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The Syndemic of HIV, HIV-related Risk and Multiple Co-morbidities Among Women Who Use Drugs in Malaysia: Important Targets for Intervention

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Keywords

Women; substance abuse; HIV; sex work; Malaysia; violence

1. Introduction[1]

Substance-using women, including criminal justice-involved women and sex workers (SWs), have historically been neglected by research, prevention and treatment [1, 2]. Recent comprehensive reviews document this deficit among women who use drugs (WWUDs), who are often socially marginalized and neglected from prevention and treatment efforts [1, 3, 4]. Consequently, it is crucial to fill this gap at the interface of treatment and prevention for women with underlying substance use disorders, especially those with or at risk for HIV, and to better understand their social and medical comorbidities. Globally, the pathways to addiction as well as the processes by which WWUDs engage in HIV prevention and treatment differ markedly from their male counterparts [5-24]. Specifically, women differ from men in their motivations for and partnerships in initiating alcohol or drug use [25].

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They also have considerably more frequent and intense experiences with interpersonal violence (IPV), sexual abuse and trauma [5, 26, 27]. Disparities in economic opportunities also differ, often with WWUDs engaging in SW, which adds additional stigma beyond substance use alone [28, 29]. Conversely, substance use in SWs may start as a coping mechanism or be deployed as a "power drug" that allows them to service more customers [30, 31]. In the setting of relationship power dynamics, poverty, stigma, and unemployment, WWUDs frequently experience elevated HIV risk by engaging in unprotected sex and/or having a male sexual partner who injects drugs [24, 32-34]. Despite awareness of these gender differences, research on HIV prevalence and risk and access to prevention and treatment among people who use drugs rarely disaggregates men from women [24, 35, 36].

While there are almost no data specifically addressing WWUDs in Southeast Asia, some regional reports focus on SWs and their substance use, unmet addiction treatment needs, psychosocial vulnerabilities, and related health risk behaviors [7, 37]. For example, a 2012 Malaysian study found HIV prevalence to be several-fold higher in SWs (10.7%) compared to the general female population (0.15%) [38], with similar reports in Thailand [39], China [17], and Cambodia [7, 40]. Lower income and engagement in SW increases WWUDs' risk of experiencing IPV [8, 14, 18, 41-43], which in turn elevates HIV risk through traumatic and risky sexual encounters, extradyadic relationships, and fear and powerlessness to negotiate condom use [8, 41, 42]. Psychiatric disorders are also highly prevalent in WWUDs [5, 15, 44] and exacerbate medical, behavioral, and social complications associated with substance use [9, 15]. These complications also interfere with a woman's ability to seek supportive addiction treatment and health services [4, 45].

Although 78.5% of cumulative HIV infections in Malaysia in 2013 were among males, the majority of whom were people who inject drugs (PWIDs), the number of cases occurring among females and being attributed to sexual transmission has been increasing since 2000

[1]**Abbreviations**:

PWIDs	People who inject drugs
WWUDs	Women who use drugs
SUD	Substance Use Disorder
NGO	Non-governmental organization
WHO	World Health Organization
MOH	Ministry of Health
NSEP	Needle Syringe Exchange Program
ATS	Amphetamine-type stimulants
SW(s)	Sex work(ers)
IPV	Interpersonal violence
SAVA Syndemic	Syndemic of Substance Abuse, Violence, and HIV/AIDS

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[46]. Addiction research in Malaysia, however, has remained primarily focused on male opioid injectors, with harm reduction efforts initiated in 2006 to reduce HIV transmission among PWIDs. Consequently, little is known about WWUDs, their medical and social comorbidity, and their engagement in harm reduction and nationally recommended HIV testing and monitoring activities. WWUDs remain under-represented and "hidden" from HIV outreach and prevention programs [46].

In the complex and constrained environment in Malaysia where the HIV epidemic among women is expanding and almost nothing is known about WWUDs [46, 47], we explored HIV risk behaviors, co-morbidities, and barriers to care among 103 WWUDs, including their engagement in nationally recommended HIV testing and monitoring.

