

Barriers and enablers to antiretroviral therapy adherence among adolescents transitioning from paediatrics to adult HIV care in sub-Saharan Africa: Scoping review

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Systematic Review

Keywords: HIV, Adolescent ART adherence, HAART, Barriers and facilitators, Transition, Paediatrics, Adult care, HIV Care, Sub-Saharan Africa, Scoping review

Posted Date: June 10th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-9953387/v1>

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Additional Declarations: The authors declare no competing interests.

Abstract

Background

Adolescents with HIV are a vulnerable, growing population, especially in sub-Saharan Africa. Improved ART access has increased survival into adolescence and eased the transition from paediatric to adult care. However, this transition often leads to lower retention in care, poor viral suppression, and declining ART adherence, posing a critical vulnerability. Despite recognition of these issues, limited evidence exists on factors affecting ART adherence during this phase in SSA. This review aims to map and synthesise existing evidence on the barriers and enablers that influence ART adherence during the transition.

Methods

The review followed the Joanna Briggs Institute methodology for scoping reviews and used the PRISMA-ScR reporting standards. Guided by the Population–Concept–Context framework, it included studies on adolescents aged 10–19 transitioning to adult HIV care in sub-Saharan Africa. A comprehensive search was conducted across MEDLINE, PubMed, CINAHL, Web of Science, and grey literature, with no restrictions on study design or publication year. Two reviewers independently screened studies, extracted data with a standardised tool, and resolved discrepancies through consensus. Data were summarised numerically and thematically, mapped across individual, interpersonal, community, and health system levels.

Results

Out of 32,030 articles, 15 studies met the inclusion criteria. These studies showed that adherence to ART and viral suppression decline after transitioning from paediatric to adult HIV care. Major barriers include psychological issues, stigma, limited ART knowledge, poor transition planning, treatment fatigue, lack of motivation, and weak social support. Enabling factors like strong ART literacy, structured transition, psychological support, self-management, and social support promote ART adherence. At the healthcare system level, barriers include a fragmented system, poor care coordination, no standard transition policy, and clinics not being adolescent-friendly. Enablers such as structured models, technology, and comprehensive care improve ART adherence during transition.

Conclusion

ART adherence among adolescents transitioning from paediatrics to adult health services is influenced by multiple factors. Personal, psychological, and mental health issues are major barriers to maintaining ART adherence. Effective transition protocols, youth-friendly services, and strong social support are vital for continuous HIV care and treatment success during this shift.

Background

Adolescent HIV is most prevalent in sub-Saharan Africa. In 2023, two million adolescents aged 10–19 years were living with HIV, with 83% of them living in sub-Saharan Africa, and the majority, 71%, were females [1]. In 2015, UNICEF estimated that globally, about a quarter of the 2 million adolescents living with HIV lived in just three African countries, namely Kenya, Nigeria, and South Africa [2]. The expansion of antiretroviral therapy (ART) has led to higher survival rates among perinatally HIV-infected children into adolescence. This demographic change has led to unprecedented interest in transferring adolescents to adult HIV care services. This transition period remains a critical vulnerability point in the HIV care continuum[3]

HIV-adolescents face significant barriers to care transitions. Older adolescents (15–19 years) have significantly lower rates of viral suppression and retention in care than children and younger adolescents under 15 years, a pattern that coincides with the post-transition period [4]. According to a narrative review in sub-Saharan Africa, 16-20-year-olds receiving adult care had a much higher mortality rate than 13-15-year-olds receiving paediatric care [3]. The same trends are observed in other resource-constrained environments, where research in low-income nations indicated that up to a quarter of transitioned patients lost interest in care during the primary year after the transition [5]. The impacts of ineffective transitions are not limited to the health outcomes of individuals, as they lead to the continued spread of HIV, reinfection, and the mixing of different variants of HIV. Furthermore, they lead to the contraction of other sexually transmitted infections, deterioration of epidemic control programmes, reduced adherence to highly active antiretroviral treatment, and drug resistance.

The existing literature is characterised by significant gaps in understanding the factors affecting ART adherence among adolescents who have recently transitioned from paediatrics to adult HIV care in sub-Saharan African settings. The majority of the literature is based on either paediatric or adult populations, and there is a lack of studies that specifically address the transition phase [3]. Limited evidence is on the HIV-related outcomes of transition in adolescents, and the literature primarily investigates the perceptions of stakeholders about the barriers to transition rather than the barriers and enablers of HIV treatment transition [6]. A 2024 systematic review found that only a third of the research addressed transition interventions, and even fewer studies reported their feasibility, acceptability, or effectiveness [7]. This is an important implementation gap, especially in low-resource areas, where healthcare systems struggle to provide optimal care for this vulnerable group.

Evidence from sub-Saharan Africa shows that many health systems are transitioning sooner than traditional standards suggest. South African studies indicate that the median age at first transition out of paediatric care is 14 years (IQR, 11–15 years), and in some settings, transition occurs after the adolescent's 12th birthday[8, 9] A survey of four countries in sub-Saharan Africa did not identify any national guidance to specify an age of transition, but reported common practise of transitioning adolescents at 15 years and above (Dahourou et al., 2017). Similarly, in high-resourced settings, a London-based study also reported a relatively early transition among adolescents aged 16 to 20 years [10]. Generally, these early transitions occur due to capacity

constraints in healthcare systems, developmental readiness tests conducted by clinicians, and varying family situations, rather than rigid adherence to age-related protocols.

There is an urgent need to evaluate barriers and enablers of ART adherence among adolescents within current healthcare systems in sub-Saharan Africa. Nevertheless, numerous obstacles impede such implementation, including inadequate infrastructure, insufficient personnel training, and ineffective communication between paediatric and adult clinicians [3]. In addition, most sub-Saharan African nations lack explicit national policies on the timing and manner of transitioning adolescents to adult care. This results in disparate practices and poor performance in healthcare facilities.

The main objective of this review was to identify barriers and enablers to antiretroviral therapy adherence among adolescents transitioning from pediatric to adult HIV care at the individual (patient, psychological, and health system-level), patient-and-psychological, and health system-level.

