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Beyond the Pill: Psychosocial and Behavioural Predictors of ART Non-Adherence Following the Single-Tablet Regimen Transition in Yaoundé, Cameroon

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Abstract

Achieving the UNAIDS 95-95-95 targets depends on optimal adherence to antiretroviral therapy (ART). While Cameroon transitioned to simplified Dolutegravir-based Single-Tablet Regimens (STR), the impact on adherence relative to Multiple-Tablet Regimens (MTR) remains to be elucidated. This hospital-based cross-sectional study among 680 participants at Yaoundé Jamot Hospital quantified adherence using a modified CPCRA 7-day recall and CASE Adherence Index. Results indicated an optimal adherence prevalence of 79.7% (95% CI: 76.4–82.7%) for the 7-day recall and 80.9% for the CASE Index. No significant difference in adherence was observed between STR and MTR users ($p = 0.494$). Multivariable modified Poisson regression revealed that lack of family support was the strongest predictor of non-adherence (aPR: 1.407, 95% CI: 1.203–1.646; $p < 0.001$). Other significant factors included depressive symptoms (aPR: 1.257, 95% CI: 1.036–1.525) and risky alcohol consumption (aPR: 1.158, 95% CI: 1.096–1.224). These findings suggest that in the era of simplified regimens, adherence is driven primarily by psychosocial and behavioural determinants rather than physical drug complexity. To bridge the final 20% gap, interventions must prioritize family support systems and mental health screening alongside pharmacological simplification.

Keywords: *Alcohol, ART Adherence, Cameroon, CASE Index, Dolutegravir, Single-Tablet Regimen.*

Introduction

The global effort to end the Human Immunodeficiency Virus (HIV) epidemic is currently guided by the Joint United Nations Programme on HIV/AIDS (UNAIDS) 95-95-95 targets [1]. These goals aim for 95% of people living with HIV (PLHIV) to know their status, 95% of those diagnosed to receive antiretroviral therapy (ART), and 95% of those on ART to achieve durable viral suppression. While the first two targets rely on health system infrastructure and diagnostic reach, the third target (viral suppression) is fundamentally dependent on optimal medication adherence [2]. Historically, an adherence threshold of ≥95% was considered the gold standard to prevent virologic failure and the emergence of drug resistance [3]. In sub-Saharan Africa, and specifically in Cameroon, the landscape of HIV treatment has undergone a significant transformation. In 2020, Cameroon transitioned to Dolutegravir (DTG)-based Single-Tablet Regimens (STR) as the standard first-line therapy. This programmatic shift was predicated on the assumption that reducing the "pill burden" from traditional Multi-Tablet Regimens (MTR) would automatically resolve adherence challenges [4]. However, clinical evidence suggests that the transition to

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simplified regimens does not occur in a vacuum; patients continue to face a myriad of psychosocial and structural barriers that can impede their ability to maintain treatment consistency.

The programmatic transition to Dolutegravir (DTG) in Cameroon was part of a broader continental shift toward more potent antiretroviral regimens. In 2019, the World Health Organization recommended DTG as the preferred first-line agent due to its superior efficacy and high genetic barrier to resistance compared to older NNRTI-based regimens [5]. Regional evidence from the NAMSAL ANRS 12313 trial conducted in Cameroon demonstrated that DTG-based therapy was non-inferior to low-dose Efavirenz, showing rapid viral load suppression even in patients with high baseline viremia [6]. Similar findings across sub-Saharan Africa, such as the ADVANCE trial, confirmed that the single-tablet TLD (Tenofovir/Lamivudine/Dolutegravir) combination significantly reduced pill burden and improved clinical outcomes [7]. Despite these pharmacological milestones, the "pill-centric" transition assumes that clinical efficacy translates directly into behavioural consistency, an assumption challenged by emerging data suggesting that social drivers remain the primary gatekeepers of long-term success [8]. Clinical observations in high-volume centers suggest that a significant proportion of patients continue to struggle to reach the 95% adherence threshold. While DTG is noted for its high genetic barrier to resistance, sub-optimal adherence remains the primary pathway to treatment failure and the potential development of secondary drug resistance [2]. Previous studies in Cameroon have established that pharmacological simplification may address the physical burden, but it does not necessarily mitigate behavioural barriers such as depression and substance use [9].

