

HIV Risk among Transgender Women: A Systematic Review of the Global Literature

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Abstract

This review examines the global literature concerning HIV/STI risk factors among transgender women (TGW). The effects of marginalization intersecting with sex work, stigma, and abuse as well as sex- and drug-related risk behaviors merit a systematic review to enable a better understanding of how these factors impact HIV/STI transmission among TGW. The current paper synthesizes the results of 36 studies conducted in multiple cultural settings. Though the selected studies similarly found heightened HIV risks faced by TGW, the focuses varied concerning the impacts of HIV-related dynamics. These variances included the effect of sex work, social stigma, various forms of abuse/violence, sex- and substance risk behaviors, mental health, housing, employment, and the relationship between HIV and other STIs. While focus and results varied, the findings are in consensus that a lack of safe-sex knowledge, various forms of abuse/violence, and diminished autonomy accelerate the TGW's risks of HIV/STIs. Variations in findings may be attributed to specific sociocultural settings and various research methods as well as differences in the risk factors being studied. This points to the need for more empirical studies – particularly those that specifically target TGW and the mechanisms of HIV/STI transmissions among the highly vulnerable population.

Keywords: HIV/AIDS, STIs, transgender women (TGW), stigma

1. Introduction

This paper examines the global literature on transgender women (TGW) living with and at risk of HIV and other STIs. The term “transgender” is commonly used as an umbrella term to describe individuals who do not conform to assigned gender norms or whose biological sex conflicts with their gender identity (APA, 2014). Assigned male-to-female (MTF) transgender people, often referred to as TGW, are culturally assigned and born biologically male but identify as female (Nemoto et al., 2012).

The global estimation of the female transgender population is unclear due to worldwide transphobic sentiment and behavior, internal and external stigma amongst transgender women, and limited attention to the population (Sabin et al., 2016). While transgender people are one of four key populations (KPs) recognized by the National AIDS Control Program (Reza-Paul et al., 2012) as being at a higher risk of HIV – the other three being men who have sex with men (MSM), injection drug users (IDUs), and sex workers (SWs) – it has been suggested that there are disparities in HIV infection between transgender women and the other high-risk populations; since they are disproportionately burdened, TGW are in dire need of HIV prevention, treatment, and care services (Baral et al., 2013).

While on a global scale, members of the LGBTQ+ community often experience incidences of discrimination and criminalization, TGW may face even more serious discrimination and vulnerability that lead to barriers to HIV care among women (Baral et al., 2013; Chakrapani et al., 2011). Incidences of stigma and discrimination are often linked to TGW resorting to sex work, facing higher risks of HIV and other STIs, physical and verbal abuse, housing and employment instability, substance use, and addiction, among other challenges (UNAIDS, 2014). Racial and ethnic disparities are also prevalent among TGW living with HIV. Black/African American and Hispanic/Latina TGW have the highest HIV prevalence in the United States (Centers for Disease Control and Prevention [CDC], 2021).

Researchers have found various high-risk factors such as engagement in sex work, sex-related risk factors, drugs,

and alcohol (substance) related risk factors, mental health risk factors, incidences of stigma/discrimination, incidences of violence/abuse/attacks, and PrEP and ART uptake. Given the urgent need to understand risk behaviors among TGW, the current article reviews recent empirical studies that examined various factors influencing TGW at a high risk of HIV and other STIs. In doing so, this review paper identifies current trends of research direction in the field, identifies gaps in the existing research, and provides recommendations for future research.

2. Methods

2.1 Inclusion Criteria

The studies were identified for (1) Peer-reviewed scholarly articles published in English-language journals, (2) empirical studies, (3) included a target population of TGW, and (4) analyzing the influencing factors placing TGW at a higher risk of HIV/STIs.

2.2 Data Sources

The literature search was conducted on August 23, 2022, using four electronic bibliographic databases: PsycINFO, CINAHL, Web of Science, and PubMed. We used a list of search terms across the search engines alongside alternate search terms separated by “or” (e.g., “HIV OR STI”). The search terms used across all four databases were “transgender” and “HIV OR STI.”

2.3 Screening

The citations were screened using a three-step process: the first was a title review, the second an abstract review, and the last an article review.

After the removal of 410 duplicates, the initial inclusion was 2,431 citations. The Mendeley Reference Manager was used for further screening. At this stage, all unduplicated citations ($n = 2,431$) were screened for studies that were unempirical, extraneous, or focused on one of the interests rather than both (i.e., only transgender or HIV/STDs). As a result, 1,339 references were excluded, leaving 682 citations. For the abstract review stage, articles were screened for relevancy based on the abstracts which resulted in the exclusion of 385 articles. For the article review selection, a comprehensive evaluation and analysis of full-text articles was used to screen the remaining references. For this stage, 35 out of 297 references were selected. The remaining 35 articles were manually searched for references, leading to the inclusion of one additional article. This search resulted in 36 eligible articles. The screening process for each step, and the reasons for exclusion, are illustrated in *Figure 1*.

2.4 Data Abstraction

A table to organize and display the reviewed studies and their characteristics was created. In *Table 1: Characteristics of Reviewed Studies*, the studies are characterized by author and publication year, study site(s), size, race/ethnicity, age range of the sample, and design of the study. A second table was created to display the results of the reviewed studies. They are again organized in *Table 2: Results of Reviewed Studies* by author and publication year, but they have been expanded to include HIV prevalence, STI rates, engagement in sex work, sex-related risk factors, substance-related risk factors, mental health, stigma, violence and abuse, pre-exposure prophylaxis (PrEP) uptake, and antiretroviral treatment (ART) uptake, among other miscellaneous factors.

3. Results

3.1 Characteristics of the Reviewed Studies

3.1.1 Study Sites and Publication Period

The reviewed studies were conducted in a diverse range of countries and societies where TGW are discriminated against and often criminalized. Key characteristics of the reviewed studies were summarized by authors, publication year, study site, age range, race/ethnicity, and study design (see *Table 1*). Reviewed studies included participants recruited from 13 countries: United States ($n = 15$), Brazil ($n = 2$), Dominican Republic ($n = 4$), Indonesia ($n = 4$), Uganda ($n = 2$), Canada ($n = 1$), Colombia ($n = 1$), Peru ($n = 1$), China ($n = 1$), India ($n = 2$), Pakistan ($n = 1$), Vietnam ($n = 1$), and Thailand ($n = 1$). The selected articles were published between 2004 and 2022. The years of data collection ranged from 1999 to 2019.

3.1.2 Study Design and Sampling

Out of 36 articles, 23 adopted qualitative methods, while 6 utilized quantitative methods. Five of the reviewed studies used a cross-sectional design. Research participants were largely recruited through community-based snowballing methods or non-governmental organizations (NGOs). The sample sizes of the selected articles varied from 6 participants to 332. 36.1% ($n = 13$) of studies had over 100 participants; 8.3% ($n = 3$) of studies had between

50 to 99 participants; 50% (n = 18) of the studies had fewer than 50 participants.