This objective was achieved by addressing the following questions:

1. What are the scope, characteristics, and settings of studies examining ART adherence during the transition from paediatric to adult HIV medical care?
2. What are the patient-level and psychological factors that influence ART adherence among adolescents transitioning from paediatrics to adult HIV medical care?
3. What are the healthcare system-level barriers and enablers that influence ART adherence among adolescents transitioning from paediatrics to adult HIV medical care?

Methods and analysis

This study is a scoping review conducted in accordance with the PRISMA-ScR guidelines, a predetermined protocol before data collection, and the Joanna Briggs Institute methodology for scoping reviews, with prior work informing the reporting of methods [11–14]. At the time of manuscript submission, the protocol had been submitted to the PLOS ONE Journal and was under review. The completed checklist is provided in Supplementary file 1 (PRISMA-ScR checklist).

Using established frameworks for scoping reviews, it defined research questions, selected relevant studies, and organised and summarised the data.

Eligibility criteria

This scoping review included studies from sub-Saharan Africa, irrespective of publication year, on adolescents who have transitioned from pediatric HIV care to adult HIV care. “Table 1”.

We used the Population-Concept-Context (PCC) framework recommended by the Joanna Briggs Institute, as well as the data items of the study, to guide the development of this scoping review, “Table 2.” [14].

Table 1 Eligibility Criteria	
Inclusion Criteria	Exclusion Criteria
Studies involving adolescents aged 10–19 years	Studies with participants outside the adolescent age range
Studies examining barriers, enablers, and determinants influencing ART adherence specifically during the transition from paediatrics to adult medical care	Studies examining ART adherence among adolescents living with HIV in sub-Saharan Africa that do not address the transition from paediatrics to adult HIV medical care Studies examining ART adherence among adolescents living with HIV in sub-Saharan Africa that do not address barriers, facilitators, and determinants during the transition from paediatrics to adult HIV medical care.
Peer-reviewed articles and Protocols	Expert opinions
Published reports, guidelines, policy documents	
Dissertations and theses, conference proceedings, and abstracts published	Social media content, Website Information
No year limit	
Published in the English Language	Non-English Language
Studies on HIV transition medical care in geographical settings	

Table 2
Population-concept-context (PCC) framework and variables of interest for the Scoping review

Population Element	Variable	Definition	Rationale
Study population	Age	Adolescents 10-19years who are moving from paediatrics to adult HIV care	Represent the WHO-defined adolescent population, a vulnerable population with a high risk of non-adherence during transition to adult HIV care
	HIV status	Adolescents living with HIV (vertical or horizontal transmission)	Ensure inclusion of all relevant portions of HIV care
	Transition stage	Indicate yes/no to the phase of transition, whether pre, during, or post-transition to adult HIV care	Captures the difference in ART adherence across transition phases
Concept	Primary domains	Factors that hinder ART adherence during transition from paediatric to adult HIV care.	Central to finding challenges of HIV treatment continuity, the central focus of the review
	Barriers to ART adherence	Facilitators of ART adherence during transition from paediatric to adult HIV care.	Key to finding promoters of ART among adolescents
	Enablers to ART adherence	Personal, mental, social, and health system level influencing ART adherence during transition from paediatric to adult HIV care.	These domains capture multilevel factors
	Secondary domains		
Context	Geographical setting, location type	Sub-Saharan Africa the setting in which the health care takes place	A region with the highest morbidity and mortality due to HIV
			Reflect disparity in health care access
Study	Design	Quantitative, qualitative, mixed methods	Allows comparative mapping of different evidence types
	year	The year the study was published	Help evaluate trends over time
	Sample size	The number of participants in each study	Provides context for interpretation
	Key findings	important findings that are not defined as barriers or enablers	Allow analysis of other findings

Settings

This scoping review was limited to sub-Saharan Africa because of its disproportionate burden of the global HIV/AIDS epidemic. Also, it accounted for the majority of adolescents living with HIV/AIDS. The region is characterised by resource-limited health systems, variable models of pediatric-to-adult HIV/AIDS transition, and high levels of stigma.[15, 16]

Electronic database sources

Relevant articles in the English language that reported on the subject matter and were included in the review from the following databases: MEDLINE, PubMed, EMBASE, Cumulative Index of Nursing and Allied Health Literature (CINAHL), and Web of Science. References of included studies were examined to identify other studies. The search extended to grey unpublished literature, including dissertations, theses, conference proceedings, and reports from credible national and international organisations. There were no restrictions on study design or year. The following keywords were combined in search strings on the databases during the literature search: HIV, AIDS, Adolescents, Young Adults, Paediatric Care, Adult Care, and Sub-Saharan Africa, SSA, together with all other alternative terms and synonyms. Boolean operators such as "AND" and "OR" were employed to refine the search. The PubMed search terms as demonstrated in. "Table 3" was adopted for the other databases and sources, as shown in Supplementary file 2 (Full search strategies for all databases).

Table 3
PubMed to be adopted for the other databases and other sources

Search	Actions	Details	Query	Results	Time
#7			Search: (#5) AND (#6)	588	07:57:13
#6			Search: (((((((Adolescent [Title/Abstract]) OR (Teenager [Title/Abstract])) OR (Young Person[Title/Abstract])) OR (Young Adult[Title/Abstract])) OR (Pubescent[Title/Abstract])) OR (Adolescent living with HIV[Title/Abstract])) OR (ALHIV[Title/Abstract])) OR (Youth[Title/Abstract])	329,355	07:37:30
#5			Search: (((((((((((ART Adherence[Title/Abstract]) OR (ART Compliance[Title/Abstract])) OR (Antiretroviral Adherence[Title/Abstract])) OR (ART Medication Adherence[Title/Abstract])) OR (ART Treatment Compliance[Title/Abstract])) OR (Anti retroviral Therapy Adherence[Title/Abstract])) OR (Anti-retroviral Therapy Adherence[Title/Abstract]))) OR (HAART Adherence[Title/Abstract])) OR (Highly Active Antiretroviral Therapy Adherence[Title/Abstract]))) OR (Retention of HIV Care[Title/Abstract])) OR (Viral Suppression[Title/Abstract])	10,011	07:28:38

Addressing missing data

For any gaps or unclear information, the authors of the primary studies were contacted through email. Where it was impossible to obtain the missing data, we relied on studies that had completed outcome information. The extent of missing data was reported along with the reasons.