In the clinical management of HIV, adherence is defined as taking 95% - 100% of the right drug, in the right way, at the right time, and in the right dose. Adherence requires an informed choice, a relationship of trust between the patient, their family or peers, and the care provider, and the implementation of evaluation procedures for better monitoring of patients on ART [10]. It is the consistent commitment to an antiretroviral therapy (ART) regimen. This requires patients to take their medications every day, exactly as prescribed, and maintain regular attendance at all scheduled medical appointments. Historically, researchers like Chesney and colleagues established that although taking the medication correctly is essential for viral suppression, remaining "retained in care" through clinic visits is equally critical for long-term health, and a 95% threshold of dose consistency was necessary for treatment success [11].

Despite this clear framework, adherence in Cameroon remains vulnerable to structural inequities; recent evidence from the Cité des Palmiers District Hospital indicates that nearly half of patients struggle to be consistent due to service-related barriers and medication-related discomfort [12]. Furthermore, the ongoing sociopolitical instability in the Northwest and Southwest regions has introduced unique disruptions to the national supply chain, forcing involuntary treatment interruptions and displacing patients into urban centers like Yaoundé, which strains local healthcare delivery [13]. These factors suggest that achieving the 95-95-95 targets requires a resilient healthcare infrastructure, particularly regarding transport accessibility, supply chain stability, and economic support that goes beyond the pharmacological benefits of drug simplification [14].

In Cameroon, where HIV prevalence, although experiencing a decreasing trend over the years, remains significant at 2.7% [15]. The specific factors influencing adherence during the national STR transition have not been fully elucidated in a large-scale clinical cohort [3]. Most existing literature focuses on biological

outcomes such as viral load suppression rates, leaving a gap in understanding the underlying behavioural and social drivers that persist even when treatment is simplified to a single pill per day [8]. There is an urgent need to identify whether the barriers to adherence in the modern treatment era are clinical, behavioural, or psychosocial in nature [16]. This study aims to evaluate the prevalence of ART adherence among adults at the Yaoundé Jamot Hospital and identify the independent predictors of non-adherence in Cameroon's STR era. By identifying these persistent barriers, this research seeks to inform a more patient-centred model of care that addresses the human side of the HIV response.

Materials and Methods

Study Design and Setting

This research utilized a hospital-based, analytical cross-sectional design. This design facilitated the simultaneous assessment of ART adherence prevalence and the identification of clinical, behavioural, and psychosocial associations at a single point in time during Cameroon's transition to Dolutegravir-based Single-Tablet Regimens (STR). The study was conducted at the Yaoundé Jamot Hospital (HJY), a premier tertiary referral center in Cameroon's capital. HJY's Care and Treatment Center (CTA) is one of the highest-volume HIV facilities in the Centre Region, serving a socio-demographically diverse urban and peri-urban population. The facility operates under the National AIDS Control Committee (NACC) framework, providing integrated pharmacological management, psychosocial counselling, and routine viral load monitoring.

Study Population and Eligibility Criteria

The target population consisted of adults living with HIV (PLHIV) currently receiving antiretroviral therapy at HJY. To be eligible for inclusion, participants had to be aged 21 years or older, have been on ART for at least six months to ensure established treatment patterns, and provide written informed consent. Patients were excluded from the study if they presented with severe cognitive impairment or were clinically too ill to complete the interview process, as these factors could compromise the reliability of the self-reported data.

Sample Size Determination and Sampling Technique

The sample size was determined using a dual-methodological approach to ensure adequate statistical power for both prevalence estimation and multivariable modelling. Initially, the Lorentz formula was used to determine minimum prevalence requirements, which were then adjusted utilizing the Events Per Variable (EPV) criterion to maintain model stability and reduce the risk of overfitting. This adjustment considered candidate variables such as alcohol use, depression, and family support, resulting in a final robust sample size of 680 participants. A consecutive sampling technique was employed, where every eligible patient visiting the ART clinic during the study period was recruited until the target was reached.

