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Barriers and facilitators of HIV partner status notification in low- and lower-middle-income countries: A mixed-methods systematic review

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Abstract

Background The uptake of HIV partner status notification remains limited in low- and lower-middle-income countries. This mixed-methods systematic review aims to summarize the barriers and facilitators of HIV partner status notification in these settings.

Methods We searched PubMed, Embase, CINAHL, PsychINFO, Scopus, and Web of Science from January 01, 2000, to August 31, 2023, for empirical qualitative and quantitative studies. Two independent reviewers completed the title, abstract, full-text screening, and data extraction. The risk of bias was assessed using a mixed-methods appraisal tool (MMAT), and the study findings were summarized narratively.

Results Out of the 2094 studies identified, 59 relevant studies were included. Common barriers included fear of stigma and discrimination, violence, abandonment, breach of confidentiality and trust, low HIV-risk perception, and limited knowledge of HIV and HIV testing. Facilitators of HIV partner status notification were feelings of love and closeness in marital relationships, feelings of protecting self and partners, and HIV counseling services.

Conclusion Efforts to improve HIV partner status notification in low- and lower-middle-income countries should consider barriers and facilitators across all its components, including notification, testing, and linkage to treatment. In addition, HIV partner services must be adapted to the unique needs of key populations.

Keywords HIV and AIDS, Sexual partners, Notification, Low- and lower-middle-income countries

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Introduction

To end the HIV pandemic, the Joint United Nations Programme on HIV (UNAIDS) has set ambitious 95-95-95 objectives to be achieved by 2030. These objectives include diagnosing 95% of people living with HIV, ensuring that 95% of diagnosed individuals are on antiretroviral therapy, and achieving viral suppression in 95% of those receiving antiretroviral therapy [1]. While significant progress has been made towards these targets, challenges persist. As of 2019, approximately 81% of people living with HIV globally were aware of their HIV status, with 82% of them on antiretroviral therapy and 88% of those on antiretroviral therapy achieving viral suppression,



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resulting in an overall viral suppression proportion of 59% [2]. The optimal implementation of HIV testing and treatment strategies has faced various obstacles, including structural, legal, and social barriers. These barriers contribute to inequities in access and uptake of HIV testing and treatment, limited retention in care, stigma and discrimination, suboptimal adherence to pre-exposure prophylaxis, limited access to key populations, and difficulties in meeting the UNAIDS targets for enrolling people living with HIV into treatment programs [3, 4].

One promising approach to achieving 95-95-95 objectives is supporting individuals to notify their HIV serostatus to others, particularly their partners [5]. HIV partner status notification plays a crucial role in identifying undiagnosed people living with HIV and those who have stopped attending clinics [6]. This process involves a voluntary two-step approach, where partners of people living with HIV are informed about their potential exposure probability and then supported in receiving testing services. The World Health Organization (WHO) has recognized the importance of incorporating partner status notification as an integral part of HIV testing services since 2012 [7]. HIV partner status notification has been shown to increase the rate of HIV testing and reduce transmission risk behaviors [8]. Also, HIV partner status notification in some situations can be different, for example, when the sexual partner has an undetectable viral load. If a partner with HIV is on treatment and has an undetectable viral load, they are unlikely to pass HIV on to others even if they do not use condoms. Based on previous studies, with appropriately scheduled viral monitoring, adherence counseling, and follow-up, these patients have a very low probability of viral rebound and HIV transmission to their sexual partners [9]. Also, it is not the individual's responsibility to ensure their partner gets tested, but it would be ideal if they could suggest it without fear of recrimination [10]. Notably, partner notification is also a process whereby sexual partners of patients with sexually transmitted infections other than HIV are informed of their exposure to infection and the need to receive treatment. Partner notification for curable sexually transmitted infections may prevent re-infection of the patient and reduce the probability of complications and further spread [11]. However, while an undetectable viral load will most likely prevent transmission of HIV, it does not prevent other sexually transmitted infections or unintended pregnancy [10].

Several studies have explored the facilitators and barriers to HIV partner status notification in high-income countries, using both quantitative and qualitative approaches [7], and identified a range of facilitators (e.g., a supportive relationship) and barriers (e.g., stigma and discrimination) [12–15]. However, women living with

HIV, may face greater barriers to HIV partner status notification than other groups. This is particularly significant given that women and girls constitute 53% of all people living with HIV globally [16]. Evidence shows that women living with HIV experience multiple, intersecting inequities related to gender, HIV status, violence, bodily autonomy, sexual and reproductive health rights, and economic dependence, among other factors [17].

Nonetheless, less is known about HIV partner status notification in the context of low- and lower-middle-income countries, which bear the highest burden of the HIV pandemic. In these regions, socio-cultural and economic factors may compromise the effectiveness of current control measures. Distinct epidemics of HIV have emerged in different geographical areas, characterized by variations in severity, affected population groups, associated risk behaviors, and viral strains. In addition to the significant human toll, the high burden of HIV has adverse social and economic impacts on many low- and lower-middle-income countries [18]. Compounded by these challenges, the uptake of HIV partner status notification remains limited in these settings. For example, rates of successful partner status notification and testing through passive HIV partner status notification services have been quite low in several low- and lower-middle-income countries [19]. Moreover, many benefits of HIV partner status notification depend on access to resources, services, and commodities that may not be readily available in these resource-constrained settings. Thus, program planners must carefully consider how to support individuals in disclosing their HIV status to others, aiming for positive outcomes while mitigating potential negative consequences [20]. Despite the existing body of literature on HIV partner status notification, there has been limited focus on ways to simplify this process and identify the associated obstacles, particularly in resource-limited settings. Therefore, this mixed-methods systematic review aims to explore the barriers and facilitators of HIV partner status notification, with a specific focus on low- and lower-middle-income countries.

Methods

Protocol and registration

We developed our review protocol and registered it in PROSPERO (CRD42022379427) [21]. We also followed the PRISMA reporting checklist to report our findings (S1 File) [22].

Eligibility criteria

Studies meeting the following eligibility criteria were included in this review: (i) Qualitative, quantitative, or mixed-methods empirical papers reporting barriers and/or facilitators for HIV partner status notification; (ii)

Conducted in low- and lower-middle-income countries as defined by World Bank [23]; and (iii) Published in English between January 2000 and August 31, 2023. While the WHO formally recognized partner status notification as an integral part of HIV testing services in 2012, this practice had already been implemented and studied earlier. We included studies published since 2000 for four reasons: (i) The WHO's report on the global HIV response from 2000 to 2015 indicated that partner status notification was feasible and effective in some settings before 2012 [24]; (ii) A 2016 WHO report identified 56 global studies on partner status notification services spanning the pre-2012 period, covering various populations and stakeholders [7]; (iii) A systematic review in 2002 reported strategies of HIV partner status notification [25]; and (iv) several studies showed existing partner status notification for preventing HIV before the year 2000 [26–28].

