HIV prevention interventions for women who use substances

Question

What are the best practices of HIV prevention interventions among women who use substances?

Key Take-Home Messages

- Generally, there is extensive research conducted on the intersection of substance use and HIV (1-6); however, there is a need for HIV prevention interventions specifically focused on women who use substances (3, 7–13).
- HIV prevention interventions for women who use substances examined in the published literature can be divided into three broad categories: therapy and counselling; education and skill building; and biomedical interventions.
- Studies show that various adaptations of therapy interventions (e.g., Cognitive Processing Therapy, group therapy, couple-based counselling) that focused on promoting safer substance use and sexual health behaviours were associated with a significant reduction in self-reported HIV risk behaviours among women using substances, including Black, Latina and Indigenous women (14–17). Increased condom use (16), a decrease in unprotected sexual activities (14, 15), and lower alcohol use (16, 17) were HIV risk reduction behaviours achieved by these counselling and therapy interventions.
- HIV/STI risk awareness and improved HIV risk-reduction skills among women who use substances were associated with a decrease in sexual risk behaviours (e.g., less unprotected vaginal or anal sex, more frequent condom use) (18–21). Interventions that aimed to improve HIV knowledge and promote HIV prevention techniques reported

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an increase in safer sexual and drug-related behaviours, including increased condom use (13, 19, 22), less unprotected sex (19, 21, 23, 24), and reduced drug and alcohol use (20).

- The literature on pre-exposure prophylaxis (PrEP) among women who use substances is limited, and PrEP uptake in this population remains low (12, 25–30). Interventions such as integration of PrEP into a community-based syringe program and a patient-centred decision aid demonstrated an increase in PrEP uptake (28, 31). However, PrEP adherence, stigma, fear of side effects, and accessibility issues were reported to be challenging for PrEP initiation and maintenance among women who use substances (11).

- The U.S. Centers for Disease Control and Prevention (CDC) online Compendium of Evidence-Based Interventions and Best Practices for HIV Prevention (32) categorizes the four-session group-based HIV prevention intervention (WORTH) (19) and the culturally-tailored five-session intervention for Black women (E-WORTH) (21) as evidence-based HIV prevention interventions (EBIs) for women who use substances.

The Issue and Why it's Important

Substance use refers to the consumption of controlled and illegal drugs, cannabis, tobacco, and alcohol for various reasons (e.g., medical purposes, religious or ceremonial purposes, personal enjoyment, stress/trauma/pain management) (33). The substance use spectrum, as defined by the Government of Canada, is comprised of five stages: non-use, beneficial use, lower-risk use, higher-risk use, and addiction (i.e., substance use disorder) (33).

The Canadian Alcohol and Drugs Survey found that 76% (n=23.7 million) of Canadians reported consuming an alcoholic beverage in 2019 (34). In Ontario, the prevalence of alcohol use in 2019 was 74% (n=9 million) (34). In the same survey, 21% (n=6.4 million) of Canadians and approximately 20% of Ontario residents had used cannabis in 2019 (34). The prevalence of psychoactive pharmaceutical use was 23% (n=7 million); 7% (n=493,000) of these individuals engaged in problematic use of the drug (i.e., not using the pharmaceuticals for their intended purpose) (34). Use of illegal drugs, including cocaine, methamphetamines, heroin, and inhalants was reported by 3% (n=1.1 million) of Canadians in 2019 (34). Prevalence of past-year use of these illegal drugs was similar among males (4% or 616,000) and females (3% or 465,000) (34).

Appropriate use of prescription drugs for medical/health purposes (e.g., opioids, benzodiazepines, and stimulants) can be valuable; however, improper consumption can be dangerous (33). Misuse of these medications can cause severe health problems, including addiction or substance use disorder, overdose, and death (33).

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Notably, the opioid crisis in Canada has grown significantly within the last ten years (35). In a surveillance report published in June 2023 by the Public Health Agency of Canada, there were 36,442 apparent opioid toxicity deaths from January 2016 to December 2022 (35). In 2022 alone, 7,328 opioid toxicity deaths were recorded; of these, 27% were among females (35).

