Concurrent sexual and substance-use risk behaviours among female sex workers in Kenya's Coast Province: Findings from a behavioural monitoring survey

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Abstract

While many studies confirm the association between HIV, alcohol and injecting drug use by female sex workers (FSWs), little is known about their use of marijuana, *khat* and other substances and the association of these substances with HIV, risky sexual behaviour, and sexual violence. To better understand this association, data were analysed from a cross-sectional, behavioural survey of 297 FSWs in Mombasa, a well-known tourist destination and the second largest port in Africa and capital city of the Coast Province in Kenya.

Among the FSWs, lifetime use of different substances was reported by 91% for alcohol, 71% for *khat*, 34% for marijuana, and 6% for heroin, cocaine, glue or petrol. The majority (79%) used more than one substance, and multiple-substance use was reported by all respondents who ever used marijuana, heroin, cocaine, glue and petrol. The risk of HIV acquisition was perceived as medium to high by 41% of respondents, 75% of whom attributed this risk to multiple partners. Sexual violence was reported by 48% of respondents, and 30% indicated that this happened several times. Despite HIV prevention programmes targeting FSWs in Mombasa, most of them continue to engage in risky sexual behaviours. This suggests that harm reduction strategies for substance use should be coupled with efforts to promote consistent condom use and partner reduction.

Keywords: *HIV, female sex workers, substance use, Kenya, Africa.*

Résumé

Bien que de nombreuses études confirment l'association entre le VIH, l'alcool et l'utilisation de drogues injectables par les travailleuses du sexe, la littérature est quasiment muette sur leur utilisation de la marijuana, du *khat*, et autres substances, et sur l'association de celles-ci avec le VIH, les comportements sexuels à risques et la violence sexuelle. Pour mieux comprendre cette association, des données ont été analysées à partir d'une étude comportementale transversale ciblant 297 travailleuses du sexe de Mombasa. Cette ville est une destination touristique réputée, le deuxième plus grand port d'Afrique et la capitale de la Province côtière du Kenya.

Parmi ces travailleuses du sexe, 91% d'entre elles ont déjà consommé au moins une fois dans leur vie de l'alcool, 71% du *khat*, 34% de la marijuana, et 6% de l'héroïne, de la cocaïne, de la colle, ou de l'essence. La majorité d'entre elles (79%) a déjà consommé plus d'une substance, et toutes celles ayant déclaré avoir déjà consommé de la marijuana, de l'héroïne, de la cocaïne, de la colle, ou de l'essence ont consommé plusieurs substances. Le risque de contracter le VIH a été estimé de moyen à fort par 41% des sujets, et 75% d'entre eux attribuait ce risque au multi-partenariat sexuel. La violence sexuelle a été signalée par 48% des personnes interrogées, et 30% ont indiqué que cela était arrivé plusieurs fois. Malgré les programmes de prévention du VIH ciblant les travailleuses du sexe à Mombasa, la plupart d'entre elles continuent de se livrer à des comportements sexuels à risques. Ceci suggère que les stratégies de lutte contre les méfaits liés à la consommation de ces substances devraient être couplées avec des efforts visant à promouvoir l'utilisation systématique du préservatif et la diminution du nombre de partenaires sexuelles.

Mots clés: *VIH, travailleuses du sexe, consommation de substance, Kenya, Afrique.*

Introduction

In developing countries, substance use is emerging as a much bigger problem than expected (UNAIDS and WHO, 2008). Numerous studies confirm the close association between substance use and HIV, but little research is being conducted in sub-Saharan Africa, the location of nearly half of the global epidemic. Literature has focused on injecting drug use, which contributes significantly to the HIV epidemic in Kenya, Mauritius, South Africa and Tanzania (Odek-Ogunde, Lore, Owiti, Munywoki, & Moor, 2001; Ndetei, 2004; Odek-Ogunde, 2004). Some studies associate alcohol use with reduced sexual inhibitions, multiple partners, unprotected sex, sexual violence, and commercial sex encounters and HIV incidence (Weiser, Leiter, Heisler, McFarland, Korte,

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DeMonner, 2006; Shaffer, Njeri, Justice, Odero, & Tierney, 2004; Chersich, Luchters, Malonza, Mwarogo, King'ola, & Temmerman, 2007; Kalichman & Simbayi, 2004; Zablotska, Gray, Serwadda, Nalugoda, Kigozi, Sewankambo *et al.*, 2006).