3.1.3 Target Population

As illustrated in *Table 1*, 77.8% (n = 28) of the selected studies examined TGW generally, 16.7% (n = 6) specifically focused on TGW sex workers, 2.8% (n = 1) also included other members of the LGBTQ+ community and cis-heterosexual participants, and 8.3% (n = 3) focused on TGW of color in a Western context. The mean (or at times median) age of the TGW ranged from the youngest participants being 18 years old to the oldest being 82 years old.

3.2 HIV Risk

3.2.1 HIV Prevalence

The prevalence of HIV infection among TGW varied greatly throughout the reviewed studies. The selected studies examined HIV prevalence amongst TGW across diverse geographical and environmental contexts. 77.8% (n = 28) of the 36 reviewed studies featured participants who were HIV positive. The lowest percentage of HIV-positive participants ranged from 18.1% (Bao et al., 2016) and the highest HIV positive participants was up to 100% (De Lind Van Wijngaarden et al. 2020; Faulk et al. 2021; Faulk et al. 2019; Faulk et al. 2019; Goldenberg et al. 2021; Logie et al. 2011; Sabino et al. 2021; Sevelius et al. 2014). The remaining studies included participants who did not know their HIV status or did not disclose their status but were still considered at high risk. Only one study included a 0% rate of participants who were HIV positive (Yan et al., 2019).

3.2.2 STI Prevalence

The reviewed studies also discussed various STI prevalence amongst the participants. Within the 11 studies that examined other STIs, 8 of the studies included either a participant's history of syphilis infection or other infections. Syphilis had the highest discussion of STI prevalence among the selected studies. The lowest syphilis infection prevalence was 3% (Nemoto et al., 2004) and the highest was 28.3% (da Silva et al., 2020). The rest of the studies that reported participant syphilis infection rates did not include prevalence percentages. Six of the reviewed studies also included gonorrhea infection and testing history. The lowest gonorrhea infection prevalence was at 4% and the highest was at 24.4% (Reback et al., 2019). Four of the selected studies included a discussion on genital warts infection and testing history (Faulk et al., 2019; 2019; 2021; Nemoto et al., 2004). Two of the selected studies also included chlamydia infection and testing history (Nemoto et al., 2004; Nuttbrock et al., 2017). Lastly, Trichomoniasis and Herpes were only discussed once within the same study (Nemoto et al., 2004), and Hepatitis B was included in another separate study (Nuttbrock et al., 2017).

3.2.3 Sex Work Engagement

Engagement in sex work was common among TGW throughout the reviewed studies. Over 19 studies (52.8%) featured participants who had previously engaged in sex work, had exchanged sex for certain types of goods, or had participated in sex work as a source of income. Within the 19 studies, participants in 10 (52.6%) reported sex work as a main source of income. Four studies included participants who did not explicitly say they were currently engaging in sex work but have engaged in sex work at some point (Budhwani et al. 2021; De Lind Van Wijngaarden et al., 2020; King et al., 2019; Nemoto et al., 2004). One study included that roughly one-fifth (21.4%) of their participants had never engaged in sex work at any point (Yan et al., 2019).

3.2.4 Sex-Related HIV Risk

Sex-related HIV risk factors of the selected works primarily consisted of the number of sex partners a participant would have, condom usage, and awareness of condom usage. Ten of the 19 reviewed studies included participants engaging in condomless sex, and 3 of those studies reported that their participants felt inclined to have condomless sex due to either client violence or out of fear of client rejection, as they relied on the income (da Silva et al., 2020; Ganju et al., 2020; Nemoto et al., 2004). Three of the reviewed studies included the number of partners a participant would have, where the lowest average was 8.45 sexual partners in the previous month of the study, while the highest was 23.4 sexual partners (Budhwani et al. 2017; Reback et al. 2019). A study reported that 52% of their participants reported having a primary partner and 36% reported at least one casual partner (Nemoto et al., 2004).

The importance of condom usage awareness was discussed in two studies (Mitchell et al. 2019; Usman et al., 2018). In one study, many participants understood that unprotected sex was a high HIV-risk behavior (Mitchell et al., 2019), whereas in another study, only 14.29% of participants were aware of the significance of condoms (Usman et al., 2018). As to condom usage, a study found a correlation between HIV testing and discussion of condom usage with their partners (Blair et al., 2021). In instances where participants could talk with their partners about using condoms, they were also more likely to get tested for HIV (Blair et al., 2021). Another study found

that Black and Latina TGW experienced a barrier in discussing condom use with partners due to the idea that PrEP users do not have to use condoms (Brooks et al., 2019). Interestingly, there was an article that reported high condom usage (95%) among their TGW participants (Sabino et al., 2021). Further, a study described that their TGW participants would implement lubricant substitutes that would ultimately cause a burning sensation in the women's anal area or root abdominal pain and diarrhea (Ssekamatte et al., 2020).

3.2.5 Substance-Related HIV Risk

Substance use was also a commonly found risk behavior among the selected studies. There were 22 studies that discussed substance use amongst the participants regarding drug and/or alcohol abuse. Sixteen out of the 22 studies (72.7%) reported on their sample population's drug abuse, and 6 of those studies (27.3%) reported that participants would use drugs as a coping mechanism to deal with either the reality of living with HIV, because of current life stresses, anxiety, transphobia, stigma, or some combination thereof. Eleven out of 22 studies (50%) discussed alcohol use, which reported histories of alcohol addiction, binging on alcohol, using alcohol as a coping mechanism, recent intoxication, or their participants being at high risk for alcohol dependency; alcohol was consumed to cope with experiences of stigma and transphobia, depression, or an HIV diagnosis. Three studies discussed the effects of substance abuse (Nemoto et al., 2004; Suguno et al., 2005; King et al., 2019). A study reported that sex under the influence was common among participants (Nemoto et al., 2004) while a different study found that participants who had sex while under the influence of substances during the current month were significantly more likely to have unprotected receptive anal intercourse (Suguno et al., 2005). Another study reported illicit substance use for courage to approach clients (King et al., 2019).

3.2.6 Stigma, Discrimination & HIV Risk

Sixteen selected studies (44.4%) reported participant's experiences of stigma and/or discrimination for their identities, HIV status, or both. Five studies (14%) included participant's experiences of discrimination within the workplace (Bao et al., 2016; Budhwani et al. 2017; King et al., 2019; Mayo-Wilson et al. 2020; Yan et al., 2019); this type of discrimination includes being called unkind names at work (Budhwani et al., 2017) or being terminated from a job once a TGW's trans identity was revealed (Mayo-Wilson et al., 2020). In addition, 4 studies (11.1%) reported participants had been discriminated against when seeking healthcare services in the past (Bao et al., 2016; Chakrapani et al., 2022; Fauk et al., 2019; Sevelius et al., 2014). Participants who had experienced discrimination by healthcare professionals felt resistance to test for HIV (Sevelius et al., 2014). Two studies (5.6%) reported participant's incidences of racist discrimination within their daily lives and healthcare facilities (Baguso et al., 2019; Logie et al., 2011). Three of the selected studies also discussed participant's experiences of discrimination from their households/family members (Bao et al., 2016; Brooks et al., 2019; King et al., 2019). There was a consensus among several of the selected studies that such negative experiences can lead to a higher risk of HIV (Baguso et al., 2019; Budhwani et al., 2021; Chakrapani et al., 2022; Perez-Brumer et al., 2017; Sevelius et al., 2014; Suguno et al., 2005). It has also been reported that when incidences of racism and anti-trans discrimination compounded and led to poor health outcomes, participants were less likely to receive HIV care (Baguso et al., 2019).