2. Methods

2.1 Setting

Kuala Lumpur is home to 1.6 million people, with 7.2 million in the greater metropolitan area [48-50]. Despite harshly imposed criminal penalties, Kuala Lumpur is home to a growing drug trade [50-52]. By 2006 in Malaysia, there were over 300,000 people who use drugs (1.1% of the total population) [53], including an estimated 170,000 PWIDs [46]. With an HIV prevalence of 25-45% in PWIDs [54], harm reduction services with methadone and needle and syringe exchange programs (NSEP) began in 2006 [54, 55]. Methadone is available through formal government-sponsored programs and from primary providers who are paid by the milligram of dose dispensed. Of note, the latter approach is often perceived as treatment even if not continuous. The Malaysian AIDS Council and its partner NGOs with their affiliated community drop-in centers are the primary sources of outreach and support for people with substance use disorders (SUD), including healthcare, education and HIV prevention services such as NSEP.

2.2 Sample and Recruitment

Eligible participants were women aged 18 years who self-reported any substance use, including alcohol, in the previous year. Participants were recruited using convenience sampling in three types of facilities identified as key sites for interacting with WWUDs: one community drop-in center (n=55), two women's shelters (n=27), and two National Anti-Drug Agency (NADA/AADK) voluntary drug treatment centers (n=21). Information sessions and posted fliers describing the study were used for recruitment at each site. After meeting with a trained research assistant to determine eligibility, participants provided written informed consent and were given a description of study risks, benefits, and the voluntary nature of participation. All 103 women who came to learn more about the survey were interviewed during July-August 2011.

2.3 Survey Administration

Administered in Bahasa Malaysia by trained research assistants, a 60-minute questionnaire assessed demographics, criminal justice history, substance use history, addiction treatment needs, HIV risk behaviors, physical health, mental health, social support, history of violence or victimization, and access to medical and social services. Interviews were conducted in

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private rooms, with no staff members present to ensure privacy and reduce perceived coercion. After completing the interview, participants were paid RM50 (~$16US) for their time.

2.4 Survey Measures and Data Analysis

"Injection drug use" was defined as having ever injected any drug in one's lifetime. Housing status and injection frequency corresponded to the 30 days prior to the last time the participant used and/or entry into treatment. Primary source of income and frequency of unprotected sex and transactional sex, defined as exchanging sex for money, drugs, a place to stay, food, or clothes, were assessed over the 6-month period prior to the interview date. "Criminal justice involvement" included both jail and prison while "ever incarcerated" included any imprisonment in one's lifetime. Childhood physical abuse was defined as having been "hit, slapped, punched, or kicked" by an adult before the age of 18 and childhood sexual abuse as having been either raped or sexually assaulted before the age of 18 [56].

Analyses including chi-square testing and bivariate and multiple variable logistic regressions were conducted using SAS version 9.3 (SAS Institute Inc., Cary, NC). Frequencies of overall and unmet need for health and social services were calculated from responses about services needed and utilized in the past 6 months. Poverty was defined using 2010 national estimates as earning 800 Malaysian Ringgit (RM) monthly [57, 58]. Housing status was categorized as: living in one's own home ("stably housed"), living with a friend or family member or in short-term housing ("unstably housed"), and living at a community shelter, outreach center, on the streets, or prison, jail, or a compulsory drug detention center ("homeless"). Frequency of engagement in transactional sex was categorized as follows: women reporting SW as their primary income source were considered to engage "regularly" in transactional sex (i.e., for money), women not reporting SW as their primary income source but still reporting exchanging sex for something at least once during the last 6 months were considered to "intermittently" engage in transactional sex, and women who did not report any transactional sex in the last 6 months were placed in the "No Transactional Sex" category. Because methadone remains an infrequently utilized treatment in outpatient settings, in the regression model women were only considered to be in formal treatment for addiction if they had been living at a residential, governmental treatment facility during the last 30 days. HIV and Hepatitis C status were self-reported. Depression was measured using the 20-item Center for Epidemiologic Studies Depression (CES-D) scale [59]; standard cut-offs of >20 classified moderate to severe symptoms [59, 60]. Social support was measured using the Medical Outcomes Study scale [61], from which selected questions were used to create a binary variable for social isolation; participants were considered socially isolated if they never or almost never had someone to take them to the doctor if they were ill or someone to turn to for suggestions about how to deal with a personal problem and with whom they could discuss their most private worries and fears.