A study in the Philippines revealed that multiple sexual risk behaviours were observed with more frequency for FSWs if alcohol was used before commercial sex (Chi Chiao, Morisky, Rosenberg, Ksobiech, Malow, 2006; Wechsberg, Luseno, Lam, Parry, Morojele, 2006). However, the research agenda has largely ignored other readily available licit and illicit substances that may also contribute significantly to the spread of HIV. Studies suggest that easily accessible substances such as *khat* and marijuana are commonly used and that multiple-substance use increases adverse behaviours (Barnwell & Earleywine, 2006; Martin, Kaczynski, Maisto, & Tarter, 1996).

Use of alcohol, marijuana and *khat* in Kenya

Alcohol is the most used addictive substance in Kenya. It is easily accessible, and there is widespread social acceptance of heavy drinking (Ndetei, Ongecha, Malow, Onyancha, Mutiso, Kokonya, 2006; KDHS 2003). Marijuana (*Cannabis sativa*) is the second most popular, due to its widespread availability and low price. Although it is illegal and most users smoke it discretely to avoid community disapproval, marijuana is cultivated for commercial purposes in several regions of Kenya (Adelekan, 2006). Another popular substance, particularly in Coast Province, is *khat (Catha edulis Forske),* also known as *miraa* in Kenya), an evergreen plant whose stems and leaves have amphetamine-like properties when chewed or drunk as tea (Kebede, Atalay, Mitike, Enquselassie, Frehiwot, Yigeremu *et al.*, 2005; Adelekan, 2006).

The coastal region of Kenya has had longer documented history of drug use in Kenya. For example a recent study showed that heroine has been available in Mombasa streets for over 25 years (Beckerleg, Telfer and Sadiq, 2006) . Confirming earlier claims that Mombasa was becoming a transit point for drug trafficking in Africa, in January 2000, 4.8 tones of Asian hashish worth US$ 13.6 millions was seized in Mombasa (Xinhua News Agency article date: 27 January 2000). A recent United Nations report highlighted the northern coastal region of Kenya bordering Somalia, which is remote with no law enforcement government agents, as a convenient route for drug smugglers. Some of the drugs find their way into Mombasa, the biggest city centre and hub for commerce in the region.

Khat is a high-cash income crop. It is profitable to the huge number of people involved in its production and marketing, including farmers, distributors and merchants (Nezar N Al-Hebshi and Nils Skaug, 2005). More *khat* is grown, picked and traded in Kenya today than ever before. Domestic consumption now extends beyond traditional *khat*-chewing communities to ethnic groups with no history of use reported now taking it up. Outside Kenya, Tanzania has become a big new market, and the Somali diaspora's appetites seem insatiable. However, there are no accurate figures on the economic growth as the Kenyan government does not classify *khat* as a cash crop. *Khat* sales continue to operate informally, with accounts maintained ad hoc. Kenyan authorities continue to ignore it, neither tracking its sale nor demanding any bribes from the proceeds. The commodity has a 48-hour shelf life, but it goes all over the world. Local politicians concerned about the nagging issue of legitimacy are already talking about pressing the Kenyan government to officially recognise *khat* as a cash crop. Certainly, in a country whose grasping political elite has always shown a talent for latching onto profit-making ventures and sucking them dry, the lack of regulation surrounding the trade seems an anomaly or an oversight (Wrong Michela, 2005).

The World Health Organization has classified *khat* as a substance that can cause psychological dependence. A study among Ethiopian in-school and out-of-school youth found that use of alcohol and *khat* was significantly and independently associated with risky sexual behaviour (Kebede, Atalay, Mitike, Enquselassie, Frehiwot, Yigeremu *et al.*, 2005). However, Kenya's laws are still silent on sale and use of *khat*. This is because of its economic value, since *khat* is the third highest foreign exchange earner among the country's horticultural crops. Little is known about the prevalence of *khat* use among sex workers in Kenya and the possible consequences of this use.