People who inject drugs are disproportionately impacted by HIV and have lower estimates related to HIV awareness, treatment uptake, and viral suppression when compared to the overall population (36). The estimated annual HIV incidence rate in Canada among people who have injected drugs in the past 6–12 months is nearly 1.5 times higher than among sexually active men who have sex with men (36)

Contextual factors have been important in understanding women's HIV-related vulnerability and associated impacts for women who use substances; this includes the division of family caretaking responsibilities (37), lack of decision-making power (7, 37, 38), lack of financial control (7, 37), and vulnerability to intimate partner violence (7, 25, 37, 38). Understanding the HIV-related risk factors of people who use drugs may not be complete without the evaluation of gender equality and relationship power dynamics (37).

Higher-risk substance use can negatively-impact mental health, relationships, finances, and physical health and well-being (33). While the intersection of substance use and HIV has been widely researched (1–6), studies have emphasized a need for specific HIV prevention interventions for women who use substances (3, 7–10). Research has highlighted how HIV prevention interventions tailored specifically to women who use substances are necessary due to both high HIV prevalence among people who use drugs and gender disparities in health outcomes among women (7). Barriers include being stigmatized and discriminated against when seeking health services, being ignored and/or disrespected by health care staff, a lack of childcare, and long wait times impacting health care service accessibility (7, 11, 39, 40).

This review summarizes literature published between 2013 and 2023 on HIV prevention interventions specifically targeting women who use substances.

What We Found

HIV prevention interventions specifically for women who use substances can be divided into three broad categories: therapy and counselling; education and skill building; and biomedical interventions.

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Therapy and counselling

A 2021 study in Atlanta analyzed the efficacy of a Group Motivational Enhancement Therapy module complimenting the previously developed Horizons intervention that was designed to improve HIV/STI knowledge with activities guided by social cognitive theory among young Black women (16, 41). The Group Motivational Enhancement Therapy module used an active learning approach, derived from motivation interviewing, to enhance young women's awareness of alcohol use, provide strategies to reduce alcohol-related sexual risk behaviour and improve their ability to communicate safer sexual behaviours (16). Throughout the study, 560 young Black women (aged 18 to 24) who reported recent sexual risk behaviours and alcohol use were randomly placed into one of the three groups: Horizons and Group Motivational Enhancement Therapy (n=185), Horizons and General Health Promotion (n=190), and enhanced standard of care (control) (n=185) (16). Participants completed 3-, 6-, 9- and 12-month follow-up assessments (16). The structure of each intervention is described below:

- Horizons and Group Motivational Enhancement Therapy: two 5-hour workshops on consecutive Saturdays, followed by eight 15-minute telephone "booster" sessions approximately one and two months after each assessment to discuss the progression of each participant's sexual health goals and barriers to communication and HIV/STI testing. Participants also received eight text messages to reinforce content learned from the intervention.

- Horizons and General Health Promotion: two 5-hour workshops on consecutive Saturdays, followed by a telephone "booster" session and a retention call approximately one and two months after each assessment. Participants received text messages if they did not answer the phone. A General Health Promotion module educated participants about health and nutrition.

- Enhanced standard of care (control): a 1-hour group session promoting HIV/STI prevention with a 30-minute video, question-and-answer session, and group discussion (16).

All interventions were led by trained Black female health educators (16). Overall, the Horizons and Group Motivational Enhancement Therapy intervention improved safer sexual health behaviours among young Black women who consume alcohol; relative to the enhanced standard of care intervention, participants in the Horizons and Group Motivational Enhancement Therapy group were more likely to have safer sex (adjusted odds ratio [aOR]=1.45, 95% CI: 1.04–2.02) and had a greater proportion of condom use (aOR=1.68, 95% CI: 1.18–2.41) (16). Additionally, condom non-use was less likely among participants in this intervention group compared to the enhanced standard of care (aOR=0.57, 95% CI: 0.38–0.83) (16). Risky alcohol

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use and weekly binge drinking was less likely to occur in the Horizon and Group Motivational Enhancement Therapy arm (aOR=0.61, 95% CI: 0.41–0.90; aOR=0.41, 95% CI: 0.21–0.77) and Horizon and General Health Promotion arm (aOR=0.57, 95% CI: 0.39–0.85; aOR=0.52, 95% CI: 0.29–0.93), relative to the enhanced standard of care (16).