Three women refused to answer HIV-related questions and were excluded from HIV-specific analyses. The Malaysian Ministry of Health (MOH) and the World Health Organization (WHO) recommend HIV testing annually for anyone using drugs and CD4

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monitoring at least twice annually for people living with HIV. Poor adherence to these HIV testing and monitoring guidelines was the primary outcome of interest. Bivariate and multiple variable logistic regression models were fitted using both backward elimination and forward selection of main effect variables as well as all possible interaction terms with a α=0.05 threshold for inclusion in the final multivariable model. Findings were robust to both analytical models and a model selected based on minimization of the AIC. Main effect variables did not exhibit multicollinearity.

2.5 Human Subjects approval

The Institutional Review Boards (IRBs) at Yale University and the University of Malaya approved the study. All women were assigned a unique code to maintain anonymity and no names were recorded.

3. Results

3.1 Sample Demographics

Table 1 provides the characteristics of the women, who primarily identified as ethnically Malay (61.2%) and Muslim (66%). They had low education levels (39.9% had not attended high school) and the majority (69.9%) was single and unstably housed (62.1%), living below the national poverty line. Nearly all (93.2%) had criminal justice involvement, with 70.9% having previously been to prison, often for extensive periods of time. Almost 20% engaged in SW as their primary source of income.

3.2 Substance Use, Sexual Risk Behaviors, and Social Isolation

Amphetamine-type substances (ATS) were the most commonly (45.6%) used drugs, followed by heroin (41.7%). Half of the sample (53.4%) reported lifetime poly-substance use and one-third (30.1%) did so in the previous 30 days. One-third of women had previously injected drugs, the majority of which had injected recently and shared injection equipment; all but one recent injector reported being injected by another person (Table 1). Sexual risk behaviors were prevalent with almost one half (n=46; 44.7%) of women having recently engaged in transactional sex for money (n=42; 40.8%), drugs (n=12, 11.7%), a place to stay (n=11, 10.7%), food (n=7; 6.8%), or clothing (n=5, 4.9%).

Among the 12 women who exchanged sex for drugs, all but one had used ATS in the last 30 days (p=0.03; Fisher's exact test). In addition, 42.4% (36/85) of women sexually active within the last 6 months reported unprotected sex and, of the 35 women who had unprotected sex in the last 30 days, almost one-third (10/35) had done so with multiple different partners. Physical violence (49.5-62%) and sexual victimization (23.8-30.7%) were highly prevalent in both childhood and adulthood; 75.8% of physical abuse was intimate partner violence. In addition, 25.2% had no close friends or relatives to talk to and 24.3% felt they could "count on" only one person (data not shown); nearly 40% did not have anyone who made them feel loved and 32-43.1% never or almost never had someone to help them in times of need such as illness or personal crisis (Table 1).

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3.3 Unmet Social and Medical Needs

More than 70% of the sample reported a need for social and medical services; the greatest unmet need was for financial and housing assistance (Figure 1). One-fourth of women who reported a need for medical services and/or a community drop-in center were unable to access these services. Despite the appearance that need for medical services is better met than other services, 70.9% of all women additionally reported an unmet need for reproductive healthcare; only 47.6% of the sample had received a pelvic exam or PAP smear within the last three years. The majority of women (62.1%) felt their SUD was a barrier to receiving reproductive healthcare. Thirteen of 15 women needing NSEP services were able to successfully access these services. Of the 74 women who had ever used heroin and the 21 who had used other opioids, 47 (63.5%) and 15 (71.4%), respectively, had ever received methadone treatment.

3.4 Psychiatric Comorbidity

Psychiatric illness symptoms were prevalent with 60.2% meeting criteria for moderate (11.7%) or severe (48.5%) depression (Table 1). Of severely depressed women, 35 (70%) used heroin (p=0.02) and 34 (68%) used ATS (p=0.23) in the last 30 days. As shown in Figure 2, depression and anxiety were the most common psychiatric issues reported. Almost one-third reported suicidal ideation in their lifetime and half of these women seriously considered suicide within the last 30 days. Almost a quarter of women (23/103) had previously attempted suicide, of which 8 had done so within the past month. Only 11.7% and 18.4% of all women had ever been prescribed psychiatric medications or received treatment or counseling for psychological or emotional problems, respectively.