Substance use among female sex workers in the Mombasa district

This study, conducted in Mombasa, a well-known tourist destination, second largest port in Africa and capital city of the Coast Province in Kenya, assessed the prevalence of substance use among 297 female sex workers (FSWs) recruited in the Mombasa district and the relationship between their use of substances and risky sexual behaviour – early sexual debut, multiple partners, condom use and STI history.

Study methods and limitations

The cross-sectional behavioural monitoring survey was part of a larger survey targeting eight most-at-risk groups in Mombasa in July 2007, including in-school and out-of-school youth aged 15 - 24 years, men at workplaces, police[1] (men and women), matatu/touts[2], truckers, women in households and female sex workers (Tegang, Emukule and Kitungulu, 2008).

This analysis focuses on FSWs because of their frequent sexual encounters and high reported lifetime use of substances. The study used an anonymous, confidential approach to recruit 297 FSWs and had a high response rate (99% or 297/300). The study was geographically restricted to Mombasa. The sampling frame comprised various time-venue combinations, and the mapping of hotspots was conducted at bars, night clubs, brothels and hotels patronised by FSWs. In this study, eligible women were at least 15 years of age, present at the hot spots and self-reported exchange of any type of sex including oral, anal and vaginal sex for money or gifts within the last 3 months of the study. They were consecutively selected, and their informed consent was obtained prior to enrolling them. The number of women interviewed in each hotspot was proportional to their estimated presence at that location within the timeframe (high peak/low peak). Estimated sizes of individual hotspots were specifically determined for this study by interviewing key informants and FSWs' peer educators. The study obtained ethical approval from the Kenyatta National Hospital Ethical Review Committee and Family Health International's Protection of Human Subjects Committee.

Information was collected by research assistants using structured questionnaires administered in Kiswahili and loaded on iPac HP personal digital assistants (PDAs) operating on a Windows Mobile platform (Tegang *et al.*, 2009).

Information was collected on the socio-demographic characteristics of the FSWs and on their substance use, sexual risk behaviour, experiences with sexual violence and perceived risk of HIV acquisition. To measure their perceived risk of HIV acquisition, they were asked if they thought their chances of getting HIV were none, low, medium or high. Their responses presume that they are HIV negative, though this may not be the case. Because of ethical issues related to disclosure in a behavioural survey, HIV status of the FSWs was not assessed as part of the study.

Questions on substance use and risky sexual behaviours

We assessed whether female sex workers ever used alcohol, cigarettes, marijuana, *khat* and/or cocaine, heroin, glue and petrol. Respondents were asked about prior injection of heroin during the previous 12 months, their sources for these substances and about needle sharing. Their addiction, understood as dependency to these substances and any attempts they had made to end such an addiction was explored (Table 1). Questions were also asked about their age at sexual debut, age at first paid sex, number of sexual partners in the last seven days and last working day, frequency of condom use with paying partners during the last 30 days, frequency of condom use with non-paying partners during last 12 months and condom use during last sex with paying and non-paying partners.

Respondents were also asked whether they had ever been forced to have sex without a condom, had ever been beaten or physically abused as a result of doing sex work and ever had been forced to have sex with any partner using threats or physical violence. To evaluate risk of HIV acquisition without exploring the actual HIV status of respondents, we enquired about their lifetime history of STI – abnormal genital discharge, scratches, ulcers, or any other STI – and also whether they had ever tested for HIV or had tested within the past 12 months. Assuming that they were HIV negative, we also inquired about their perceived risk of HIV and whether they rated it as low, medium or high, as well as reasons for perceived risk, knowledge regarding HIV prevention, and exposure to peer education.

Data management and analysis

Data from the PDAs were downloaded and exported into SPSS version 15.0 for Windows database and STATA version 8.0 (Stata Corporation, College Station, TX, USA) for statistical analysis. To control for correlation between repeated measures from the same FSW, generalised estimating equation (GEE) methods were applied to compare frequencies of lifetime use of different substances. Also, chi-square and odds-ratios tests were applied to assess associations. Continuous variables were categorised prior to conducting these tests.

