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Strategies to improve HIV prevention service uptake among young women who sell sex in sub-Saharan Africa: A scoping review

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Abstract

Introduction: Young women engaged in selling sex in sub-Saharan Africa are disproportionately vulnerable to HIV due to factors like young age, stigma, violence, economic hardship, limited negotiating power, and restrictive norms. These factors limit access to HIV prevention service such as Pre-exposure prophylaxis (PrEP) and worsen HIV-related outcomes. Despite this, young women who sell sex are not adequately prioritized in regional strategies. This review synthesizes evidence on factors influencing HIV service engagement among young women who sell sex, aged 15-24 in sub-Saharan Africa and strategies to improve uptake.

Methods: We systematically searched PubMed, Embase, and Web of Science for peer-reviewed studies that either described factors influencing HIV prevention service uptake among young women who sell sex or HIV prevention strategies targeting this group. We identified 30 studies for analysis of which six were interventional and 24 were observational. We employed the Capability, Opportunity, and Motivation Model of Behaviour to map factors influencing service uptake and used the Behaviour change wheel to determine the policy options and intervention types for tailored HIV prevention strategies.

Results: Findings showed that physical and psychological capability to use services were enhanced by community mobilization, peer education, and mobile health initiatives. Motivation to engage with HIV prevention services was enhanced through community empowerment, social protection, and peer support. Social opportunities were strengthened through Peer-led outreach, participatory approaches, healthcare provider training, and social support addressing support for mental health, violence, and substance abuse. Physical opportunities were expanded by implementing integrated youth-friendly services and mobile clinics.

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59 **Discussion:** Strategies to enhance individual capability and motivation, largely affected by internal
60 and anticipated stigma, are underexplored. There remains a need to increase PrEP awareness and
61 access in the subregion. Peer-led models cut across as strategies that improve service engagement
62 at both individual and environmental levels. Mobile health and participatory approaches involving
63 young women in design show promise but evidence remains limited.

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65 **Conclusion:** HIV prevention efforts specifically targeting young women who sell sex require
66 comprehensive, community-driven, and tailored approaches that address structural, social, and
67 individual barriers. However, more research particularly interventional in Central and West Africa
68 are needed.

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70 **Key words:** Young women, sex work, HIV Prevention, tailored strategies, Sub-Saharan Africa

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73 **Introduction**

74 HIV disproportionately affects young women who sell sex in sub-Saharan Africa, with acquisition
75 rates nearly nine times higher than those of young women who do not sell sex [1,2]. According to
76 the Joint United Nations Programme on HIV/AIDS (UNAIDS), 63% of new HIV acquisitions
77 occur among women aged 15-24 years in sub-Saharan Africa; with sex work identified as a major
78 driver of the epidemic in the region [3]. A pooled analysis in 2020 across nine countries in sub-
79 Saharan Africa found that by ages 18–19, HIV prevalence among young women who sell sex was
80 approximately 45.4% in Southern Africa, 5.8% in Central Africa, and 4.0% in West Africa [4].
81 Despite this high HIV burden, young women who sell sex typically engage less with HIV testing

and preventive measures compared to older female sex workers [4,5]. This heightened vulnerability results from an interplay of individual, social, economic, and structural factors including poverty, age-disparate clients, and difficulties in negotiating condom use [6,7].

Economic necessity often drives young women into sex work, highlighting broader issues of gender inequality and limited economic opportunities for adolescent girls and young women[3,8]. In most African countries, sex work is criminalised; the criminalisation, stigma and discrimination associated with sex work further contribute to the marginalisation of young women who sell sex [9]. This may increase their vulnerability to exploitation and violence and their access to essential HIV prevention services such as testing, counselling, condom distribution, and Pre-exposure prophylaxis (PrEP), thereby exacerbating the challenges they face in safeguarding their health and well-being [9,10]. Despite this elevated risk, young women who sell sex are not adequately prioritized in regional HIV prevention strategies, reflecting a broader oversight of younger key populations (KPs) in HIV responses, as noted in the World Health Organization (WHO) review of National Strategic Plans from 2018 [10,11].

Addressing HIV prevention among young women who sell sex requires a holistic and theory driven approach that combines behavioral interventions with broader structural and community-level strategies to address the complex factors contributing to their vulnerability [12]. Several frameworks can be applied to better understand and address the factors influencing HIV prevention among young women who sell sex; One such widely used and empirically validated model is the Capability, Opportunity, Motivation, Model of Behaviour (COM-B), which identifies key factors that drive behaviour change [13]. It considers cognitive, social, and environmental determinants; highlighting the interplay of motivation (beliefs, confidence), capability (knowledge, skills), and

opportunities (social and environmental influences) [13]. Based on the COM-B, the Behaviour Change Wheel (BCW) was developed, providing a systematic and theory-guided method for classifying intervention types for a given health behaviour, context and target individuals or population [14]. The BCW stipulates three layers: the sources of behaviour (i.e. the COM-B constructs), intervention functions (e.g. modelling, education); and policy categories (e.g. legislation, service provision).

While recent evidence suggests that improving access to HIV prevention for young women who sell sex should involve addressing the social determinants of health [4,12,15,16], there remains a gap in understanding what strategies have been implemented to enhance HIV prevention uptake and how these strategies are tailored to their needs. This scoping review aims to fill this gap by mapping existing evidence and providing a comprehensive overview of tailored HIV prevention strategies for young women who sell sex in sub-Saharan Africa. In addition, building on the COM-B model, will deepen understanding of how multi-level factors shape HIV prevention uptake among young women who sell sex in the region.

Methods

This scoping review adhered to the updated methodological guidelines inspired by Arksey & O'Malley, encompassing five key steps [17,18]. These included: (1) Developing the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data and (5) collating, summarising and reporting the results. The final search for identifying studies and collecting data was initiated on June 12, 2024, with no publication date restrictions. Articles retrieved ranged from 2007 to 2024. The protocol was registered on the Open Science Framework (OSF) with the

following reference; OSF Registration: 24/11/08 <https://osf.io/2ykd9/>. Data extraction and synthesis from included full text articles was completed in April 02, 2025.

1. Developing the research question.

To guide the review, we utilized the PICO approach, which focuses on the Population, Phenomenon of Interest, and Context [19]. The aim was to explore how HIV prevention strategies are tailored to meet unique needs of young women who sell sex aged 15 to 24 in sub-Saharan Africa using a behavioural lens. We formulated the following review question: **‘What are the factors influencing engagement with HIV prevention services among young women who sell sex aged 15-24 in sub-Saharan Africa, and what strategies can improve service uptake within this population?’** We considered key HIV prevention services as those that reduce vulnerability to HIV including education, risk reduction counselling, STI screening and treatment; condom distribution and promotion; PrEP; stigma reduction interventions, legal reform, and access to social protections [10].

2. Identifying relevant studies.

We developed a search string using the PubMed search builder to retrieve peer-reviewed articles. The final search formula included the following core terms: **[(HIV AND prevention strategies OR Service accessibility) AND (Young women who sell sex) AND (sub-Saharan Africa countries)]** see supplementary file 1 for full string. Appropriate MeSH terms and field tags were used, alongside free-text formats. This search string was adapted for the following electronic databases, PubMed, **Embase**, and **Web of Science**, and filtered to include only human studies with

no time restrictions (see Supporting Information File 1 for the complete search string).
Complementary hand searches were also performed using **Google Scholar** and **Google Search**,
focusing on indexing relevant concepts associated with interventional studies on HIV prevention
strategies for young women who sell sex in SUB-SAHARAN AFRICA countries.

3. Study selection.

Articles retrieved from various databases were uploaded to the Rayyan platform for screening.
After removing duplicates, a random sample of 100 articles was generated from the total output
and independently screened by two reviewers (NM and CN) to pilot the eligibility criteria and
assess inter-rater reliability (details in Supporting Information File S2). The inter-rater agreement,
with a kappa coefficient of 0.82, indicated very good strength of agreement [20]. We randomly
divided the full sample of records into three groups, with each reviewer (NM, CN, and JV)
conducting independent preliminary screenings of titles and abstracts. One reviewer (NM)
analysed the retained full-text articles. The study eligibility criteria are described in **table 1**.