A study recorded that a large number of transgender women felt that HIV was inevitable due to past negative experiences within healthcare facilities (Sevelius et al., 2014). Negative experiences result in the avoidance of healthcare settings altogether (Logie et al., 2011). Another study discussed how younger participants who reported higher levels of transphobic incidences were 3.2 times more likely to have engaged in unprotected receptive anal intercourse (Suguno et al., 2005). Three of the selected studies discussed intercommunity stigma with TGW (Chakrapani et al., 2022; Sevelius et al., 2014; Van Wijngaarden et al., 2020). For example, a study described that TGW participants experienced high levels of inner and outer stigma and felt that being transgender was considered a punishment within itself; participants also blamed other TGW for being the reason for society's harsh treatment of them (Van Wijngaarden et al., 2020). Additionally, there was an internal hierarchy amongst TGW regarding the natural petiteness of their bodies, as these physical characteristics saw certain women placed on the top of the hierarchy of beauty. Another study further reported that participants who were HIV positive reported stigma from other transgender sex workers who were not HIV positive (Chakrapani et al., 2022). Thus, participants who reported they engaged in sex work were hesitant to test with HIV test counselors who were a part of the transgender community due to a fear of diagnosis exposure and community stigma (Chakrapani et al., 2022; Sevelius et al., 2014).

Conversely, two studies discussed how participants who had positive experiences within healthcare facilities or had strong social networks resulted in good outcomes; if a participant had good experiences with healthcare professionals, they were more positively influenced to receive HIV treatment; if they had strong networks, they

would provide positive social support in accessing HIV related services (Fauk et al. 2019; Fauk et al. 2019).

3.2.7 Violence, Abuse & HIV Risk

Twelve of the selected studies (33.3%) discussed TGW's experiences with violence and abuse. Three studies (8.3%) reported incidences of verbal abuse and attacks (Brooks et al., 2019; Budhwani et al., 2017; Yan et al., 2019). Such abuse came from the public, clients, peers, or family members. Furthermore, four studies (11.1%) included participant's experiences of police violence, abuse, or distrust; this type of abuse included harassment (Bao et al., 2016), forced relocation to unfamiliar areas, or forced services (Ganju et al., 2020), beatings (King et al., 2019), and being forced into uncomfortable or discriminatory situations resulting in decreased trust in the police (Yan et al., 2019). Abuse from the clients of transgender sex workers was reported in four of the reviewed studies (Budhwani et al., 2017; da Silva et al., 2020; Ganju et al., 2020; King et al., 2019).

3.2.8 Mental Health & HIV Risk

Eighteen of the selected studies (50%) reported on TGW's state of mental health, which would result in high levels of depression, PTSD, anxiety, suicidality, trauma, shame, fear, low self-esteem, and/or internalized stigma. Nine studies (25%) included participants' levels of depression which would range from moderate to extreme; four studies (11.1%) expressed participants' feelings of anxiety (Goldenberg et al., 2021; Nemoto et al., 2021; Usman et al., 2018; Yan et al., 2019). In 6 studies (16.7%), external and/or internal stigma was explained as the reasoning behind participant's low state of mental well-being (De Lind Van Wijngaarden et al., 2020; Ganju et al., 2020; Goldenberg et al., 2021; King et al., 2019; Logie et al., 2011; Operario et al., 2014).

3.2.9 Other HIV Risk Factors

Some studies addressed social factors influencing HIV risks among TGW. Race and ethnicity were an important HIV risk factor for TGW. Four out of the 15 studies reported on the HIV risk for TGW of color, particularly those of African American and Latin descent. For example, a study suggested that attention needs to be pointed toward TGW of color since they are already at higher risk because of social factors such as discrimination, victimization, a lack of access to education, employment, health care, and unstable housing (Nemoto et al., 2004). Another study reported that social factors such as housing instability, unemployment, and exposure to violence are experienced at higher rates among young TGW and TGW of color (D'Avanzo et al., 2021). Compared to white TGW, Black and Latina TGW were more likely to contract HIV/AIDS (Nuttbrock et al., 2017). Transgender women of color are the most affected by HIV, and thus should be prioritized in public health efforts (Blair et al., 2021). Seven of the selected articles (19.4%) discussed a history of housing instability, recording that the lowest number of participants experiencing homelessness was 14.8% (Reback et al., 2019) while the highest rate was 74% (Mayo-Wilson et al. 2020). Three of the studies (8.3%) also included participant histories of incarceration as a risk factor for HIV (Nemoto et al., 2021; Operario et al., 2014; Reback et al., 2019).

Unemployment and poverty were also risk factors that five of the selected studies (13.9%) covered; these studies discussed how either unemployment (D'Avanzo et al., 2021; Operario et al., 2014), poverty (da Silva et al., 2020; Fauk et al., 2021), limited employment opportunities (Fauk et al., 2021), or economic marginalization (Perez-Brumer et al., 2017) placed participants at risk for HIV since participants felt they had no other choice but to engage in sex work.

Lastly, three studies showed TGW's reluctance to undertake HIV medications or testing due to concerns about side effects. For example, TGW who were hesitant about ART were due to possible internal and physical side effects (Mitchell et al., 2019). Similarly, another study found that participants prioritized transition-related care rather than HIV-related care (Sevelius et al., 2014) as there were concerns of the HIV medicine disrupting the effects of hormone treatment; if TGW were forced to choose between attending an appointment for HIV care or to receive hormones, they would generally prioritize the latter. In the same vein, another study found that the most reported reason for participants not taking PrEP was concern about drug interactions with hormones (Poteat et al., 2019).

3.2.10 PrEP Up-take

Six of the selected studies (16.7%) discussed PrEP up-take among TGW (Blair et al., 2021; Brooks et al., 2019; D'Avanzo et al., 2021; Poteat et al., 2019; Sevelius et al., 2014; Ssekamatte et al., 2020). Only one study recorded all participants using PrEP, with the participant's average PrEP use being at 6.2 months (Brooks et al., 2019). Other studies examined PrEP use willingness, knowledge, or accessibility (Blair et al., 2021; D'Avanzo et al., 2021; Poteat et al., 2019; Sevelius et al., 2014; Ssekamatte et al., 2020). TGW having someone to talk to about PrEP or having strong community connectedness brought positive perceptions and conversations on the subject (Blair et al., 2021; D'Avanzo et al., 2021). A study reported that, out of the 56% of participants who tested positive for HIV, only 87% had heard of PrEP, 18% of which had ever taken it (Poteat et al., 2019). Among the Black and Latina

TGW who had never taken PrEP, only 75% were willing to take it (Poteat et al., 2019). TGW prioritized hormone treatment over HIV-care treatments, as gender-affirmation is of more importance than HIV medications (Sevelius et al. 2014). Another study reported that some TGW participants were unable to access PrEP due to work schedule conflicts with healthcare services, a result of healthcare services operating during the day when TGW would be sleeping after working overnight (Ssekamatte et al., 2020).