To calculate frequencies of substance use, 'regular use of any substance' was considered to have precedence over any other occurrences. If a respondent declared regular use of any substance, she was classified as a regular substance user. If a respondent declared lifetime use of all substances but never used any on a regular basis, she was classified as a rare substance user. Relating to frequency of condom use, we combined the initial categories 'all the time' and 'sometimes' into 'often'.

Study findings

The median age of 297 FSWs was 25 years (IQR: 21 - 29), 78% were Christians, and 71% had primary level or less education (Table 2). Only a handful (1%) lived in any sort of union, though 89% said

Table 1. Questionnaire items on substance use and experience of sexual violence

Substance use

1. During the last 4 weeks how often have you taken alcohol? *(Every day, A t least once a week, Less than once a week, Never, Don't know, No response)*
2. Some people have tried a range of different types of drugs. Which of the following, if any, have you tried? *(Cigarettes, Khat, Marijuana, Alcohol, Glue or petrol, Cocaine, Heroin)*
3. How frequently have you used any of these substances: cigarettes, khat, marijuana, alcohol, glue or petrol, cocaine, heroin? *(Regularly, Rarely, Once only)*
4. Have you ever been addicted to any of these substances: Cigarettes, khat, marijuana, alcohol, glue or petrol, cocaine, heroin? *(Yes, No, Don't know, No response)*
5. If you have been addicted to any of these substances, have you tried to stop their use? *(Yes, No, Don't know, No response)*
6. Some people have tried injecting drugs such as cocaine or heroin. Have you injected such drugs in the last 12 months? *(Yes, No, Don't know, No response)*
7. If you have injected cocaine or heroin in the past 12 months, who supplied you with these drugs and needles? *(Street vendor, Bar/club worker, Chemist/pharmacist, Health/clinic worker, Another drug user)*
8. With how many people have you ever shared needles or syringes? *(None, 1–2, 3 or more)*

Sexual violence

1. Have you ever been forced to have sex without using a condom?
2. During the last 12 months, how many times have you avoided arrest by providing the police officer with a 'sexual favour'?
3. How many times have you been forced to have sex with any partner using threats or physical violence even though you did not want to?

they supported someone and 45% said they supported at least three dependents. Table 2 shows that 84% cited financial need or problems as their main reason for engaging in sex work and 66% relied solely on sex work for their livelihoods. The remaining one-third who were engaged in part-time sex work derived other income from secretarial or clerical work, domestic work, dancing, hawking or street vending.

Table 2. Socio-demographics of FSW

Socio-demographic characteristics	All participants N=297
Age	
15 - 24	46% (137/297)
25 - 59	54% (160/297)
Education	
Primary or none	71% (212/297)
Secondary +	32% (95/297)
Religion	
Protestant/other Christian	34% (101/297)
Catholic	44% (131/297)
Muslim and others	22% (65/297)
Source of income	
Sex work alone	66% (195/297)
Sex work and other source	34% (102/297)
Reasons for doing sex work	
Financial need/problems	84% (248/297)
Sexual violence	
Witnessed at least one form of sexual violence	77%(228/297)
Ever been forced to have sex without a condom	48% (141/297)
Substance use	
Lifetime use of at least one substance	96% (285/297)
Lifetime use of 2 or more substances	80% (234/297)

Prevalence of substance use among FSWs

Ninety-six per cent (285/297) of the FSWs reported lifetime use of the following substances: cigarettes, marijuana, *khat*, alcohol, glue, cocaine or heroin (Table 2). The proportion of women who ever used alcohol (91%) was significantly higher than the proportion who ever used any other single substance (Chi-square=252.19, $p<0.01$, df=4). Nearly 80% (234/297) said they had indulged in two or more of these substances. After alcohol, *khat* was the second most used substance, with significantly higher use (71%) than cigarettes (51%), marijuana (34%) and heroin, cocaine, glue and petrol (6%) (Chi-square=200.36, $p<0.01$, df=3). Also, women aged older than 25 years reported significantly more use of marijuana than the younger ones [53% versus 35%; p<0.01; OR=2.10 (1.28<OR<3.45)] (Table 3).