Eligible study populations included adults (≥ 18 years of age), people living with HIV, people most vulnerable to acquiring HIV (including gay men and other men who have sex with men, female sex workers, people who inject drugs [29], and healthcare providers. We also included studies conducted in multiple sites or countries if barriers/facilitators were separately analyzed and reported per site or country.

Information sources

In November 2022, we systematically searched six electronic databases: PubMed, Embase, CINAHL, Psych Info, Scopus, and Web of Science using predefined search terms (S2 File). We also reviewed the abstracts of the last two years of AIDS, the Center for Disease Control (CDC) STD Prevention Conference, the International Union against Sexually Transmitted Infections conferences, and the WHO website for relevant literature. The search was updated in August 2023 to identify additional literature published after November 2022. The key search terms included: (“HIV” OR “Acquired Immunodeficiency Syndrome” OR “AIDS”) AND (“contact tracing” OR “partner notification” OR “partner treatment” OR “partner testing” OR “partner referral” OR “provider referral” OR “passive referral” OR “contact referral” OR “patient referral”) AND (“Lower middle-income countries” OR “Low-income countries”). Additionally, grey literature search involved hand searches of unpublished research reports, policy literature, working papers, newsletters, government documents, speeches in Google and Google scholar (first 300 hits [30]). We used key phrases, such as “telling your partner,” “talking with a partner about HIV status,” or “sharing HIV status with partner”.

Study selection and data collection

We uploaded all identified citations into Endnote (v.20) reference management software and removed duplicates. Two independent reviewers (FT and MB) screened and assessed all titles and abstracts against our pre-defined eligibility criteria. Studies deemed non-relevant or reporting from high-income countries were excluded at this stage. If the exclusion decision was unclear, the study was included for full-text screening. Both reviewers independently assessed the full-texts of the remaining studies. Studies that did not meet all eligibility criteria were excluded, and the reasons for exclusion were recorded. Disagreements were resolved through discussion with a senior author (HSH). We developed and tested a data extraction table on three studies to ensure all relevant data items could be extracted. From each included study, we extracted the following data items: First author, year of publication, study location, study type, participants' characteristics, sample size, study aims, and findings related to the review question (i.e. barriers and facilitators for HIV partner status notification). FT verified the extracted data for accuracy and made necessary additions or modifications. We compared the data we individually extracted and resolved any disagreement through discussion.

Data transformation

We extracted data on barriers and facilitators to HIV partner status notification from the included studies. Qualitative findings, including the qualitative component of mixed methods studies, were extracted as presented in the original research papers, capturing themes and paragraphs of textual description. Quantitative findings, including the quantitative component of mixed methods studies, were transformed into textual descriptions [31]. Finally, we merged qualitative findings and transformed study findings into a single dataset.

Risk of bias in individual studies

To assess the methodological quality of the included studies, we used the Mixed Methods Appraisal Tool (MMAT) [32]. This tool, widely used in systematic reviews, offers the advantage of assessing interdependent qualitative and quantitative elements of mixed-methods research. We independently identified the categories of study design using the MMAT tool and then appraised each study against the corresponding methodological quality criteria [32]. We discussed potential exclusion for studies failing to meet more than one quality criterion. However, we were inclined towards inclusion to avoid omitting potentially crucial insights to comprehensively understand the phenomenon under study [33, 34].

Mixed methods synthesis

We applied framework synthesis, a highly transparent and deductive approach recommended for the synthesis of evidence on complex interventions [35]. This approach combines critical, realistic, and subjective idealistic epistemology elements. We analyzed our data set using Excel software [36]. The analysis involved iterative coding and sub-coding of the extracted results, with individual definitions, cross-checking, discussion, and refinement of the code system. We resolved disagreements through discussion. We applied a modified version of Song et al.'s approach [36] to analyze and present barriers and facilitators of HIV partner status notification. The primary aim of this study was to evaluate barriers and facilitators of HIV partner status notification in low- and lower-middle-income countries, along with extracting these findings for testing and linkage to treatment if available. First, we assigned each extracted result (i.e. barrier or facilitator) to one of the three components based on their definition level: Notification of sexual partners by people living with HIV, testing of sexual partners after they have been notified of possible HIV exposure, and linking partners living with HIV to treatment services. Second, we thematically analyzed each barrier or facilitator, considering its contextual description. Third, to summarize the comprehensive barrier or facilitator descriptions, we applied meta-summary—a quantitatively oriented aggregation of qualitative findings first proposed by Sandalowsky, Barroso, and Voils (2007) [34]. After familiarizing ourselves with the extracted dataset, reading and re-reading the identified barriers and facilitators, and exploring underlying patterns, we identified the barriers and facilitators of HIV partner status notification.

Results

Study selection

Of the 2094 included studies in the primary search, 59 studies were included in the final step. The PRISMA Flow Diagram presents the number of papers included throughout the selection process, along with the reasons for exclusion (Fig. 1).

Description of studies included in the review

Table 1 provides an overview of the characteristics of the included studies. The studies were conducted in various countries, including Kenya ($n=14$) [37–50], Uganda ($n=10$) [51–60], Malawi ($n=8$) [61–68], Tanzania ($n=6$) [69–74], Ethiopia ($n=4$) [75–78], Cameroon ($n=3$) [79–81], Mozambique ($n=2$) [82, 83], Zambia ($n=2$) [84, 85], South Africa ($n=2$) [86, 87], Nigeria ($n=1$) [88], Malawi and Tanzania ($n=1$) [89], Guinea-Bissau ($n=1$) [90], India ($n=1$) [91], Rwanda ($n=1$) [92], Burkina Faso ($n=1$) [93], Lesotho ($n=1$) [94], and Iran ($n=1$) [95]. Among the 59 included studies, 23 were qualitative, 12 were cross-sectional, 11

were clinical trials, seven were mixed methods, and six were cohort studies. Also, the age range of participants in the included studies was 19–78, and the range of the sample sizes was 14 in qualitative studies to 9,022 in quantitative studies.

Risk of bias and quality appraisal

Most of the included studies were of high quality ($n=39$; 66.1%), while some were moderate ($n=9$; 15.3%) or weak quality ($n=11$; 18.6%). The weakest element in the qualitative studies was the lack of detail necessary to evaluate whether the data substantiated the interpretation of results. As most of the quantitative studies were conducted among the key populations whom outside researchers often find hard to reach, information bias due to non-response to some sensitive questions was the main issue in these studies. The weakest element in the mixed-methods studies was a lack of consideration of divergence between qualitative and quantitative results.

Synthesis of results

The following narrative synthesis of results summarizes identified barriers and facilitators overall and by key population. Socio-demographic characteristics and behaviors associated with HIV partner status notification are presented separately, given that they represent individual-level drivers of notification uptake rather than external barriers or facilitators. The integrated quantitative and qualitative data were converged in this study. Figure 2 presents an overview of the barriers and facilitators to HIV partner status notification.

