes have fears about disclosure of their HIV status and 44.7% have had persistent feelings of sadness, while 40.2% have had persistent feelings of hopelessness in the past one month. More so, 29.5% have sometimes been discriminated against.



Table 7: Physiological and Psychological Factors Influencing Adherence to ART

Factors	Frequency	Percent
Physiological Factors		
No Effect	16	12.1
Negative Effect	116	87.9
Psychological Factors Group		
No Psychological Symptom	51	38.6
Mild Psychological Symptom	77	58.3
Severe Psychological Symptom	4	3.0

Table 7 shows that majority (87.9%) of respondent's experienced negative effects from the drugs while (12.1%) experienced no side effect from ART. More than half of the respondents (58.3%) experienced mild psychological symptoms, (38.6%) did not experience any psychological symptom while (3 %) experienced severe psychological symptoms

Table 8: Participants' Views on Services Received at the Clinic

On ART Centre	Yes		No	
	Freq.	%	Freq.	%
Do you feel listened to?	128	97	4	3
Are you treated with respect?	129	98	3	2.3
Did you participate in an HIV/ART structured treatment preparation session before you started taking your ARTs?	128	97	4	3
Are you given the chance to state your problems and ask questions	125	95	7	5.3
Do you feel you can trust the health workers	121	92	11	8.3
Do you have privacy during consultation and counselling?	127	96	5	3.8
Were you satisfied with the clinic environment	120	91	12	9.1
Are you satisfied with the facilities of the clinic	121	92	11	8.3
Do the health workers provide enough information about your disease?	131	99	1	0.8

Table 8 shows participants' views on services received at the clinic. Results from the study indicates that the greatest proportion of the respondents, 97% feel listened to, 98% feel treated with respect, and 97% participated in an HIV/ART structured treatment preparation session before they started taking your ARTs. Also, 92% of the respondents feel they can trust the health workers and are satisfied with the facilities of the clinic respectively

Table 9: Rating of Service Received by Participants

Types of Service	Frequency	Percent
Poor Services	1	0.8
Good Services	131	99.2
Total	132	100

Table 9 shows that the greatest proportion of respondents (99.2%) rated the hospital services as good while (0.8%) rated the services as poor.



Table 10: Family and Community Supports to women of childbearing age with HIV/AIDS.

Family and Community Supports	Frequency	Percent
Who did you disclose your HIV Status to		
Spouse	60	45.5
Counsellors	3	2.3
Parents/siblings/relatives	44	33.3
Community	1	0.8
Nobody	24	18.2
Who accompanies you to the hospital/clinic		
Spouse	57	43.2
Friend	15	11.4
Mother	51	38.6
Others	9	6.8
What facilitates you in your ARVs adherence		
Consistent reminders (i.e. alarm clock, radio)	43	32.6
Pill box	19	14.4
Clinic visits	51	38.6
Family support	15	11.4
Others	4	3.0
In what way did your partner help you to adhere		
Remind	53	40.2
Home visit from CHW/CHV HIV/ART	51	38.6
Educational	14	10.6
Other	14	10.6

Table 10 shows available family and community supports to Participants. Result from the study indicates that the greatest proportion of the participants, 45.5% disclosed their HIV status to their spouses, 43.2% of them also have their spouses accompanying them to the hospital. Also, 38.6% stated that clinic visits mostly remind them of taking their pills and 40.2% of them, had their partners remind them of taking the pills.