Table 1: Study eligibility Criteria

INCLUSION	DEFINITION	RATIONALE
Population	Young Women Who Sell Sex (YWSS) aged 15-24 years	Studies focusing on this demographic with a broad definition of sex work (including transactional sex) are essential, as they are at high risk for HIV and need prevention strategies tailored to their unique vulnerabilities.
Phenomenon	HIV prevention strategies for young women who sell sex (YWSS). OR	Articles should detail intervention approaches/strategies targeting YWSS, including theoretical bases, implementation experiences, and outcomes. Understanding these strategies is crucial for addressing YWSS's unique needs and improving health outcomes
	Factors influencing uptake of HIV prevention services among YWSS	Articles which offer insights into barriers and facilitators to uptake of HIV prevention services (eg; awareness raising, education, condom distribution, behavioural interventions, biomedical primary prevention methods such as PrEP) specifically among YWSS at all levels: individual, social or structural via either quantitative, qualitative or mixed methods studies
Context [SUB-SAHARAN AFRICA]	Sub-Saharan Africa (SUB-SAHARAN AFRICA);	This region has the highest burden of HIV regarding YWSS, and recent studies are needed to understand current challenges and advancements in HIV prevention efforts specific to this population.
EXCLUSION	DEFINITION	RATIONALE
Population	Studies that do not provide a separate data analysis for the YWSS category	Research must focus on/or include YWSS (15-24 years) to ensure relevance to the review's objectives and must present a separate analysis for YWSS
		Articles were also excluded if full text could not be retrieved to check if a separate analysis for YWSS was included
Phenomenon	Publications that mention HIV prevention but don't expatiate on the strategies or on their barriers and enablers	Articles were excluded if they discussed HIV among YWSS without focusing on prevention strategies or their influencing factors, e.g focusing on HIV incidence, testing, contraception, discussing HIV risk or determinants of vulnerability, focus on other STIs.
Type of articles	(Systematic) review articles, editorials, commentaries, opinion pieces/viewpoints, theses and book (chapters)	These types of articles were excluded if they were not peer reviewed Review Articles: Individual articles included in Reviews (systematic, scoping etc) were included if they met the inclusion criteria above and did not include any items mentioned in the exclusion criteria
Inaccessible Articles	Articles whose full text version could not be retrieved	Articles that lack comprehensive details in their abstracts, such as explicitly indicating whether a separate analysis for YWSS was conducted or if HIV prevention strategies were discussed thoroughly, will be excluded if the full-text versions cannot be accessed.

4. Charting the data.

We developed a data extraction sheet to capture key study features and piloted it for consistency (Supporting Information File S3). This sheet was adapted for each article category. We recorded information from selected studies, including authors, publication years, intervention details, outcomes, and factors influencing HIV prevention uptake. We analyzed the findings from each study using the COM-B model (**Figure 1**) and the BCW components [13,14].

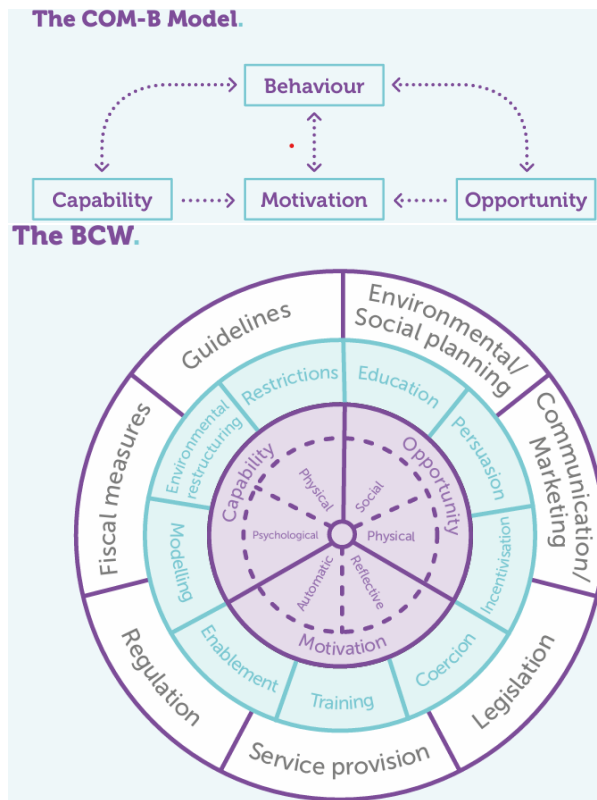


Figure 1: The COM-B Model and Behaviour Change Wheel [13]

5. Results

The initial search identified 1,472 articles, of which we included 30 in the final analysis (**Figure 2**) [21]. This comprised 24 observational studies examining factors influencing HIV prevention uptake among young women who sell sex (table 2) and six interventional studies describing strategies to enhance their engagement with HIV prevention services (table 3).

IDENTIFICATION

SCREENING

ELIGIBILITY

INCLUDED

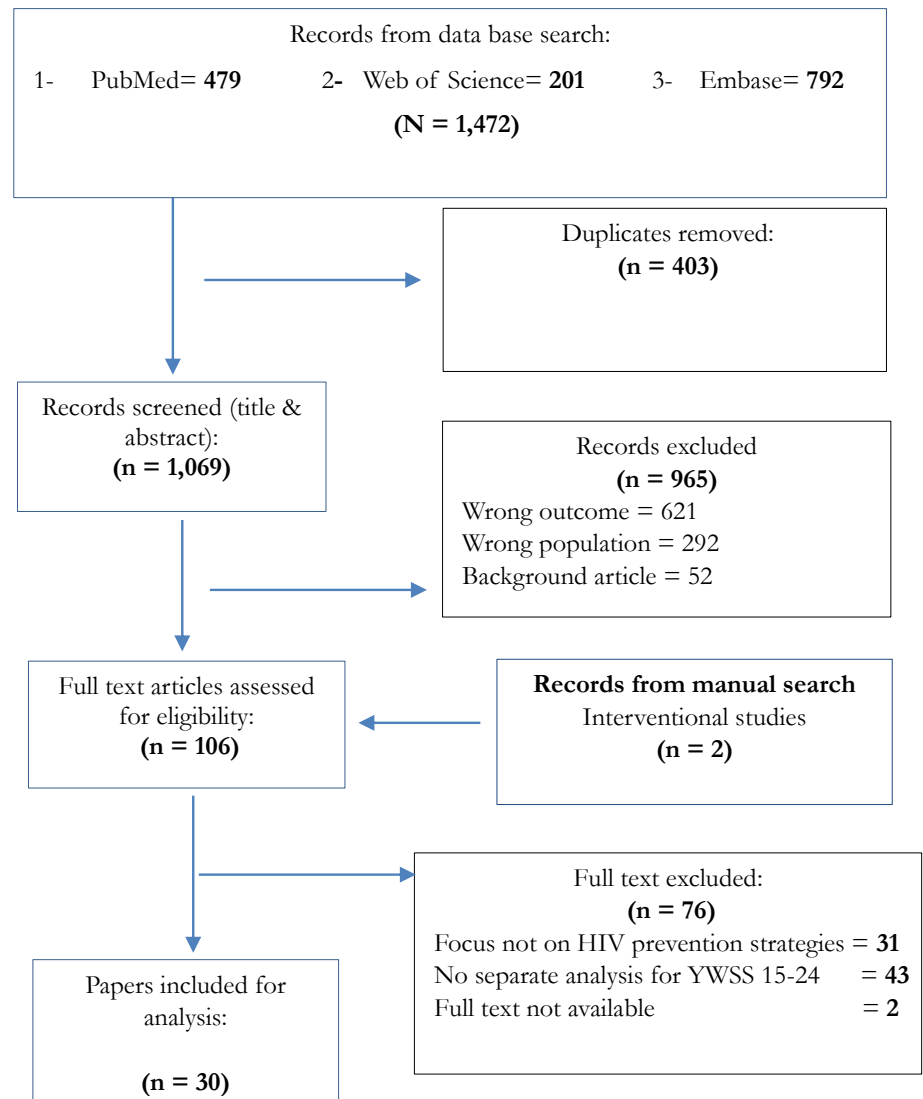


Figure 2: PRISMA Flow Chart

The results were organized using the COM-B constructs to explore factors influencing young women who sell sex's engagement with HIV prevention services. The presentation covers the studies' geographical distribution and their study designs. We then described individual factors (Capability and Motivation), social opportunities, and structural/environmental factors (physical opportunities). We also reviewed interventional studies, their mechanisms, policy implications,

and the COM-B constructs they impact, highlighting how strategies influence behavior and service uptake.

Geographical Distribution and study design

Among the 24 observational studies, 12 studies were conducted in Southern Africa (including six in Zimbabwe, four in South Africa, one in Swaziland, and one in Malawi), nine in East Africa (four in Kenya, two in Uganda, two in Tanzania, and one in Ethiopia), two in Central Africa (both in Cameroon), and one in West Africa (Nigeria) (**figure 3**). By design, four studies utilized qualitative methods, four employed quantitative methods, and 16 used mixed-method approaches

Among the six interventional studies, three of these studies were conducted in Zimbabwe (Southern Africa), two in Kenya (East Africa), and one in Burkina Faso (West Africa) using designs such as Cohort or non-randomized designs, including programmatic surveillance of ongoing or pilot programs (**Figure 3**).