3.5 HIV Continuum of Care

As illustrated in Figure 3, 19.4% had never been tested for HIV and 27.7% of reported test results were more than one year old, thus failing to meet MOH national recommendations for annual testing for people who use drugs. While three women refused to provide details about their HIV statuses, 25% (20/80) of the remaining sample reported that their most recent HIV test was positive. Of those identifying as HIV-infected, 15% did not have a recent CD4 count (within the last 6 months). Nine (52.9%) of 17 women were eligible (CD4<350 cells/mL) for ART per WHO guidelines; two never initiated ART and one defaulted. With regard to other medical co-morbidities (Table 1), 8.9% and 4% reported having Hepatitis C and B, respectively, and 3% had had active tuberculosis. Self-reported rates of diagnosed STIs (gonorrhea, chlamydia, and syphilis) were 2.9%, although 32% reported at least one STI symptom such as painful urination, genital swelling, genital pain or sores, or abnormal vaginal discharge within the last year.

After controlling for all covariates (Table 2), drug injection (AOR 0.28, p=0.01) and experiencing adulthood IPV (AOR 2.73, p=0.04) were independently associated with not adhering to HIV testing and monitoring guidelines.

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4. Discussion

Despite the vast body of literature on men who use drugs in Malaysia [62-64], to our knowledge this is the first study to focus exclusively on the hidden population of WWUDs who "appear" absent and marginalized from HIV prevention and treatment strategies. The women in this study demonstrate considerable medical and psychiatric comorbidity exacerbated by profound poverty, unstable living situations, and social isolation. These factors likely converge, leading to engagement in SW as a survival mechanism and resultant high rates of IPV [43]. While active substance use complicates diagnosis of mental illness, psychiatric symptoms are high, potentially as a consequence of post-traumatic stress disorder from IPV, may result in engagement in high-risk behaviors but low rates of entry into medical care [43, 65]. Due to substance use and sexual risk behaviors, these women are at significant risk for contracting or transmitting HIV but the majority are unable to access appropriate medical and social support services due in part to their ongoing substance use and social destabilization from recurrent incarceration [43, 45, 66, 67].

Syndemics such as the **S**ubstance **A**buse, **V**iolence, and HIV/**A**IDS (SAVA) syndemic have been successfully used to describe mutually reinforcing interactions between two or more health conditions (e.g., substance use, HIV/AIDS or HIV-related risk, or psychiatric illness) that negatively affect the burden of disease when combined with adverse social conditions (e.g., homelessness or IPV) [65]. These concomitant dynamics magnify each other (Figure 4) and may in part explain why WWUDs are disenfranchised from systems of HIV prevention and treatment [10, 16, 25, 68, 69]. Our sample of challenging-to-recruit WWUDs in urban Malaysia exemplifies the ways in which key issues at the individual, relationship, community, healthcare setting, and policy levels, when left unsupported and unaddressed, conspire against HIV prevention and treatment efforts particularly in women [70-74].

Unlike the pattern reported among their male counterparts who primarily injected opioids [75-78], only one-third of women had injected drugs, mostly with ATS or opioids. Most women who had recently injected, however, were at increased risk of blood-borne diseases like HIV and viral hepatitis due to their injecting behaviors (e.g. being injected by someone else) [24, 45, 67].

Poverty facilitates a risk environment in which women face unequal access to healthcare, marginalized treatment by healthcare providers, gender inequalities, competing life priorities, denial of health problems, and the inability to leverage social capital and economic resources to provide for their families [66, 79]. Likely as a consequence of poverty, social isolation, and a lack of resources and social services, many women had engaged in SW, either just to survive or to maintain their level of drug use. This work involved sex with multiple partners often without using condoms, further stigmatizing these women and placing them at even greater health risk.

Multiple co-morbid conditions including HIV, viral hepatitis, STI symptoms, and high rates of depression and anxiety affected the women surveyed. Over 60% of women met screening criteria for major depression, likely related to a multitude of factors including childhood trauma and abuse, adulthood IPV, or SUDs. The circular influence of mental illness and

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substance use, with one affecting the other, can result in an interaction that complicates and worsens health conditions [80, 81].

Consistent with the SAVA syndemic, 30.7% of our sample reported sexual trauma and half reported childhood physical abuse. There is a known bidirectional relationship between violence and substance use; women who have experienced childhood trauma have higher rates of substance use and those who use substances tend to more frequently be involved in abusive relationships [42]. As high rates of sexual and physical abuse and IPV were also reported in adulthood, this trauma history may have affected the women's behaviors and relationships as adults.

