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Factors Affecting Adherence to Antiretroviral Therapy Among People Living with HIV/AIDS in Nyakitunda Sub-County Isingiro District

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Abstract:

HIV remains a global public health challenge, with ART adherence below the UNAIDS 95% target. In Uganda, adherence averages 88%, and Western Uganda reports lower rates in children (79%) and adolescents (89%). Factors influencing adherence in Nyakitunda Sub-County, Isingiro District, are undocumented. This study assessed knowledge, socio-economic, and health facility determinants of ART adherence.

A cross-sectional mixed-methods study involved 154 ART clients (stratified random sampling) and 15 health workers (purposive sampling). Quantitative data were analyzed using Stata 18 at univariate, bivariate, and multivariate levels; qualitative data underwent thematic content analysis.

ART adherence was 91%, with 95% of clients having adequate knowledge. Socio-economic barriers included financial constraints (68%), limited healthcare access (64%), and fear (67%), while education (74%) and self-motivation (69%) facilitated adherence. Quality counselling (AOR=7.06, p=0.001) and departmental coordination (AOR=5.43, p=0.045) improved adherence, whereas long waiting times (72.7%) and missed appointments (AOR=7.62, p=0.002) hindered it.

High adherence coexisted with persistent socio-economic and health system barriers. Targeted interventions to improve counselling, reduce delays, ensure drug supply, and address financial constraints are critical for sustaining ART adherence in rural Uganda.

Keywords — **HIV/AIDS, Adherence, Antiretroviral Therapy, People Living with HIV.**

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I. INTRODUCTION

HIV/AIDS remains a significant global public health concern, with an estimated 38 million people living with HIV (PLHIV) (UNAIDS, 2020). Optimal adherence to antiretroviral therapy (ART) defined as taking at least 95% of prescribed doses is essential for viral suppression, prevention of drug resistance, and reduced HIV transmission (WHO, 2024; Bezabhe et al., 2016). However, adherence is often compromised, particularly among individuals with mental disorders, who experience additional barriers such as stigma, substance use, and limited clinical follow-up (Arashiro et al., 2023; Williams et al., 2021). In sub-Saharan Africa, which bears 67% of the global HIV burden, adherence challenges remain a major obstacle to achieving epidemic control (UNAIDS, 2019).

This study was guided by the Socio-Ecological Model (SEM) (Bronfenbrenner, 1979), which explains that health behaviors are shaped by multiple, interacting levels of influence: individual, interpersonal, community, organizational, and societal. In the context of ART adherence, these levels encompass personal factors (knowledge, attitudes, risk perception), social networks (family and peer support), community norms, healthcare facility practices, and broader policy environments. The SEM is particularly relevant in resource-limited settings where structural and social determinants strongly influence treatment outcomes.

ART adherence is the degree to which a person's behavior aligns with prescribed treatment regimens, including timing, dosage, and frequency (Vixens et al., 2012). WHO (2016) defines optimal adherence as ⩾95% of prescribed doses taken. Sub-optimal adherence accelerates disease progression, increases healthcare costs, and contributes to ART resistance (Do et al., 2013).

Globally, ART coverage has expanded from 100,000 people in 2003 to 27.5 million in 2020 (WHO, 2020). Despite this progress, retention in care and adherence remain suboptimal in many low-income countries, with 24-month retention rates in Africa at only 70% (Abebe Moges et al., 2020). In Uganda, ART coverage reached 67% for adults and 47% for children by 2016, with viral suppression rates just under 60% (UNAIDS, 2019). Local studies highlight barriers including poverty, transport costs, food insecurity, stigma, non-disclosure, and health system inefficiencies (Arinaitwe et al., 2021).

In Nyakitunda Sub-County, Isingiro District, ART adherence is hindered by psychological distress, stigma, long distances to health facilities, and missed appointments, despite the availability of free medication. Limited data exists on the interplay between knowledge levels, socio-economic status, and health facility practices in influencing adherence in this rural setting.

II. METHODS

Study Design

A cross-sectional mixed-methods design was employed to assess factors influencing ART adherence among PLHIV in Isingiro District. Quantitative surveys captured prevalence and patterns, while qualitative interviews explored in-depth perspectives from healthcare providers.

Study Area

The research was conducted in Nyakitunda Sub-County, Isingiro District, Western Uganda an area with a high HIV prevalence (12.5%, DHIS2 2024). Four MOH-accredited public health facilities, representing urban to rural settings, were purposively selected for their high patient volumes and ART service coverage.