3.2.11 ART Up-take

Ten of the selected studies (27.8%) included reports of TGW's ART uptake. Only one study had all participants using ART (Fauk et al., 2019). Another study also discussed ART usage broken down by race; they reported that 79.1% of African American participants, 90.9% of Hispanic/Latina participants, 100% of White participants, 74.7% of Asian participants, and 87.0% multi-racial participants were on ART (Baguso et al. 2019). Three studies showed that over 80% of participants were prescribed or taking ART; Operario et al. (2014) reported 92% of participants living with HIV as currently receiving antiretroviral treatment; Reback et al. (2019) reported that, among HIV-positive participants, 82.3% reported currently being prescribed HIV medications; and Sabino et al. (2021) reported that 85% of the participants reported taking all of their prescribed ART pills daily. Further, two studies discussed why TGW declined using ART (Chakrapani et al., 2022; Sevelius et al., 2014). They reported that negative experiences or lack of gender-affirmation led to a delayed initiation of ART. It was also reported that delays in up-take were associated with fear of discrimination within transgender communities for disclosing HIV status (Chakrapani et al., 2022). Furthermore, any negative experience would then initiate participants to take a drug "holiday" or break which would result in damaged patient-provider communication (Sevelius et al., 2014).

3.3 HIV Transmission Mechanisms

The reviewed studies suggested that condomless sex and low safe-sex knowledge (Usman et al., 2018; Yan et al., 2019) were primary factors in HIV/STI transmission. Whether by force or choice, condomless sex was common amongst TGW in the selected studies, especially for participants who were sex workers. It is noteworthy that none of the reviewed studies deduced that HIV/STI transmission mechanisms came from drug injections.

4. Discussion

This review synthesized the global literature on HIV/STI risk factors among transgender women (TGW). The selected studies similarly found heightened HIV risks faced by TGW, with multiple risk factors including engagement in sex work, social stigma, various forms of abuse/violence, sex- and substance risk behaviors, mental health, housing, and employment. While focuses and findings varied, the findings are in consensus that a lack of safe-sex knowledge, various forms of abuse/violence, and diminished autonomy accelerate TGW's risks of HIV/STIs. The literature also suggests that TGW, especially younger women, and women of color, are at a higher risk of contracting HIV/STIs.

Previous systematic reviews examined the overall disparity TGW experience through high HIV-risk sexual behaviors (Becasen et al. 2019; Herbst et al., 2008; Poteat 2014). It has been over a decade since the first systematic literature review on TGW in the USA (Herbst, 2008) and HIV prevalence among TGW continues to grow while the social environments of TGW remain static and challenging. While 77.8% of the selected articles featured HIV-positive participants (Baguso et al., 2019; Bao et al., 2016; Barrington et al., 2021; Blair et al., 2021; Budhwani et al, 2021; Chakrapani et al., 2022; da Silva et al., 2020; De Lind Van Wijngaarden et al., 2020; Fauk et al., 2021; Fauk et al., 2019; Fauk et al., 2019; Goldenberg et al., 2021; Hines et al., 2020; King et al., 2019; Logie et al., 2011; Mayo-Wilson et al., 2020; Mitchell et al., 2019; Nemoto et al., 2004; Nemoto et al., 2021; Nuttbrock et al., 2017; Operario et al., 2014; Poteat et al., 2019; Reback et al., 2019; Sabino et al., 2021; Sevelius et al., 2014; Suguno et al., 2005; Usman et al., 2018), it is plausible that the actual percentage is higher as there were participants who were either unaware of their status or did not wish to disclose their status. Selected studies also showed that, along with HIV, TGW have a higher risk of becoming infected with other STIs, particularly syphilis and gonorrhea.

Throughout the selected studies, it was common for TGW to experience difficulty finding employment outside of the sex industry (e.g., nightclubs, escorting, etc.). In addition, participants turning towards sex work as a means of survival – labor in exchange for food and drugs – was common. There is a clear correlation between participating in sex work and HIV/STI prevalence; participants who either had a history of participating in sex work or were actively participating at the time of the study were at a higher risk of contracting HIV/STI.

A greater effort should be made to provide TGW with resources and tools for safer sex. Yet, it is worth noting that not all participants were given a choice on condom usage as it was reported that some participants were forced to participate in condomless sex by clients (Ganju et al., 2020). For the participants that do have a choice, the efforts to understand why participants partake in unprotected sex need to be investigated. In addition, as the selected

studies demonstrated, many TGW had multiple partners for both commercial and personal reasons, and thus increased efforts should be made for the women to regularly test for HIV/STIs and receive resources for safer sex.

Further, the existing literature showed that drugs and alcohol were common mechanisms through which TGW cope with internal and external stigma and/or discrimination, deal with the stresses of life, or transphobia. Commonly used drugs included marijuana, cocaine, methamphetamine, injection drugs, alcohol, glue, and fuel sniffing. The dependency on substances developed as a result of combating depression, anxiety, PTSD, and other mental health disorders. If not to combat circumstances surrounding mental health, TGW would engage in illicit substances to either muster up the courage to approach a client or help be sexually responsive to clients. Despite evidence of TGW's low mental well-being, studies on mental health issues among TGW remain quite limited and deserve much more attention in future research.

The social networks of TGW should continue to be researched because the implementation of network-based interventions can be effective in dissuading risky sexual behaviors. It is well-known that changes in sexual behavior include reports of being less likely to engage in unprotected anal intercourse (UAI) and being more likely to participate in HIV testing (Arnold et al., 2018). The behaviors of social networks can also be associated with the feasibility and rate of engagement in the exchange of sex (Fehrenbacher, 2021). However, the proximity of social networks is also important to consider; people who do not have peers residing in their communities are considered at a higher HIV risk (Kolack et al., 2021). Similarly, through longer and constant communication via social media, TGW's HIV risk behaviors become positively associated with their network members (Reback, 2019). TGW who kept constant communication with their network members were more likely to report HIV protective behaviors generated by the community. On the other hand, there are cases where social networks can also negatively impact HIV/STI risk behaviors. Certain characteristics can be harmful and lead to higher risks of contracting HIV/STIs (Saber et al., 2019; Tyler et al., 2013). Researchers have suggested that HIV prevention efforts should implement social network approaches that are tailored specifically for TGW for more effective outcomes (e.g., Clark et al., 2020; Yu et al., 2024). Voiced by participants within the selected studies, TGW calls for services created by and for TGW. Furthermore, systems of support for the experiences of stigma and discrimination could be implemented, as it is common for TGW to feel inclined to engage in sex work because of employment discrimination.

5. Significant Contributions

This study significantly contributes to the existing body of knowledge of HIV risks among transgender women by identifying factors such as STI prevalence rates, sex work engagement, sex-related risk factors, substance-related risk factors, mental health, experiences of stigma, discrimination, and violence, PreP and ART uptake, and more that increase transgender women's chances of contracting HIV. This study contributes to the limited literature on TGW's risk behaviors and recommends future researchers continue identifying risk behaviors. Future research could also explore the strategies TGW are implementing to prevent contracting HIV.