HIV is concentrated in incarcerated populations, with the majority of prisoners having SUDs, thereby increasing their HIV risk [82]. Most (70.9%) of the women surveyed had been incarcerated, primarily due to drugs or drug-related arrests (91.7%). Criminal justice involvement disrupts social networks [83] and alters the women's stability [84], housing conditions, and ability to attain medical and social services, creating increased likelihood of marginalization upon their release and further exacerbating stigma and poor health outcomes.

While most (80.6%) women surveyed had been tested for HIV at some point in time, likely as a result of mandatory HIV screening policies in prisons, nearly one-third of test results were outdated, perhaps due to high-risk women not accessing voluntary testing in community settings. Nonetheless, self-reported HIV prevalence was 20%. One-third of ART-eligible women were not receiving treatment and 15% of women potentially eligible for ART had not been recently assessed by laboratory CD4 count. Adherence to recommended HIV screening and laboratory monitoring in this high-risk population are crucial steps in the HIV continuum and will likely require the development of gender-specific services to more effectively engage WWUDs in HIV prevention and treatment to prevent HIV infection and transmission.

HIV testing and monitoring is central to HIV treatment as prevention strategies [85, 86]. Important in these findings are factors that may facilitate and impede treatment as prevention efforts. One reason that being a PWID appears to facilitate HIV testing is the continued focus on targeted HIV testing despite evidence of a more generalizing HIV epidemic in Malaysia [47]. These findings emphasize the need to expand targeted HIV screening and treatment efforts beyond PWIDs to include women who use but do not inject drugs and those who experience IPV, since IPV can be a consequence of unequal relationship power dynamics, violence or fear of violence upon discussing HIV risk and prevention methods with sexual partners, and even victimization by police [8, 21, 45, 87].

In socially and religiously conservative societies like Malaysia, women are increasingly marginalized, thereby increasing their vulnerability and experiences with discrimination against them in the setting of substance use [25, 69]. WWUDs demonstrate high levels of unmet need for addiction treatment programs and related health and social services but in many cases are less likely than men to access these services [10, 16, 68]. Some studies suggest this is due to their desire to uphold their role as family caretaker and unwillingness

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to leave their children in order to seek help for themselves [16, 18]. Their own families may also restrict their access to addiction treatment services out of shame or denial of their addiction or an attempt to protect them from being identified as having a SUD [18].

WWUDs in this study reported relatively little unmet need for medical and community outreach services including NSEP. One explanation is that only one-third of WWUDs had injected drugs; the remaining women, especially ATS users, may not have perceived a need for NSEP services. For these women, access to NSEP may not be a reliable measurement of access to addiction treatment and support services. In addition, most women who had used opioids also reported receiving methadone in their lifetime, indicating their unmet addiction treatment needs may not be as great as their unmet need for social support services. Moreover, they themselves reported poor access to social services, including financial assistance, housing assistance and vocational training. This services gap places women at a social and economic disadvantage, thus impacting their drug use and sexual risk taking behaviors and overall health status. In Malaysia in particular, social expectations for women and stigma toward WWUDs may compound the challenges they face when seeking addiction treatment and other forms of care [88-90].

4.1 Limitations

In this exploratory pilot study, small sample size and convenience sampling limited the power to detect differences in potential covariates. Moreover, we cannot generalize these findings to all drug-using women in Malaysia; nonetheless, this is the largest sample of WWUDs assessed in Malaysia to date, which speaks to Malaysia's marginalized epidemic of drug use, HIV risk and social disenfranchisement among women and provides a glimpse into the problems faced by WWUDs. Finally, while HIV status was not confirmed by laboratory-based testing, we believe the high self-reported prevalence likely represents the minimum prevalence since most women were not recently tested, yet engaged in high-risk behaviors. Notwithstanding these limitations, this study's exploratory nature allowed the detection of key issues for WWUDs, laying the groundwork for future studies.