Source of evidence selection and data extraction

All observational epidemiological studies, systematic reviews, meta-analyses, guidelines, reports, and conference proceedings that identified patient-level, healthcare system, and psychosocial factors associated with ART adherence among adolescents transitioning from paediatric to adult HIV care in sub-Saharan Africa were eligible. Reviews, commentaries, case reports, and abstracts that contain insufficient information were not included. All studies with methodological problems, irrelevant publications, incomplete reports, and studies conducted outside sub-Saharan Africa were excluded, with reasons stated. Studies were included regardless of differences in ART regimens. All definitions of “transition” were accepted as defined by individual studies. Covidence was used to manage, collate, and deduplicate the search output. Comprehensive literature reviews were conducted by two authors (K. A.Y. and R.A.N.) independently at two levels: i. title and abstract; ii. full text. The two authors screened and evaluated the results to determine which studies were useful. Completed study reports were obtained and examined to ensure they meet the predetermined inclusion criteria, and the data were extracted by the two authors.

A pre-tested, standardised data extraction table was used by the reviewers to capture information, including the study’s author(s), year, journal, setting, aim, study design and methodology, population characteristics, measures of ART adherence, identified barriers to ART adherence, facilitators of ART adherence, and all relevant variables. This is fully detailed in Supplementary file 3: Data extraction tool for charting the included studies.

Discrepancies were resolved through discussions and consultation with a third reviewer. A PRISMA-ScR Chart, as shown in Fig. 1, illustrates the study’s inclusion criteria, selection process, outcomes of the final search, and reasons for excluding certain articles.

Outcomes and prioritisation

The results of the review were chosen to encompass the multilevel determinants of ART adherence during the transitional phase. Considering the exploratory purpose of this scoping review, emphasis was placed on mapping and categorising evidence rather than quantifying effects. Details of outcomes and their definitions are available in "Table 4."

Table 4
Outcomes of interest and prioritisation of the scoping review

Outcomes	Definition	Rationale
Primary outcomes	ART adherence during transition: consistency of ART use among adolescents moving from paediatric to adult HIV care	Central outcome that reflects the continuity of HIV treatment and the risk of treatment failure
Secondary outcomes	Individual level: Psychological and behavioural influences such as stigma, mental health, and disclosure	Main determinant of ART adherence at the personal level
	Socio-cultural: Family, peer, and community influence on adherence behaviour	Captures the social environment’s influence on ART adherence
	Health systems: structural and service delivery elements affecting transition care	Identifies public health system-level determinants of ART adherence
	Service gaps: identified weaknesses and gaps in the transition of HIV care in adolescents	Helps inform policy and intervention development

Data analysis and synthesis

A coding framework was developed through both inductive and deductive methodologies to organise the categorisation of barriers and enablers into distinct themes. The coding framework is accessible within the supporting material (Supplementary File 4: Coding Book).

Descriptive numerical analysis and qualitative thematic analysis were used to synthesise the extracted data through tables. Barriers and facilitators were mapped across the individual and psychological, community, and health systems levels.

Definitions

ART adherence refers to how well a person’s behaviours, such as taking medication, attending scheduled clinic appointments, following a diet, or making lifestyle changes, align with the care and treatment plans jointly agreed upon by the healthcare provider and the individual living with HIV. ([14].

Transition: Purposeful, planned movement of adolescents from pediatric to adult-oriented care.[15]

Results

This scoping review mapped the existing evidence on barriers and enablers to antiretroviral therapy adherence among adolescents transitioning from paediatrics to adult HIV care in Sub-Saharan Africa according to the inclusion and exclusion criteria and PCC. Two independent reviewers (K.A.Y and R.A.N)

used a systematic approach and identified a total of 3,230 records from MEDLINE-1126, PubMed-588, CINAHL-426, and Web of Science-1090. Two articles were manually added from references. Covidence automatically deduplicated 1141, and K.A.Y and R.A.N manually deduplicated 9, making a total of 1149. 2082 articles were screened by K.A.Y., and R.A.N. screened articles by title and abstract; 2006 studies were excluded. Following this, 76 articles were thoroughly screened in full text. Sixty were excluded for specific reasons, including wrong setting – 2, Wrong outcomes – 7, Full articles not available – 3, Wrong patient population – 2, not in transition period – 28. Reasons for excluding studies at each stage were documented. Ultimately, 15 studies met the inclusion criteria after rigorous screening and eligibility assessment and were included in the final synthesis. The process is diagrammatically represented in a PRISMA flow chart (Fig. 1).

The research mainly focused on studies from sub-Saharan Africa, including Kenya, South Africa, Uganda, Nigeria, Malawi, Mozambique, Tanzania, Zimbabwe, and Zambia. Additional data were obtained from global systematic review and policy analysis studies, including those from SSA. The included articles were mainly published from 2017 to 2025. Most studies were observational or quantitative (7 studies), including natural experiments, retrospective observational longitudinal studies, randomised controlled trials, observational cohort studies (multi-country longitudinal analyses), cross-sectional studies, and two prospective cohort studies. The qualitative research (n = 3) employed methods such as in-depth approaches, participatory techniques, and photovoice. Additionally, three review articles, a systematic review, a narrative review, and a qualitative synthesis were included. Policy and guideline documents made up two studies (n = 2). Sample sizes ranged from small qualitative groups of 24 participants to large multi-country cohorts of over 5,000 adolescents and young people with HIV transitioning from paediatric to adult HIV care. Adolescents ranged in age from 10 to 19 years, with some studies including participants up to 24 years. Other studies also explored the experiences of caregivers and healthcare providers.