6. Limitations

This study has potential limitations. As part of the screening process for articles, systematic reviews typically only allow published studies from journals thus potentially excluding valuable information from unpublished studies, and grey literature such as blogs, dissertations, government documents, etc. Another potential limitation of this study is the language bias. Articles published in English were included in the screening process and works that were published in any other language besides English were excluded from this systematic review. This practice may introduce a language bias, and potentially exclude valuable information on the topic that was published in another language. The search strategies of this systematic review may have limitations. This review used four electronic bibliographic databases, PsycINFO, CINAHL, Web of Science, and PubMed to search for articles and despite efforts to have comprehensive search strategies, there is still the possibility relevant studies may have been missed due to limitations in databases, use of keywords, or omission of certain journals. Lastly, this systematic literature began in August of 2022, due to the time lag between the start of the study and the publication, there is the possibility of outdated information, and newer studies may have not been included in the review.

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The data that support the findings of this study are available on request.

Competing Interests Statement

There are no competing or potential conflicts of interest to declare.

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Table 1. Characteristics of Studies

Authors (Year)	Participant Race/Ethnicity	Study Site	Year(s) of data collection	Study sample & size	Age range of sample	Study design
Baguso et al. (2019)	African-American/Black (n=43) Latina (n=43) Other (n= 34)	San Francisco, California, USA	2016 to 2017	123 TGW	23-71	Quantitative
Bao et al. (2016)	Kinh (n=190) Other (n=14)	Ho Chi Minh, Vietnam	2015	204 TGW	18-41+	Cross-sectional
Barrington et al. (2021)	Dominican (n=30)	Dominican Republic	12 Months	30 TGW Sex Workers	19-68	Qualitative
Blair et al. (2021)	Hispanic/Latina (n=112) African American/Black (n=80) Non-Black/Non-Hispanic (n=72)	Los Angeles, California, USA	July 2015-Sep 2016	264 TW	25-44	Quantitative
Brooks et al. (2019)	African American/Black (n=10) Hispanic/Latina (n=9)	Los Angeles, California, USA	Oct 2017-Nov 2018	19 BLTW PrEP users	21-50	Qualitative
Budhwani et al. (2021)	Dominican	Santo Domingo, Santiago, Barahona, Puerto Plata, Dajabon, and La Altagracia provinces in the Dominican Republic	April-Nov 2016	307 TGW	16-62	Cross-sectional
Budhwani et al. (2017)	Dominican	Santo Domingo, Dominican Republic and Santiago, Dominican Republic	Dec 2013-April 2014; Data collected in Feb 2014	78 TGW Sex Worker	18-39	Quantitative
Chakrapani et al. (2022)	Indian	Delhi, Mumbai and Hyderabad, India	Sep - Nov 2019	30 TGW	18-30	Qualitative
D'Avanzo et al. (2021)	African American/Black (n=49) Hispanic/Latina (n=24) White (n=41) APT/Multiracial/Other (n=21)	Philadelphia, Pennsylvania, USA San Francisco, California, USA	April-Dec 2018	128 TW	N/A	Quantitative
da Silva et al. (2020)	Brazilian (n=6)	Recife Pernambuco (pe) Brazil	April to June 2017	6 TGW	15-24	Qualitative

De Lind Van Wijngaarden et al. (2020)	Thai	Thailand	N/A	11 TGW	29-45	Qualitative
Fauk et al. (2021)	Indonesian	Indonesia	Dec 2017-Feb 2018	29 TGW	Mean age 44 yrs	Qualitative
Fauk et al. (2019)	Indonesian	Yogyakarta, Indonesia	Dec 2017-Feb 2018	29 TGW	32-57	Qualitative
Fauk et al. (2019)	Indonesian	Eight different provinces in Indonesia	Dec 2017-Feb 2018	29 TGW	32-57	Qualitative
Ganju et al. (2020)	Indian	Maharashtra, India	N/A	68 Trans Sex Workers	20-40	Qualitative
Goldenberg et al. (2021)	Dominican	Dominican Republic	Mar-Aug 2019	100 TGW Sex Workers	18-60	Qualitative
Hines et al. (2020)	African American/Black Latina Asian/Pacific Islander White	Central Indiana, USA	Nov 2011 & July 2013	18 TGW	21-60	Qualitative
King et al. (2019)	Ugandan	Kampala, Uganda	July-Oct 2013	45 TGW	18-24	Mixed Methods
Logie et al. (2011)	African (n= 37) European (n= 21) Aboriginal (n= 17) "Canadian" (n=15) Latina (n=4) Asian (n=3) South Asian (n=3)	Ontario, Canada	N/A	104 HIV positive women	20-57	Qualitative
Mayo-Wilson et al. (2020)	African American (n=12) Latina (n=1) Asian (n=1) White (n=5)	Richmond, Virginia, USA St. Louis, Missouri, USA	July 2018-Mar 2019	19 TW	18-50	Cross-Sectional Qualitative
Mitchell et al. (2019)	Indonesian (n=42)	Bandung, Indonesia Denpasar, Indonesia Yogyakarta, Indonesia	2015-2016	42 TGW	N/A	Qualitative
Nemoto et al. (2004)	African Americans (n=112) Latinas (n=110) APIs (n=110)	San Francisco, California, USA	Nov 2000-July 2001	332 TW of Color	18-60	Mixed Methods

Nemoto et al. (2021)	African American (n=48) Hispanic (n=8) Asian and Pacific Islander (API) (n=1) Multi-racial (n=3)	Alameda County, California, USA	2012-2017	60 TGW	19-60	Mixed Methods
Nemoto et al. (2004)	African American (n=16) API (n=15) 12 Latina (n=12) multiracial backgrounds (n=5)	San Francisco, California, USA	Nov 1999 - Feb 2000	48 MTF transgender	19-55	Qualitative
Nuttbrock et al. (2017)	White (n=81) Ethnicity Hispanic (n=78) Black (n=40)	New York City, New York, USA	Dec 2004 - Sep 2007	199 TGW	19-59	Mixed Methods
Operario et al. (2014)	Asian/Pacific Islander (n=40) Black/African American (n=42) Hispanic (Latino) (n=40) White (non-Hispanic) (n=30) Mixed race/other (n=39)	San Francisco, California, USA	Nov 2008-Nov 2010	191 TGW	N/A	Cross-sectional
Perez-Brumer et al. (2017)	Peruvian	Lima, Peru	Jan-Feb 2015	48 TGW	18-44	Qualitative
Poteat et al. (2019)	African American/Black Hispanic/Latina	Baltimore, Maryland, USA and Washington, DC, USA	Qual May - Oct 2015 Quant April 2016 - May 2017	201 BLTW	19-82	Mixed Methods
Reback et al. (2019)	Hispanic/latina (n=115) African American/black (n=82) Mixed race/ethnicity (n=24) Caucasian/white (n=20) Native American/Alaskan Native (n=17) Asian/Pacific Islander (n=6) Other (n=6)	Los Angeles, California, USA	July 2015-Sep 2016	271 TGW	Mean age 35	Quantitative