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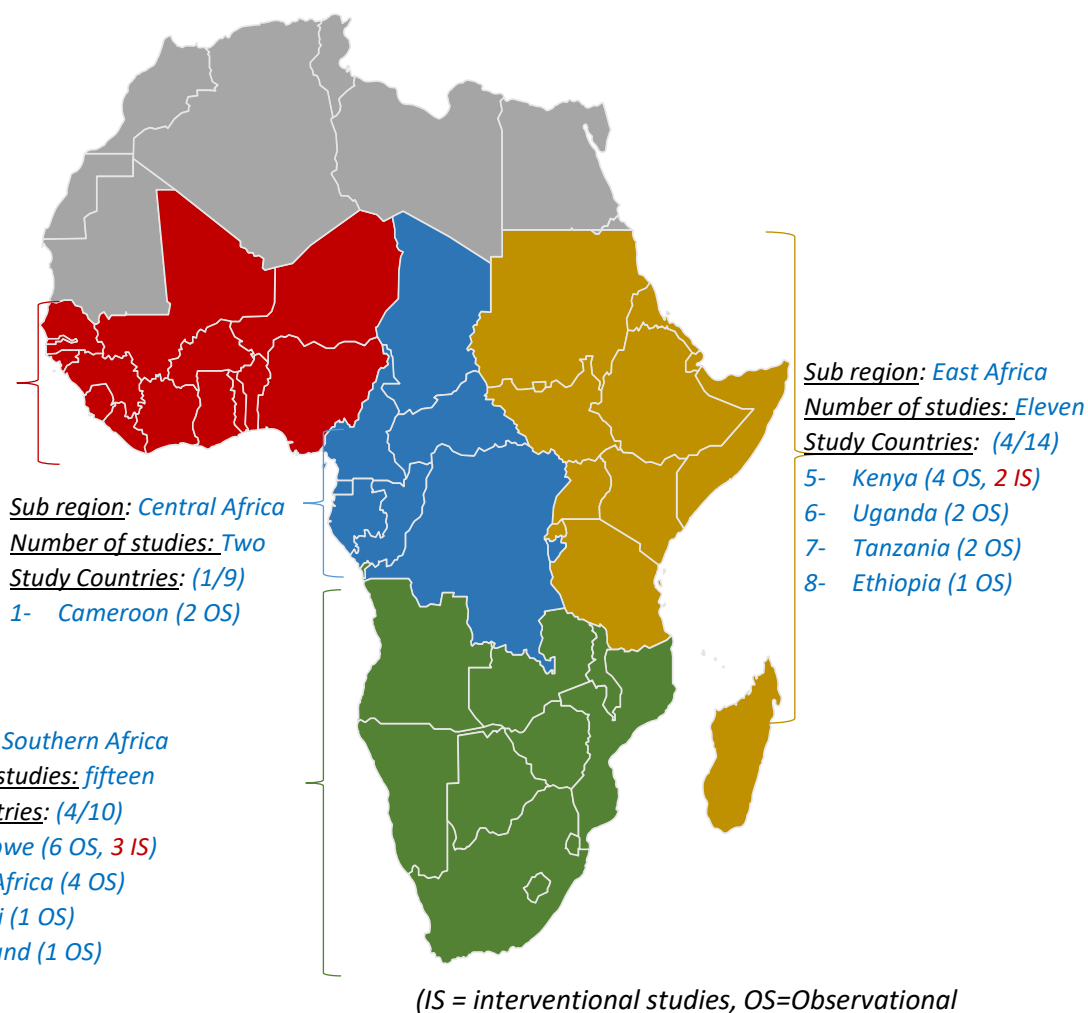


Figure 3: Geographical distribution of included studies [22]

5.1. Factors influencing engagement with HIV prevention services (Table 2)

Table 2: Studies assessing factors shaping HIV Prevention service uptake among young women who sell sex in sub-Saharan Africa

Author	Country	Aim	Design & population	Findings on factors influencing HIV prevention, mapped according to the COM-B model		
				1-Physical Capability:(e.g stamina, physical ability & skills), 2-Psychological Capability (e.g knowledge, cognitive/ inter personal skills, mental ability)	Motivation (beliefs about what is good and bad) (e.g. I have the desire to, I feel the need to)	1-Social Opportunity: (e.g Inter personal influences, social cues and cultural norms) 2-Physical Opportunity (e.g environmental resources like sufficient time, materials & structures)
1 Cowan et al, JIAS, 2019[23]	Zimbabwe	Assess impact of FSW (female sex workers) programming on HIV incidence and prevalence; describe sex work; model elimination of transmission through sex work	Descriptive analysis/ modeling; data (2011–2017) collation 67,000 FSWs/RDS in 19 sites	2-Lack of comprehensive knowledge and understanding about HIV prevention impairs their ability to make informed health decisions and engage with services.	feelings of fatalism (“I will take treatment when I get HIV”), reduces their intent to engage with prevention services	1-Stigma related to sex work discourages seeking care; peer support and empowerment through peer-led education foster trust and encourage service engagement. 2-Logistical barriers such as geographic distance and limited access to services hinder uptake; outreach efforts like mobile units help overcome these barriers.
2 Crankshaw et al. 2021, Soc Science & Medicine,[24]	Zimbabwe	Investigate age-related determinants of sexual and reproductive health vulnerabilities among YWSS (Young women who sell sex) aged 16–24	42 in-depth interviews and 30 FGD with 198 participants, via snowball sampling	1-Inexperience and shame increased vulnerability, affecting safe sex negotiation. 2-Stigma and identity issues hindered engagement with health services 2-Peer education and support helped build confidence and resilience	Stigma associated with using same clinics known for serving FSWs discouraged YWSS from seeking care	1-Subordinate social position and exploitation reduced access and retention in programs/ Support from peer networks and mentors facilitated engagement and retention. 2-Outreach creating safe spaces improved access to healthcare.
3 Hensen et al., JAIDS 2021[25]	Zimbabwe	Support PrEP use among YWSS by identifying gaps in uptake and influencing factors	Mixed methods; RDS 963 HIV- women 18-24 in two cities; cohort study at two time points		Desire for self-protection supported willingness to use PrEP.	1-Fear of disclosing sex work, HIV stigma, and misconceptions about PrEP hindered acceptance and use/ Support from peers and social networks reinforced consideration and continued use of PrEP 2-Limited PrEP offers from healthcare providers and logistical barriers (clinic distance, costs) reduced access. 1/2- Attendance at clinics and social support increased PrEP offer and uptake.
4 Machingura [26] et al., BMC Women Health ,2023	Zimbabwe	Explore facilitators and barriers to engagement with the DREAMS ((Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe) initiative among YWSS	Interviews with 43 YWSS aged 18-24, purposively sampled from two cities		Desire to escape poverty motivated initial participation in the DREAMS program	1-Social stigma around HIV and sex work hindered initiation and adherence to PrEP/ supportive social networks reinforced retention/ Community mobilization and social support helped build relationships that promote sustained engagement. 2-Lack of financial resources and opportunity costs (e.g., expenses, poverty) led to withdrawal/limited engagement.
5 Chabata ST, JIAS, 2020 [27]	Zimbabwe	Assess the impact of the DREAMS programme on condom use among YWSS aged 18-24	prevention cascade analysis; 2,431 YWSS recruited via RDS across six sites	2-Experiencing sexual violence and mental health issues decreased condom use.	Perceptions of unreliability of condoms reduced consistent use.	1-Good peer relationships enhanced condom negotiation and use
6 Chiyaka et al., PLOS One, 2018 [28]	Zimbabwe	Identify & describe locations/ contexts for YWSS to inform the DREAMS program (SOCIAL MAPPING)	Mixed methods; social mapping across six sites (targeting YWSS aged 15-24 using peers	1/2- Limited knowledge of available health services and negotiation skills reduced uptake of HIV prevention.	Motivation to support families (e.g younger siblings) enhanced engagement in the DREAMS program despite barriers.	1-Fear of disclosure and societal stigma hindered health service seeking and engagement/ Tensions with older sex workers and criminalization created hostile environments, discouraging collective action/ Supportive peer networks facilitated information sharing and resource access