Barriers and facilitators to HIV partner status notification Notification of sexual partners by people living with HIV

Barriers In the context of notifying sexual partners by people living with HIV, several barriers to HIV partner status notification emerged across multiple settings: Fear of stigma and discrimination [37, 38, 47, 56, 73, 74, 76, 77, 88, 90, 95], fear of separation and abandonment of a sexual partner [37, 56, 58, 59, 63, 64, 72, 73, 76, 77, 80, 86, 88, 90, 93, 95], fear of violence (e.g., physical, emotional, sexual, otherwise) [41–43, 47, 55, 56, 58, 73, 76, 79, 80, 86], fear of partner reactions, including blame [37, 41, 63, 64, 76, 77, 93], fear of rejection and abuse [59, 73], fear of breach of confidentiality and trust [37, 38, 56, 95], having multiple partners [38, 41, 51, 63, 72], insufficient HIV knowledge [47, 71, 74], fear of loss of financial support [37, 44, 47, 80], lack of support from partner [47, 59], feelings of shame [88, 95] and denial [74, 90], social-ecological factors (e.g., culture, traditional gender roles and fear of criminalization) [44, 47, 56, 71, 77], lack of access to partner contact information and uncertainty of how to notify them [74],

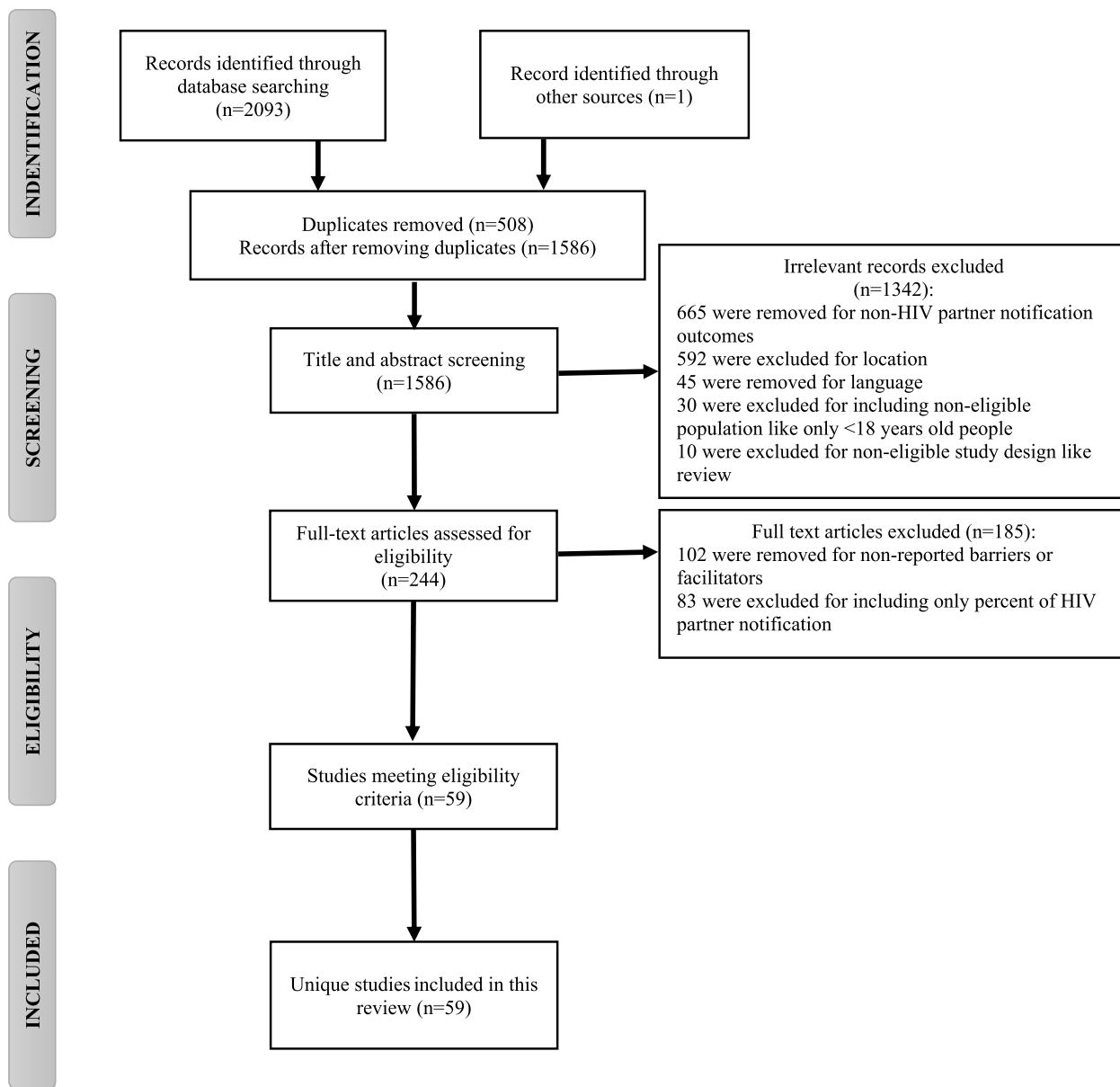


Fig. 1 PRISMA flow diagram for selection of studies on HIV partner status notification

geographical barriers [76], and fear of isolation and job loss [37].

Facilitators Several factors facilitated HIV partner status notification: Using assisted partner notification [43, 60, 77, 80, 83, 86, 92, 95], feelings of love and closeness in relationships, and maintaining trust [54, 63, 64, 68, 71, 79, 85], moral duty and sense of responsibility [54, 86], feeling of self-care [54], incentives and services like counseling and support [86, 94], positive cultural practices, such as education and change of the social norms, such as supporting communities to support each other, people living with

HIV, and people from key populations, adopting a protesting and pro-treatment strategy and improving communication and relationship skills [68, 85], and partner support [94].

Testing of sexual partners after they have been notified of possible HIV exposure

Barriers Common barriers related to the testing of sexual partners were: Fear of the consequences of a positive diagnosis [56], fear of stigma and discrimination from a

Table 1 Summary of included studies reporting on barriers and facilitators to HIV partner status notification by study type in low and lower-middle-income countries, 2000–2023