Table 11: Test of association between socio-demographic variables and degree of Adherence to ART among the participants

	Adherence to ART		Chi-sq.	Df	p	Remark
Educational Qualification	Low	High				
Not more than Primary Education	13 27.7%	31 36.5%	1.057	1	0.34	NS
At least Sec Education	34 72.3%	54 63.5%				
Marital Status	Low	High				
Single	10 21.3%	27 31.8%	1.650	1	0.23	NS
Married	37 78.7%	58 68.2%				



Type of family	Low	High				
Nuclear	34 72.3%	70 82.4%				
Joint	13 27.7%	15 17.6%	1.815	1	0.19	NS

Key: Chi-sq. = df = degree of freedom, p = level of significance, NS = Not Significant

Table 11 shows that, there was no statistically significant association between educational qualification and degree of adherence to ART among the participants (Chi-sq. = 1.057, df = 1, $p > 0.05$). There was no statistically significant association between marital status and degree of adherence to ART among the participants (Chi-sq. = 1.650, df = 1, $p > 0.05$). Also, there was no statistically significant association between the family type and degree of adherence to ART among the participants (Chi-sq. = 1.815, df = 1, $p > 0.05$).

Discussion

Adherence to anti-retroviral therapy is the bedrock of HIV treatment in Nigeria. It is therefore important to continually promote its use especially among women living with HIV/AIDS in Nigeria. All women engaged in the study were women of reproductive ages with mean age 34years. The educational attainment of respondents revealed that the greatest proportion (50.8%) had secondary education as their highest point of study.

The findings of this study revealed that majority of the respondents had high level of adherence which can be comparable with findings from other studies conducted locally in North-central Nigeria which showed (88%)⁶. A 31.8% suboptimal adherence found in this study is comparable to that which was found from the study done in Ethiopia and South Africa^{7,8,9}. A large proportion (72.9%) never forgets to take their ART medication, (69.9%) of the respondents stated they did not skip any medication in the last 30 days which is in line with public health reports, also, it was found that (75%) of respondents strictly complied with appointment renewal of ART prescriptions^{10,11,12}. This however indicated that the level of adherence in this study is suboptimal, and this could be as a result of the (27.3%) of respondents who at times forgot to take their medication. In this study also, 87.9% of the respondents had negative effects of the medications while 12.2 % of them experienced no side effect from their ART. This could be a reason for suboptimal adherence to ART.

Results showed that more than half of the respondents (56.8%) experienced fatigue and anaemia followed by (48.5%) who experienced skin rash and nausea in relation to this, this however is similar to findings from a cohort study¹³ that reported that more than half of the respondents had anaemia after the pill use. From the qualitative responses also, skin rash was identified as a side effect. In contrast to findings from this study, some responses from the FGD stated that they had no side effect whereas findings from^{9,14} identified diarrhoea and vomiting as the most common side effect of ART, which negates findings from this study. A significant number of women of childbearing age (73.6%) in this study were placed on Tenofovir, Lamivudine, and Dolutegravir (T.L.D); In respect to this, it has been reported that T.L.D is less associated with hepatic toxicity¹⁵. This could be a reason why it is mostly a preferred choice by caregivers.

More so, findings from this study showed that more than half of the respondents (58.3%) had mild psychological symptoms while 38% of them had no

psychological symptoms at all. The study established that 68% of respondents sometimes was afraid of people discovering their HIV status. This is like findings from⁴, which further stated that this could result in tendency to isolate themselves thus leading to feeling of depression, anger and suicide. As seen in this study also, 44.9% indicated they have persistent feeling of sadness that one could not just control while 40.2% of the respondents had persistent feeling of hopelessness in the past one month as a result of their HIV status. In addition, findings from this study revealed that majority of respondents (99.2%) stated that the hospital services were good, respondents stated they were well listened to at the clinic, were treated with respect, they could trust the health care workers and were given adequate information¹⁶. However, findings from the study on determinants of adherence to antiretroviral therapy among HIV-positive adults showed that there was dissatisfaction from health care facility and health care workers in Sub-Saharan Africa¹⁷ is in contrast with findings from this study.

Educational qualification was not independently associated with ART adherence which is in line with findings that stated that factors such as educational attainment and marital status have shown inconsistent results in predicting adherence according to^{8,18}. This is surprising because higher levels of educational qualification are expected to facilitate better communication between the patient and the health care workers and as a result increase retention of information provided by the health worker.