Sabino et al. (2021)	White (n=53) Black/mixed (n=42) Other (n=5)	Sao Paulo, Brazil	Nov 2016-Aug 2017	106 TGW	20-68	Cross-sectional
Sevelius et al. (2014)	African-American/Black (n=44) Latina (n=7) Pacific Islander (n=4) Native American (n=4) Multiracial (n=4) Caucasian (n=4) Other (n= 1)	San Francisco, California, USA	N/A	38 TGW	N/A	Qualitative
Ssekamatte et al. (2020)	Ugandan	Kampala, Uganda	N/A	22 TGW Sex Workers	N/A	Qualitative
Suguno et al. (2005)	African American Latina Asian Pacific Islander (API)	San Francisco, California, USA	N/A	332 TGW	18-60	Qualitative
Usman et al. (2018)	Pakistani (n= 16)	Lahore city, Pakistan	N/A	16 HIV+ TGW Sex Workers	18-55	Qualitative
Yan et al. (2019)	Chinese	Nanjing & Suzhou cities in Jiangsu Province, China.	Jan-Mar 2018	15 TGW	20-55	Qualitative

Table 2.

Authors (Year)	HIV Prevalance (%)	Other STI Rates (%)	Sex Work Engagement	Sex related risk factors (%)	Substance-related risk factors (%)	Mental health	Stigma & Discrimination	Other Factors	Violence/Abuse/Attack (Direct/Forceful)	PreP Uptake (%)	ART uptake (%)
Baguso et al. (2019)	95.93% (118/123) of participants self-reported a positive test for HIV; 4.1% (5/123) self-reported a negative or unknown HIV status	N/A	N/A	N/A	8.94% (11/123) reported alcohol use in the past 12 months; 54.47% (67/123) reported substance use in the past 12 months	N/A	When combined, anti-trans discrimination and racism were linked to poor health outcomes and not accessing HIV care.	N/A	N/A	N/A	African American - 79.1% on ART; Hispanic/ Latina - 90.9% on ART; Multiple Races - 87.0% on ART; Whites - 100% on ART; Asians - ART use (74.7%)
Bao et al. (2016)	59.3 of participants reported uptake of HIV testing in the past year; 18.1 % (37/204) of participants were HIV infected.	Those who have tested for HIV in the past year (n = 118), 37.3% (n = 44) also tested for STIs	39.2% (n = 47) of participants that tested for HIV in the past year reported to have transactional sex with men in the past month	58.3% reported always using condom transactional sex, 29.2% reported usually/sometimes, and 12.5% reported never	36.7% (HIV) - weekly/daily use of alcohol; 49.5% monthly alcohol use; 27.8% - never using alcohol. 36.7 % - yes on substance use; 63.3% - no on substance use.	41.3% of participants who have tested for HIV in the past year reported high levels of PTSD; 33.1% low levels of PTSD, and 25.6% tested negative for PTSD.	Those who have tested for HIV in the past year, 11.5% reported discrimination in their households, 18.3% reported discrimination at their workplaces and 6.6% reported discrimination at a healthcare facility.	N/A	Those who have tested for HIV in the past year, 27.4% have been harrassed by the police	N/A	N/A
Barrington et al. (2021)	30 transgender women living with HIV	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	At endline of study, 84.6% of participants were taking ART, however 95.5% of participants had stopped taking

											ART that past weekend of the study
Blair et al. (2021)	35.2% of participants were HIV positive	N/A	N/A	Discussion of condom use with participant's alters were most likely to have HIV testing conversations	Discussion of drug use with participant's alters was positively associated with HIV testing conversations	N/A	Transgender women of color are the most affected by HIV and should be prioritized in public health efforts	N/A	Alters who knew about Prep were more likely involved in HIV testing conversations with participants.	N/A	
Brooks et al. (2019)	N/A	N/A	N/A	BLTW experience a barrier in discussing condom use with partners due to the idea that PreP users do not have to use condoms	N/A	Family support may play an important role in helping influence PrEP use among at-risk BLTW and improve their general mental and emotional well-being	Participants reported HIV stigma. There is a belief from their family members, and cisgender community members that the participants are already HIV positive and are at fault for the spread.	N/A	Participants share reports of stigma manifested as public verbal attacks, death wishes, judgment, or rejection	All participants were using PreP; Mean length of time on PreP was 6.2 months and 57.9% reported PreP use to one or more family members	N/A
Budhwani et al. (2021)	35.8% of the sample were living with HIV	N/A	74.2% of participants had engaged in sex work at some point	N/A	11.1% of participants reported marijuana use, 11.4% reported cocaine use, and about 42% of the sample was at high-risk for alcohol dependency.	N/A	The sample of transgender women had high rates of negative exposures, potentially lower quality of life, and those risks were associated with HIV.	N/A	21.92% of the sample reported experienced violence in the past 12 months, and 61.6% reported experiencing at least one stigma event in the past 12 months	N/A	N/A

Budhwani et al. (2017)	Participants were not asked about HIV status, however HIV knowledge was extremely low	N/A	N/A	Participants reported an average of 8.45 sexual partners in the prior month, with a maximum of 49 partners. 67.76% of participants reported condom use the last time they had sex with a trusted partner; 92.96% reported condom use the last time they had sex with a coercive partner, and 91.78% reported using a condom the last time they had sex with a client	N/A	N/A	42.31% of participants reported people calling them unkind names at work; 73.08% of transgender female sex workers reported difficulty obtaining medical care	N/A	42.31% reported being physically victimized by clients. The sample reported high levels of verbal discrimination and physical victimization	N/A	N/A
Chakrapani et al. (2022)	All 30 participants were HIV positive	N/A	37% of participants engaged in sex work	N/A	Alcohol was used to cope with depression resulting from lack of support from their families and societal discrimination	Participants experienced depression after being discriminated and would turn to alcohol as a coping mechanism.	Multiple incidents of discrimination from healthcare professionals, members of their community, and other transgender sex workers that are not HIV positive were reported	N/A	N/A	N/A	ART initiation had been delayed due to discrimination experiences or lack of gender affirmation. Fear of discrimination within TGW communities for disclosing HIV status also delayed ART initiation.