ART Adherence Measurement

ART adherence was assessed using multiple indicators, including viral suppression, self-reported adherence, pill counts, clinic attendance, retention in care, and medication possession ratio (> 95%). A significant decline in viral suppression and retention in care was mainly observed after transitioning to adult HIV care compared to those who stayed in paediatric care. Viral suppression also showed variability and remained suboptimal after the transition. Determinants of ART included individual and psychological factors, family and social support, community, health system factors, and national transition and programme policies. Transition model outcomes included peer-led interventions, teen clinics, comprehensive integrated care, structured programs, and the Pediatric Adolescent Adult Preparedness (PAPA) Model. Evidence demonstrates that coordinated and structured transition models are associated with improved ART adherence and retention in care, with > 90% at 12 months post-transition. Low viral suppression was, however, inconsistent

Thematic Analysis of Individual-Level (Patient and Psychological Factors) Barriers That Influence ART Adherence Among Adolescents Transitioning from Paediatrics to Adult HIV Care

Themes	Sub Themes	Codes	Description	Authors
Psychological Distress and Mental Health Challenges	Depression and Anxiety	Depression, Anxiety, Hopelessness, Emotional Distress	Mental health difficulties reduce consistency and motivation in ART adherence	[16–18]
	Transition -related stress	Loss of familiar care, fear of adult clinics, Uncertainty, shift to adult responsibility	Transition introduces psychological stress, negatively impacting adherence. Transition coincided with identity struggles affecting adherence	[19–22]
	Stigma	Denial of HIV status, Internalised stigma, Shame, self-blame	Stigma led to poor adherence behaviours and disengagement	[15, 23–25]
	Fear of Disclosure	Secrecy, fear of discrimination, non-disclosure to peers	Adolescents skip medication to avoid unintended disclosure	[16, 21, 26]
	Poor Acceptance of HIV status	Identity conflict, Denial,	Challenges in accepting HIV Status led to an impact on ART adherence	[16, 23, 27]
Individual Factors	Insufficient knowledge of ART	Poor knowledge of ART, reduced awareness of lifelong treatment, misunderstanding of dosing	Adolescents lacked the requisite knowledge in the ART regimen and the effect of non-adherence in post-transition when caregiver guidance was reduced	[21, 23, 24, 28]
	Insufficient transition preparation	Lack of preparation for transition	Limited structured education, unclear expectations of adult care	[20, 25, 27, 29]
Self-Management Challenges and Autonomy	Poor adherence skills, self-efficacy challenges	Forgetfulness, Lack of routines, or self-management	Lack of confidence in managing treatment and life demands Adolescents struggle with ART management after transition	[19, 27, 28]
	Developmental factors	Resistance to routine, denial, risk-taking	Adolescent developmental stage changes contributed to inconsistent adherence	[17, 23]
Treatment Fatigue and Motivation	Low Perceived Risk	Underestimating consequences, feeling healthy	Adolescents exhibit non-adherence when asymptomatic	[17, 19]
	Treatment Fatigue	Pill burnout, Pill burden, ART exhaustion	Over time use of ART led to reduced ART fatigue and motivation	[18, 28, 30]
Institutional Factors	Lack of privacy/Boarding school	Rigid schedules, Inability to store drugs, Inability to take drugs discreetly	Clash of work, school and clinic schedules, lack of privacy negatively impacted adequate dosing and engagement	[17, 26]
Care Gaps	Gaps in care, Poor Adherence in paediatrics care	Previous history of non-adherence in paediatrics care	Strong predictor of ART adherence	[21, 29]
Social Support and Care Dynamic	Loss of Caregiver Support	Loss of caregiver, reduced parental involvement, and independence	Limited caregiver oversight during transition led to missed clinic visits and doses	[20, 21, 24]
	Peer Influence	The desire to be like friends, the desire to fit in, peer pressure, and peers' inquisitiveness	Adolescents valued social acceptance of peers over acceptance in school, saying	[16, 26]
Patient-Level and Psychological Enablers That Influence ART Adherence Among Adolescents Transitioning from Paediatrics to Adult HIV Medical Care				
ART therapy Literacy	ART knowledge	Understanding the ART benefit, knowledge, and consequences of non-adherence	Improved ART knowledge is associated with better behaviour towards ART	[23, 24, 28]
	Transition Preparedness	Structured Transition preparation and counselling	Structured Transition preparation and counselling enhanced readiness and enhancement	[20, 27, 30]
Psychological and Resilience Support	Positive coping mechanisms, mental health support, acceptance of HIV, and a safe disclosure environment	Adaptive coping mechanism, Emotional and Psychological support, Counselling support, Self-acceptance, Reduced self-stigma, Peer support, Disclosure to Trusted Individuals	Adolescents who had better psychological support and mental readiness had better ART adherence	[16–19, 23, 26, 27]
Self-Readiness and Management Skills	Adherence to routine, better self-management skills	Reminder system, routine habit	Structured routine enhanced ART adherence	[24, 28]
	transition readiness	Transition preparedness, autonomy	Transition preparedness, autonomy improved ART medication adherence	[19, 20]

Themes	Sub Themes	Codes	Description	Authors
Community and Social Support	Positive peer club and support,	Peer encouragement, support group	Peer networks and clubs promoted	[16, 26]
	Continued care involvement	Parental monitoring, family support	Ongoing care support enables ART adherence	[21, 24]

The thematic analysis identified patient-level and psychological factors influencing ART adherence among adolescents transitioning from paediatrics HIV to adult HIV care. The analysis identified 15 main themes and 23 subthemes across 15 articles. The factors involve both facilitators and barriers to ART adherence

Barriers related at Individual level (psychological and patient factors) that influence ART adherence among adolescents transitioning from paediatrics to adult HIV medical care.