4.2 Conclusions

Our findings demonstrate a syndemic of substance abuse, IPV, HIV/AIDS, mental illness, and social instability. In our study, most WWUDs were not regular injectors but remained at risk for HIV due to high-risk sexual behaviors and injecting practices. Inconsistent medical care and insufficient mental health and addiction treatment created further vulnerability to poor health outcomes. Of particular concern are the observed suboptimal HIV screening and monitoring rates amongst the women in our sample, despite their connection to outreach and addiction treatment services. In the context of Malaysia's PWID-targeted HIV interventions, non-injecting WWUDs and those who experience IPV may be at greatest risk for poor HIV treatment outcomes. Interventions to improve addiction treatment strategies and reduce HIV transmission should be sensitive to these unique patterns of drug use, risk behaviors, and social vulnerability among WWUDs [4, 45]. Future research on women and transgender people with SUDs is needed in Malaysia to better inform HIV and reproductive health policies. Mental health and social support are potentially key targets for future interventions directed at WWUDs in Malaysia.

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Highlights

- Women who use drugs are a hidden group of people with or at risk for HIV infection.
- In Malaysia, these women are inadequately engaged in the HIV continuum of care.
- Prevalence of HIV, psychiatric comorbidity and exposure to violence (IPV) is high.
- Non-injection drug use and IPV undermine HIV prevention and treatment strategies.
- Gender-specific interventions are needed for the growing HIV epidemic among women.

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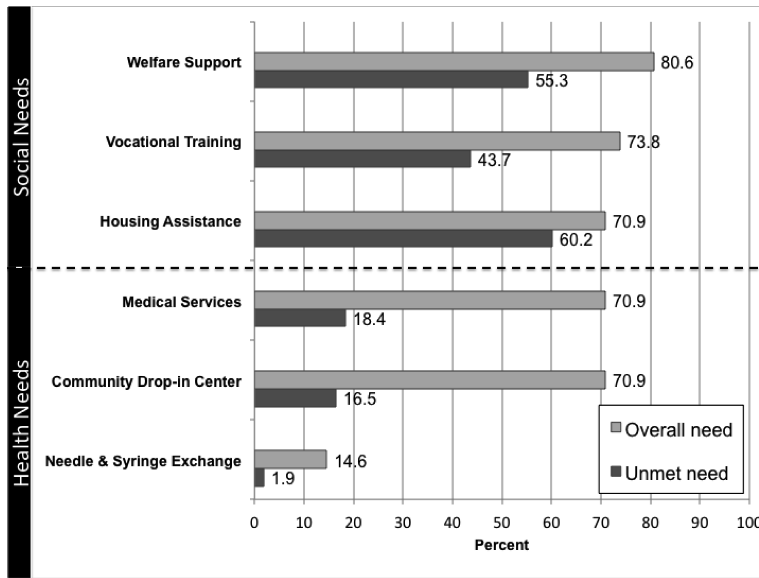

Figure 1.
Percentage of participants reporting a need for social support and health services in past six months

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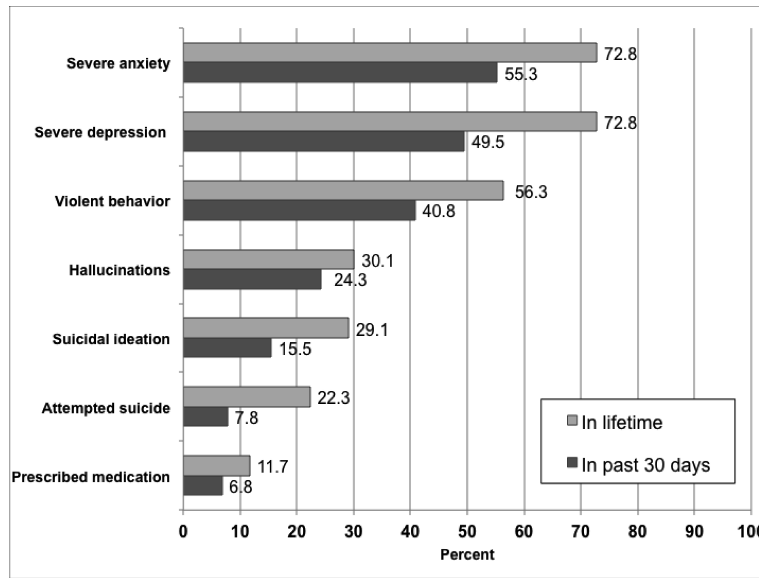

Figure 2.