7 Chimbindi et al., AIDS Care, 2022 [29]	South Africa	Evaluate implementation of PrEP targeting YWSS in KwaZulu-Natal	Mixed-method evaluation, 2,184 AGYW (Adolescents and young women aged 13-22;	2-Limited knowledge about PrEP's availability and effectiveness caused ambivalence and low uptake	Perceptions of HIV testing stigma and fear of medication reduced willingness to get screened and use PrEP.	1-Stigma and mobility hindered self-identification and consistent access to PrEP/ Community-based initiatives, peer navigators, and mobile clinics facilitated access and supported demand 2-Restrictive eligibility criteria and inaccessibility in primary health care (PHC) limited physical access to PrEP
8 Rao et al., 2022, PLOS One [30]	South Africa	Examine persistence on oral PrEP among female sex workers (FSWs) in eThekweni from 2016 to 2020	Data analysis from TB HIV Care 2776 FSWs (1102 under 25 years)	2- Lower HIV knowledge , negotiation skills, and higher stigma, reducing persistence.		1-Stigma, limited social support, and violence increased vulnerability and affected retention. 2-community awareness, and support strategies enhanced engagement and uptake over time
9 Chimbindi et al, 2019, Sex Trans Infect [31]	South Africa	Examine PrEP eligibility, awareness, uptake & perceptions among AGYW, & impact of PrEP implementation on community demand and attitudes	Mixed-methods process evaluation mapping, surveys, IDI /KII 2184 AGYW	2-Lack of understanding and misconceptions about PrEP among AGYW reduced willingness to use it	Some AGYW (adolescent girl & young women) viewed PrEP as a beneficial alternative and showed willingness to explore it	1-Community stigma and limited outreach reinforced negative perceptions and restricted access, impacting uptake. 2-Increased awareness through community outreach and education improved acceptance and potential for higher uptake.
10 Chimbindi et al, AIDS Res. Hum. Retroviruses[32]	South Africa	To evaluate the effectiveness of PrEP delivery within the DREAMS initiative and assess perceptions of stakeholders and young women	Mixed-method process evaluation using mapping, survey/2184 AGYW 13-22, KII	2-Community perceptions equating condom use with fear; preference for discreet pills 2- Empowerment from peer-built trust	Low risk perception and fatalism affecting motivation to seek PrEP, Supportive peer relationships enhancing adherence	1-Stigma related to sex work creating resistance to healthcare services/Empowerment from peer educators fostering trust and engagement 2- Mobile health services reaching hard-to-reach areas
11 Mountain et al, AIDS Res. Hum.Retroviruses	Kenya	To examine relationships between different types of violence and HIV prevention uptake measures among self-identified YWSS (14-24)	Cross-sectional study analyzing bio- behavioural data collected in 2015	2- Psychological impact of violence reducing self-efficacy and motivation	Awareness of HIV risk motivating prevention behaviours	1-Community stigma leading to reluctance to seek services 2-Lack of access to healthcare facilities, especially after violence/Supportive healthcare environments and outreach programs
12 Cheuk et al., JMIR Public Health Surv, 2019 [33]	Kenya	Refine HIV prevention programs for AGYW at risk due to transactional and casual sex (LOCATION MAPPING)	modified programmatic mapping; on AGYW aged 14 to 24/ key informant interviews	2-stigma and fear of judgment limiting service use		1-Social stigma leading to marginalization/ Many hotspots are unrecognized (2) by programs, indicating outreach gaps/ Peer networks and community familiarity promote support and motivation 2-Limited access to healthcare facilities due to geographical barriers/Community outreach improve engagement
13 Were D et al., JIAS, 2020 [34]	Kenya	Analyze missed opportunities in PrEP delivery among KP using programmatic surveillance using routine program data	89 project-supported sites/ 299,798 persons tested for HIV, including YWSS 15-24	2-Feelings of shame hinder knowledge and confidence to seek PrEP.	Positive peer testimonies increasing awareness and motivation to use PrEP	1-Social stigma and perceived labelling as promiscuous reduce social support and motivation/ Peer influence and support encouraging service use 2-Limited access to healthcare facilities and multiple visits/ Low priority and reluctance from healthcare providers/ Community outreach and integrated services reducing stigma
14 Kyongo et al, J. Int. AIDS Soc, 2018	Kenya	Assess retention rates on PrEP & identify factors influencing drop- out and continuous use among FSW/MSM & Young Women (YW)	Prospective PrEP demonstration project enrolling 1585 participants	2-Misconceptions about how PrEP works	perceived lower personal risk over time Sense of social responsibility to protect oneself and partners	1-Community stigma and discrimination from HCWs/ Support from social circles (peers, partners)encourage ongoing PrEP use 2-Barriers in physical access & unavailability of comprehensive prevention services affecting retention
15 Duff et al., AIDS Care, 2017 [35]	Uganda	Examine factors driving inconsistent condom use among	400 YWSS aged 19-25 recruited through peer	1/2- Limited knowledge or skills to negotiate condom use and manage substance effects	Migration for sex work and economic pressure leads to compromises on safe sex	1-Violence and physical/sexual coercion by clients/ Police harassment discouraging service access/Addressing

		YWSS & clients Cross-sectional quantitative design;	& community-led outreach strategies		practices/Positive self-agency and empowerment	violence and stigma, enhances opportunities for safe sex practices.
16 Nakiganda et al., Sexual Health, 2024 [36]	Uganda	Assess effectiveness of PrEP on sexual pleasure & HIV concerns among FSWs in 3 Trans-African Highway towns & 4 fishing areas	Structured interviews with 524 participants attending PrEP visits from Jan to July 2021		Perception that PrEP increases sexual pleasure and reduces HIV worry motivate PrEP use	1-Engagement with peers & community outreach enhances willingness to use PrEP/ 2- Geographical access limitations to PrEP services/Availability of integrated PrEP services improves uptake
17 Decker et al., Sex Transm Infect, 2016 [37]	Cameroon	Assess prevalence of gender-based violence (GBV) among female sex workers (FSWs) and its associations with HIV risk and healthcare access	Cross-sectional design; 1817 FSWs (473 aged 18-23y) recruited via snowball in 7 cities	2-GBV affects psychological strength and decision-making capacity regarding safe sex.	Fear and stigma in healthcare settings reduces motivation to access services	1-Limited access to justice and law enforcement hostility/ Peer support networks among YWSS & Community engagement for outreach enhance uptake
18 L. Bowring et al., [38] Lancet Child Adolesc Health, 2019	Cameroon	Assess unmet HIV prevention and treatment needs among YWSS (YFSWs) and MSM Cross-sectional analysis using a biobehavioral survey	RDS) in 5 cities, 2,255 FSWs and 1,323 MSM, with 32% of FSW/ 63% of MSM aged 18-24	2-Lack of participation in peer education hinder awareness and safe practices/ Untreated STI symptoms due to stigma or lack of knowledge/Higher education promoting better health literacy		1- Criminalization and discrimination creating a hostile environment 2- Limited access to community-based organizations and HIV services/Distribution of free condoms through community organizations
19 Lichtwarck [39] HO et al., BMJ Glob Health, 2023	Tanzania	Identify factors associated with early disengagement from PrEP services among FSWs	Cohort analysis of 470 FSWs enrolled through RDS from March to July 2021;	2- Mental distress associated with disengagement from PrEP	Younger age and fewer clients linked to disengagement from PrEP	1-Supportive health services and peer support improved retention
20 Wamoyi et al., Tanzan. J. Health Res, 2022	Tanzania	Explore barriers and enablers to accessing HIV services for YWSS/ Ethnographic research involving six SRH program implementers	Photovoice methodology with 10 YFSWs aged 18-24 years			1- Stigma due to young age and sex work hinder support and access/Support from service providers and peer groups promote engagement. 2-Lack of differentiated services for adolescents and YWSS limits access/ Prompt, localized, 24-hour services
21 Lancaster et al., AIDS Behav., 2020 [40]	Malawi	Identify preferences for PrEP delivery among FSWs using discrete choice experiment (DCE)	150 FSWs from Lilongwe, targeting those under 25 years	2- Lack of awareness about PrEP and benefits limited understanding of prevention options	Desire to avoid HIV motivate HIV prevention behaviour.	1- Social stigma and discrimination in healthcare/societal and legal stigma hinder access and willingness to seek services 2-Preference for integrated, accessible, discreet services
22 Fonner et al., PLOS One, 2014 [41]	Swaziland	Examine the relationship between social capital constructs and HIV-related risk among female sex workers (FSW)	Cross-sectional study; 325 FSW aged 18 and older; recruited using RDS	2-Police refusal of protection and harassment limit engagement with services		1-Low social cohesion and trust among sex workers & Stigma and discrimination from law enforcement and society hinder support and health access./ Support from peers encouraging condom use and testing
23 Olakunde et al., Int. J. STD AIDS, 2024 [42]	Nigeria	Assess barriers to PrEP uptake among young key populations (YKP) aged 15–24/ Secondary data analysis of the 2020 (IBBSS	multi-stage probability sampling of 7,263 YKP across 12 states		Fear of side effects and low risk perception reduce motivation to initiate PrEP	1-Social stigma and discrimination limits PrEP uptake/ Supportive social environment and accessible services facilitate uptake. 2-Limited availability and awareness of PrEP services reduces access
24 Dr. L. Van Blerk, AIDS Care, 2007 [43]	Ethiopia	Explore the mobility of sex workers and its impact on access to HIV prevention services	Mixed-methods <i>IDI</i> /Focussed group Discussion (<i>FGD</i>) with 60 YWSS aged 14 to 19, recruited through NGO DIC	2- Lack of knowledge about HIV services hampers service utilisation 2-exploring ways for girls to access information and maintain contact with support structures while moving between places of work	Desire for better conditions motivating information seeking	1-Societal stigma and discrimination discourage seeking HIV services/ Peer networks providing information and support 2- Mobility issues and economic barriers Limited physical access to healthcare

298 **5.1.1. Factors influencing capability:** The COM-B model identifies two key axes of capability:
299 physical capability, which encompasses stamina, physical ability, and skills, and psychological
300 capability, which involves knowledge, cognitive/ interpersonal skills, and mental ability [13].
301 Among the 24 observational studies assessing factors that influence engagement with HIV
302 prevention services among young women who sell sex, only three studies highlighted factors
303 related to physical capability [24,35,44]. All three studies discussed inexperience or inability to
304 negotiate safe sex, with one study highlighting how substance use could impair ability to negotiate
305 condom use [35].

306 The majority of studies (16 in total), discussed barriers related to psychological capability,
307 primarily focusing on two key aspects: lack of knowledge and mental ability.

308 **5.1.1.1 Barriers**

309 **Limited Knowledge on HIV Prevention services:** Nine studies highlighted that limited
310 knowledge, awareness and understanding of HIV prevention methods, particularly PrEP, hindered
311 ability to make informed health decisions [23,29–32,35,38,43,44]. This was often exacerbated by
312 misconceptions about PrEP (e.g it was meant only for those who are already sick) and a lack of
313 knowledge on where to access these services [31].