Data Collection Procedures and Instruments

Data were collected using a structured, pre-tested questionnaire supplemented by clinical data, including the most recent viral load and current ART regimen types, extracted directly from patient clinical files. To ensure diagnostic and behavioural accuracy, the study utilized validated screening tools and standardized operational thresholds. The primary outcome, ART adherence, was cross-validated using the CPCRA 7-day Recall [17]and the CASE Adherence Index [18]. Optimal adherence was operationally defined as a score of ≥95% on the 7-day recall or a composite score >10 on the CASE Index. Agreement between these two measures was evaluated to ensure the reliability of self-reported data in the context of the transition to simplified regimens.

Behavioural and psychosocial risks were quantified using standardized instruments to identify independent predictors of treatment interruption. Depressive symptoms were screened using the Patient Health Questionnaire-2 (PHQ-2), where a score of ≥ 3 was identified as a threshold indicating a high probability of major depressive disorder [19]. Risky alcohol consumption was assessed via the AUDIT-C tool, with thresholds defined as a score of ≥ 3 for women and ≥ 4 for men [20]. Following the National AIDS Control Committee in Cameroon (NACC) guidelines for treatment monitoring, viral suppression was operationally defined as a viral load <1000 copies/mL and unsuppressed as a viral load >1000 copies/mL. These standardized metrics allowed for a robust analytical comparison between Single-Tablet Regimen (STR) and Multi-Tablet Regimen (MTR) users while controlling for psychosocial confounders.

Study Variables

The primary dependent variable for this study was ART adherence status, categorized as adherent or non-adherent. The independent variables comprised several domains, including socio-demographic factors such as age, sex, residence, educational status, and professional or marital status. Clinical and treatment-related variables included the duration of ART, current regimen type (STR vs. MTR), WHO clinical staging, and most recent viral load results. Finally, behavioural and psychosocial variables were assessed, focusing on risky alcohol use, the presence of depressive symptoms, HIV status disclosure, stigma, Healthcare worker relationship, perceived ART effectiveness, knowledge of ART, ART timing, medication side effects, clinic accessibility, and the level of perceived family or social support.

Data Management and Statistical Analysis

Data were processed and analysed using R Statistical Software (version 4.5.1). Descriptive statistics summarized the cohort, with categorical variables reported as frequencies and percentages, and continuous variables summarized as means with standard deviations or medians with interquartile ranges (IQRs), depending on the data distribution. Cohen's Kappa (k) was calculated to assess agreement between the CPCRA and CASE adherence tools. For the analytical phase, variables with $p < 0.05$ in bivariate analysis were included in a multivariable modified Poisson regression model with robust standard errors. This produced adjusted prevalence ratios (aPR), and diagnostic testing, including the generalized variance inflation factor (GVIF < 1.15), was conducted to verify statistical integrity and rule out multicollinearity.

Handling of Missing Data

Data completeness was assessed before analysis. Variables with missing values were examined to determine the extent and pattern of missingness. Overall, the proportion of missing data across key study variables was low (<5%). Given the minimal level of missingness and the cross-sectional nature of the study, a complete-case analysis approach was applied. Participants with missing data for specific variables were excluded only from analyses involving those variables and retained in all other analyses where data were complete. No statistical imputation was performed, as the low level of missing data was unlikely to introduce significant bias or compromise statistical power.

Results

Socio-demographic and Clinical Profile of Study Participants

The study enrolled a total of 680 participants. The mean age of the cohort was 42.8 years (SD ± 10.4), with the highest proportion of participants in the 41–50 age group (38.5%). As summarized in Table 1, the cohort was predominantly female (n = 458, 67.4%), and the majority were married or cohabiting (n= 430,

63.2%). Regarding clinical characteristics, 78.5% (n= 534) were on Single-Tablet Regimens (STR), and viral suppression (<1000 copies/mL) was 95.1% (n= 647). Anthropometric data indicated 57.9% of participants had a normal BMI, and over 36% were classified as either overweight or obese (See Table 1).