The effectiveness of a couple-based HIV counselling and testing intervention to reduce the risk of acquiring HIV infection among heterosexual Latina and Black women who use drugs was assessed in two publications from 2013 and 2015, but they relied on data from a randomized trial that was conducted in New York City between 2005 and 2007 (14, 15). As these data are almost two decades old (from 2005–2007), the findings of these publications should be interpreted with caution, taking into consideration a very different current context of drug use and HIV testing and care landscape (14, 15). Participants were randomized into one of three study arms: couple-based HIV counselling and testing (110 couples; n=220), women-only relationship-focused counselling (n=104 women), and the women-only counselling and testing control group (n=116 women) (14, 15). The couple-based counselling intervention was comprised of a personalized action plan based on their risk profile, interactive exercises to build communication skills, and conversations surrounding harm reduction practices, safe sexual behaviours, social norms, and gender roles (14, 15). The women-only relationship-focused counselling intervention was similar to the couple-based intervention, though was performed by and addressed only to the women, rather than to the couples (14, 15). A women-only National Institute on Drug Abuse (NIDA) standard-of-care HIV counselling and testing was used as the control (14, 15). HIV risk behaviour follow-up assessments were conducted three and nine months after interventions were conducted (14, 15). Women's HIV risk at 9-month assessment was significantly reduced in the couple-based HIV counselling and testing group compared to both the NIDA standard HIV counselling and testing control group (3.04 HIV infections averted per 1,000 person years, p=0.0004) and the women-only relationship-focused HIV counselling and testing group (1.39 HIV infections averted per 1,000 person years, p=0.05) (14, 15).

The feasibility and effectiveness of Cognitive Processing Therapy for Indigenous women with post-traumatic stress disorder (PTSD) who recently used substances was evaluated in a randomized control trial (17). A total of 73 American Indian and Alaska Native women at two rural Pacific Northwest behavioural health clinics in the U.S. were included in the study (17). The primary objective of this study was to assess the feasibility and effectiveness of Cognitive Processing Therapy for Indigenous women with PTSD, HIV sexual risk behaviour, and substance use (17). The study assessed outcomes such as PTSD symptom severity, alcohol use frequency, substance abuse or dependence diagnosis, and high-risk sexual behaviour (17). This 13-session Cognitive Processing Therapy intervention was adapted specifically for the Indigenous community, and barriers

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were removed for community health care providers using the Cognitive Processing Therapy manual by enhancing readability, eliminating technical scientific terminology, and culturally adapting concepts, definitions, and handout materials (17). Women were randomly assigned into two groups: immediate Cognitive Processing Therapy (n=37) and a 6-week waitlist control (n=36) (17). Those in the control group completed a post-waitlist assessment at the end of the waitlist period and were offered the adapted Cognitive Processing Therapy (17). Overall, 82% (n=60 of 73) Indigenous women received at least one Cognitive Processing Therapy session (n=28 of 37 in immediate arm; n=32 of 36 in waitlist arm), and 30% of women who attended counselling completed Cognitive Processing Therapy treatment (17). Immediate Cognitive Processing Therapy was associated with a lower frequency of alcohol use (medium effect size, Cohen's *d*=0.77) and sexual risk behaviours (large effect size, Cohen's *d*=1.02) compared to the 6-week waitlist group (17). The authors highlighted the "promising" nature of Cognitive Processing Therapy on substance use and high-risk sexual behaviours (17).

Education and skill-building

A randomized controlled trial published in 2014 evaluated Project WORTH (Women on the Road to Health), a group-based psycho-educational and skills-building intervention that observed 306 women involved with drugs who were recruited from community supervision settings in New York City (19). Core components of the intervention addressed HIV/STI knowledge, risk reduction problem-solving and negotiation skills, condom use intentions, and risk reduction goal setting (19). Participants were randomized into one of three groups: a four-session traditional group-based HIV/STI intervention (traditional WORTH, n=101), a four-session multimedia group-based HIV/STI intervention (multimedia WORTH, n=103), or a four-session group-based Wellness Promotion intervention (control, n=102) (19). During the baseline assessment, 77% (n=237) of all participants reported unprotected vaginal or anal sex, and 63% (n=194) reported having multiple sex partners (19). Over the 12-month follow-up period, there was a 28% reduction in the number of unprotected vaginal or anal sex occurrences with primary partners in the traditional WORTH group relative to the control (incidence rate ratio [IRR]=0.72, 95% CI: 0.57–0.90) (19). Reported protected sex acts with primary partners were 10% higher for women in both WORTH interventions than in the control group (mean difference [b]=0.10, 95% CI: 0.02–0.18) over the entire follow-up period (19). Additionally, over the 12-month follow-up period, participants in the intervention groups were more likely to report consistent condom use than those in the Wellness Promotion control arm (odds ratio [OR]=2.36, 95% CI: 1.28–4.37) (19).