There was no significant association between the various family types of women and their adherence levels which is in contrast with findings from a systemic review¹⁹. A significant number of participants stated that they got no support from the community. Negative reactions from community members make patients withdraw entirely from any contact with the community and rely entirely on support from family members⁴.

Implications of findings

The findings of this study underscore the need for concerted efforts by international organizations, governments, and other stakeholders to enhance the quality of healthcare provided to women of childbearing age living with HIV/AIDS. Achieving this goal requires targeted strategies to mitigate the adverse effects of HIV/AIDS and mother-to-child transmission (MTCT) on women and their children. Central to this is ensuring optimal adherence to antiretroviral therapy (ART). Although nurses are not solely responsible for providing comprehensive support to women with HIV/AIDS,



they play a crucial role in facilitating adherence to ART. This can be achieved by advocating for these women and mobilizing support from policymakers and stakeholders.

Given the expectation for women with HIV/AIDS to adhere strictly to their ART regimens, nurses should prioritize educating them on the importance of adherence. Intensive health education and counselling by skilled nurses and midwives are essential to achieve this. Consequently, hospital policies should be revised to include in-service training for nurses and midwives, equipping them to provide regular and effective health education and counselling in HIV clinics.

Conclusion

Majority of patients in this study were satisfied with the hospital services rendered and had good support from families. However, fatigue, anaemia, skin rash and nausea were identified as the side effects that contributed to non-adherence, also fears of people knowing their status, distance from the clinic, poor community support and sometimes inadequate food are all contributing factors associated with non-adherence. Beyond targeted training programs, there is a necessity for systemic interventions that address the social, psychological, and cultural factors influencing adherence. Stakeholders, including policymakers, healthcare providers, community leaders, and support networks, must collaborate to create supportive environments, reduce stigma, and ensure access to resources. This study highlights the importance of tailored interventions that account for unique demographic and psychosocial dynamics, ultimately contributing to global efforts to reduce HIV/AIDS prevalence and improve the quality of life for those affected. Providing social and economic support, strengthening community acceptance through sensitization, and enhancing healthcare services via professional training and adherence monitoring are critical for improving the quality of life and ART adherence among women living with HIV/AIDS.

Declarations

Ethical Consideration: Participants' confidentiality and anonymity were upheld. Questionnaires bore no identifiers, and participation was voluntary, with the right to withdraw at any stage. The study's purpose and relevance were explained to participants before obtaining informed consent. Approval for the study was sought from the Oyo State Ministry of Health and from Adeoyo Maternity Teaching Hospital ethical review

committee. Ethical principles of confidentiality, beneficence, non-maleficence to participants and voluntariness were adhered to.

Author contributions

Grace C. Ibezimuoh: Conceptualization of the study, study design, data collection, analysis, and manuscript drafting.

Grace Ademuyiwa: Methodology development, data validation, statistical analysis, and manuscript review.

Ikenna Ojiegbe: Literature review, and data interpretation.

Miracle C. Ndikom: Supervision, and revision of the manuscript

Chizoma M. Ndikom: Study oversight, ethical approval coordination, final manuscript review, and expert guidance

Conflict of Interest: Authors declare no conflict of interest

Funding This research was not funded by any agency or organization

Acknowledgement: We sincerely express our gratitude to all individuals and institutions that contributed to the successful completion of this research.

First and foremost, we extend our deepest appreciation to the women living with HIV/AIDS who participated in this study. Their willingness to share their experiences and insights was invaluable in enriching our understanding of adherence to antiretroviral therapy. We also acknowledge the staff and administration of Adeoyo Maternity Teaching Hospital in Ibadan, Nigeria, for their cooperation and support during the data collection process. Their assistance facilitated smooth access to necessary information and participants. Our heartfelt thanks go to the Department of Nursing, College of Medicine, University of Ibadan for providing the resources and enabling environment that made this research possible. Finally, we are grateful to our mentors, colleagues, and families for their unwavering encouragement, guidance, and support throughout this research journey.

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