Psychological Distress and Mental Health

Psychological distress and mental health issues remain key barriers to ART adherence in adolescents. Conditions such as depression, anxiety, hopelessness, and emotional distress decrease motivation and consistency in following ART regimens [16–18]. Adolescents also encounter transition-specific stressors, including fear of adult clinics, loss of the supportive paediatric care environment, and a sudden push into adult healthcare settings [19, 31]. These stressors occur during a period of identity development, further impairing adherence [4, 32]. Stigma, shame, and internal denial of HIV status are common, leading to care disengagement and nonadherence [23, 24]. Fear of discrimination often leads to secrecy about medication use and to missed doses to avoid peer judgment [33, 34]. Difficulty accepting one's HIV status is linked to identity conflict, denial, and poor adherence [16, 23, 27]

Patient factors

The level of individual preparedness for transition and knowledge is an important factor influencing adherence. A lack of understanding of ART, including its lifelong nature and the need for precise dosing, predicts poorer adherence once caregivers are no longer overseeing treatment following the transition [23, 28, 32]. Many adolescents are simply unaware of their specific regimen and the long-term consequences of not adhering [24]. This lack of knowledge is often linked to insufficient preparation for the transition to the new adult-focused care system and minimal guidance on managing care independently [27, 29, 31] .

Challenges of Self-Management, Autonomy, and Self-Efficacy

Poor self-management skills, inconsistent medication routines, and missing doses indicate a lack of confidence in one's ability to manage treatment, especially amid numerous daily responsibilities [19, 27, 28]. Developmental challenges such as rejecting routines, denial, and risk-taking during adolescence are significant factors behind fluctuating adherence [3, 23].

Treatment Fatigue and Motivation

Concerns about "pill fatigue" and the underestimation of perceived risks decreased motivation to adhere to ART. When adolescents are asymptomatic, they tend to underestimate the importance of consistent dosing and may not adhere to treatment [3, 19]. "Pill fatigue," related to the heavy burden of taking medication daily, sometimes multiple times a day, contributes to ART fatigue [18, 28, 29].

External environmental and past care factors also influence adherence. Institutional issues, such as strict school schedules in boarding schools, hinder discreet administration and storage of ART [3, 33]. An adolescent's care history in the paediatric setting strongly predicts later adherence; those with a history of gaps in care or previous poor adherence are more likely to experience future nonadherence [29, 32].

Social Support and Care Dynamics

Transitional changes in caregiver and social support influence adherence, as the loss of caregiver support and decreased parental involvement contribute to missed clinic visits and doses [24, 31, 32]. Peer support can also pose a major challenge; peers' influence and the need to "fit in" can sometimes override adolescents' motivation to remain adherent [33, 34] .

Enablers at the patient-level and psychological factors that influence ART adherence among adolescents transitioning from paediatrics to adult HIV medical care.

ART therapy literacy

Higher ART literacy, encompassing understanding the advantages of ART and the risks of non-adherence, correlates with improved adherence [23, 24, 28]. Targeted transition-preparation programmes and counselling at specialised clinics are also positively associated with improved adherence outcomes [27, 29, 31]

Psychological And Resilience Support

Resilience and adaptive coping skills are crucial for maintaining long-term adherence, and mental health support, along with counselling, positively influences adherence outcomes [3, 23]. Important elements include fostering self-acceptance, overcoming shame, and having trusted individuals to whom to disclose one's status [18, 19, 27, 33, 34] ,

Self-Readiness and Management Skills

Practical self-management skills, such as using pill boxes and following timed schedules, are linked to better adherence [24, 28]. Overall readiness for transition and independence is significantly correlated with ongoing adherence [19, 31].

Community and Social Support

Ongoing social support is crucial. Supportive peer groups foster community and enhance adherence [33, 34]. Additionally, continued involvement of family and caregivers is a key factor in maintaining ART adherence during the transition period [24, 32].

Barriers and Enablers in the Healthcare System Level That Influence ART Adherence Among Adolescents Transitioning from Paediatrics to Adult HIV Medical Care

Themes	Sub-themes	Codes	Description	Authors
Health System Structure and Coordination	Unstructured and Fragmented Health Care	Lack of seamless linkage in health services, loss to follow-up, and inadequate comprehensive health care	Disconnected health services, including sexual and reproductive health services, Mental health services, lead to loss to follow-up	[15, 17, 23]
	Communication gaps	Lack of communication between the career	Improper handoff between paediatric and adult care leads to disruption of care	[16, 17]
	Service enrolment	Non-friendly adolescent-adult clinics	Judgmental, overburdened, depersonalised adult settings; long waits; unfriendly staff	[23]
Provider and Staffing Factors	Staff competence and attitudes	Lack of trained nurses and negative attitudes	Providers lack skills in adolescent counselling	[17, 26]
Policy and structural factors	Lack of standardised guidelines	No specific national guidelines, lack of policy inclusion	Lack of standardized protocol leads to the unified transition protocol	[21, 22]
	Legal Barriers	Legal constraints, poor access to services	Structural difficulties that prevent adolescents from accessing ART	[15, 23]
	Age-based transition	Rigid age threshold, transfer based on age	Transition based on age and not maturity to handle adherence leads to non-adherence	[21, 22]
Enabling Factors at The Health System Level That Affect ART Adherence Among Adolescents in Sub-Saharan Africa				
Structured Transition Intervention	Well-coordinated transition programmes	PAPA Models, Early preparation coordination	Guided, proactive transition protocol improves outcome	[15, 16, 20]
Technological Resources	Technology and Advocacy support	Digital reminders, social media, and advocacy groups	Digital and advocacy tools enhance medication consistency	[15–17, 26]
	Readiness Assessment	Transition readiness score, modifiable factors	Tools to evaluate clinical readiness score for adult transition	[18, 27]
Healthcare Environment	Adolescent-friendly models	Teen clinics, youth-friendly clinics, sense of belonging,	A supportive youth-focused environment leads to improved adolescent engagement	[17, 20, 25, 27]
Community-level Environment	Community and Integrated ART	Community ART delivers integrated models	Alternative delivery models make ART more accessible	[17, 23]

Facilitators of Healthcare System-Level Barriers That Influence ART Adherence Among Adolescents Transitioning from Paediatrics to Adult HIV Medical Care

The thematic analysis identified healthcare system-level barriers and facilitators that influence ART adherence among adolescents transitioning from paediatrics to adult HIV medical care. These factors are categorised into themes, sub-themes, codes, descriptions, and authors. For barriers in health systems, three major themes were identified: Health System Structure and Coordination, Provider and Staffing Factors, and Policy and Structural Factors. Facilitators included Structured Transition Interventions and the Healthcare Environment.