Table 1. Socio-Demographic and Clinical Characteristics of Study Participants

Characteristic	Category	Frequency (*n*)	Percentage (%)
Socio-demographic			
Sex	Female	458	67.4
	Male	222	32.6
Age Group (years)	21–30	85	12.5
	31–40	201	29.5
	41–50	262	38.5
	>50	132	19.4
Marital Status	Married/Cohabitating	430	63.2
	Single/Divorced/Widowed	250	36.8
Education Level	No Formal/Primary	118	17.4
	Secondary	415	61.0
	University/Tertiary	147	21.6
Employment Status	Employed/Self-employed	396	58.2
	Unemployed/Student	284	41.8
Residence	Urban (Yaoundé)	556	81.8
	Peri-urban/Rural	124	18.2
Anthropometric			
Body Mass Index (BMI)	Underweight (<18.5)	41	6.0
	Normal (18.5–24.9)	394	57.9
	Overweight (25.0–29.9)	161	23.7
	Obese (≥30.0)	84	12.4
Clinical			
ART Regimen Type	Single-Tablet (STR)	534	78.5
	Multi-Tablet (MTR)	146	21.5
Duration on ART	6 months – 2 years	129	19.0
	2 years – 5 years	258	38.0
	>5 years	293	43.0
WHO Clinical Stage	Stage I / II	592	87.1
	Stage III / IV	88	12.9
Viral Load Status	Suppressed (<1000 c/mL)	647	95.1
	Unsuppressed (≥1000 c/mL)	33	4.9

Prevalence of ART Adherence and Tool Comparison

The overall prevalence of adherence was 79.7% (n=542) according to the CPCRA 7-day recall and 80.9% (n=550) via the CASE Index. As detailed in Table 2, adherence rates were further analysed by specific regimen types: DTG-based STR, Other STRs (TELE), and Multiple Tablet Regimens (MTR). For the 7-day recall, adherence was 79.2% for DTG-based STR, 100.0% for TELE-based STR, and

80.2% for MTR. No statistically significant difference in adherence was found across these treatment groups (p = 0.494). Similarly, the CASE Index demonstrated adherence rates of 80.2%, 100.0%, and 81.8%, respectively, showing no significant variation by regimen type (p = 0.462). The agreement between the two adherence measurement tools was substantial, with a Cohen's Kappa of k = 0.768 (p < 0.001), as detailed in Table 4.

Table 2. Prevalence of ART Adherence and Measurement Tool Comparison

Adherence Measure	**Adherent *n* (%)**	**DTG-based STR (*n*=485)**	**Other STR (TELE) (*n*=8)**	**Multi-Tablet (MTR) (*n*=187)**	***p*-value**
7-Day Recall (CPCRA)	542 **(79.7%)**				0.494
Adherent (≥95%)		384 (79.2%)	8 (100.0%)	150 (80.2%)	
Non-Adherent (<95%)		101 (20.8%)	0 (0.0%)	37 (19.8%)	
CASE Index	550 **(80.9%)**				0.462
Adherent		389 (80.2%)	8 (100.0%)	153 (81.8%)	
Non-Adherent		96 (19.8%)	0 (0.0%)	34 (18.2%)	

Note: DTG= Dolutegravir, STR= Single Tablet Regimen, TELE= Tenofovir/Lamivudine/Efavirenz (single dose), MTR= Multi Tablet Regimen.

Table 3. CPCRA & CASE Index Concordance

Measurement Tool	**CASE Index Adherent(*n*)**	**CASE Index Non-adherent(*n*)**	**Total(*n*)**
7-day Recall Adherent(*n*)	**521**	21	542
7-day Recall Non-adherent(*n*)	29	**109**	138
Total(*n*)	550	130	**680**

Cohen's Kappa (k= 0.768 [95% CI: 0.706 – 0.829] p < 0.001)
Concordance: 92.65% (n=630), discordance: 7.35% (n=50).

Independent Predictors of Non-Adherence

Multivariable modified Poisson regression analysis identified four independent predictors of non-adherence (Table 4). Lack of family support was the strongest predictor, associated with a 40.7% increase in the prevalence of non-adherence (aPR: 1.407, 95% CI: 1.203–1.646; p < 0.001). Depressive symptoms were associated with a 25.7% increase in non-adherence (aPR: 1.257, 95% CI: 1.036–1.525; p = 0.020). Participants engaging in risky alcohol consumption had a 15.8% higher prevalence of non-adherence (aPR: 1.158, 95% CI: 1.096–1.224; p < 0.001). Finally, non-disclosure of HIV status was associated with an 11.4% increase in non-adherence (aPR: 1.114, 95% CI: 1.050–1.182; p < 0.001).