314 **Mental ability to engage with HIV prevention services:** Conversely, seven studies examined
315 how mental distress could impair uptake or willingness to engage with services
316 [24,33,34,37,39,41,45]. Three studies highlighted key barriers that undermined psychological
317 capability among young women who sell sex [24,33,34]. These included internal and anticipated
318 stigma, such as feelings of shame or low self-worth related to age and sex work, which hindered
319 willingness to seek PrEP [34]. This also included fear of judgment stemming from the sensitive

nature of discussing transactional or casual sex which could inhibit open communication within healthcare settings, preventing access to the services needed [33]. Identity issues were also noted; younger participants often distanced themselves from a “sex worker” label, making it difficult to identify with targeted interventions and thus limiting their reach [24]. Four studies discussed how experiences of violence both from clients and police, could cause mental distress , discouraging young women who sell sex from seeking HIV prevention services [37,39,41,45].

5.1.1.2 Enablers:

Peer education and mobile health initiatives: Four studies identified key enablers related to psychological capability [24,32,38,43]. They emphasized that increasing knowledge about HIV prevention methods like PrEP and empowering through peer educators built trust, encouraged ongoing engagement, and gave young women who sell sex more control over their health decisions. Two of these studies also highlighted the need for innovative ways such as mobile health to help young women access information and stay connected with support services while moving between different workplaces [32,43].

5.1.2. Factors influencing motivation: Motivation refers to the internal drives and beliefs that influence decisions and actions; for young women who sell sex, this includes factors that affect their willingness to engage with HIV prevention services [13].

5.1.2.1 Barriers

Stigma related barriers: Five of 24 studies found stigma related barriers that significantly demotivates young women who sell sex from engaging with HIV prevention services [24,29,34,39,46]. This included anticipated stigma associated with using the same clinics as older

sex workers and having to take an HIV test, including fear of judgment in healthcare settings and internal stigma related to young age, sex worker identity, and feelings of low self-worth.

Barriers related to Prep use: Four studies highlighted barriers related to PrEP use, with two discussing experiencing feelings of fatalism (e.g ‘I will take treatment when I get sick’) and two emphasizing the fear of side effects, which affected motivation to engage in taking PrEP [23,29,32,42].

Misconceptions on HIV prevention methods: Three studies discussed barriers related to perceptions of the unreliability of certain HIV prevention methods, such as condoms, often associated with low perceived HIV risk [32,42,45]. The findings suggest that many young women who sell sex may underestimate their risk of acquiring HIV, which hinders their motivation to pursue preventive measures like PrEP.

5.1.2.2 Enablers:

Eight of the 24 studies identified key enablers that enhance motivation to engage with HIV prevention focusing on the three points discussed below;

Desire for self-protection: Five of the eight studies discussed desire for self-protection among young women, highlighting that the need to protect themselves from HIV was a strong motivator for HIV prevention uptake such as PrEP [25,31,36,40,43]. They viewed PrEP as beneficial, allowing them to maximize sexual pleasure without the worry of acquiring HIV [31,36].

Desire to escape poverty: Two studies discussed the desire to escape poverty, emphasising that young women who sell sex were motivated by the need to support their dependents by engaging with programs offering HIV prevention services integrated with social protection support (i.e. education and economic empowerment) [26,44].

Experience sharing among peers: One study explored how positive experiences and testimonies from peers who had benefited from PrEP increased motivation among young women who sell sex to seek similar services [34].

5.1.3. Factors influencing Social Opportunities: Social opportunities include the social environment, norms, and support systems that can either facilitate or act as barriers to HIV prevention for young women who sell sex [13].

5.1.3.1 Barriers:

Barriers Related to Stigma: In sixteen out of 24 studies, stigma emerged as a significant factor reducing social opportunities for young women who sell sex to engage consistently with HIV prevention. Five studies described how anticipated stigma related to sex work created reluctance to engage with services related to HIV and PrEP, as young women who sell sex feared judgment from peers and healthcare providers [23,26,32,42,43]. Findings from two studies indicated that fear of disclosure, (i.e. the concern that their involvement in sex work could be exposed to family and community), deterred young women from accessing health services or participating in research [25,28]. Six studies highlighted that social stigma around HIV undermined ability for young women who sell sex to initiate and adhere to PrEP [25,26,33,34,40,41]. This was often fuelled by societal misconceptions about PrEP use and discrimination within communities and healthcare settings [25,40,42]. This in turn led to fear of social harm and judgment among young women who sell sex, who were initially willing to take PrEP [34,40]. Similarly, two studies found that targeting a narrow age group like young women who sell sex for PrEP often limited its uptake due to stigma associated with being part of that specific group [29,31]. Lastly, social stigma around using the

same clinics known to serve older sex workers also discouraged service engagement among young women who sell sex, especially as most did not self-identify as sex workers [24].

Relationships with older peers: Three studies discussed the effect of strained relationships between young women who sell sex and older peers deterring them from seeking HIV prevention services [24,28,41]. The subordinate social position and exploitation of young women who sell sex within sex worker hierarchies or networks, combined with the absence of protective support systems, substantially undermined social cohesion and trust, and impaired their ability to make informed decisions about their health [24,41]. Tensions frequently arose in interactions with older peer educators and due to competition with older sex workers, leading to hostile environments that discouraged young women who sell sex from building supportive networks or working collaboratively to improve safety and address health concerns [28].

Criminalisation of sex work: Six studies indicated that the criminalisation of sex work fostered a hostile environment that hindered young women who sell sex from seeking help, significantly reduced their willingness to access health services, and increased their vulnerability to HIV [28,30,35,38,41,46]. This criminalisation contributed to a culture of impunity for violence against young women who sell sex, with police hostility and inadequate protection threatening their safety and further discouraging them from seeking healthcare or reporting abuse [28,38,41,46]. As a result, many young women who sell sex experienced physical and sexual abuse from clients, which was often associated with inconsistent condom use [30,35].

5.1.3.2 Enablers

Social network and support: Eleven studies found that supportive social networks and peer support significantly expanded social opportunities for engagement with HIV prevention efforts

[26,28,29,33,34,36,39,42,43,45,46]. Peer-led education and community programs fostered trust, sharing of information, and a sense of belonging, which normalized prevention methods like PrEP and boosted confidence. Informal peer networks allowed women to share resources, experiences, and advice, enhancing understanding and acceptance of HIV prevention measures. Supportive peer relationships also contributed to increased condom use and HIV testing, as women felt more empowered to negotiate safe practices and seek help. Peer groups strengthened social bonds, helping to overcome barriers like stigma and discrimination and encouraged their ongoing participation in HIV prevention efforts.

5.1.4. Factors influencing Physical opportunities: Physical opportunities refer to the resources available in the environment of young women who sell sex which may enable or hinder them from participating in HIV prevention efforts [13].

5.1.4.1 Barriers:

Ten out of 24 studies identified barriers that reduce physical opportunities for young women who sell sex to engage with HIV prevention services [23,25,26,29,33,34,38,40,42,43].

Limited-Service Availability: Five studies highlighted limitations in both the type and range of HIV prevention services available for young women who sell sex [25,29,34,40,42]. These included insufficient PrEP offerings by healthcare providers, often due to low prioritization and reluctance, which hindered ongoing prevention efforts [25,34,42]. Low PrEP offers were also linked to the inaccessibility of PrEP, stock shortages that necessitated multiple visits, and restrictions stemming from strict eligibility criteria [29]. the lack of differentiated, youth-friendly services such as

flexible operating hours, discretion, and tailored approaches for young women who sell sex, made these services less appealing and accessible to them [40].

Resource and geographical barriers: Five studies revealed limited access to healthcare facilities due to geographical distance and transportation challenges, which hindered HIV prevention service uptake among young women who sell sex [23,26,33,38,43]. Clinic inaccessibility reduced physical access, and many hotspots (sex work venues) remained unrecognized or underserved, creating outreach gaps and further decreasing access to prevention services [23,33,38]. Additionally, economic barriers such as opportunity costs associated with healthcare visits led to withdrawal and limited engagement in prevention efforts [26,43].

5.1.4.2 Enablers

Nine studies found that outreach activities, especially those implemented by community-based organisations, effectively expanded physical access to HIV prevention services for young women who sell sex [23,24,30,31,33,34,36,38,40,43]. This was facilitated by bringing services closer, creating safe spaces, and enhancing acceptance [23,24].

Mobile health units and clinics effectively reached women in hard-to-reach areas, bridging geographical gaps and addressing mobility barriers [43]. They reduced stigma associated with traditional healthcare settings by providing PrEP and related services directly in hotspots such as bars, red-light districts, and sex venues, often operating 24/7, which facilitated increased access to HIV prevention for young women who sell sex [31,43]. Peer educators played a vital role in mobilizing communities and increasing awareness, while initiatives distributing free condoms supported higher service uptake [30,34,38].

Integrated healthcare models that combined PrEP with reproductive health services like family planning, created a conducive environment for discretely accessing multiple resources, and prompt, localised services further improved engagement [36,40].

5.2. Strategies to enhance uptake of HIV prevention services (Table 3)

All the six interventional studies firmly rooted in the policy option of Service Provision, utilized education and enablement strategies to empower young women who sell sex by providing vital information about HIV prevention and care (See table 3).

