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Levels of alcohol use and history of HIV testing among female sex workers in Mombasa, Kenya

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Abstract

HIV testing is a critical first step to accessing HIV care and treatment, particularly for high-risk groups such as female sex workers (FSWs). Alcohol use may be a barrier to accessing HIV services, including HIV testing. We analyzed data from a cross-sectional survey of 818 FSWs in Mombasa, Kenya, and estimated the association between different levels of alcohol use and having never tested for HIV. In multivariable analyses, higher levels of alcohol consumption were associated with having never tested for HIV (PR 1.60; 95% CI: 1.07, 2.40). Future interventions should explore whether reducing harmful drinking improves HIV testing among FSWs.

Keywords

HIV testing; alcohol use; female sex workers; HIV prevention

Introduction

HIV testing is the critical first step to accessing HIV care and treatment (Dilernia et al., 2013; Kilmarx & Mutasa-Apollo, 2013). Timely linkage to care and early initiation of antiretroviral therapy (ART) are essential to achieve virologic suppression and reduction in HIV transmission (Cohen et al., 2011; Govindasamy et al., 2011; MacPherson et al., 2012; Rosen & Fox, 2011). Test-and-treat HIV prevention strategies are increasingly being considered for a number of high-risk populations, including female sex workers (FSWs; Delva et al., 2012). For test-and-treat strategies to be effective, barriers to HIV testing need to be addressed.

FSWs in sub-Saharan Africa (SSA) are widely recognized as a critical population to target for HIV testing and prevention services (Braunstein et al., 2011; World Health Organization, 2005). The prevalence of HIV among FSWs in Mombasa is estimated between 30–35% (Luchters et al., 2010; van der Elst et al., 2009), compared with 4.3% among the general

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population (National AIDS and STI Control Programme, Ministry of Health, Kenya, 2013). Nearly 14% of new HIV infections are estimated to be attributable to sex with FSWs in Kenya (Kenya National AIDS Control Council, 2009). Despite the need for HIV testing among FSWs, voluntary counseling and testing has been reported as low as 7% (Abdelrahim, 2010). In Kenya, nearly 60% of FSWs report not knowing their HIV status (Luchters et al., 2008). Younger age, less education, and not having a regular sexual partner have been associated with decreased HIV testing among FSWs in Asia (Hong et al., 2012; Xu et al., 2011). Less is known about factors associated with HIV testing among FSWs in SSA.

Alcohol use among FSWs is high and has long been identified as a contributor to risky sexual behavior (Asiki et al., 2011; Kalichman, Simbayi, Kaufman, Cain, & Jooste, 2007; World Health Organization, Department of Mental Health and Substance Dependence, 2000; Zablotska et al., 2006). In Kenya, 30% of FSWs report drinking daily (Chersich et al., 2007). Alcohol use has been associated with an increased number of sexual partners, unprotected sex, inconsistent condom use, and sexual violence (Coldiron et al., 2008; Pitpitan et al., 2012; Weiser et al., 2006). Outcomes across the HIV care continuum, including sub-optimal ART adherence and loss to follow-up from HIV care, have also been linked to alcohol use (Deribe, Hailekiros, Biadgilign, Amberbir, & Beyene, 2008; Kenya et al., 2013; Nakimuli-Mpungu et al., 2012; Ohl et al., 2013). Alcohol use has previously been associated with HIV testing behavior and may play a role in failure to seek HIV testing (Fatch et al., 2012; Luseno & Wechsberg, 2009). However, little is known about the relationship between alcohol use and HIV testing among FSWs in SSA.

The goal of the present analysis was to investigate the association between levels of alcohol use and never having tested for HIV among FSWs who use alcohol in Mombasa, Kenya.