Among women who reported ever using only a single substance in their life, alcohol was more frequently reported as lone substance ever used by 82% (42/51) of respondents. Lifetime users of marijuana, heroin, cocaine, glue or petrol always reported multiple-substance use. Among FSWs who reported lifetime use of heroin or cocaine, 1 out of 8 women admitted sharing needles with one or more persons. Half the FSWs who disclosed they had problems with substance addiction indicated they had made attempts to stop their use. Most FSWs who used alcohol and cigarettes admitted using these substances regularly, while most users of other substances reported less frequent consumption.

Risky sexual behaviour

Among the FSWs, 73% were 15 - 19 years old at sexual debut. The mean reported age for first paid sex was 20.2 years (SD 4.71). We did not find a significant association between substance use and age at sexual debut; 18% of women aged 15 - 24 years, and 16% of the older ones, reported having had early sexual debut. Among the younger ones, 8% reported having their first paid sex before reaching 15 years of age while this was the case for only 2% of older FSWs (25 - 59 years old). Also, among women who had

Table 3. Substance use of various socio-demographic FSW subgroups

Socio-demographic characteristics	Cigarette users	Marijuana users	*Khat* users	Alcohol users	Coke/heroin/ glue users[1]	N
Age						
15 - 24	48	35*	73	90	8	137
25 - 59	53	55*	70	91	4	160
Education						
Primary or none	55	37	72	92	7	212
Secondary +	43	28	71	87	3	95
Religion						
Protestant/other Christian	49	40	78	92	9	101
Catholic	52	31	66	90	4	131
Muslim and others	52	31	72	89	5	65
Source of income						
Sex work alone	56	33	73	92	7	195
Sex work and other source	40	35	69	87	4	102
Reasons for doing sex work						
Financial need/problems	53	36	70	91	6	248

* Highly significant difference, $p<0.01$.

[1]The substance ever mostly used was glue/petrol (5.4%), followed by heroin (5.1%) and finally cocaine (3.4%).

more than 4 sexual partners during the last 7 days, 24% reported having had their first sexual intercourse before reaching 15 years of age and 6% reported having had paid sex before reaching 15 years. In Table 4, FSWs who had their first paid sex before age 20 were more likely to report lifetime use of *khat* compared with women who had their first paid sex at a later age [79% versus 63%; Chi-square 8.73; $p<0.01$; df=1; OR=2.16 (1.25<OR<3.74)]. Slightly over half (52%; 155/297) of the FSWs had engaged in sex work for more than 5 years. Those in this category were more likely to have ever smoked cigarettes (57%) than the younger ones in this business (44%) [Chi-square 4.57; $p<0.05$; df=1; OR=1.65 (1.01<OR<2.68)].

Looking at associations between substance use and the number of sexual partners during the previous working day, significantly more FSWs who had sex with two or more partners admitted ever using heroin, cocaine, glue or petrol (8%), compared with FSWs who reported only one or no partners (2%) during the last working day [Chi-square=4.38, $p<0.05$, df=1; OR=3.20 (1.02<OR<10.07)] (Table 4).

Table 4. Proportion (row %) of FSWs who ever used substances by selected sexual characteristics or behaviours