Health System Structure and Coordination

The structure and coordination of the health system significantly influence ART adherence among adolescents at the system level. Issues such as unstructured and fragmented healthcare, lack of seamless integration of health services, loss to follow-up, and inadequate comprehensive care, including disconnected sexual and reproductive health, mental health, and other services, contribute to gaps in continuity. [15, 17, 23]. Communication gaps among healthcare providers lead to improper handoffs between pediatric and adult care, disrupting treatment. Additionally, adolescent-unfriendly clinics characterised by judgmental, overburdened, depersonalised adult settings, long wait times, and unfriendly staff lead to adolescents being non-adherent to treatment.[23]

Policy, Legal and Structural Barriers

The absence of standardised national guidelines, inclusive policies, and clear transition protocols results in inconsistent practices. Legal restrictions, limited access to services, and structural barriers hinder adolescents from accessing ART services, significantly impacting their adherence. Additionally, transitioning based solely on age rather than maturity can lead to poor adherence. Furthermore, a transition based on age instead of maturity can cause non-adherence ([21, 22]. Lack of trained nurses and negative attitudes. Providers lack skills in adolescent counselling [17, 26]

Facilitators That Influence ART Adherence Among Adolescents Transitioning from Pediatrics to Adult HIV Medical Care

Structured Transition Intervention Protocols

Well-coordinated transition programs, such as the PAPA Models and early preparation coordination, and guided, proactive transition protocols have been recognised as facilitating ART adherence at the facility level [15, 16, 20]. According to [3, 15, 33, 34] Digital and advocacy tools enhance medication adherence among adolescents transitioning from paediatric to adult care. In addition, the transition readiness score, a modifiable factor, helps to evaluate the clinical readiness score for adult transition [18, 27]

Supportive Healthcare Environment

A supportive healthcare environment, including Adolescent-friendly models, Teen clinics, and youth-friendly clinics, provides a sense of belonging and improves adolescent engagement [17, 20, 25, 27]. Alternative delivery models, including the Community ART delivery framework and integrated models, have been shown to make ART more accessible to adolescents [17, 23]

Discussions

This scoping review mapped the scope of the included articles, focusing on patient, psychological, and health system levels, exploring barriers and enablers to antiretroviral therapy (ART) adherence among adolescents transitioning from paediatrics to adult HIV care in Sub-Saharan Africa. While many articles addressed barriers and enablers to ART adherence in adolescents, relatively few have concentrated on the transition phase. This transition has been recognised as a significant period of vulnerability characterised by high rates of ART non-adherence, increased risk of mortality, and morbidity [35]. The studies covered countries such as Kenya, South Africa, Uganda, Nigeria, Malawi, Mozambique, Tanzania, Zimbabwe, and Zambia, revealing a notable gap in West, Northern, and Central Africa, with only one eligible article from Nigeria. Understanding variations in ART adherence among adolescents during the transition period across Sub-Saharan African nations is vital for developing a comprehensive, continent-specific protocol to address barriers to ART adherence. These articles were published from 2017 to 2025. Most studies were observational or quantitative (7 studies), including natural experiments, retrospective observational longitudinal studies, randomized controlled trials, observational cohort studies (multi-country longitudinal analyses), cross-sectional studies, and two prospective cohort studies. The qualitative research (n = 3) employed methods such as in-depth approaches, participatory techniques, and photovoice. Additionally, three review articles, a systematic review, a narrative review, and a qualitative synthesis were included. Policy and guideline documents made up two studies (n = 2). This diverse inclusion of articles allows for methodological triangulation, which enhances the validity, depth, comparability, and contextual relevance.

The findings from the thematic analysis identified psychological and mental health challenges as a primary barrier to ART adherence among adolescents in sub-Saharan Africa. Depression, anxiety, hopelessness, and emotional distress, along with transition-specific stressors such as fear of adult clinics, loss of the supportive paediatric care environment, and a sudden push into adult healthcare settings, negatively impact ART adherence. These stressors occur during a period of identity development, further impairing adherence [25, 32]. Stigma, shame, and internal denial of HIV status are common, leading to care disengagement and nonadherence [15, 23, 24]. This finding is not isolated, as similar trends were identified in studies in South Africa by [36, 37]. Fear of discrimination often leads to secrecy about medication use and missed doses to avoid peer judgment [33, 34]. This aligns with another qualitative study in Thailand, where stigma and shame were primary concerns for informants navigating Thai society with HIV and affecting ART adherence.[38]. Difficulty accepting one's HIV status is linked to identity conflict, denial, and poor adherence. Overall, findings on psychological and mental health challenges are consistent with multiple studies, including a systematic review, a meta-analysis, and a cross-sectional, multi-centre study in Botswana, all of which indicate that these challenges significantly impede ART adherence [39, 40]. This suggests that ART clinics must address not only medical concerns but also incorporate psychological interventions and mental health screenings as a routine part of ART care to support adolescents. Furthermore, adolescents with adaptive coping mechanisms, emotional and psychological support, counselling, self-acceptance, and reduced self-stigma tend to have better ART adherence [3, 18, 19, 23, 27, 33, 34]. This was consistent with another scoping review, which identified better mental and coping strategies and resources as promoters of ART adherence among adolescents.[36]. Adolescents in transition to adult HIV care must psychologically prepare adolescents for prospective mental health challenges in order to effectively address this barrier. Being proactive with this measure may improve ART adherence among adolescents.

The result also revealed limited self-management skills, an autonomy gap, and a lack of knowledge as significant barriers to ART adherence among adolescents transitioning from paediatrics to adult HIV services. Adolescents are expected to transition to adult care without the requisite knowledge and proper self-management skills about HIV and HAART. Poor adherence skills and self-efficacy challenges, including forgetfulness, lack of routines or self-management, and reduced confidence in managing treatment and life demands, make adolescents struggle with ART management after transition [19, 27, 28]. There is converging evidence from a mixed-methods study in Uganda and a qualitative study in Tanzania that identified limited knowledge and skill gaps as a deterrent to ART adherence among adolescents [41, 42]. Many adolescents lacked the requisite knowledge of the ART regimen and the effect of non-adherence in post-transition when caregiver guidance was reduced, leading to increased ART neglect. Identified facilitators, such as understanding the benefits of ART and knowing the consequences of non-adherence, led to better ART adherence [23, 24, 28]. Also, structured transition preparation and counselling enhanced readiness and enhancement [20, 27, 30]. A similar trend emerged in a cross-sectional study in Rwanda [43]. Adequate knowledge of HIV/AIDS, drugs, understanding mechanisms and side effects, and the consequences of ART non-adherence leads to better behaviour. It reduces myths, superstitions, and misconceptions surrounding ART and further empowers adolescents to champion the good course of HAART.