Table 3: Studies on Tailored HIV Prevention Interventions for young women who sell sex in sub-Saharan Africa

Author	Country	Aim	Design and Population	1-Intervention Description 2-Policy option 3-Intervention type	1-Physical Capability:(e.g stamina, physical ability & skills), 2-Psychological Capability (e.g knowledge, cognitive/ inter personal skills, mental ability)	Motivation (beliefs about what is good and bad) (e.g. I have the desire to, I feel the need to)	1-Social Opportunity: (e.g Inter personal influences, social cues and cultural norms) 2-Physical Opportunity (e.g environmental resources like sufficient time, materials & structures)
1 Joanna Busza et al, AIDS Care, 2016 [47]	Zimbabwe	To address the needs of YWSS regarding violence prevention, clinical service access, and skill-building through a pilot program	Mixed methods evaluation of a one-year pilot program at three sites involving 143 YFSWs aged 15-19 through opportunistic recruitment within the Sisters program	1-Monthly interactive workshop focused on peer interactions, SRH community empowerment , and building trust and skills among YWSS to enhance service uptake 2- Service Provision 3- Education & Enablement	2-enhances knowledge and cognitive skills, empowering YWSS to make informed decisions regarding their health and well-being	boost self-confidence , awareness of rights, & motivation to engage in services' addressing perceived barriers (violence & negotiation)	1- Peer interactions & enhanced cooperation among YWSS fostering a support network & communal norms around safety and service uptake 2- Creates opportunities for engagement through workshops and improved access to clinical services
Intervention outcome	Enhanced cooperation & alertness regarding safety & Improved trust in the program and increased self-confidence. Increased clinical attendance						
2 Chabata et al, 2022 JMIR Public Health Surveillance, [48]	Zimbabwe	To compare RDS & peer outreach in recruiting & referring YWSS for HIV prevention and care services under the DREAMS program	Comparing RDS (10 seeds per city) and peer outreach (18 trained peers & community mobilization) in two cities from Apr to Jul 2017 and Jan to Jul 2018	1-RDS; purposive sampling involving incentives, 2 recruits per seed (scripts and coupons). Peer outreach ; training, outreach and support, engage beyond referral 2- Service Provision 3- Education & Enablement	2-Peer educators provide knowledge about HIV prevention and care, aiding in decision-making and empowering YWSS to engage in proactive health behaviours	Provides information about the benefits of accessing HIV prevention services, affirming the importance of HIV care and prevention.	1- Trained peer educators helps normalize health-seeking behaviours and creates a community support structure. 2-Creates structured opportunities for YWSS to access HIV prevention services by addressing logistical barriers
Intervention outcome	RDS recruited 1,204 YWSS with 41.6% accessing DREAMS services. Peer outreach recruited 5,386 YWSS, with 17.3% accessing services						
3 Chabata et al, BMJ Global Health, 2022 [49]	Zimbabwe	Assess the impact of the DREAMS partnership on HIV incidence among YWSS young women who sell sex in two Zimbabwean cities:	Non-randomized plausibility comparing cohort from 2 intervention districts & 4 non- intervention districts using RDS to identify YWSS for testing and referral	Package (social protection-educational subsidies, cash transfers, vocational training), HIV prevention (adolescent-friendly SRH services, HTS, PrEP, & community mobilization), and GBV prevention & support 2- Service Provision 3- Education & Enablement	2-Peer educators boost knowledge on HIV prevention supporting informed decision-making encouraging proactive health behaviours	Education on HIV risks and prevention strategies fosters conscious planning and motivation to engage in protective health behaviors, such as negotiating condom use.	1- Peer support & community mobilization enhance social networks and cultural norms supporting safe health practices among YWSS 2-Access to services like PrEP, HTS & Social Protection creates a favourable environment for YWSS to seeking services
Intervention outcome	Lower HIV incidence in DREAMS sites/ Improved access to clinical & HIV prevention, knowledge of HIV status and ability to negotiate condom use. Improved coverage of social protection						
4 Bhattacharjee P et al., Journal of the International AIDS Society, 2022 [50]	Kenya	Assess effectiveness of a pilot intervention aimed at scaling up HIV prevention services for YWSS & extract lessons learned/ Mixed-methods, pre/post-intervention study using three data sources	Monthly routine program monitoring data (October 2019 - September 2020), polling booth surveys conducted before and after the intervention, and FGDs and key informant interviews (KIIs). 1,376 cisgender YWSS were registered in the program, with 28% under 19	Combination prevention services, including structural, behavioural & biomedical services such as HTS, PrEP, condoms & support for violence, using peer-led mobilization & service provision in sex work venues 2- Service Provision 3- Education & Enablement	2- Access to comprehensive information and support regarding HIV prevention	peer-led mobilization improved trust and motivation to engage with services	1- Peer-led mobilization fosters a supportive environment among YWSS, through social networks. 2- Accessible locations for HTS and PrEP directly in sex work venues , making it easier for YWSS to engage.
Intervention outcome	Increases in engagement with HIV prevention services & HIV-related knowledge (from 61.7% to 90%) and PrEP usage (from 8.5% to 32.2%). Linkage to HIV treatment. Harassment by family/ discrimination in educational institutions						
5	Kenya	To assess optimal peer educator (PE) ratios for	Mixed-methods study using programmatic monitoring	peer-led outreach, micro-planning to prioritize hotspots, and a	2-Intervention improved knowledge among YWSS	Peer led outreach and microplanning improved	1-Engagement from peer educators enhances community support & networks , encouraging

Bhattacharjee P et al., PLOS ONE, 2018 [51]		effective outreach and their impact on HIV/STI service utilization among KP, particularly FSWs	data from Oct 2013 to Sept 2016, involving 133,675 FSWs and 18,460 MSM. FGD and qualitative interviews supplemented the analysis	combination of behavioural, biomedical, and structural interventions to optimize KP:PE ratios for tailored outreach	regarding HIV prevention, fostering cognitive skills necesub-Saharan Africary for informed decisions	trust and confidence in engaging with services giving a sense of community ownership	peers to seek necesub-Saharan Africary health services 2-Optimizes peer educator ratios and facilitates regular outreach , the environment provided more consistent access to health services
Intervention outcome	Reduction in KP:PE ratios (from 147:1 to 91:1 for FSWs/Associated increases in regular outreach contacts and improved service utilization, risk reduction counseling, STI screening,						
6 Traore IT et al., Journal of the International AIDS Society, 2015 [52]	Burkina Faso	To evaluate the efficacy of a targeted community-based intervention on HIV prevention and care services for FSWs	Prospective interventional cohort study involving HIV-FSWs aged 18-25 in Ouagadougou, with a 21-month maximum follow-up. 321 participants enrolled, 277 completed the follow-up	The intervention consisted of peer-led education sessions, free STI syndromic management, condoms, hormonal contraceptives, psychological support, and general care for HIV+ participants.	2- The Program enhances knowledge about HIV prevention, empowering participants to make informed decisions about their sexual health.	Exposure to safer sex practices make condom use a routine behavior over time. Educational sessions raise awareness of HIV risks, boosting motivation to practice safer sex and use condoms consistently.	1-Peer-led education fosters a supportive network , normalizing health care-seeking behaviours among YWSS 2-Free STI management and contraceptives enhances access for YWSS, promoting safer sexual practices.
Intervention outcome	During 409 person-years of follow-up, there were no seroconversions. There was an increase in consistent condom use among casual clients & a reduction in the likelihood of having more than one regular partner after adjustment.						

5.2.1. Strategies to enhance capability: These approaches aimed to help young women adopt and maintain safer practices through targeted education, skill-building, and boosting self-confidence. To improve knowledge about HIV prevention, three methods were used: **community mobilisation, peer education, and outreach activities**. One study organized monthly interactive workshops and community mobilisation to enhance knowledge on HIV prevention and empower them to make informed health choices [47]. Four other studies used **peer educators** to increase trust, confidence, and knowledge about prevention services [48,49,51,52]; While one study brought services closer to sex venue locations to make it easier for them to access health information and HIV prevention services [50].

5.2.2. Strategies to enhance motivation: These strategies encompassed three main approaches: **community empowerment, peer support, and integration of social protection activities**. Four of the six studies utilized **peer-led models** to engage young women who sell sex and provide information about the benefits of accessing HIV prevention services [48–51]. These peer-led approaches were particularly impactful, as they fostered trust, relatability, and a sense of community through social support and shared experiences; enhancing willingness to engage in services. Two studies assessed the impact of integrating social protection measures such as cash transfers, educational subsidies, and vocational training with HIV prevention services (DREAMS program), addressing economic vulnerabilities and reinforcing the value of health-seeking behaviours among young women who sell sex [48,49]. One study utilized community empowerment strategies to boost self-confidence, awareness of rights, and motivation of young women who sell sex to engage in services, addressing perceived barriers related to violence and safe sex negotiation [47].

5.2.3. Strategies to enhance social opportunities: These included **fostering peer interactions and cooperation**, which helped build support networks and establish communal norms around safety and service uptake [47–52]. Training peer educators played a key role in normalizing health-seeking behaviors and creating community support structures [48,51,52]. Peer-led mobilization efforts promoted a supportive environment through strong social networks, encouraging women to access HIV prevention services [47,49,50].