Study type	First author (Year of publication)	Location	Year of data collection	Study population	Sample size	Age (Year)	Quality score (out of 5)	
Clinical trial	Joseph Davey et al., 2022 [87]	South Africa	2021	Women living with HIV	176	Mean: 35	2	
	Dovel et al., 2022 [62]	Malawi	2018–2020	People living with HIV on antiretroviral therapy	365	Mean: 37 SD ^a : 11.6	4	
	Mutale et al., 2021 [84]	Zambia	2019–2020	Pregnant women	316	NR ^b	4	
	Jeremiah et al., 2021 [89]	Malawi and Tanzania	2010	Pregnant women	535	Mean: 27	4	
	Choko et al., 2019 [61]	Malawi	2016–2017	Pregnant women and their male partners	2349	Mean (SD) ^b : Women: 24.8 (5.4), male partners: 29.6 (7.5)	5	
	Korte et al., 2019 [57]	Uganda	2018	Pregnant women and their primary male partners	Pregnant women: 824 and male partners: 896	NR ^b	3	
	Krakowiak et al., 2016 [48]	Kenya	2013–2014	Pregnant women and their primary male partners	601	Mean (SD) ^b : 24.7, 4.9	4	
	Masters et al., 2016 [50]	Kenya	2015–2016	Pregnant women (Antenatal and postpartum)	600	Mean: 24	5	
	Osoti et al., 2014 [39]	Kenya	2014	Pregnant women	300	Mean: 22	4	
	Brown et al., 2012 [68]	Malawi	2012	People newly diagnosed with HIV	170	NR ^b	2	
	Brown et al., 2011 [67]	Malawi	2008–2009	People newly diagnosed with HIV	267	Median: 28, IQR ^c : 24–33	4	
	Remera et al., 2022 [92]	Rwanda	2018–2019	People newly diagnosed with HIV on antiretroviral therapy (index client)	6336	NR ^b	5	
	Pashaei et al., 2022 [95]	Iran	NR ^b	Women living with HIV	192	Mean (SD) ^b : 41.59, 8.7	4	
	Markos Kachero, et al., 2021 [78]	Ethiopia	2020	All male partners of pregnant women	798	Mean (SD) ^b : 37.5 (7.1)	5	
	Tih et al., 2019 [80]	Cameroon	2007–2015	People living with HIV (index client) and their sexual partners/contact persons	9022	Median: 36, IQR ^c : 30–43	5	
	Cross-sectional study	Buhikire et al., 2018 [51]	Uganda	2016	People newly diagnosed with HIV	464	Mean: 32	4
		Kahabuka et al., 2017 [71]	Tanzania	2015	People newly diagnosed with HIV	384	Mean: 33.2	5
Omunakwe et al., 2015 [88]		Nigeria	2015	People living with HIV on antiretroviral therapy	250	Mean: 37.1, SD ^b : 8.8	3	
Myers et al., 2016 [83]		Mozambique	2014	People newly diagnosed with HIV	206	Median: 29, IQR ^c : 24–34	4	
Alemayehu et al., 2017 [75]		Ethiopia	2014	Male partners	422	Range: 30–39	3	
Henley et al., 2013 [79]		Cameroon	2009–2010	People living with HIV (index clients) diagnosed in antenatal care, voluntary counseling and testing, and inpatient facilities and partners	1463 People living with HIV, 1607 sexual partners	Median: 31, range: 15–70	5	
Makoleka et al., 2012 [85]		Zambia	NR ^b	Pregnant women	120	Range: 18–29	4	
Otieno et al., 2010 [40]		Kenya	1999–2005	Pregnant women living with HIV	116	Median: 30, IQR ^c : 23–38	3	

Table 1 (continued)

Study type	First author (Year of publication)	Location	Year of data collection	Study population	Sample size	Age (Year)	Quality score (out of 5)
Mixed- methods study	Klabbers et al., 2021 [56]	Uganda	2019	People living with HIV (index client) and sexual partners, health care workers	Index clients: 882, sexual partners: 1,126, healthcare providers: 32	Mean (SD) ^a : Index clients: 35 (9.46), Sexual partners: 34 (9.04), health care workers: 32 (7.52)	4
	Offorjebe et al., 2020 [66]	Malawi	2017–2018	People living with HIV	404	Mean: 37.6, IQR ^c : 30–44	2
	Wely et al., 2020 [46]	Kenya	2018	People newly diagnosed with HIV And health care workers	Health care workers: 17	NR ^b	4
	Klabbers et al., 2020 [55]	Uganda	2018	People living with HIV (index client) and sexual partners	33 qualitative; 882 quantitative	Mean (SD) ^a : 35 (9.5)	4
	Plotkin et al., 2018 [72]	Tanzania	2015	People newly diagnosed with HIV	391 index clients and 249 sexual partners of index clients	Range: 23–34	4
	Selvaraj et al., 2017 [91]	India	2011–2015	Married people living with HIV	3884	Mean: 38	5
	Falnes et al., 2011 [70]	Tanzania	2007–2008	Health personnel, women and their partners	426	Mean: 27	4
	van der Elst et al., 2022 [45]	Kenya	2018–2020	People newly diagnosed with HIV	24	Median: 26, IQR ^c : 19–39	2
	Liu et al., 2022 [38]	Kenya	2020	HIV testing service providers	14	Mean: 35	3
	Lofgren et al., 2021 [58]	Uganda	2017	People living with HIV and Health care workers	Health care workers: 20	Median: 32 IQR ^c : 20–55 (people living with HIV)	5
Qualitative study	Sanga et al., 2021 [73]	Tanzania	2019	People living with HIV	7 FGDs ^d and 30 in-depth interviews	Range: 31–45	2
	Sircar et al., 2020 [43]	Kenya	NR ^b	Health care workers	52	NR ^b	2
	Madiba et al., 2020 [94]	Lesotho	2019	Pregnant women	15	Mean: 20	2
	Monroe-Wise et al., 2019 [47]	Kenya	2015	People living with HIV	47	NR ^b	2
	Van Der Elst et al., 2019 [44]	Kenya	2013–2016	People living with HIV (subtype-1) and sex workers	23	Women: 28 Men: 26	4
	Conserve et al., 2019 [69]	Tanzania	2015	Key implementers of HIV and AIDS interventions, healthcare providers, secondary school boys and members of the community	Men: 23	Mean: 27.3, SD ^a : 6.5	2
	Daniels et al., 2019 [86]	South Africa	2017	pregnant women living with HIV	28	Mean: 28.7	3
	Odoyo et al., 2019 [49]	Kenya	2017–2018	Health care workers	71	Mean: 32	4
	Sanga et al., 2019 [74]	Tanzania	2014–2015	People newly diagnosed with HIV and health care workers	38	NR ^b	5

Table 1 (continued)