Study Population

Participants included adult ART clients (≥18 years) with documented missed appointments, poor adherence, or treatment default, as well as healthcare workers involved in ART delivery. Defaulters were defined as clients absent from clinic for ≥2 consecutive months.

Sampling Procedures

Quantitative participants (n=154) were selected via stratified random sampling from ART clinic registers, while qualitative participants (n=15 healthcare workers) were purposively chosen for their ART service experience. This dual approach ensured diverse patient and provider perspectives.

Sample Size Determination

Using Cochran's formula with 89% adherence prevalence (EGPAF, 2018), a sample size of 150 was calculated and adjusted to 160 to account for non-response. The final sample comprised 169 participants, including 154 clients and 15 healthcare workers.

Data Collection Methods

Quantitative data were obtained via structured questionnaires assessing demographic, socioeconomic, and facility-related adherence factors. Qualitative data were gathered through in-depth interviews with healthcare providers to capture experiential insights on adherence challenges.

Data Analysis

Quantitative data were entered into Excel, exported to STATA 18, and analyzed at univariate, bivariate, and multivariate levels using logistic regression to assess associations ($p<0.05$, 95% CI). Continuous variables were summarized as means; categorical variables as frequencies and percentages. Qualitative interview data were thematically analyzed through coding, categorization, and identification of emerging themes on ART non-adherence.

III. RESULTS

Table .1 Demographic characteristics of respondents

Variables	**Category (n=169)**		**Total**
	Clients(n=154) **n (%)**	**Health care Providers (n=15)** **n (%)**	**n (%)**
Gender			
Males	80 (52)	7(47)	87(51)
Female	74 (48)	8(53)	82(49)
Age Bracket			
18-29 years	13(8)	2(13)	15(9)
30-39 years	25(16)	3(20)	28(17)
40-49 years	77(50)	6(40)	83(49)
50 years and above	39(25)	4(27)	43(25)
Level of Education			
Primary	94(61)	0(0)	94(56)
Secondary	41(27)	0(0)	41(24)
Tertiary	13(8)	15(100)	28(17)
None	6(4)	0(0)	6(3)
Marital Status			
Married	109(71)	10 (67)	119(70)
Single	29(19)	3(20)	32(19)
Divorced	16(10)	2(13)	18(11)
Residence			
Urban	37(24)	4(27)	41(24)
Suburban	42(27)	5(33)	47(28)
Rural	75(49)	6(40)	81(48)

Among clients living with HIV/AIDS, 80 (52%) were male and 74 (48%) female, with half aged 40-49 years 78(51%). Most were married 109(72%), had primary education 94(61%), and resided in rural areas 75(49%). Healthcare providers were predominantly tertiary-educated (15, 100%), with 47% male and 53% female representation, and 40% aged 40-49 years.

Adherence of clients living with HIV/AIDS and their knowledge on adherence

Adherence Levels

Most clients, 95 (61.7%), demonstrated excellent adherence (98–100%), with 0-2 missed doses. Good adherence (96–97%) was seen in 25 (16.2%), average adherence (94-95%) in 15 (9.7%), fair adherence (90–93%) in 12 (7.8%), and poor adherence (<89%) in 7 (4.5%). Overall, 91% maintained adherence above 90%, reflecting strong treatment compliance.

Knowledge Levels

Excellent knowledge was reported in 95 (62%) clients, good knowledge in 25 (16%), and moderate knowledge in 15 (10%). Limited (fair)

knowledge occurred in 12 (8%), and very poor knowledge in 7 (4%). In total, 95% achieved at least moderate knowledge (score ≥3), indicating high awareness of ART adherence requirements.

Socioeconomic factors affecting adherence to antiretroviral therapy

Table .2: Socioeconomic factors affecting adherence to antiretroviral therapy (n=154)

Variable	n(%)
Financial Situation of Clients	
Difficulty affording transportation to health facilities for ARV refills	104(67.5)
Difficulty in accessing antiretroviral medication	50(32.4)
Accessibility of healthcare facilities affects adherence to ARVs	
Poor attendance at regular medical appointments	24(15.6)
missed appointments for ARVS	98(63.6)
Delayed refills	32(20.8)
Support From Your Family	
Receives emotional support from family to stay on treatment	106(68.8)
Family encouragement helps in keeping clinic appointments and taking medication as prescribed	48(31.2)
Cultural beliefs on HIV/AIDS	
Cultural myths and misconceptions about HIV/AIDS negatively influence ART adherence.	101(65.6)
Cultural stigma and fear of being judged affect patients' willingness to continue treatment	53(34.4)
Availability of educational resources or counseling on HIV/AIDS	
Improves understanding and knowledge	114(74.0)
Provides information on HIV/AIDS and treatment	40(26.0)
Access to healthcare coverage	
Ease of use to continue with ARV adherence.	39(25.3)
Indirect financial burdens associated with accessing ARVs	115(74.7)