Variable	Cigarette users	Marijuana users	Khat users	Alcohol users	Coke/heroin/ glue users	N
Age at sexual debut						
<15 yrs	55	39	74	92	8	49
15 - 19 yrs	51	33	71	90	6	217
20 - 24 yrs	42	32	71	94	3	31
Age at first paid sex[2]						
Mean age (SD)	19.9 (4.6)	19.8 (4.9)	19.7 (4.5)	20.1 (4.7)	18.2 (3.7)	
<20 yrs	54	36	78.9*	92	7	152
20 - 24 yrs	48	32	63.4*	89	4	145
Mean years in sex work (SD)	6.6 (5.2)	6.3 (5.0)	6.3 (4.9)	6.3 (5.5)	6.5 (4.0)	-
No. years in sex work						
<5 years	44*	33	68	89	4	142
5+ years (5 - 39)	57*	35	74	92	8	155
No. sex partners last 7 days[3]						
0 - 3	55	33	71	89.7	4	136
4+	47	35	72	91.3	8	161
No. sex partners last working day						
0 - 1	47	34	68	88.8	3*	143
2+	54	34	75	92.2	8*	154
Payment at last sex[4]						
Ksh 0-500 (US$: 0-8)	50	36	70	89.1	8	183
Ksh 501+ (>US$8)	52	31	74	93.0	3	114
Condom use during last sex						
Within past 7 days	49	32	72	90.7	6	259
With a paying client	50	31	72	90.3	6	236
With non-paying partner	44	31	72	89.3	5	75
Total	51	34	71	91	6	297

*Significant difference, $p<0.05$.

[2]Among FSWs aged 15 to 24 years, 8% reported having their first paid sex before reaching 15 years of age. This was the case for only 2% of older FSWs (25-59 years old). Also, 17.5% of younger FSWs and 15.6% of the older ones reported having had early sexual debut.

[3]Among FSWs who had more than 4 sexual partners during the last 7 days, 23.6% reported having had their first sexual intercourse before reaching 15 years of age and 6.2% reported a paid sex before reaching 15 years.

[4]More than half (52.5%) of FSWs reported that 'financial problems' lead them to sex work.

Table 5. Repartition (%) of FSWs by frequency of condom use with non-paying partners last 12 months

Variable	Cigarette users	Marijuana users	*Khat* users	Alcohol users	Coke/heroin/ glue users	N
Frequency of condom use with non-paying partner last 12 months	*N*=70	*N*=53	*N*=98	*N*=125	*N*=11	***Total*** *N*=137
Often	43	35	55	52	27	53.6
Sometimes	29	25	18	22	36	22.5
Never	29	30	27	25	36	23.9

A higher proportion of FSWs who earned less than US$8 during their last commercial sex (8%) reported lifetime use of heroin, cocaine, glue or petrol compared with those who had never used any of these substances (3%), but the difference was not statistically significant (Table 4).

Consistent condom use in any sex acts with paying clients in the past 30 days was reported by 65% (193/297) of women. Ninety-four per cent (94%) of women reported using a condom during last sex with paying clients. Condom use at last sex with non-paying clients was significantly lower (54%). Substance use was not linked to the amount paid for sex without a condom.

Sexual violence

FSWs were asked whether they had ever been forced to have sex without a condom, been beaten or physically abused as a result of doing sex work, or been forced to have sex by a partner using threats or physical violence. At least one of these questions was answered in the affirmative by 77% (228/297) of respondents. Almost half (48% or 141/297) reported ever been forced to have sex without condom, and 30% indicated that this was a regular problem.

FSWs who ever used any substance often reported being beaten or abused as a result of doing sex work than those who never used any substances. However, the difference was not statistically significant, except for the group of FSWs who reported lifetime use of heroin, cocaine, glue or petrol.

Perceived risk of HIV infection

FSWs who ever used cigarettes, marijuana, heroin, cocaine, glue or petrol were significantly more likely to report ever having had an STI than non-lifetime users of these substances. More than three-quarters of respondents (77% or 228/297) had ever been tested for HIV, and more than half had been tested within the past 12 months. Among all FSWs, 41% perceived a medium to high risk of HIV acquisition. Among this group, 75% attributed the risk to multiple partners and less than 1% cited rape. In the last 6 months before the study, 43% of respondents had a session with a peer educator of the prevention programme 'Preventing STI/HIV transmission in coast targeting sex workers' with objectives to increase their knowledge on HIV prevention, increase condom use, reduce alcohol uptake and increase condom negotiation skills. Among all respondents, 55% had comprehensive knowledge of HIV/AIDS, defined as being able to simultaneously name abstinence, faithfulness to a non-uninfected partner and condom use as the main HIV-prevention methods, while at the same time having no misconceptions about HIV transmission (i.e. knowing that the virus is not acquired through mosquito bites or by sharing a meal with an infected person).