5.2.4. Strategies to enhance Physical opportunities: Interventional approaches included workshops and improved access to clinics, supported by **peer outreach, training, and outreach activities** that extended beyond referrals [47,48]. Respondent-driven sampling (RDS) and peer-led outreach provided structured opportunities for young women who sell sex to access HIV prevention services, targeting hotspots and utilizing micro-planning to optimize peer educator ratios for tailored outreach [48,51]. The Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe (DREAMS) package; comprising **social protection**, educational subsidies, cash transfers, vocational training, and adolescent-friendly SRH services; created a supportive environment encouraging service seeking, including PrEP, HTS, and Gender based support (GBV) support ([49]. Additionally, bringing services like PrEP and HIV testing directly into sex work venues improved convenience and engagement [50]. Free STI management and contraceptive services further promoted safer practices [52]

516 **Table 4 and 5 below compare and contrast findings per region and intervention**

517 **Table 4: Regional comparisons of study findings**

Region	Barriers to Uptake	Facilitators to Uptake	Key Interventions	Notes
Southern Africa (Zimbabwe, South Africa, Swaziland, Malawi)	Stigma and discrimination Criminalization and police hostility Limited youth-friendly and differentiated services Poverty and economic barriers Violence and exploitation	Peer support and community mobilization Mobile outreach and clinics Integration of services (PrEP, SRH) Social protection programs (DREAMS) Peer-led education	PrEP: Low awareness, access issues Condoms: Knowledge but inconsistent use	structural barriers prominent. Emphasis on social networks and community-driven approaches; Interventions focus on peer support, mobile clinics, and integrated social protection.
Eastern Africa (Kenya, Uganda, Tanzania, Ethiopia)	Stigma and fear of judgment Limited physical access to services Poor awareness of PrEP Criminalization and law enforcement hostility Mobility and geographical barriers	Peer education and outreach Mobile health (mHealth) and clinics Community engagement and peer support Integrated health services	PrEP: Low retention, awareness Condoms: Perceived unreliability	Digital and peer-led strategies show promise; location mapping enhances reach.
Central Africa (Cameroon)	Discrimination/ criminalization Gender-based violence Limited access to community-based services Poor participation in peer education	Peer support networks Community mobilization Integration of HIV and GBV services	PrEP: Low participation and awareness Condoms: Poor consistent use	Violence and legal barriers significantly hinder access; peer support is crucial.
West Africa (Nigeria, Burkina Faso)	Social stigma and discrimination Lack of differentiated, youth-friendly services Limited awareness of PrEP Geographical barriers	Peer education and community outreach Supportive social networks Community-based service delivery	PrEP: Low awareness, high dropout Condoms: Perceived low risk	Stigma and service accessibility are persistent obstacles; Community engagement is vital.

518

519 **Table 5: Interventional comparison of study findings**

Intervention Type	Common Barriers	Facilitators	Key Strategies & Lessons
PrEP	Low awareness and understanding Fear of side effects Stigma and discrimination Limited availability/access Misconceptions about efficacy	Peer testimonies and community support Mobile outreach and clinics Integration with SRH services Community empowerment	Peer-led education, community mobilization, and addressing stigma are critical. Mobile clinics increase access, especially in remote areas.
Condoms	Inconsistent use due to violence, substance use, low perceived risk Lack of negotiation skills Social stigma and partner resistance	Peer support and social networks Condom distribution in hotspots Education on condom efficacy	Violence and substance use are internal barriers; supportive environments and peer support foster consistent use.
Other Services (GBV, social protection, integrated care)	Criminalization and violence Lack of tailored youth services Poverty and opportunity costs	Community mobilization Supportive peer network Integrated service delivery	Holistic, multi-sectoral approaches addressing social determinants improve engagement and health outcomes.

520

521

522

Figure 4 below summarises the review findings

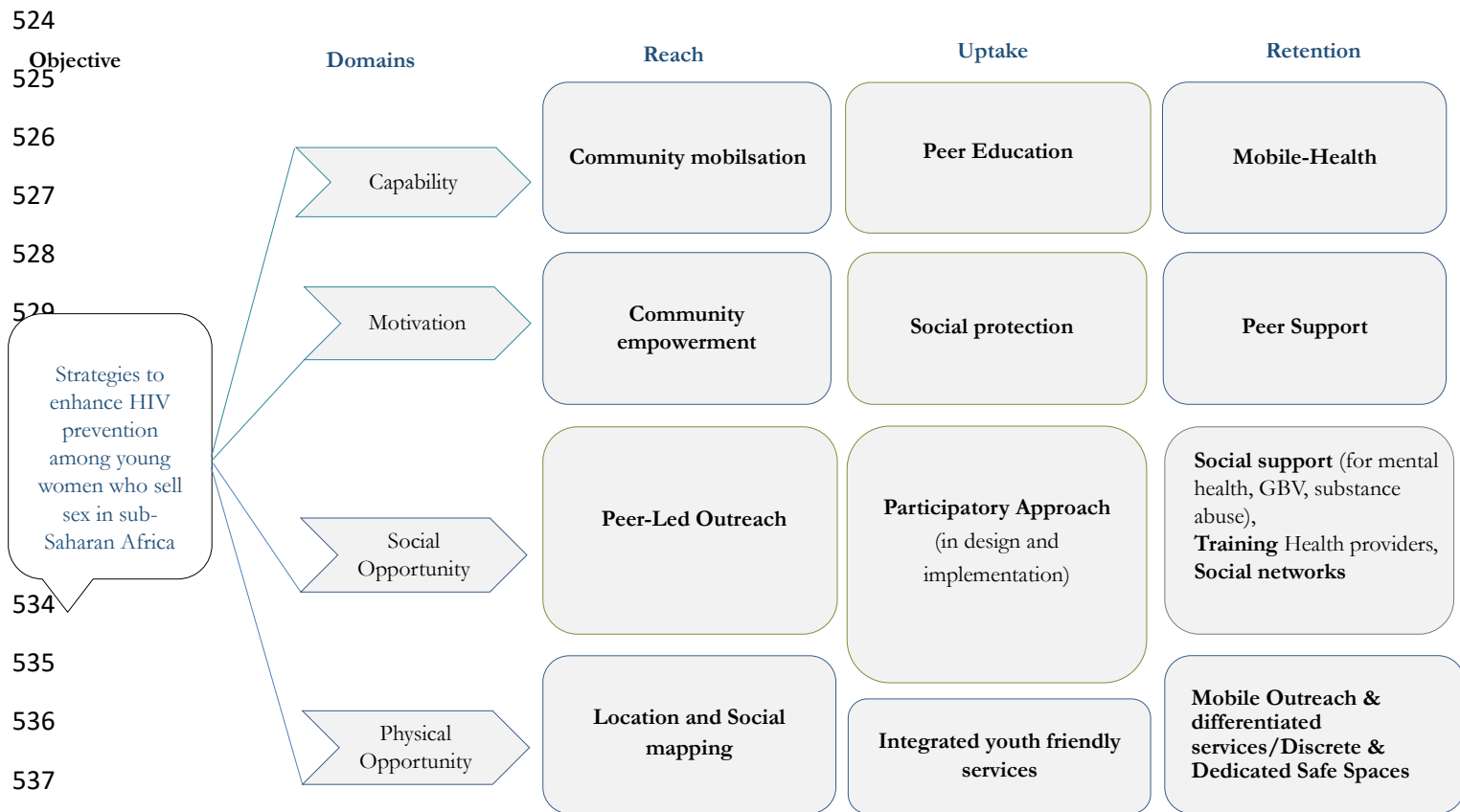


Figure 4: Strategies to enhance HIV prevention among YWSS; behaviour change perspective

Discussion

This scoping review systematically mapped existing evidence on HIV prevention strategies tailored for young women who sell sex in sub-Saharan Africa using the COM-Model as theoretical framework to guide analysis. By synthesising 30 peer-reviewed studies comprising both interventional and observational research, the review highlights a multifaceted landscape of

barriers and enablers influencing HIV prevention service and explores strategies aimed at improving engagement.

Our findings reveal that young women who sell sex in sub-Saharan Africa face a complex array of challenges. Pervasive stigma (which cuts across the COM-B constructs) and societal discrimination related to their young age and involvement in sex work limit their access to health services, increasing their vulnerability to HIV acquisition [2,3,7–9,12,38]. These barriers arise from internal factors affecting capability and motivation like misconceptions, stigma, and identity issues, as well as external factors affecting social and physical opportunities such as economic vulnerabilities, criminalisation of sex work, and a lack of tailored programs for young women who sell sex [3,10,11,23]. Similar issues have been documented in regions like Southeast Asia and Latin America, where high HIV acquisition rates among young women who sell sex are exacerbated by inadequate health service availability and quality [53]. These parallels suggest that the vulnerabilities faced by young women who sell sex in sub-Saharan Africa are part of a broader, global phenomenon.