Financial constraints were the most cited barrier, with 104 (68%) clients reporting difficulty affording transport for ART refills and 115 (75%) facing indirect costs related to treatment access. Healthcare access challenges were noted by 98 (64%), while fear of taking ARVs was reported by 101 (67%). On the positive side, emotional support from family was experienced by 106 (69%), and 114 (74%) indicated that educational resources and support improved their understanding, encouraging adherence.

The health facility-based factors affecting adherence to antiretroviral therapy by HIV/AIDS clients

Table .3: Association between clients Adherence and health facility factors affecting adherence

Variable	Adjusted OR	Std. Err	P-value	95% CI
Healthcare Personnel Attitude				
No effect	1.00			
Negatively affects adherence	0.31	1.93	0.872	(0.03 - 62.4)
Motivates adherence	0.99	0.73	0.989	(0.23 - 4.20)

Accessibility of Health Facility				
Encourages clients	1.00			
Inaccessibility to facility	0.50	2.32	0.829	(0.02 – 16.69)
Convenient location	0.85	0.52	0.791	(0.26 - 2.79)
Quality of Counseling/Education				
Lack of commitment	1.00			
Well-informed during counseling	8.41	3.63	0.024	(1.19 - 15.62)
Clear education demonstration	43.94	86.99	0.056	(0.91 – 21.28)
Coordination/Communication Among Departments				
Poor communication	1.00			
Coordinated departments positively impact	6.22	4.99	0.063	(1.29 - 30.01)
Good coordination supports outcomes	9.20	6.64	0.003	(7.02 - 33.37)
Inaccessibility of Health Centre				
Challenging appointments	1.00			
Missed ARV appointments	7.62	2.39	0.002	(2.87 - 12.36)
Irregular adherence	8.35	8.64	0.989	(0.54 - 21.08)
Individual Beliefs on ARVs				
Lack of willingness	1.00			
Fear affects adherence	0.07	0.09	0.052	(0.005 - 1.03)

Logistic regression identified key determinants of adherence. Quality counselling significantly increased adherence, with well-informed clients more likely to adhere (AOR = 8.41, 95% CI [1.19–15.62], p = 0.024). Good coordination among departments also positively influenced adherence (AOR = 9.20, 95% CI [7.02–33.37], p = 0.003). Conversely, missed ARV appointments were strongly associated with reduced adherence (AOR = 7.62, 95% CI [2.87–12.36], p = 0.002), and fear of ARVs showed a borderline negative effect (AOR = 0.07, 95% CI [0.005–1.03], p = 0.052). Other factors, including healthcare personnel attitudes and facility accessibility, were not statistically significant (p > 0.05). Some wide confidence intervals, such as for facility inaccessibility (AOR = 0.50, 95% CI [0.02–166.9]), indicate imprecision likely due to sample size. These results underscore the importance of client education, effective departmental coordination, and appointment adherence in optimizing ART outcomes.

Health Worker Perspectives on ART Adherence

Interviews with 15 healthcare providers revealed strong knowledge of adherence monitoring

through pill counts, appointment tracking, counseling, and viral load checks. Providers emphasized using simple language and visual aids to educate clients:

"*We monitor adherence by counting the remaining tablets during refill visits; if a client has more than 10 left, it raises a red flag*." (Clinical Officer, Facility B)

"*I conduct monthly adherence counseling and use a visual adherence chart to track missed doses.*" (Nurse, Facility D)

"*Education level of the client is important…we explain using simple language to ensure they know what adherence means*." (Nurse, Facility C)

Health Facility Resources

Staff highlighted constraints including insufficient personnel, limited counseling space, irregular ARV supply, power outages, and inadequate transport for client follow-up:

"*Sometimes ARVs delay at the central store, and we are forced to give clients fewer tablets than required."* (Pharmacist, Facility B)

"*There are days we have only two staff managing over 100 clients, how do you expect quality service?"* (Nurse In-Charge, Facility D)

"*We lack bicycles or fuel to trace missed clients in the villages. This leads to many dropping out.*" (VHT Liaison Nurse, Facility C)

Causes of Poor Adherence

Health workers identified stigma, discrimination, misinformation, substance use, and family neglect as major barriers