Table 4. Multivariable Predictors of ART Adherence

Predictor Variable	7-day Recall aPR [95% CI]	p-value	CASE Index aPR [95% CI]	p-value
Psychosocial Factors				
Risky Alcohol Use (Yes)	1.158 [1.096 – 1.224]	**< 0.001***	1.151 [1.091 – 1.215]	**< 0.001***
Depressive Symptoms (Yes)	1.257 [1.036 – 1.525]	**0.020***	1.230 [1.003 – 1.510]	**0.047***
Family support (disagree)	1.407 [1.203 – 1.646]	**< 0.001***	1.375 [1.171 – 1.615]	**< 0.001***
Disclosure (disagree)	1.048 [0.986 – 1.114]	0.133	1.114 [1.047 – 1.185]	**< 0.001***
Clinical Factors				
Viral Load (>1000 cps)	1.068 [0.936 – 1.219]	0.327	1.142 [1.000 – 1.306]	0.051
Few Side Effects (Disagree)	0.950 [0.873 – 1.034]	0.239	0.962 [0.883 – 1.047]	0.367

*Note: **aPR** = Adjusted Prevalence Ratio; **CI** = Confidence Interval. All models were adjusted for age and gender and utilized robust standard errors; *Statistically significant (p < 0.05).*

Discussion

The prevalence of optimal ART adherence identified in this study (79.7% via CPCRA and 80.9% via CASE Index) reveals a critical adherence gap of ~20% at the Yaoundé Jamot Hospital. While these figures are consistent with other urban cohorts in sub-Saharan Africa, they fall short of the 95% threshold historically required for durable virologic success. Interestingly, the high rate of viral suppression (95.1%) observed in this cohort, despite a lower optimal adherence rate (79.7%), highlights what may be termed the 'Adherence-Suppression Paradox.' This phenomenon is supported by Byrd et al, who demonstrated that modern antiretrovirals can maintain suppression at adherence levels as low as 80%, thanks to the superior pharmacological forgiveness and a high genetic barrier to resistance of dolutegravir-based therapy [6] [21]. While this biological safety net is a milestone for the national STR transition, relying on drug potency to mask behavioural inconsistency is a precarious long-term strategy. As noted by Ndiaye and Bangsberg [2], pharmacological simplification does not eliminate the behavioural drivers of resistance; rather, it shifts the clinical focus from 'pill counting' to managing the complex psychosocial lives of patients themselves.

One of the most significant findings of this research is the lack of statistical difference in adherence between participants on Single-Tablet Regimens (STR) and those on Multi-Tablet Regimens (MTR) (p = 0.494). These findings contradict a large body of global literature, which posits that pill burden is a primary determinant of treatment consistency. A 2008 meta-analysis and large-scale North American cohorts reported that simplified single-pill regimens significantly improved both adherence and virologic suppression compared to multi-pill alternatives [22]. Similarly, Altice et al. argued that the physical complexity of medication was a major barrier for patients with co-morbidities [23]. However, our findings align more closely with recent studies in sub-Saharan Africa, such as those by Ndiaye and Mbuagbaw [8, 14], which suggests that in resource-limited settings, the

convenience of a single pill is secondary to the availability of social support and food. This indicates that the 'Pill Burden' model, while valid in high-income settings, may have reached a point of diminishing returns in urban African cohorts like Yaoundé, where psychosocial stressors far outweigh the physical act of just swallowing tablets (3).