Study type	First author (Year of publication)	Location	Year of data collection	Study population	Sample size	Age (Year)	Quality score (out of 5)
	Quinn et al., 2018 [60]	Uganda	2018	Fishermen and sex workers in fishing communities, male and female mainland community members, and healthcare providers	64 Interview and 6 FGDs ^a	Median: Fishing communities: 28, Mainland communities: 26, Healthcare providers: 32	3
	Hino et al., 2018 [63]	Malawi	2018	People living with HIV	40	Mean: 28, range (18–51)	4
	Matoga et al., 2018 [65]	Malawi	2016	Health care workers and clinic observations	15	Median: 32, IQR ^c : 28–38	2
	Cairasco et al., 2017 [82]	Mozambique	2009–2012	People living with HIV; peer educators working for community-based organisations, providing services to people living with HIV, community members; people who had family members living with HIV and AIDS, Couples.	227	NR ^b	4
	Goyette et al., 2016 [37]	Kenya	2015	Clients, health advisors, HIV testing and counseling counselors	20	Median: 40	2
	Kamanga et al., 2015 [64]	Malawi	2008–2009	People newly diagnosed with HIV, healthcare providers	28	NR ^b	5
	Nakigozi et al., 2013 [59]	Uganda	2010–2011	People living with HIV and health care workers	Patients: 48, health care worker: 12	IQR ^c : 15–49	3
	Netsanet et al., 2013 [77]	Ethiopia	2012	People newly diagnosed with HIV	15	Mean: 32	5
	Njoring et al., 2011 [81]	Cameroon	2009	HIV and TB patients	32	Mean: 36	3
	Issiaka et al., 2010 [93]	Burkina Faso; West Africa	2010	Women living with HIV	79	Mean: 24.5	5
	King et al., 2009 [54]	Uganda	2004	People living with HIV	48 qualitative semi-structured interviews and 1092 structured interviews	Median: 37 for women and 40 for men	5
Cohort study	Madsen et al., 2020 [90]	Guinea-Bissau	2018	People newly diagnosed with HIV	495	Median: 37 (women), IQR ^c : 32–45	4
	Pintye et al., 2019 [41]	Kenya	2017–2018	Male partners of women	3620	Median: 24, IQR ^c : 21–28	5
	Kiene et al., 2017 [52]	Uganda	2017	Sexual partners	304 (152 females, 152 males)	Mean (SD) ^d : Male: 35.20 (18.8), Female: 32.54 (8.9)	5
	Kim et al., 2014 [53]	Uganda	2012	Pregnant women	188	Median: 24, IQR ^c : 20–29	4
	Sharma et al., 2021 [42]	Kenya	2018–2019	Women living with HIV	1050	Mean: 29, range (15–74)	5
	Tegegne et al., 2022 [76]	Ethiopia	2015–2020	People living with HIV on antiretroviral therapy	792	Mean: 64.3, range: 48–78	5

^a Standard deviation^b Not reported^c Interquartile range^d Focus group discussion

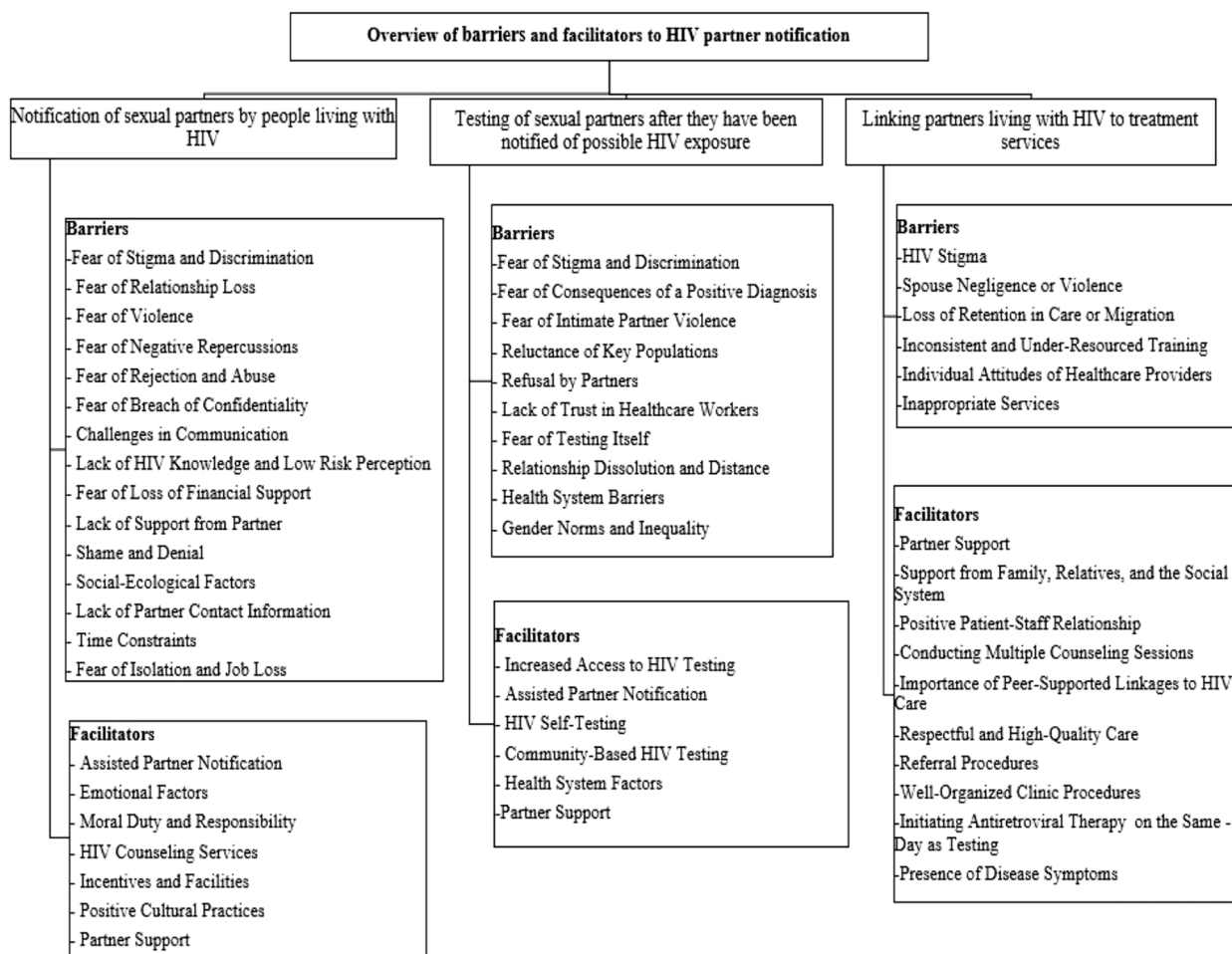


Fig. 2 Overview of barriers and facilitators to HIV partner status notification

partner, family, health care workers, and society [43, 82, 90, 91], fear of intimate partner violence [46, 56, 66], or abandonment [67, 82, 90], afraid of telling an HIV status with sexual partners or other people, and loss of social status [82]. Also, people who belonged to key populations (e.g., gay men and other men who have sex with men, female sex workers, people who inject drugs) [43, 91] and people with extramarital or multiple sexual partners [56, 69] were more reluctant to HIV testing of their partners. Some barriers were related to the refusing partner to HIV testing [51, 71, 90], lack of trust in health care workers or counselors [37, 43, 66], fear of being tested [56, 75, 78], ignorance of the testing [78], ignorance of the importance of HIV testing due to incorrect information [56, 75], or having limited time and financial resources [59]. Some others were related to not being able to contact partner [90] due to their partner living far from of the HIV testing site [51, 90], the partner went to another clinic for testing, the partner died or was too sick, relationships dissolved [90], geographically distant [56]

partner not retained in care [51]. Health system barriers included inconvenient clinic hours of operation, lack of incentives, lack of space and limited trained staff and poor staff attitude [65], inadequate resources, including room setup, lack privacy, lack of a mechanism to trace a partner, problems related to working hours, absence of an independent gender-sensitive unit and support groups [75], poorly organized clinic procedures and visit schedules, overcrowding, long waiting times, and distance and transport costs to HIV care centers [74]. Some barriers for healthcare providers to refuse HIV status notification were difficulty obtaining partners' accurate contact information, low salaries, lack of equipment, and high workload [38]. In addition, there were also barriers, such as harmful gender norms and inequities (e.g., women's fear to request their spouse for HIV testing, refusal by partners and gender-based violence) [66, 70, 91].