E-WORTH (Empowering African-American Women on the Road to Health), a cultural adaptation of the aforementioned Project WORTH, is a group-based HIV/STI prevention intervention with

21. Gilbert L, Goddard-Eckrich D, Chang M, Hunt T, Wu E, Johnson K, et al. Effectiveness of a culturally tailored HIV and sexually transmitted infection prevention intervention for Black women in community supervision programs: A randomized clinical trial. JAMA Network Open. 2021;4(4):e215226.

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computerized self-paced modules designed for Black women with a history of drug use who are mandated to parole, probation, or alternative-to-incarceration programs (so-called community supervision programs) (21). In 2021, a randomized clinical trial was conducted in two New York City community supervision program sites to evaluate if E-WORTH could effectively reduce STIs and condomless sex among 352 women in community supervision programs who identified as Black or African American, including 79 women (22.5%) who also identified as Latinx (21). The E-WORTH intervention was comprised of a 1-hour individual HIV testing and orientation session and four weekly 90-minute group sessions (21). A streamlined HIV testing-only control condition was used as the comparison, which included one 30-minute session of HIV testing and information (21). Both groups were facilitated by Black female community supervision program staff (21). Follow-up was conducted at 3-, 6-, and 12-months post-intervention (21). Of the 352 enrolled participants, 172 were allocated to the E-WORTH arm and 180 were allocated to the control group (21). Among all participants, 58.8% (n=207) reported using illicit drugs and 42.9% (n=151) reported binge drinking in the past 30 days, while only 23.1% (n=81) were in substance use treatment in the past 90 days (21). At baseline, 109 tested positive for any STI (36.5%, n=62/172 in E-WORTH arm; 26.3%, n=47/180 in control arm), of which 79.8% (n=87) had proof of treatment such as a prescription bottle or note (79.0% E-WORTH, n=49/62; 80.9% control, n=38/47) (21). At the 12-month follow-up, 15.2% (n=20) women in the E-WORTH intervention and 26.1% (n=37) in the control tested positive for any STI (21). Compared to the control group, E-WORTH participants had 54% lower odds for detecting any STI at the 12-month follow-up (OR=0.46, 95% CI 0.25–0.88; p=0.01) (21). E-WORTH participants also reported having a mean of 19.4 acts of condomless vaginal or anal intercourse at baseline compared to 23.8 (SD=30.6) in the control group (21). At the 12-month follow-up, acts of condomless sex decreased to 14.3 (SD=28.3) and 20.0 (SD=30.3) in the E-WORTH and control groups, respectively: women in the E-WORTH intervention had 38% fewer total acts of condomless sex in the past 90 days (IRR=0.62, 95% CI 0.39–0.97; p=0.04) (21).

Both WORTH and E-WORTH are included in the CDC Compendium of Evidence-Based Interventions and Best Practices for HIV Prevention (32). In addition to these two interventions, the compendium's archived section includes two additional interventions: one testing the effectiveness of HIV/STI Safer Sex Skills Building for women in community drug treatment (42), and the other testing the effectiveness of women's co-op for Black women who use crack and are not in drug treatment (43). While the 2017 secondary analysis of Safer Sex Skills Building (18) is based on the original data (more than two decades old) and falls beyond the time frame of this review, the Co-Op intervention has been adapted (20) to young women and tested in a randomized trial of 237 sexually active, substance-using Black female adolescents (20). The participants were randomized into two groups: the Young Women's CoOp intervention (n=118) and

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a nutrition control group (n=119) designed to improve health and reduce chronic disease risk through healthy eating and physical activity (20). In efficacy analyses, at three-month follow-up participants in the Young Women's CoOp were significantly less likely to report sex without a condom at last sex relative to the nutrition control group (20). In addition, a significant reduction in marijuana use was identified in participants enrolled in the intervention group from baseline to the follow-up period (20). A significant decrease in heavy alcohol use was observed from baseline to the follow-up period for the nutrition control arm; a reduction in heavy alcohol consumption also was found between the same time period for the Young Women's CoOp group, however this was not statistically significant (20). The authors highlighted that the results of this study are mixed, emphasizing the challenges for interventions targeting female youths using substances (20).