D'Avanzo et al. (2021)	All participants had to be HIV negative or unknown to be eligible; More than half of participants believe they are at 0 risk for HIV	N/A	Over 50% participated in sex work in exchange for money/food/drugs/etc	N/A	N/A	N/A	N/A	Social conditions that limit the ability for individuals to participate fully in communities, such as housing instability, unemployment, and exposure to violence, are experienced at higher rates among trans women; particularly young trans women and trans women of color	N/A	Least community-connected cluster had less trust and more negative perceptions of PrEP; Those engaged and active in the community had positive perceptions of PrEP	N/A
da Silva et al. (2020)	All participants were living with HIV/AIDS and syphilis (28.3%) in comparison to cisgender women	TGW sex workers had higher rates of HIV (12.4%) and syphilis (28.3%)	N/A	Condoms use choices are limited for TGW sex workers	N/A	N/A	N/A	Job scarcity and poverty influenced sex work as income for survival	Some participants experienced client and or situations of intrafamily violence	N/A	N/A
De Lind Van Wijngaarden et al. (2020)	All participants were HIV positive	N/A	72.73% of participants have been or are currently involved in sex work	N/A	N/A	Often the case for middle and low class, difficulty in finding employment and stigma lead TGW to sex work	Participants reported high levels of outer and internalized stigma. Internalized stigma includes considering being transgender as a	N/A	N/A	N/A	N/A

							<p>punishment and blaming other transgender women for society's harsh treatments. Stigma within the TGW commuity include putting those who were born with natural, petite bodies at the top of the hierarchy of beauty .</p>				
Fauk et al. (2021)	All participants self-reported as HIV positive	Several participants self- reported to have had one or two STIs including syphilis, gonorrhoea, and genital warts.	All of the participants had been involved in sex work for several years	N/A	N/A	N/A	N/A	Poverty, responsibility to support families, limited employment opportunities and low education were factors towards sex work.	N/A	N/A	
Fauk et al. (2019)	All participants self-reported as HIV positive	Several of the participants had also been infected with other STIs such as syphilis, gonorrhoea, and genital warts	All the participants had sex work as one of their sources of income and also had part time jobs	N/A	N/A	N/A	Participants reported good treatment from healthcare professionals and staff which influenced their decisions to receive treatment	N/A	N/A	N/A	All participants were on ART

Fauk et al. (2019)	All participants self-reported as HIV positive	Several of the participants had also been infected with other STIs such as syphilis, gonorrhoea, and genital warts	The participants reported sex work as one of their main sources of income	N/A	N/A	Some participants would conceal their HIV status from their potential social networks, including family and community members due to fear of HIV stigma, rejection, and shame, resulting in failing to benefit from these network	Good social relationships and social networks among TGW may explain the strong social support they provided for one another regarding the accessibility of HIV/AIDS- related services	N/A	N/A	N/A	N/A
Ganju et al. (2020)	N/A	N/A	N/A	Pervasive client violence was common where the participants were forced sex and forced condomless sex	N/A	Majority of participants had intense feelings of shame or embarrassment for coming out; Stigma, violence and lack of family support had psychological consequences, including low self-esteem, depression and suicidal ideation, and many had run away from abusive homes	N/A	N/A	Police pose the greatest threat to TGW. Participants reported being forced to give free services or relocate to unfamiliar areas.; Violence from clients, family members, partners and communal peers was common. Many participants experienced being isolated, beaten and taunted	N/A	N/A
Goldenberg et al. (2021)	All participants were HIV positive	N/A	N/A	N/A	About 50% of participants reported binge drinking on a weekly basis and	24% of participants reported experiencing	Except for one, all participants have experienced trans stigma	N/A	N/A	N/A	N/A

					approximately 50% reported drug use within the past 6 months	moderate to severe depression in the past 2 weeks and 34% reported experiencing anxiety in the past 2 weeks; Internalized and sex work stigma were highly associated with moderate to severe depression					
Hines et al. (2020)	All participants were HIV positive; Majority have been living with HIV for the past 1-5 years at the time of the interviews	N/A	Many participants reported engaging in sex work after HIV diagnosis	N/A	Participants would report drug use to cope with positive HIV status	Feeling ashamed or embarrassed about their diagnoses was common among participants at this stage; Many avoided social outings for fear of others finding out about their HIV diagnosis	N/A	Some participants believed HIV was an inevitable outcome of being transgender; Due to lack of support, participants were reluctant to face their HIV diagnosis, had privacy and confidentiality concerns, and delayed engaging in HIV care; Homelessness, drug use, sex work, and mental health problems hampered participants ability to get medical help	Interpersonal violence was commonly reported from the participants	N/A	N/A

King et al. (2019)	8.9% have previously tested for HIV; 20% of participants were HIV positive	N/A	59.1% had engaged in sex work in the past and 53.8% are involved in sex work as their main source of income	84.1% of participants had ever used a condom.	Participants discussed high levels of drug and alcohol use. Substances mentioned included cocaine, marijuana, cigarettes, alcohol, glue and fuel sniffing, but not injecting drugs. One participant said that substance use gave her the courage to approach potential clients.	Some respondents stated that they had become dependent on substances after the trauma they have lived through or due to the stresses of sex work	Stigma and discrimination were common experiences among TGW; Stigma and discrimination was often described as linked to higher risk sexual behaviour, especially in relation to lack of employment due to discrimination; as well as the abuse and discrimination received in the workplace or from family members	N/A	Abuse and violence were common experiences among TGW. Participants described beatings by the police and by sex work clients, as well as the abuse and discrimination received in the workplace or from family members	N/A	N/A
Logie et al. (2011)	All participants were HIV positive	N/A	N/A	N/A	Some participants had intersections of sex work stigma, and drug use stigma	Participants discussed how experiences of internalized and enacted stigma reduced self-esteem, self-worth, and for some participants increased depression or suicidality	Many participants reported experiences of racism, transphobia, discrimination and stigma; Racism was highlighted in daily life, research, HIV services, and health care	N/A	Participants highlighted that sex workers are at risk for experiencing sexual violence	N/A	N/A
Mayo-Wilson et al. (2020)	37% of participants reported being HIV positive, 53% reporting	N/A	N/A	100% of participants reported condomless sex in the past 6 months	Participants described relying on drugs to be responsive to male sexual desires and to achieve their	N/A	Some of the participants indicated that they were terminated from their jobs	74% of participants lacked housing in the past year of the study;	N/A	N/A	N/A

			of color reported the highest levels of HIV and STDs							
Nemoto et al. (2021)	34 participants were HIV positive	N/A	14.7% of participants main source of income was sex work	Participants who had not engaged in sex work and/or used drugs were more likely to have enrolled in HIV care;	Participants discussed feelings of depression, anxiety, and PTSD	There was also a struggle in community attached to care	Many participants struggled with unstable housing, lack of transportation, past incarceration, and sex work.	N/A	N/A	55.9% had previously taken ART; 44.1% have never taken ART
Nemoto et al. (2004)	N/A		89% had previously exchanged sex for money, 48% were currently involved in commercial sex;	TGW sex workers are inclined to engage in unsafe sex with customers due to financial burdens for survival and desperate economic needs; They engage in unsafe sex with both customers and primary partners because they seek gender validation from sex partners	Participants acknowledged that drug use was common throughout the community, serving as a way for many TGW to cope with past or current lifestress and anxiety; Drugs and sex work were perceived as intimately interconnected	N/A	N/A	N/A	N/A	
Nuttbrock et al. (2017)	HIV incidence across the yearly assessment points was 2.8 % (nine new cases). During year 1 year period.	Syphilis, Hepatitis B, Gonorrhea, and Chlamydia incidences were also measured during the three	40.7 % of participants reported recent sex work; Those foreign born were more involved in sex work	N/A	N/A	N/A	N/A	Compared to Whites, Black and Latina TGW were more likely to contract HIV/AIDS	N/A	N/A