Facilitators In the component of HIV testing of partners, common facilitators were: Increasing access to HIV

testing [91], such as direct access to HIV counseling and testing, availability of free services, counseling services offered by multiple stakeholders [46, 91], assisted partner notification [83], HIV self-testing [41, 50, 62, 66, 84, 87] with financial incentives [61], safe home visits and HIV testing of pregnant women and their couples [39, 48, 53, 57], encouraged to test and support by their partners [52, 69, 85, 89]. Also, some factors like uncertainty about acquiring HIV [83], disease symptoms [72], risky sexual behavior [69], and afraid of the transmission of HIV [76] were facilitators of HIV testing. Health system factors in this component were: Collaboration of expert clients and local leadership [56], availability of facilities [65], training, spreading awareness of HIV testing, communicating with patience and nonjudgmental attitude and assuring confidentiality [37, 38, 81] counseling strategies including emphasizing personal benefits [56] health education materials (such as pamphlets, posters, video and audio productions), HIV knowledge [78] and allowing time to process HIV test results [56].

Linking partners living with HIV to treatment services

Barriers Barriers related to linking partners living with HIV to treatment services were HIV stigma, partner negligence or violence [40, 82], and loss of retention in care [51]. This component was also noted from the side of health care workers; inconsistent and under-resourced training, individual attitudes of providers [43], and inappropriate services, such as lack of ability of staff to link partners living with HIV to treatment services [51] were also in this component.

Facilitators Support and encouragement from partners [40, 45, 94], family, relatives, and social system [45, 74] support and good patient-staff relationship, conducting multiple counseling sessions [45, 74], the importance of peer-supported linkages to HIV care and the need for respectful, high-quality care [65] referral procedures and well-organized clinic procedures [45, 74], initiating antiretroviral therapy on the same day as testing [62], also having symptoms of the disease [74] can be a reason for linking people living with HIV to treatment.

Results by location, study type and key population

While our review included a limited number of studies from Asia, potentially limiting comparability with studies conducted in Africa, stigma emerged as a pervasive barrier across countries. Notably, the barriers identified in Asian settings appeared to be more pronounced in the

context of HIV notification and testing components of partner status notification services. Regarding the study types, no significant differences were observed in the reported facilitators and barriers, with the exception of clinical trials. These intervention studies frequently evaluated strategies, such as increasing access to HIV testing, including HIV self-testing, as a facilitator for partner status notification.

A large number of studies focused on people living with HIV ($n=20$). Other populations included healthcare providers, HIV testing and counseling counselors ($n=15$), sexual partners of people living with HIV or pregnant women ($n=14$), people newly diagnosed with HIV ($n=13$), pregnant women ($n=12$), community members ($n=2$), key populations like gay men and other men who have sex with men, transgender people, female sex workers, incarcerated people ($n=3$) and women living with HIV ($n=4$). Results are presented in Table 2, where the findings are categorized by key population, emphasizing the distinct needs and contexts of each group in the context of low- and lower-middle-income countries.

Discussion

In this mixed-methods systematic review, we analyzed data from 59 studies conducted in low- and lower-middle-income countries to comprehensively document and understand recent and emerging barriers and facilitators to HIV partner status notification. Our findings revealed common barriers across key populations, such as pervasive fear of stigma and discrimination and their negative consequences, including violence, abandonment, and breach of confidentiality and trust. This review also identified several facilitators, including emotional factors, such as feelings of love and closeness in relationships, the dynamics of marital relationships, and a sense of self and partner protection. Additionally, we identified innovative testing modalities that can enhance the effectiveness of HIV partner status notification, including increased access to HIV testing through methods through HIV self-testing.

Our findings underscore how stigma and discrimination function as primary barriers to HIV status disclosure across key populations. The complex decision to discuss HIV sero-status prevents many individuals from seeking HIV testing and counseling services or disclosing their status upon diagnosis [82]. Women face particular challenges, including fears of family stigmatization, loss of child custody, property rights, and spousal support [96, 97]. These barriers are compounded by concerns about violence, abandonment, breaches of confidentiality, and limited HIV. Legal frameworks, particularly HIV-specific criminal laws [98, 99], create additional

Table 2 Barriers and facilitators of HIV partner status notification by key population in low and lower-middle-income countries, 2000–2023

Population type	Notification of sexual partners by people living with HIV	Facilitators	Barriers	Facilitators	Barriers	Facilitators
People living with HIV [47, 54–56, 58, 59, 62, 63, 66, 73, 76, 79–82, 88, 91, 92]	<ol style="list-style-type: none"> 1) Fear of Stigma and Discrimination 2) Fear of Violence 3) Fear of Relationship Loss 4) Fear of Breach of Confidentiality 5) Fear of Rejection and Abuse 6) Fear of Negative Repercussions 7) Fear of Loss of Financial Support 8) Lack of HIV Knowledge and Low Risk Perception 9) Social-Ecological Factors 10) Challenges in Communication 11) Time Constraints 12) Lack of Partner Contact Information 13) Lack of Support from Partner 14) Shame and Denial 	<ol style="list-style-type: none"> 1) Emotional Factors 2) Moral Duty and Responsibility 3) Assisted Partner Notification 	<ol style="list-style-type: none"> 1) Fear of Consequences of a Positive Diagnosis 2) Fear of Stigma and Discrimination 3) Fear of Intimate Partner Violence 4) Fear of Testing Itself 5) Relationship Dissolution and Distance 6) Lack of Trust in Healthcare providers 7) Gender Norms and Inequality 8) Reluctance of Key Populations 	<ol style="list-style-type: none"> 1) Increased Access to HIV Testing 2) Assisted Partner Notification 3) Community-Based HIV Testing 4) Health System Factors 	<ol style="list-style-type: none"> 1) HIV Stigma 2) Spouse Negligence or Violence 	<ol style="list-style-type: none"> 1) Initiating antiretroviral therapy on the Same-day as Testing
People newly diagnosed with HIV [45, 46, 51, 64, 67, 68, 71, 72, 74, 77, 83, 90, 92]	<ol style="list-style-type: none"> 1) Fear of Stigma and Discrimination 2) Fear of Relationship Loss 3) Fear of Negative Repercussions 4) Challenges in Communication 5) Lack of HIV Knowledge and Low Risk Perception 6) Lack of Partner Contact Information 7) Social-Ecological Factors 8) Shame and Denial 	<ol style="list-style-type: none"> 1) Emotional Factors 2) Positive Cultural Practices 3) Assisted Partner Notification 	<ol style="list-style-type: none"> 1) Fear of Stigma and Discrimination 2) Fear of Intimate Partner Violence 3) Fear of Consequences of a Positive Diagnosis 4) Refusal by Partners 5) Health System Barriers 6) Relationship Dissolution and Distance 	<ol style="list-style-type: none"> 1) Increased Access to HIV Testing 2) Community-Based HIV Testing 3) Assisted Partner Notification 	<ol style="list-style-type: none"> 1) Loss of retention in care or Migration 2) Inappropriate Services 	<ol style="list-style-type: none"> 1) Support from Family, Relatives, and the Social System 2) Positive Patient-Staff Relationship 3) Well-Organized Clinic Procedures 4) Presence of Disease Symptoms
Women living with HIV [42, 87, 93, 95]	<ol style="list-style-type: none"> 1) Fear of Stigma and Discrimination 2) Fear of Relationship Loss 3) Fear of Negative Repercussions 4) Fear of Rejection and Abuse 5) Fear of Breach of Confidentiality 6) Shame and Denial 7) Lack of HIV Knowledge and Low Risk Perception 8) Time Constraints 	<ol style="list-style-type: none"> 1) Emotional Factors 2) Moral Duty and Responsibility 	<ol style="list-style-type: none"> 1) Fear of Stigma and Discrimination 2) Fear of Relationship Loss 3) Fear of Negative Repercussions 4) Fear of Rejection and Abuse 5) Fear of Breach of Confidentiality 6) Shame and Denial 7) Lack of HIV Knowledge and Low Risk Perception 8) Time Constraints 	<ol style="list-style-type: none"> 1) HIV Self-Testing 	<ol style="list-style-type: none"> 1) Loss of retention in care or Migration 2) Inappropriate Services 	<ol style="list-style-type: none"> 1) Support from Family, Relatives, and the Social System 2) Positive Patient-Staff Relationship 3) Well-Organized Clinic Procedures 4) Presence of Disease Symptoms