Percentage of participants reporting mental health issues

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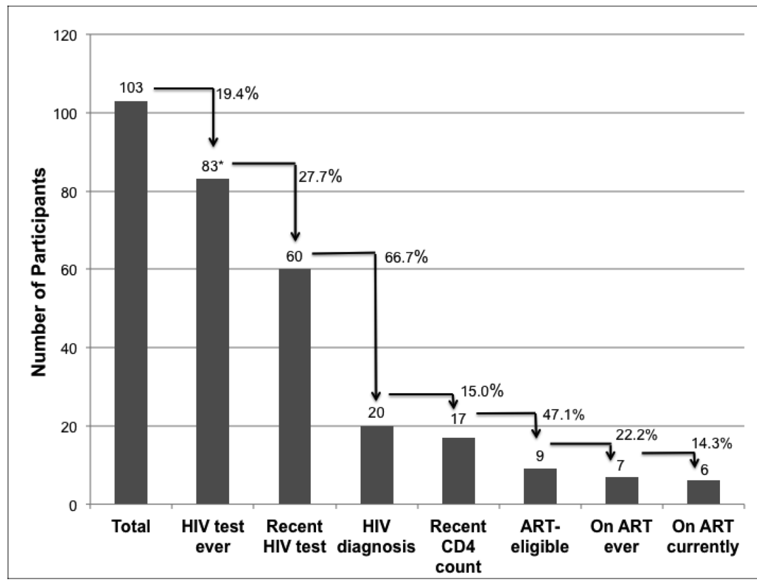

Figure 3.

HIV Continuum of Care

Legend: ART: antiretroviral therapy; * Three participants refused to answer additional HIV-related questions.

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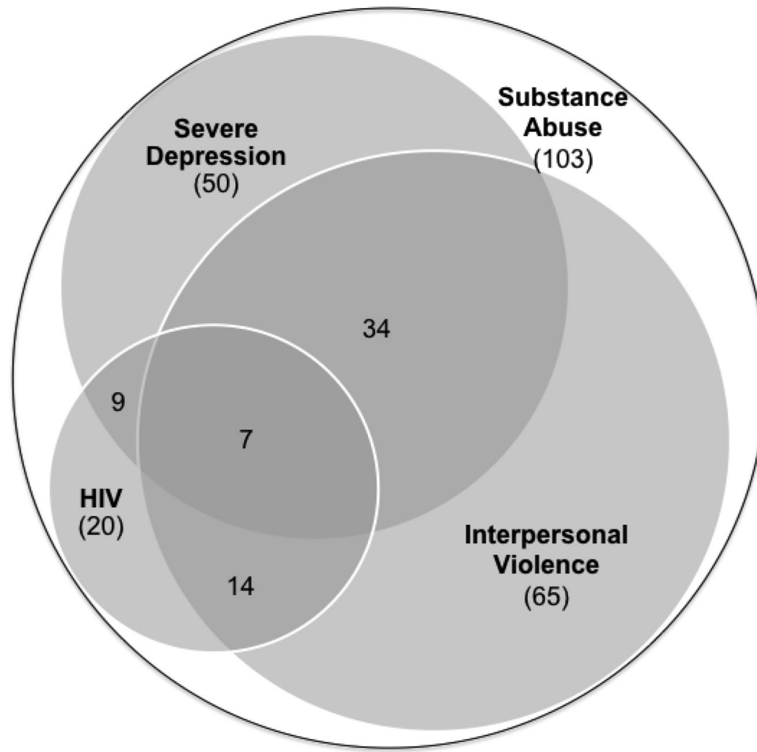

Figure 4.
The Syndemic of HIV/AIDS, Interpersonal Violence and Major Depression among 103 Substance-Using Women

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Table 1

Participants' Demographic Characteristics, HIV Risk Behaviors, and Related Co-morbidities (N=103)

Variable	N (%)
Mean age (±SD)	39.4 ±10.7
Monthly income, median (range)	RM 800 (0 – 30,000)
Above national poverty level	45 (43.7)
At or below national poverty level	58 (56.3)
Ethnicity	
Malay	63 (61.2)
Indian	17 (16.5)
Chinese	15 (14.6)
Other	8 (7.8)
Religion	
Muslim	68 (66.0)
Buddhist	11 (10.7)
Hindu	11 (10.7)
Christian	7 (6.8)
Other	4 (3.9)
None	2 (1.9)
Housing Status	
Stably Housed	39 (37.9)
Unstably Housed	32 (31.1)
Homeless	32 (31.1)
Education	
None / Kindergarten	12 (11.7)
Elementary / Middle (Primary)	29 (28.2)
Early High School (Secondary- Form 3)	29 (28.2)
Late High School (Secondary- Form 5)	27 (26.2)
Pre-University (Form 6) / University	6 (5.8)