	HIV rates were 3.0%; 3.3 % during year 2; and 1.8 % during year 3	Cumulative all together, forty new cases of HIV or another sexually transmitted infection were observed during follow-up (17.4 %)								
Operario et al. (2014)	39% reported HIV-positive status	N/A	36% reported unprotected anal intercourse during the past 3 months; Greater levels of stigma were significantly associated with unprotected anal intercourse	25% reported alcohol intoxication during the past 30 days; an illicit drug during the past 30 days; Greater levels of stigma were significantly associated with alcohol intoxication and illicit drug use	48.2% were classified as depressed based on CES-D scores; Greater levels of stigma were significantly associated with depression	Greater levels of stigma were significantly associated with housing status, and self-reported general health.	61% were currently unemployed, 61% earned less than \$500 during the previous month, 28% had unstable housing, and 52% had a history of incarceration.	N/A	N/A	92% of participants living with HIV were currently receiving antiretroviral treatment
Perez-Brumer et al. (2017)	N/A	N/A	60.4% reported engaging in sex work in the past three months and 14.6% described formal or informal employment excluding sex work	N/A	N/A	Being labeled as transgender include stigmatized statuses of being a sex worker or being HIV positive, whether or not the participant engages in sex work or is HIV positive or not. Participants also reported medical	Pervasive social exclusion, fuelling economic marginalization, limiting employment to sex work factors with HIV vulnerabilities	N/A	N/A	N/A

								spaces inhabit anti sex work and anti transgender attitudes that limit HIV prevention by policing who can receive condoms.			
Poteat et al. (2019)	56% of participants tested HIV-positive, 90% of those who tested positive were aware of their status; 87% had heard of PrEP. 72 participants self-reported HIV-negative or status-unknown	N/A	79% reported a lifetime history of sex work	47% reported condomless anal sex in the prior 12 months.	N/A	N/A	N/A	HIV knowledge, transgender pride, legal gender affirmation, history of exchange sex, and HIV risk perception were each significantly associated with willingness to take PrEP; Among the participants who were not willing to take PrEP, the most commonly reported reason (65%) was concern about drug interactions with hormones	N/A	Out of the 56% who tested positive for HIV, 87% have heard of PrEP; Only 18% who had heard of PrEP had ever taken it; BLTW who had never taken PrEP, 75% were willing to take it.	N/A
Reback et al. (2019)	35.4% of participants reported to be HIV positive; 95.2%	26.7% reported a lifetime history of syphilis (26.7%) and 24.4% reported	36.2% reported as a main source of income	Participants reported an average of 23.4 sex partners, and 54.2% reported condomless anal intercourse.	40.2% reported binge alcohol use, non- medical marijuana use (36.2%), or methamphetamine	N/A	N/A	14.8% of participants were experiencing homelessness; 67.9% reported some history of	N/A	N/A	Among HIV positive participants, 82.3% reported currently being prescribed HIV

	reported ever having had an HIV test	gonorrhoea		use (27.3%)	incarceration					medications	
Sabino et al. (2021)	All participants were HIV positive	63% of participants reported prior treatment for a STI	N/A	Majority of participants reported high condom use	46% of participants reported illicit/recreational drug use. Those associated with drug use had lower scores in physical health and symptoms, and body changes.	Although quality of life scores ranged from good to excellent, participants with depression scored lower on the total quality of life score.	20% of participants reported feelings of discrimination for being a TGW	N/A	N/A	85% of the participants reported to taking all ART pills everyday in the week prior to the survey administration	
Sevelius et al. (2014)	All participants were HIV positive by self-report	N/A	N/A	N/A	Participants discussed using drugs and alcohol to cope with transphobia and/or avoid dealing with the reality of their diagnosis. Using substances has interfered with their engagement in care and adherence to medications.	About half of the participants reported currently using or having used some form of mental health treatment, including psychotropic medications. The issue of not having readily available mental-health services was discussed and also the idea that medications over therapy being more accessible is an issue	Resistance to test for HIV due to past transphobic experiences in healthcare and the believed stereotype that HIV was inevitable; Hesitant to test with HIV test counselor who was also part of the transgender community, and this was especially important for those who reported that they were engaged in sex work when they received their diagnosis.	Prioritizing care	N/A	If forced to choose between receiving hormones or attending an appointment with HIV provider, participants would always prioritize HIV medications. There were concerns of drug interactions with hormones	Negative healthcare experiences led to delayed initiation of antiretroviral therapy, taking drug "holidays", and impaired patient-provider communication
Ssekamatte et al. (2020)	36.4% of participants (8/22) have tested for	Cost and accessibility of STI medicine resulted in use	N/A	Use of lubricants substitutes have caused burning sensation in the anal	Use of alcohol increased risk for HIV/STI	Alcohol was used to combat depression	N/A	Violence greatly influenced decisions to seek appropriate medical help. Fears of violence	Unable to access PreP due to work schedule	N/A	

	HIV; 87.5% (7/8) of those who have tested for HIV have tested 2-3 times per year.	herbal medicine to treat syphilis		area, abdominal pain and diarrhea				not only affected their social lives but also health seeking	conflicts with healthcare services	
Suguno et al. (2005)	Self-reported HIV prevalence was reported at 26%; 7% of participants either had never been tested, or had been tested but did not know or refused to disclose	N/A	51% of participants reported they were currently engaging in commercial sex work as a source of income during the past 6 months;	overall, 24% of participants had engaged in unprotected receptive anal intercourse in the past 30 days	Participants who had sex while under the influence of substances in the past 30 days were significantly more likely to have engaged in unprotected receptive anal intercourse than those who had not	Depressed individuals reported significantly higher levels of exposure to transphobia. Self-esteem was also negatively correlated with exposure to transphobia	Younger participants reporting higher levels of transphobia exposure were 3.2 times more likely to have engaged in unprotected receptive anal intercourse	N/A	early exposure to violence are linked to HIV/STI vulnerability	N/A N/A
Usman et al. (2018)	85.71% of participants (12/14) were in the clinical latency stage of HIV; 28.57 (4/14) were diagnosed with AIDS	N/A	N/A	Only 14.29% (2/14) of participants were aware condom use importance	Drugs were used as a coping strategy due to increased stigmatization	87.05% (14/16) of participants who have experienced discrimination have felt depression and anxiety	N/A	N/A	N/A	N/A N/A

Yan et al. (2019)	None of the participants reported being HIV positive	7.14% , 1 of the participants tested positive for an STI; Overall, participants were not very concerned about risk for HIV and other sexually transmitted infections (STI).	Difficulties in finding employment and generating income for involvement in commercial sex work; About one fifth (21.4%) had never engaged in sex work and preferred to call themselves kua xing bie zhe and MTF	Anal intercourse without condoms was common.	Several study participants reported histories of alcohol addiction	Gender dysphoria, depressive thoughts, anxiety, suicidal attempts, and self-mutilation; family abuse, social discrimination, economic struggles, domestic violence, and inability to reach goals also affected their mental health.	Workplace discrimination was common. Participants reported lack of testing due to fear of discrimination and stigma at testing sites; Difficulties accessing hotel accommodations or opening bank accounts due to ID issues	N/A	Most of the participants reported rejection, physical violence, verbal abuse, suppression, and restriction from their families due to their identities. Sexual and Physical abuse; Being forced into uncomfortable or discriminatory situations by police officers, and did not trust the police.	N/A	N/A
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