The multivariable analysis identified lack of family support as the most potent independent predictor of non-adherence (aPR: 1.407, $p < 0.001$). In the socio-cultural context of Yaoundé, the family unit serves as the primary infrastructure for treatment reminders, emotional resilience, and financial support for transport to the clinic. When this support is absent, the psychological burden of a chronic diagnosis is exacerbated, leading to treatment fatigue. This finding is further complicated by the significant association between non-disclosure of HIV status and non-adherence (aPR: 1.114, $p < 0.001$). Disclosure is not merely a social act but a clinical prerequisite for consistency. Patients who hide their status are often engaged in 'strategic non-adherence', intentionally skipping doses to avoid detection in social or professional settings [4, 24], which is a major barrier to ART adherence in Cameroon. This finding is consistent with evidence from Western Cameroon, where lack of disclosure to a close relative was a primary driver of treatment interruption [25]. The psychological energy required to maintain a 'double life' leads to cognitive exhaustion, suggesting that the benefits of a single-tablet regimen are neutralized if the patient cannot take that tablet openly within their domestic environment [26].

Furthermore, the intersection of mental health and substance use remains a critical bottleneck. Participants with depressive symptoms were 25.7% more likely to be non-adherent (aPR: 1.257, $p = 0.020$). Depression often manifests as a loss of motivation and cognitive "fog," making the habit of daily medication intake difficult to sustain. Simultaneously, risky alcohol consumption showed a strong association with non-adherence (aPR: 1.158, $p < 0.001$). This mirrors findings by Tchakounté et al., [27], who identified alcohol consumption as a significant risky behaviour associated with ART interruption in Yaoundé. This behavioural pattern is often driven by 'interactive toxicity beliefs', the pervasive myth that mixing antiretrovirals with alcohol causes lethal liver toxicity, thus patients intentionally skip doses to avoid perceived harm [28].

The substantial agreement between the CPCRA 7-day recall and the CASE Adherence Index ($k = 0.768$, $p < 0.001$) validates the use of self-reported tools in this setting. While self-reporting is often prone to social desirability bias, the high correlation between these two distinct scales suggests that when patients are interviewed in a non-judgmental, clinical environment, they provide an accurate reflection of their behavioural patterns. This high agreement reinforces the feasibility of using simplified screening tools, such as the CASE Index, during routine clinic visits to identify at-risk patients before virologic failure occurs.

Despite these insights, several limitations must be acknowledged. First, the cross-sectional design of the study captures a single snapshot in time, which precludes establishing definitive causal relationships between psychosocial predictors and non-adherence. While we identified associations, we cannot definitively state whether depressive symptoms cause non-adherence or if the stress of struggling with a chronic treatment regimen exacerbates mental health challenges. Second, although the CASE Index and 7-day recall showed high concordance, the study lacked an objective measure of adherence, such as electronic pill monitoring (MEMS), which is less susceptible to the "Hawthorne effect" in which patients improve their behaviour because they are being watched. Third, the research was conducted at a single tertiary referral center

(Yaoundé Jamot Hospital). While this facility is representative of high-volume urban care in Cameroon, the findings may not be fully generalizable to rural primary health centers where structural barriers, such as drug stock-outs or extreme travel distances, may play a more dominant role than the psychosocial factors identified here.

Conversely, this study possesses significant strengths. With a robust sample size of 680 participants, it is one of the largest contemporary analyses of the Single-Tablet Regimen (STR) transition in the Centre Region of Cameroon. Unlike many clinical studies that focus solely on biological outcomes, this research explicitly quantifies the "human side" of the HIV response, providing granular data on the roles of family support, alcohol, and mental health. Furthermore, the inclusion of both STR and MTR users allowed for a head-to-head comparison that challenges the prevailing "pill-burden" narrative, offering a more nuanced understanding of adherence in a resource-limited context. By cross-validating self-reported adherence against viral load data, the study provides a comprehensive overview of the "adherence-suppression paradox," making it a valuable baseline for future longitudinal research in the region.

Conclusion

In the contemporary landscape of HIV management in Cameroon, the transition to simplified, Dolutegravir-based Single-Tablet Regimens (STR) represents a significant pharmacological milestone. However, this study demonstrates that reducing the physical pill burden does not automatically translate into optimal treatment adherence. The finding that there was no statistically significant difference in adherence between STR and MTR users ($p = 0.494$) serves as a crucial indicator that the "pill-centric" approach to adherence has reached a point of diminishing returns.