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Variable	N (%)
Relationship Status	
Single	72 (69.9)
Partnered / married	31 (30.1)
Primary Income Source[a]	
Full-time, traditional	32 (31.4)
Part-time, traditional	23 (22.5)
Sex work	20 (19.6)
Financial assistance	4 (3.9)
Friend	3 (2.9)
Other	20 (19.6)
Criminal Justice Involvement	96 (93.2)
Ever incarcerated	73 (70.9)
Length of incarceration, median (range)	46 months (2 months – 33 years)
Injection drug use	
Lifetime	33 (32.0)
Last 30 days	22/33 (66.7)
Shared injection equipment	15/22 (68.2)
Been injected by another person	21/22 (95.5)
Condom use[a] **– last 6 months**	
Unprotected sex	36 (35.3)
Protected sex	49 (48.0)
No sex	17 (16.7)
Violence & victimization	
Childhood sexual trauma[b]	31 (30.7)
Childhood physical abuse	51 (49.5)
Adulthood sexual trauma[b]	24 (23.8)
Adulthood physical abuse[c]	62 (62.0)

Variable	N (%)
Intimate partner violence	47/62 (75.8)
Any transactional sex – last 6 months	46 (44.7)
Regular	20 (19.4)
Intermittent	26 (25.2)
None	57 (55.3)
Elements of Social Isolation Never or almost never is there someone…	
To give her love and affection	30 (29.1)
To help if she was confined to bed	33 (32.0)
To take her to the doctor	33 (32.0)
To hug her	40 (38.8)
To turn to for suggestions about how to deal with a personal problem [a]	40 (39.2)
With whom she can share her most private worries and fears [a]	44 (43.1)
Health Co-Morbidities	
Severe depression	50 (48.5)
HIV [c]	20 (20.0)
Viral hepatitis (C and/or B) [b]	13 (12.9)
Tuberculosis (active) [b]	3 (3.0)

[a] n=102

[b] n=101

[c] n=100

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Table 2

Bivariate and Multivariate Associations with Lack of Adherence to National HIV Testing and Monitoring Guidelines (N=100)

Characteristic	N [a]	% (n/N) not in adherence	Unadjusted OR (95% CI)	Adjusted OR [b] (95% CI)
In residential treatment for substance use				
Yes	81	32.1 (26/81)	**0.34 (0.12-0.96)**	--
No	19	57.9 (11/19)	referent	
Homeless or unstably housed				
Yes	63	28.6 (18/63)	**0.38 (0.16-0.88)**	--
No	37	51.4 (19/37)	referent	
Relationship status				
Relationship	29	41.4 (12/29)	1.30 (0.54-3.15)	--
Single	71	35.2 (25/71)	referent	
Ever injected drugs				
Yes	33	21.2 (7/33)	**0.33 (0.13-0.87)**	**0.28 (0.10-0.77)**
No	67	44.8 (30/67)	referent	referent
Heroin as favorite drug				
Yes	43	25.6 (11/43)	**0.41 (0.17-0.97)**	--
No	57	45.6 (26/57)	referent	
ATS as favorite drug				
Yes	46	43.5 (20/46)	1.67 (0.74-3.80)	--
No	54	31.5 (17/54)	referent	
Transactional Sex				
Yes	44	38.6 (17/44)	1.13 (0.50-2.57)	--
No	56	35.7 (20/56)	referent	
Interpersonal violence				
Yes	63	41.3 (26/63)	2.03 (0.82-5.04)	**2.73 (1.04-7.14)**
No	35	25.7 (9/35)	referent	referent
Social Isolation				
Yes	55	36.4 (20/55)	0.94 (0.42-2.13)	--
No	45	37.8 (17/45)	referent	
Severe Depression				
Yes	48	33.3 (16/48)	0.74 (0.33-1.67)	--
No	52	40.4 (21/52)	referent	

[a] Numbers may not sum to total due to missing data.

[b] For the fully adjusted model, N=98 with Pearson Goodness of Fit Test p=0.702.