Table 2 (continued)

Population type	Notification of sexual partners by people living with HIV		Testing of sexual partners after they have been notified of possible HIV exposure		Linking partners living with HIV to treatment services	
	Barriers	Facilitators	Barriers	Facilitators	Barriers	Facilitators
Pregnant women [39, 40, 48, 50, 53, 57, 61, 84–86, 89, 94]	<ol style="list-style-type: none"> 1) Fear of Relationship Loss 2) Fear of Violence 	<ol style="list-style-type: none"> 1) Emotional Factors 2) Positive Cultural Practices 3) Partner Support 4) Moral Duty and Responsibility 5) HIV Counseling Services 6) Incentives and Facilities 	NR ^a	<ol style="list-style-type: none"> 1) HIV Self-Testing 2) Community-Based HIV Testing 3) Partner Support 	<ol style="list-style-type: none"> 1) HIV Stigma 2) Spouse Negligence or Violence, 	<ol style="list-style-type: none"> 1) Partner Support
Key populations including gay men and other men who have sex with men, transgender people, sex workers, people in prisons [44, 60]	<ol style="list-style-type: none"> 1) Fear of Stigma and Discrimination 2) Fear of Loss of Financial Support 3) Fear of Rejection and Abuse 4) Fear of Violence 5) Fear of Negative Repercussions 6) Fear of Breach of Confidentiality 7) Fear of Relationship Loss 8) Social-Ecological Factors 9) Challenges in Communication 10) Lack of Support from Partner 	<ol style="list-style-type: none"> 1) Assisted Partner Notification 2) Emotional Factors 3) Moral Duty and Responsibility 	NR ^a	<ol style="list-style-type: none"> 1) Assisted Partner Notification 2) Increased Access to HIV Testing 3) Community-Based HIV Testing 4) Health System Factors 	NR ^a	NR ^a
Sexual partners of people living with HIV or pregnant women [41, 48, 52, 55–57, 61, 70, 75, 78–80, 82]	<ol style="list-style-type: none"> 1) Fear of Stigma and Discrimination 2) Fear of Violence 3) Fear of Negative Repercussions 4) Fear of Relationship Loss 5) Fear of Rejection and Abuse 6) Fear of Breach of Confidentiality 7) Fear of Loss of Financial Support 8) Challenges in Communication 9) Social-Ecological Factors 	<ol style="list-style-type: none"> 1) Emotional Factors 2) Assisted Partner Notification 3) Partner Support 	<ol style="list-style-type: none"> 1) Fear of Stigma and Discrimination 2) Fear of Consequences of a Positive Diagnosis 3) Fear of Intimate Partner Violence 4) Fear of Testing Itself 5) Refusal by Partners 6) Relationship Dissolution and Distance 7) Gender Norms and Inequality 8) Health System Barriers 9) Reluctance of Key Populations 	<ol style="list-style-type: none"> 1) HIV Self-Testing 2) Increased Access to HIV Testing 3) Partner Support 4) Assisted Partner Notification 5) Health System Factors 	<ol style="list-style-type: none"> 1) HIV Stigma 2) Spouse Negligence or Violence, 	NR ^a

Table 2 (continued)

Population type	Notification of sexual partners by people living with HIV	Testing of sexual partners after they have been notified of possible HIV exposure	Linking partners living with HIV to treatment services
	Barriers	Facilitators	Barriers
Health care workers, health advisors, HIV testing and counseling counselors [37, 38, 43, 46, 49, 56, 58–60, 64, 65, 69, 70, 74, 82]	<ol style="list-style-type: none"> 1) Fear of Stigma and Discrimination 2) Fear of Relationship Loss 3) Fear of Violence 4) Fear of Rejection and Abuse 5) Fear of Negative Repercussions 6) Fear of Breach of Confidentiality 7) Fear of Loss of Financial Support 8) Fear of Isolation and Job Loss 9) Challenges in Communication 10) Social-Ecological Factors 11) Lack of Support from Partner 12) Lack of HIV Knowledge and Low Risk Perception 13) Shame and Denial 14) Lack of Partner Contact Information 	<ol style="list-style-type: none"> 1) Emotional Factors 2) Assisted Partner Notification 	<ol style="list-style-type: none"> 1) HIV Stigma 2) Spouse Negligence or Violence 3) Inconsistent and Under-Resourced Training
		<ol style="list-style-type: none"> 1) Increased Access to HIV Testing 2) Assisted Partner Notification 3) HIV Self-Testing 4) Community-Based HIV Testing 5) Health System Factors 6) Partner Support 	<ol style="list-style-type: none"> 1) Importance of Peer-Supported Linkages to HIV Care 2) Support from Family, Relatives, and the Social System 3) Conducting Multiple Counseling Sessions 4) Well-Organized Clinic Procedures 5) Presence of Disease Symptoms
		<ol style="list-style-type: none"> 1) Fear of Consequences of a Positive Diagnosis 2) Fear of Stigma and Discrimination 3) Fear of Intimate Partner Violence 4) Fear of Testing Itself and Distance 5) Relationship Dissolution and Distance 6) Health System Barriers 7) Gender Norms and Inequality 8) Lack of Trust in Healthcare providers 9) Reluctance of key Populations 	

^a Not reported

obstacles, especially for marginalized populations including lesbian, gay, bisexual, transgender, queer/questioning, intersex, and asexual (LGBTQIA+) people, people who use drugs, and people involved in sex work, undermining the principle that sexual health is a shared responsibility between sexual partners [100, 101]. Women living with HIV face further challenges through forced sterilization and criminalization of transmission [99, 102].