The evidence presented here indicates that the main factors behind the 20.3% adherence gap at Yaoundé Jamot Hospital are mainly psychosocial and behavioural rather than clinical. While the high rate of viral suppression (95.1%) demonstrates the strong biological effectiveness, high genetic resistance barriers, and the forgiving nature of modern regimens, the ongoing link between non-adherence and issues like lack of family support (aPR = 1.407), depressive symptoms (aPR = 1.257), and risky alcohol use (aPR = 1.158) shows a fragile success. Without addressing the social infrastructure and mental health needs of patients, maintaining the long-term progress toward the 95-95-95 targets remains uncertain. Ultimately, achieving optimal adherence today depends more on the strength of the support network around patients than on the simplicity of the medication.

Recommendations

Based on the findings of this study, several critical interventions are recommended to bridge the 20% adherence gap and sustain the successes of the Single-Tablet Regimen transition in Cameroon. At the policy level, prioritizing the integration of routine, simplified mental health screening into the national HIV guidelines and care package, utilizing validated tools such as the PHQ-2 at every clinical visit, would allow healthcare providers to identify patients struggling with depressive symptoms before behavioural lapses lead to virologic failure. Furthermore, clinical facilities should adopt multi-dimensional adherence assessments, such as the CASE Adherence Index, to supplement viral load monitoring and provide a more proactive view of patient behaviour.

At the clinical level, there is an urgent need to shift from an individual-centred treatment model to a family-centred approach. Given that the lack of family support was the most significant predictor of non-adherence in this study, clinicians must move beyond the mere provision of pills to facilitating safe disclosure processes and strengthening domestic support

networks. This is particularly vital in the context of polymedication, where the management of HIV alongside other clinical protocols increases the cognitive and psychological burden on the patient. This structural shift should be complemented by targeted behavioural counselling that adopts a nuanced harm-reduction strategy. It is imperative that healthcare providers actively debunk the widespread "interactive toxicity" myths concerning ART and alcohol specifically the belief that mixing the two leads to lethal poisoning, which remains a primary driver of intentional dose-skipping in the Centre Region.

Addressing this gap requires a dual-priority communication model; while clinicians must maintain necessary warnings regarding the impact of alcohol on general liver health and its complications within a framework of polymedication, they must explicitly clarify that alcohol does not render antiretrovirals toxic. By uncoupling the fear of "poisoning" from the advice on healthy lifestyle choices, providers can prevent the dangerous practice of intentional treatment interruption. Ultimately, by integrating family-centered counselling, the domestic environment can be transformed from one of secrecy and fear into a supportive network that ensures medication consistency even in the face of complex social and behavioural challenges.

Finally, community-level interventions must be expanded to provide a safety net for patients who lack strong domestic support systems. The expansion of community-led "adherence support groups" and peer-navigator programs can provide the social accountability and emotional resilience necessary for long-term treatment consistency. Future research should focus on longitudinal designs to evaluate the long-term durability of Dolutegravir-based regimens in the context of persistent sub-optimal adherence (<95%), alongside qualitative explorations into the cultural nuances of non-disclosure. Such a comprehensive, multi-sectoral approach will be essential to ensuring that pharmacological simplification is matched by robust psychosocial care, ultimately securing the path toward the UNAIDS 95-95-95 targets.

Data Availability

The dataset analysed during the current study is available from the corresponding author upon reasonable request, subject to ethical approval and institutional data-sharing policies.

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Conflict of Interest

The authors declare no conflicts of interest related to this study.

Ethical Approval

Ethical clearance was obtained from the Regional Ethics Committee for Human Research-Center (CRERSH-CE) (No. 0021-/CRERSH/2025). Before conducting the study, written informed consent was obtained, and all identifying information (names, initials) was omitted to ensure confidentiality. Participation was free and voluntary; participants could leave the study at any time without affecting the care they received in this hospital.

Author Contributions

- **Mbohli Semirnyuy Sharon Lum:** Conceptualization, methodology, investigation, formal analysis, writing-original manuscript.
- **Pefura Yone Eric Walter:** Supervision, methodology, writing-review & editing.
- **Djenabou Amadou:** Writing-review & editing.

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