An HIV prevention intervention called Reducing Risky Relationships for HIV was developed and implemented among women in correctional institutes in four U.S. states (Kentucky, Delaware, Rhode Island, Connecticut) who engaged in weekly drug use prior to incarceration (23, 24). In this two-arm randomized clinical trial, content regarding sexual risk behaviour was presented to and discussed with women in varying formats: Women in both study arms viewed a 17-minute video on drug use and HIV, and in addition to this, the women in the intervention arm participated in five prison-based group sessions and a single booster delivered by telephone or face-to-face approximately 30 days post-release. (23, 24). Of the 444 women randomized into the intervention and control groups, 344 completed the intervention and follow-up 90 days after release from prison (23, 24). Of these 344 women, 178 remained in the intervention arm and 166 in the control arm (23, 24). During the follow-up period, participants from the Reducing Risky Relationships for HIV group were more likely to self-report an increase in HIV risk behaviour knowledge than those in the control group (23). Additionally, women in the intervention arm self-reported fewer unprotected sexual behaviours; a 55.3% reduction in the expected count of unprotected sexual behaviours in the last 30 days was observed relative to women in the control arm (24). It should be noted that, due to the brief follow-up period, it is unknown if women in the Reducing Risky Relationships for HIV group maintained lower levels of unprotected sexual behaviours beyond their first three months in the community (24).

The National Institute on Drug Abuse (NIDA) Standard intervention is designed to educate people who inject drugs and encourage HIV prevention techniques (44). In two sessions (approximately 20–30 min each), the interventionist meets with a program participant and delivers risk-reduction messages; introduces practice of risk-reduction skills (e.g., cleaning injection equipment, talking about practicing safe sex) through modeling and rehearsal; reinforces behavior change efforts; and provides referrals to treatment, if indicated (45). A total of 400 women who use drugs in rural

31. Roth AM, Tran NK, Felsher M, Gadegbeku AB, Piecara B, Fox R, et al. Integrating HIV preexposure prophylaxis with community-based syringe services for women who inject drugs: Results from the Project SHE demonstration study. Journal of Acquired Immune Deficiency Syndromes. 2021;86(3):e61–e70.

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Appalachian jails in the U.S. were randomized into two study groups: the NIDA Standard education intervention (n=201) and the NIDA Standard plus motivational interviewing group (n=199) (44). The NIDA Standard focuses on risk reduction education and the NIDA Standard plus motivational interviewing combines risk reduction education with individualized, targeted approach of motivational interviewing (44, 46). HIV risk behaviours were assessed three months following release from prison (44). The study supported the feasibility of delivering the NIDA Standard and Motivational Interviewing-based HIV risk reduction interventions (44). However, study findings did not support the additive value of a motivational enhancement to HIV prevention education and testing, and instead indicate that exposure to HIV risk reduction information and testing (NIDA Standard) can be associated with reduction in high-risk injection drug use and needle sharing practices during community re-entry (44).

A 2017 systematic review included ten studies focused on HIV risk reduction interventions among reproductive-age (15 to 44 years) women who use substances (13). However, only two of the included studies were conducted in high-income countries since 2013 to meet the inclusion criteria of this Rapid Response (19, 24). The findings of these two studies are discussed above (19, 24).

Biomedical interventions

PrEP can be an effective HIV prevention intervention for women who use drugs (31); however, lower PrEP awareness and uptake among women who use substances, and the understudied nature of PrEP in this population, has also been acknowledged (8, 11, 12, 25, 47, 48). Currently, women who inject drugs are not identified as a priority group for PrEP interventions even in high-income countries (48). There is limited research that focuses on PrEP as the primary biomedical HIV prevention intervention for women who use drugs.