Discussion and conclusion

This study shows a higher prevalence of substance use among FSWs in Mombasa than that reported in Kenya's 2002 behavioural surveillance survey, which found that 38% of FSWs ever used *khat*, 19% ever used marijuana, 1% ever used petrol or glue, and 2% ever used cocaine or heroin (Kenya Ministry of Health, 2002). Among FSWs ever using alcohol and *khat*, those reporting multiple sexual partners and those perceiving a lower risk of HIV consistently engaged in greater STI/HIV risk-taking and self-reported having experienced more sexual violence. Though this last variable was not time-bound, a similar study conducted in Mombasa in 2006 revealed that 44% of FSWs binge drinkers reported sexual violence in the past 12 months (Chersich, Luchters, Malonza, Mwarogo, King'ola, & Temmerman, 2007).

Despite the fact that *khat* is considered to be a relatively safe substance, this study demonstrated some associations between its use by FSWs and their history of STIs as well as their HIV risk perception.

This survey established that FSWs in Mombasa who ever used alcohol and either *khat* or marijuana might be more vulnerable to the HIV infection than others. This vulnerability is expressed in a larger number of sex partners, inconsistent use of condoms with clients and greater exposure to sexual violence. Despite efforts by several programmes implemented in Mombasa to facilitate access to HIV prevention and education among FSWs, many are still engaging in substance use that leads them to inconsistent condom use and therefore increases their exposure to STIs, intimate partner violence, high levels of multiple sexual partnership and HIV/STIs infection. These findings corroborate those of a survey conducted among FSWs in Mombasa in 2006 which revealed that 'Binge-drinking patterns were associated with a higher number of sexual partners and increased risk of condom bursting' (Chersich, Luchters, Malonza, Mwarogo, King'ola, & Temmerman, 2007).

Determinations of appropriate risk-reduction strategies require more quantitative and qualitative research on the social and cultural context in which sex work and multi-substance use occurs. Simply promoting consistent condom use and partner reduction is unlikely to have a considerable effect on the HIV epidemic among FSWs. More effect might be expected if efforts also focus on harm-reduction strategies for substance use, in addition to strategies to curb the production and sale of socially accepted substances such as alcohol and *khat*. Unfortunately, interventions are hampered by widespread tolerance and legal impediments.

While several studies have associated substance use with risky sexual behaviour and HIV risk, we cannot draw a direct causal relationship between use of *khat* or marijuana (alone or in combination), their psychological and pharmacological effects and sexual risk-taking, because of this study's cross-sectional design.

Though the FSWs had few reservations about disclosing their practices relating to substance use, risky sexual behaviour or experiences with sexual violence, their consumption of illegal substances may have been underreported. Future studies could test and compare responses generated via ACASI (audio computer-assisted, self-interview) with those obtained by face-to-face interviews.

Further research is needed to better understand the social context within which FSWs engage in substance use and risky sexual behaviour and the factors that are drivers for engagement in sex work. Qualitative studies may help to establish the reasons why FSWs start using substances and why they continue to use them.

Other studies may also determine the accessibility and availability of these substances and explain the social networks relating to their use and distribution. This additional non-quantitative information would help programme planners to design integrated HIV and substance use prevention programmes.

Future quantitative studies should expand the sample size with more in-depth questions on substance use to strengthen the findings of this study, possibly focusing questions on recent use of substances and their consequences on sexual behaviours. This knowledge will enable policymakers to design more effective measures to control substance use among FSWs, a vulnerable and marginalised group.

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Footnotes

[1] Police are known to enjoy free services in exchange for protection from women who carry illegal trade like selling illicit brews in urban slums.

[2] In Kenya, Matatus are vans or mini-buses performing urban and inter-urban transportation. Matatu touts are the young Hip Hop, enjoying the lucrative informal sector transport industry in Kenya. The nature of their business guarantees them continuous expendable income, leading to a spending and luxury pattern of life unmatched by their unemployed peers.

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