The COM-B analysis, showed that many studies tend to focus on social and physical opportunities, with less emphasis on internal factors such as motivation and physical ability, which are also critical for sustained engagement [23,24,26,28–31,33,34,36,38–40,42,43,45,46]. To overcome geographical barriers related to physical opportunities, findings suggested that using location and social mapping, especially in hotspots (sex work venues), to identify young women who sell sex [25,28,29,33,34,40,42]. Combining this with peer outreach and community empowerment can effectively expand their reach and improve access to services [33]. Interventions that make youth-friendly services accessible such as flexible operating hours near locations where young women

who sell sex are known to congregate, utilising age-appropriate tools and language can attract them, especially when these services are dedicated and not merged with older sex workers [24,25,30,34,36,38,40,52]. However, supply-side barriers like limited PrEP availability and outreach remain unaddressed, suggesting that the overall availability and promotion of PrEP within the sub-Saharan African region are still inadequate [25,29,34,40,42].

Strategies that utilise peers in outreach activities have shown promise in overcoming barriers, related to stigma across all COM-B constructs, by fostering a more comfortable environment for young women who sell sex [24,33,48,50]. Actively involving young women who sell sex in the design and implementation of age-specific HIV prevention strategies such as PrEP and condom rollout through microplanning or community workshops improved community acceptance; however, such participatory approaches remain underutilized, with only a few studies documenting their use [47,51]. This highlights the need for more interventions employing participatory, community-driven approaches to enhance acceptability and effectiveness.

The socio-legal context within sub-Saharan Africa marked by the criminalisation of sex work, pervasive stigma, and limited health infrastructure poses significant challenges for young women who sell sex to effectively engage with HIV prevention services [28,30,35,38,41,46]. Unlike more permissive environments where structural interventions such as decriminalization or legal reforms have facilitated service uptake (e.g., New Zealand, South Australia), sub-Saharan African countries often lack such policy support, exacerbating barriers like discrimination and violence [54]. Nonetheless, some studies suggested that providing a supportive social framework (in line with integrated services and person centered approaches) such as services or referrals for gender-

594 based violence (GBV) and mental health can mitigate the adverse effects of criminalization [25–
595 28,35,37,41,48,49].

596

597 While internal motivation (affected by factors such internal or anticipated stigma) has received
598 less attention in the literature, it appears to play a significant role in the engagement of young
599 women who sell sex with HIV prevention services [25,31,36,40,43]. Feelings of being too young,
600 low self-worth, misconceptions about PrEP’s efficacy, low perceived risk and the fear of being
601 judged often discourage young women who sell sex from seeking services [32,42,45]. Addressing
602 these motivational barriers through community empowerment and peer support may enhance
603 uptake [48–51]. For example, programs like the DREAMS initiative, implemented in several
604 African countries, integrate social protection services such as cash transfers, vocational training,
605 and economic empowerment activities [48,49]. These interventions motivate young women to
606 engage with HIV prevention services by enhancing their desire to escape poverty, thereby
607 alleviating economic pressures (i.e inability to support dependents) that increased their
608 vulnerability to HIV [26,44]. Such programs also address transport barriers and motivate
609 engagement with services like PrEP and condom use without fear of client retaliation [26,43].

610

611 Regarding capability, most studies focus on addressing psychological barriers such as limited
612 knowledge through peer education and community mobilization [23,29–32,35,38,43,44]. The
613 review’s findings align with global evidence emphasizing the effectiveness of community-led,
614 peer-based, and mobile outreach approaches in enhancing HIV knowledge among marginalized
615 populations for HIV prevention [55]. Similar strategies have been successfully implemented
616 among adolescent key populations in Asia and Latin America, where peer educators and mobile

clinics have increased service access and adherence [56]. For example, in Southeast Asia, peer-led interventions have improved condom use and PrEP adherence among young sex workers, paralleling observations in sub-Saharan Africa [57].

Mobile health technologies have been suggested as innovative ways to keep young women who sell sex connected to services as they move between locations [32,43]. However, interventional studies testing these strategies are scarce, particularly among young women who sell sex, indicating a need for more research to evaluate their long-term benefits and drawbacks similar to studies conducted among general youth populations in high-income settings [58]. Despite their potential, such digital interventions require contextual adaptation to overcome structural barriers effectively.

Regional comparisons.

Across African regions, stigma, criminalization, and violence remain key barriers to HIV service uptake, while peer-led education, community mobilization, and mobile clinics are widely facilitators [23,26,32,42,43]. Southern Africa faces deep structural challenges, with interventions like DREAMS emphasizing community and social support [59–68]. Eastern Africa employs digital outreach and location mapping to improve access, especially among young women [69–75]. Central and West Africa are heavily impacted by violence and societal stigma, relying on peer networks and localized engagement [76–79]. All regions rely on combining biomedical interventions like PrEP with social and structural strategies like peer support, community involvement, and stigma reduction [47–52]. This highlights the importance of tailored, multi-faceted approaches for engagement and retention in HIV prevention services.

640

641 **Strengths and Limitations:** A key strength of this review lies in its comprehensive application of
642 the COM-B framework, allowing for a theory driven and systematic synthesis leading to a nuanced
643 understanding of behavioural determinants across individual, social, and environmental levels.
644 The inclusion of diverse study designs enhances the robustness of insights into barriers and
645 enablers. However, limitations include potential publication bias, as the search was limited to peer-
646 reviewed literature in three databases.

647

648 **Research Gaps:** While existing strategies are promising, several gaps remain. Most studies have
649 been conducted in South and East Africa, with few from Central and West Africa. This limit
650 understanding of regional differences, including legal and cultural factors. In general, there is a
651 lack of interventional studies focused on young women who sell sex. More research is needed to
652 see how strategies can be tailored, scaled up, and sustained over time. Few studies have examined
653 how legal, social, or mental health issues influence program success in different settings.
654 Additionally, digital and social media interventions for young women who sell sex are rare, and
655 many programs lack clear theoretical frameworks or do not report them. Most research focuses on
656 improving environments and increasing knowledge, but less on individual motivation and physical
657 ability such as skill building to access services. While participatory approaches showed promise,
658 only a few studies used participatory workshops or microplanning interventions, indicating a need
659 to further develop and evaluate these community-driven strategies

660 **Recommendations for Future Studies:** Future research should focus on addressing the gaps
661 identified, especially in individual factors, broader structural issues, innovative mobile
662 technologies, participatory design, and the use of theory-based intervention frameworks. The

findings from such implementation research are key to shaping policies and practices. They can help develop programs that are more inclusive, effective, sustainable, and culturally appropriate. Particular attention should be given to conducting long-term studies to assess the sustainability, effectiveness, and acceptability of multi-component strategies. These strategies could include community empowerment, peer-led approaches, and digital innovations. There is also an urgent need to explore interventions tailored to the socio-cultural and legal realities of Central and West Africa, where current evidence is limited.

Conclusion: This review identifies promising HIV prevention strategies for young women who sell sex in sub-Saharan Africa such as peer outreach, mobile health, and participatory approaches. However, their success is often hindered by structural barriers like criminalisation, stigma, and weak health infrastructure and research, especially in Central and West Africa. To effectively reduce HIV transmission, a comprehensive, theory-based approach combining behavioural, structural, and community interventions is vital. Collaboration among policymakers, implementers, and researchers is needed to adapt strategies, promote legal reforms, and provide social and economic support for sustainable progress.

Competing interests

The authors declare that they have no competing interests

Authors' contributions

Conceptualization of the Review, NM, CN, JV, KM, PN, BH; **Screening of Articles:** NM, CN, JV; **Full text Data synthesis:** NM; **Review of Full text data synthesis;** CN, JV; **Writing-original manuscript draft,** NM, CN, JV; **Review and Editing;** KM, PN, BH; All authors have read and agreed to the published version of the manuscript.

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688 under which this study was conducted.

689 **Data Availability Statement**

690 Data sharing not applicable to this article as no datasets were generated or analysed during the
691 current study.

692 **Ethics approval and consent to participate:** Not Applicable

693 **Consent for publication:** Not Applicable

694 **Funding:** Not Applicable

695 **Supporting Information**

696 Supporting Information file 1: Search String

697 Information on file format: Details of the full search string for the Review in the 3 electronic data
698 bases (PubMed, Embase and Web of Science), including the key words, search string, search date
699 and outcome.

700

701 Supporting Information file 2: Kappa coefficient

702 Information on file format: Presents reviewer agreement with a Kappa coefficient, including
703 decision tables, Kappa details, and interpretation guidelines used to validate the eligibility criteria
704 for including or excluding articles.

705

706 Supporting Information file 3: Data Extraction Sheet

707 Information on file format: This data extraction sheet outlines key categories for collecting detailed
708 information from studies on HIV prevention among young women who sell sex in sub-Saharan
709 Africa, including study design, interventions, outcomes, barriers, and facilitators. It also provides
710 key themes for intervention and barrier/enabler analyses aligned with the COM-B model.

711

712 **List of abbreviations** [Optional]

Abbreviation	Full Meaning
AGYW	Adolescent Girls and Young Women
BCW	Behaviour Change Wheel
COM-B	Capability, Opportunity, Motivation - Behaviour Model
FGD	Focus Group Discussion
FSW	Female Sex Worker
GBV	Gender-Based Violence
HIV	Human Immunodeficiency Virus
KI	Key Informant
KP	Key Population
NGO	Non-Governmental Organization
PrEP	Pre-exposure Prophylaxis
RDS	Respondent-Driven Sampling
SRH	Sexual and Reproductive Health
STI	Sexually Transmitted Infection
YWSS	Young Women Who Sell Sex

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