Furthermore, the results showed that several factors, including lack of social support, peer pressure, strict school routines, difficulty in storing or taking drugs discreetly, gaps in care, poor adherence in paediatric settings, and conflicts between work, school, and clinic schedules, negatively affected ART adherence

among adolescents transitioning from paediatric to adult HIV care. For many young adults, the decision to continue treatment depends on multiple factors; hence, all possible measures should be taken to reduce barriers to maintain viral suppression and ensure consistent ART adherence. Despite these barriers, several ART enablers, such as digital tools, reminder systems, and structured routines, improved ART retention. Strong social support and peer encouragement emerged as a protective factor, with adolescents demonstrating better ART adherence outcomes [16, 26]. This supports the findings from research in Nairobi and South Africa that ongoing family support, including parental assistance, improves ART adherence.[21, 24]. These platforms provide a sense of belonging, offer a safe space for adolescents to share their experiences and challenges, reduce stigma, and provide coping support during the transition period. Similarly, another study among older HIV populations in Thailand emphasises that supportive, trusted relationships, such as with clinical teams and empowered parents, help adolescents maintain good medication adherence [38]. Teaching adolescents about HIV and ART should involve the whole family to support them. Additionally, caregivers of ALHIV should receive continuous professional development training to update them on current practices specifically related to adolescent HIV.

The analysis showed a sharp contrast in the effect of disconnected health services, including sexual and reproductive health services and mental health services, leading to loss to follow-up compared to youth-friendly models. Improper handoff between paediatric and adult care, judgmental and overburdened adult settings, long waits, and unfriendly staff cause HIV care disruptions [16, 17]. Providers' lack of skills in adolescent counselling remains a disturbing factor and a barrier to HIV adolescent care. Overall, an unstructured health system and poor coordination negatively impact health services [15, 17, 23]. When the healthcare environment becomes uncondusive, it deters adolescents from seeking help, which negatively impacts strategies to combat the HIV burden. Conversely, a proper health service environment promotes better adolescent engagement. This is supported by research in Kenya, where teen clinics and youth-friendly clinics are identified as fostering a sense of belonging among adolescents [31]. Additionally, alternative delivery models, such as community ART, integrated, and PAPA models, make ART more accessible. The importance of patient advocacy and coordinated handoffs among various disciplines to maintain continuity of care is also emphasised.[24]

The results revealed that a lack of a standardised protocol, unified transition protocols, and structural difficulties prevent adolescents from accessing ART [15, 23]. A rigid age threshold, transfer based on age, not maturity, is associated with ART adherence, leading to non-adherence. [21, 22]. It often leads to prematurity in adult care, and children are often unable to synthesise the ART and its demands. Studies in South Africa have shown that transition readiness assessments and tools to evaluate the clinical readiness score for adult transition facilitation improve ART adherence. [18, 27]. Interventions that incorporate gradual transition, readiness assessments, and adolescent counselling have demonstrated effectiveness in enhancing continuity of care and helping adolescents develop self-management skills.

This study demonstrates that ART adherence among adolescents moving from paediatric to adult care is influenced by multiple factors and consistent with a global outlook. Nevertheless, unique challenges exist, including the absence of standardised protocols, uncoordinated health systems and transition processes, limited resources, and stigma. These issues emphasise the importance of creating locally tailored strategies that address patient-specific, psychological, and health-system barriers.

Implication on Policy

Evidence suggests that the transition of adolescents from paediatric to adult HIV care should be done comprehensively. A routine psychological and mental health reference screening should be implemented regularly, as it remains a significant barrier. Stigma reduction interventions should be proactively initiated routinely at HIV clinics

There is a need for a standardised transition protocol for adolescent HIV programmes in sub-Saharan Africa that details timing, preparation, retention measures, and follow-up procedures. Additionally, the transition should be gradual, treated as a process rather than a single event, with a checklist to address gaps among the adolescent, provider, and support care systems.

There is an urgent need for a global health policy, yet continent-specific guidelines for comprehensive health care at the national to implementation levels are needed, as fragmented health care remains a major barrier to care.

There should be a legal framework to remove structural barriers for adolescents, thereby improving ART adherence in Sub-Saharan Africa.

Transition clinics are encouraged to prepare adolescents mentally and physically before getting them into adult HIV care.

Adolescent-friendly clinics should be integrated into adult care, staff should be trained specifically for adolescents, and they should be designed to reduce barriers, including long wait times.

Strengthen social, family, and peer support, as these have been established as protective factors for ART adherence.

Institutions such as boarding schools should implement policies and interventions that support ART adherence among adolescents.

Strengths and Limitations

Research focused on a critical period, the transitioning period, which is an underexplored area in adolescent HIV research. The study concentrated on Sub-Saharan Africa, a region with the highest HIV burden in the world. The findings regarding adolescents living in Sub-Saharan Africa during the transition from paediatrics to adult HIV care will inform stakeholders about the dynamics at the individual and psychological levels, as well as health system determinants of ART adherence.

EMBASE could not be assessed despite being included in the planned search. Evidence was limited in scope, with relatively few articles focusing solely on transition. Definitions of ART adherence varied, which may affect the generalizability and comparability of the findings.

Articles in any other languages aside from English were excluded

Conclusion

The transition period remains a critical stage in adolescence characterised by a marked decline in medication consistency. ART adherence among adolescents transitioning from paediatric to adult health services is influenced by multiple factors. Personal, psychological, and mental health challenges remain significant barriers to ART adherence during this transition. At the health system level, transition protocols, youth-friendly services, and strong social support are essential in achieving continuous HIV care and long-term treatment success for adolescents moving from paediatrics to adult HIV services.