"*Clients hide their medications or skip doses because they fear being seen by family members*." (ART Counselor, Facility D)

"*One woman told me she was chased from home when her husband learned she was HIV-positive*." (Nurse, Facility A)

IV. DISCUSION

Client Knowledge and ART Adherence

This study found that the majority of clients living with HIV/AIDS (91%) demonstrated excellent knowledge of ART adherence, with 95% scoring at least moderate knowledge (≥3), reflecting a generally high awareness of HIV treatment**.** These findings are consistent with prior research indicating that effective counselling and health literacy interventions significantly enhance patients' understanding of adherence behaviours (Perazzo, Reyes & Webel, 2017). Moreover, targeted health worker training in HIV care facilitated the transfer of knowledge, particularly among clients with at least primary education who were better able to comprehend counselling messages (Chang et al., 2021).

Nonetheless, 9% of clients continued to exhibit poor adherence, highlighting that knowledge alone is insufficient to ensure compliance. Structural and socioeconomic barriers including limited medication access, transportation challenges, and financial constraints remain critical determinants of adherence outcomes (Bou Malhab et al., 2023). These results underscore the dual importance of maintaining robust client education and counseling programs while simultaneously addressing systemic and structural obstacles that may compromise adherence.

Socioeconomic factors

The study identified financial constraints as a major barrier to ART adherence, with 68% of clients reporting difficulty affording transport to health facilities. This aligns with previous findings that limited financial resources significantly hinder clients' ability to attend appointments consistently (Nkattingi & Tshivhase, 2023).

Accessibility challenges were further compounded by missed or delayed clinic visits (64%), reflecting broader deficiencies in healthcare infrastructure and personnel in rural areas (Coombs et al., 2022). Fear of taking ARVs affected 65% of clients, often driven

by stigma, mistrust of healthcare providers, and limited social support networks (Okello et al., 2025).

On a positive note, 74% of clients reported that educational resources and support systems enhanced their adherence knowledge, with modern digital tools including SMS reminders, mobile applications, and social media platforms facilitating improved information dissemination and patient engagement. Overall, these findings indicate that while socioeconomic and psychosocial barriers such as cost, access, and stigma impede adherence, targeted education and digital interventions can effectively mitigate some of these challenges, promoting sustained treatment compliance.

Health System Factors Facilitating ART Adherence

The study found that motivated and supportive healthcare workers significantly enhanced ART adherence, with over 65% of clients reporting better adherence when attended by responsive staff, compared to only 8% when staff motivation was low. This is consistent with prior research highlighting that respectful and attentive healthcare providers are key enablers of adherence (Apuulison et al., 2025).

Facility-level factors, including convenient location (64%) and consistent ARV availability (78%), further facilitated treatment compliance, underscoring the importance of accessible and well-resourced services (Wedajo et al., 2022). High coordination and communication among healthcare providers also supported adherence, benefiting 78% of clients.

Quality counseling and education proved particularly influential, with 90% of clients reporting improved treatment commitment, consistent with findings by Pius et al., (2021). Education level played a significant role: clients with at least primary education were 15.5 times more likely to adhere than those without formal education (OR = 15.5, p = 0.010), echoing Kajeguka et al. (2018) on the link between comprehension of health information and treatment compliance. Additionally, clients who were well-informed during counseling were 7.1 times more likely to adhere (OR = 7.06, 95% CI: 2.78–11.34, p = 0.001), supporting Damulak et al. (2021), who showed that counseling empowers clients to express concerns and enhances adherence. These findings underscore the pivotal role of healthcare worker engagement, structured counseling, and effective facility organization in promoting optimal ART adherence.

CONCLUSION

The study demonstrated high ART adherence (91%) and knowledge (95% scored ≥3) among clients in Isingiro, reflecting strong treatment compliance and awareness. Nonetheless, a minority still exhibited poor adherence and limited knowledge. Socioeconomic barriers, including financial constraints, healthcare accessibility, and fear, hindered adherence, whereas education and self-motivation supported it, with primary education emerging as a key predictor. Quality counseling, patient education, and effective departmental coordination significantly enhanced adherence, while long waiting times and missed appointments reduced it. Overall, well-informed counseling and basic education were critical determinants of successful ART adherence.

V. ETHICAL APPROVAL AND CONSENT

Ethical approval for the study was obtained from Bishop Stuart University Research Ethical committee (BSU-REC-2023-88) and permission was granted by the District Health Office and heads of the selected health facility. Informed consent was obtained from all participants, who were assured of voluntary participation, the right to withdraw at any time, and confidentiality of their information.

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