The context-specific nature of these barriers varies between resource settings, with low- and lower-middle-income countries struggling with limited resources, weak healthcare infrastructure, entrenched cultural norms, and low-risk perception [4, 12], while high-income countries grapple with legal and ethical issues affecting marginalized populations, such as undocumented refugees, immigrants, Indigenous people, and people of color. Despite these differences, successful interventions across contexts share common elements, such as community-based approaches, support services, and capacity-building efforts [97, 98, 100, 103]. Addressing context-specific barriers while harnessing facilitators tailored to local realities is crucial for effective HIV partner status notification strategies globally [5, 97, 104]. Until healthcare professionals and communities effectively address HIV stigma and its consequences, these barriers will continue to fuel the spread of HIV. Therefore, developing supportive strategies that assist people living with HIV in disclosing their HIV status and implementing community initiatives to transform attitudes towards HIV stigma and discrimination offer the most promising path forward.

Our review also identified different aspects of partner support that contribute to the process of HIV partner status notification, including emotional connections, such as love and closeness in marital relationships and motivations to protect oneself and one's partner. Previous studies have highlighted the potential positive outcomes associated with HIV partner status notification, including a desire for a closer relationship [103, 105]. Partner notification could also lead to greater relationship closeness and stability [106]. Effective communication between partners, during which people living with HIV encourage their partners to consider screening or treatment, has been identified as a critical component of successful partner notification strategies [11]. Service providers should therefore consider these factors (e.g., stability, closeness, intimacy) in the HIV counseling process. While these interventions primarily aim to modify individual behavior, their system-level impacts could be viewed as secondary effects resulting from these behavioral changes [107]. This multifaceted approach ensures that interventions address both individual and systemic aspects of behavior change, maximizing their potential impact.

Our review identified several innovative testing approaches that could enhance HIV partner status notification and early diagnosis, including HIV self-testing, community-based HIV testing, mobile testing, and home-based testing. The WHO guidelines on HIV self-testing and partner notification highlight these novel approaches as promising methods for reaching people with undiagnosed HIV and strengthening partner engagement and relationship bonds [7]. However, it is important to acknowledge that implementing HIV self-testing in low and lower-middle-income countries faces challenges, such as cost barriers and user error rates [108]. Notably, despite the concept of undetectable=untransmittable (U=U) being established since at least 2018 [109], none of the studies in our analysis discussed it, suggesting healthcare workers' reluctance to discuss this critical information with patients. Although a 2019 study advocated for all healthcare workers to discuss U=U with all people living with HIV [110], our findings suggest this recommendation has not been widely implemented. This oversight is particularly concerning as it potentially infringes upon patients' rights to access the most current and relevant health information [111]. The lack of U=U discussions represents a critical gap in HIV care and education that warrants immediate attention from healthcare providers and policymakers. Future research should prioritize this aspect, specifically examining the implementation of U=U discussions in clinical settings and evaluating healthcare providers' adherence to their duty of sharing and discussing this crucial information with patients. Addressing these issues by tailoring innovative approaches to the specific contexts of low and lower-middle-income countries and providing education and training programs is crucial to effectively identify and control HIV in key populations, and preventing its transmission to others. Studies have shown that community-based and non-governmental organizations (NGOs) play a crucial role in supporting HIV services engagement, complementing traditional healthcare settings. These organizations implement various effective programs, including HIV testing promotion among key populations, reduction of HIV-related and marginalized-group stigma, and addressing testing-related fears. They also work to promote pro-testing peer and social norms while ensuring non-judgmental, culturally competent HIV counseling and testing services [112]. Additionally, programs that combine critical reflection on gender norms with information sharing (e.g., antiretroviral therapy benefits) and skill-building (e.g., communication) have proven effective in supporting people living with HIV and key populations in their engagement with HIV services [113].

Strengths and limitations

A major strength of this review is its integration of quantitative and qualitative data to address a complex research question. This approach allows for a comprehensive synthesis of diverse perspectives, providing decision-makers with results directly relevant to their work. Additionally, the broad scope of this review enables the identification of emerging and lesser-known barriers and facilitators, offering a comprehensive view across diverse populations.

Nevertheless, this review has several limitations. First, despite our comprehensive search strategy, it is possible that some relevant studies were not identified in our search, potentially leading to the omission of certain barriers or facilitators that may be absent from this synthesis. Second, the nature of the data precludes the establishment of causality for the identified barriers and facilitators. Third, while results are presented across various populations, some key populations and territories are underrepresented, potentially limiting the generalizability of findings. Fourth, this study could not identify any differences in barriers and facilitators of HIV partner status notification between older and more recent studies, despite the possibility that challenges in HIV care may have evolved over time. This aspect should be considered in future research, especially considering the game-changing context of U=U. Lastly, in this study, we included only people aged 18 or older and our findings are not generalizable to minors living with HIV.

Conclusion

HIV partner status notification is essential to effective HIV prevention and treatment. Our findings highlight several important factors that can be leveraged to increase HIV partner status notification in resource-limited settings and provide valuable evidence for shaping practice, policy, and future research aiming to advance global HIV targets. A notable gap in the reviewed studies was the discussion of U=U. Healthcare providers have a responsibility to discuss U=U with all people living with HIV, and this critical issue warrants further research attention. Future studies would also benefit from actively incorporating the perspectives of people living with HIV, as their insights are essential for informing policies and programs. People living with HIV have long advocated for the removal of punitive policies and laws that create barriers to status disclosure, even in the context of U=U. The intersection of criminalization, discrimination, and various vulnerabilities further complicates this situation. Therefore, policymakers should carefully consider the legal and ethical implications of partner notification requirements at the global level.

Abbreviations

MMAT	Mixed-methods appraisal tool
WHO	World Health Organization
CDC	Center for Disease Control
NGO	non-governmental organization
IQR	Interquartile range
SD	Standard deviation
NR	Not reported
FGD	Focus group discussion

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12879-024-10241-2>.

Supplementary Material 1.

Supplementary Material 2.

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Authors' contributions

FT, MK and HSH designed the study; AB conducted a literature review/search; FT and MB screened the title/abstract and full-texts, and extracted data; FT and MB conducted data synthesis. The initial draft of the manuscript was prepared by FT and revised by MK. All authors reviewed and approved the final version of the manuscript.

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Data availability

All data generated or analyzed during this study are included in this published article and its supplementary information files.

Declarations

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Consent for publication

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Competing interests

The authors declare no competing interests.

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