In a pilot trial conducted in Connecticut, the authors aimed to design and test a tool to help women make informed decisions about PrEP (28). A decision aid about PrEP to meet women's needs was developed and the study recruited 164 women with substance use disorders into a clinical trial (28). Women could choose to receive more information about PrEP through the decision aid or to instead receive a generic pamphlet (enhanced standard of care) (28). The elements of the decision aid involved a discussion on the pros and cons of using PrEP relative to other prevention strategies, addressing domains identified as important to women with substance use disorders, including PrEP efficacy, cost, side effects, medication interactions, insurance coverage, and need for disclosure to partners (28). The decision aid successfully increased women's interest in PrEP among those who received it and was associated with an increased chance of initiating PrEP by 12 months (28). The decision aid helped to change the minds of women with

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substance use disorders regarding PrEP, especially those at a higher risk for HIV, and was also associated with starting PrEP, even though the women were not directly linked to care as part of the study (28).

Roth *et al.* (2021) implemented the Project SHE demonstration study, in which PrEP integration was combined with a community-syringe service program in Philadelphia to evaluate HIV prevention among women who inject drugs (31). Participants were recruited from a weekly drop-in program that provides food, showers, clothing, and social support to women (31). Women were eligible for study inclusion if they were reporting injection drug use in the last 30 days and had at least one behaviour in the last six months that was associated with an increased risk of HIV infection (such as syringe sharing, sex exchange, inconsistent condom use) (31). Those eligible for the study were offered 24 weeks of daily PrEP and were asked to complete surveys and clinical assessments at baseline, and weeks 1, 12, and 24 of the study (31). A total of 95 women were included; 69.5% (n=66) of the participants were White, 14.7% (n=14) were Black and 11.6% (n=11) were Hispanic/Latina (31). Additionally, 63.4% (n=59) identified as currently experiencing homelessness, 78.9% (n=75) reported inconsistent condom use, and 54.3% (n=51) identified their self-perceived risk of HIV infection as extremely or very unlikely (31). Two participants reported positive HIV tests at weeks 12 and 24, respectively, reporting inconsistent or no PrEP adherence within two weeks of their positive HIV diagnosis (31). Three factors were associated with an increase in PrEP uptake among women who inject drugs over the follow-up period: inconsistent condom use (aOR=3.38, 95% CI: 1.07–10.7), experiencing sexual assault (aOR=5.89, 95% CI: 1.02–33.9), and frequent access to syringe service programs (aOR=1.85, 95% CI: 1.24–2.77) (31). By week 24, 44.2% (n=42) were retained in PrEP care (31). The authors concluded that integrating PrEP with syringe service programs is feasible and acceptable for women who inject drugs (31). This supports the notion that daily PrEP is a viable prevention tool for women who inject drugs, but this population will likely need additional supports to adhere and persist in care (31).

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Factors That May Impact Local Applicability

The research presented in this review was primarily conducted outside of Canada. Availability and access to services can significantly differ between jurisdictions, therefore direct application of interventions may yield inconsistent outcomes. Additionally, some research evaluated interventions that were adapted to different groups of women who use substances; as a result, it may be challenging to directly apply interventions to women who differ from the studied populations by patterns of substance use including alcohol, and by race, ethnicity, and other characteristics. Furthermore, many factors and complexities are associated with alcohol and drug use, and drawing general conclusions from individual studies and applying it to the broader population of women who use substances may be difficult and/or inappropriate. Finally, this review only includes studies specifically focused on women using substances. Studies evaluating HIV prevention interventions among mixed populations that include both female and male participants using substances are not included in this Rapid Response, unless a separate analysis for female participants was provided.

What We Did

We searched Medline (including Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE® Daily and Ovid MEDLINE®) using text terms HIV AND women* AND (text terms [Injecting drug use* or Injection drug use* or who inject or IDU* or intravenous drug use* or who use* drugs or use* adj2 drug* or drug use] or MeSH terms [exp Substance-Related Disorders/ or exp Substance Abuse, Intravenous/] or terms [(intravenous* or parenteral* or inject* or IV) adj3 (drug* or substance*) adj8 (abuse or addict* or use* or using or people or person*) or PWID* or PWUD*or [(substance use* or use*) adj5 substance*] in titles or abstracts). Searches were conducted on July 28, 2023 and results limited to English articles published from 2013 to present. Only studies conducted in high-income countries were included. Reference lists of identified articles were also searched. Google (grey literature) searches using different combinations of these terms were also conducted. The searches yielded 1,364 references from which 48 were included.

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