Abbreviations

ART
Antiretroviral Therapy
HAART
Highly active anti-retroviral therapy
HIV
Human Immune Virus
PRISMA
ScR-Preferred Reporting Items for Systematic Review and Meta-analysis-Extension for Scoping Review
TDR
Special Programme for Research and Training in Tropical Diseases
WHO
World Health Organisation

Declarations

Ethics and Disseminations

No field data was collected; hence, ethical approval was not required. However, the data retrieved was handled appropriately. Findings will be disseminated through publication in a peer-reviewed journal, presentation at scientific conferences, and engagement with policymakers and programs implemented in Adolescent HIV care.

Consent of Publications

Not Applicable

Availability of Data and Materials

All data generated or analysed during this scoping review will be included in the published articles and the supplementary file. The full search strategy, data extraction table, and synthesis will be accessible to readers. Any additional supporting material will be shared upon reasonable request from the author.

Conflict of Interest

There is no competing interest among authors

Funding

This study was funded by the TDR, the Special Programme for Research and Training in Tropical Diseases, co-sponsored by UNICEF, UNDP, the World Bank, and WHO. The funding body had no role in the study design, data collection, analysis, interpretation, or manuscript preparation. The views expressed in this work are solely those of the researcher and do not necessarily reflect those of TDR, UNICEF, UNDP, the World Bank, WHO or the University of Ghana.

Authors Contribution

The study title, protocol and main work were initiated by K.A.Y. following methodological guidance from F.N.G. The study was adapted into a scoping review. K.A.Y. took responsibility for designing the study, drafting the initial version, and creating the search strategy. K.A.Y. and R.A.N. screened the included articles. A.F.M., E.L.T., M.V., E.A., F.N.G. and R.A.N. reviewed the draft, made grammatical revisions, and carried out the literature search. E.A. and M.V. critically evaluated the study and offered academic support for scientific writing. F.N.G. provided senior oversight and methodological coaching throughout the development of the protocol. All authors reviewed and approved the final manuscript.

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Figures

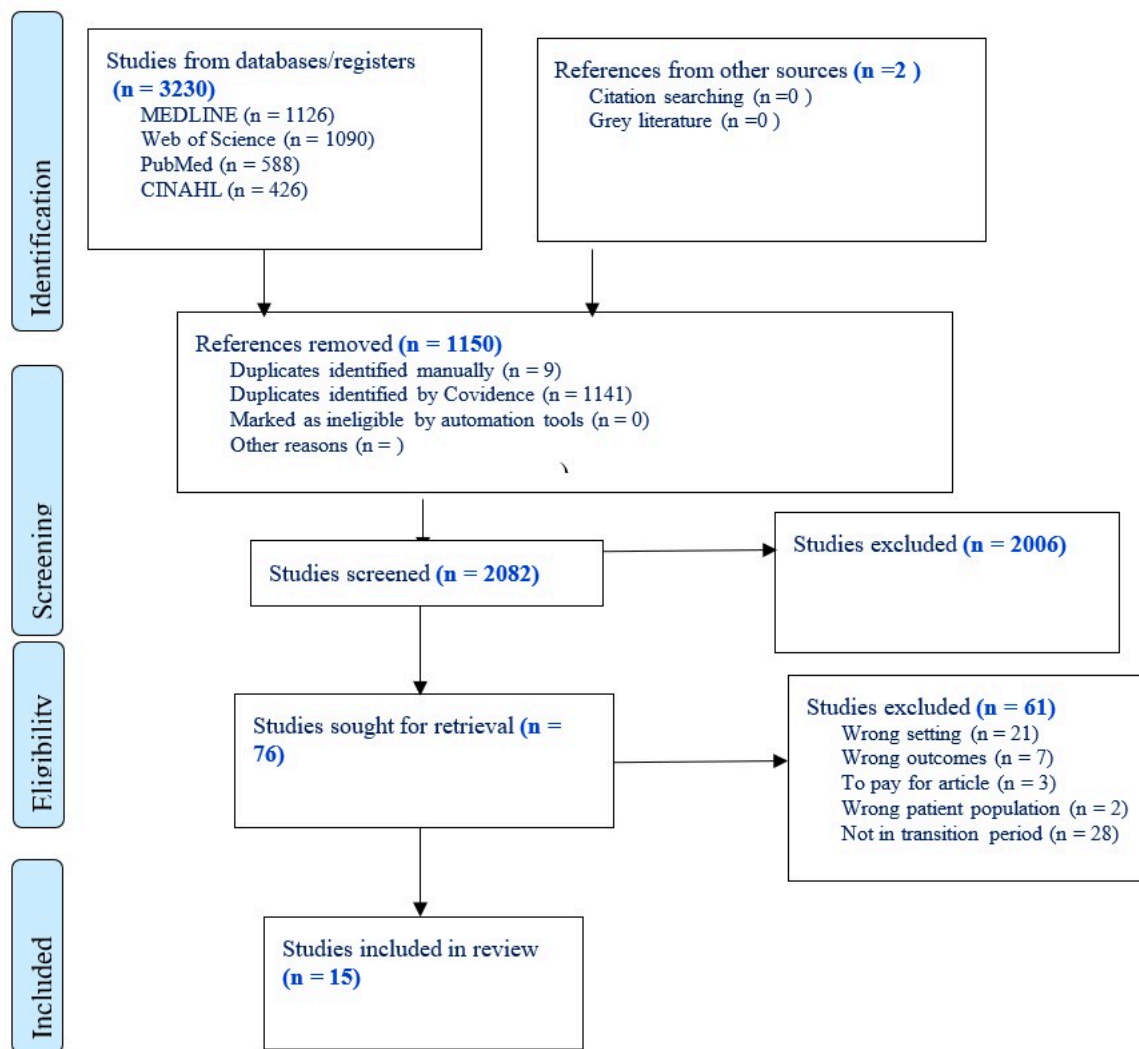


Figure 1

Prisma Flow Diagram for the review Scope and Characteristics of Included Studies

Supplementary Files

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