Methods

Data for the present analysis come from 818 women who completed the baseline interview of a longitudinal intervention to reduce alcohol use among FSWs in Mombasa, Kenya between October 2011 and October 2012. FSWs were enrolled from three community drop-in centers that provide condoms and routine HIV/sexually transmitted infection (STI) testing through US Agency for International Development's (USAID) AIDS, Population and Health Integrated Assistance Plus (APHIAplus) program. Participants were randomized to either a brief alcohol-reduction intervention or nutritional counseling and followed for 12 months. The goal of the intervention was to reduce alcohol consumption among FSWs; therefore, only women who regularly drank alcohol but were not alcohol dependent, self-reported being a FSW, were ≥18 years of age, and lived in Mombasa were eligible for inclusion in the intervention and present analysis. Participants received HIV and STI testing as part of the intervention at baseline, 6 and 12 months. Women were asked about HIV testing frequency regardless of HIV status. HIV incidence was a primary endpoint of the main study; therefore, lab-confirmed HIV status was prioritized and information on knowledge of HIV status was not collected. Baseline HIV status was used as a surrogate for knowledge of HIV status. All participants provided written informed consent and the study was approved

by the ethical review boards of the Kenyatta National Hospital in Kenya and FHI360 in the USA

Measures

Alcohol use during the past year was measured using the WHO-endorsed 10-item Alcohol Use Disorders Identification Test (AUDIT; Babor & Higgins-Biddle, 2001), which has been previously validated in Kenya (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). Women enrolled in the intervention had AUDIT scores from 7 to 19. In the present analysis, we used previously established definitions (Babor & Higgins-Biddle, 2001; MacAskill et al., 2011; Miller, Zweben, DiClemente, & Rychtarik, 1992) to categorized alcohol use into higher “harmful” alcohol use (AUDIT score 16–19), compared to lower “hazardous” alcohol use (AUDIT score 7–15; referent). Whether a participant had tested for HIV prior to enrolling in the study was self-reported at baseline. Confounders of interest included baseline age, education, number of children, number of sexual partners in the last 7 days, number of years as a FSW, and HIV status. Categorization of age and number of years as a FSW was based on quartiles. Very few women reported being currently married (3%) or living with a partner (8%); therefore, these variables were not included as confounders.

Statistical analysis

We used log-binomial and Poisson models with a robust variance estimator (Barros & Hirakata, 2003) to estimate the association between alcohol use and having never tested for HIV. Multivariable estimates were obtained using a Poisson model, due to convergence issues with the log-binomial model. In addition to all confounders, multivariable estimates included adjustment for the drop-in center attended. We conducted a sensitivity analysis restricted to HIV-uninfected women at baseline since knowledge of being HIV-infected could impact both testing behavior and alcohol consumption. All analyses were conducted using Stata 11 (StataCorp, College Station, TX).

Results

Women included in the study overall were young in age (30% aged 18–23); however, a higher proportion of women who had never tested for HIV were aged 31–54 (38% compared to 23%). The majority of women had little education (55% never attended school or only primary school) and had at least one child (81%). A higher proportion of women with no prior HIV testing reported >7 years of sex work, compared to women who had tested for HIV (31% compared to 24%). A higher proportion of HIV-infected women had never tested for HIV (29% compared to 19% of women who had tested; Table 1).

The prevalence of HIV among all FSWs in the study was 20%. Approximately, 11% of FSWs reported never having been tested for HIV prior to enrolling in the study. Among FSWs who had ever been tested, 45% reported testing every 3 months or more, 15% reported testing every 6 months, 12% reported testing every 1–3 years, and 16% reported testing only once.

In multivariable analyses, women who reported harmful alcohol consumption were 1.60 (95% CI: 1.07, 2.40) times as likely to have never tested for HIV, compared to women with

hazardous alcohol consumption. Being age 31 or older was independently associated with never having tested for HIV (PR 1.98; 95% CI: 1.06, 3.70), while having at least one child (PR 0.39; 95% CI: 0.24, 0.64) was associated with previous HIV testing (Table 2). In the sensitivity analysis restricted to HIV-uninfected women, the association between harmful drinking and having never tested for HIV was similar (PR 1.64; 95% CI: 1.00, 2.69).

Discussion

In this population of FSWs who consume alcohol, women who reported higher harmful drinking were significantly more likely to have never tested for HIV, compared to women who reported lower hazardous drinking. These results are consistent with previous evidence suggesting that alcohol use is associated with HIV testing behavior for women in SSA (Fatch et al., 2012; Luseno & Wechsberg, 2009). While the cross-sectional nature of our study precludes attributing causality, our results suggest that FSWs with harmful alcohol use may be more likely to have never tested for HIV.

Increasingly, alcohol use has been recognized as an important factor for a range of HIV outcomes, including HIV testing (Fatch et al., 2012; Gari et al., 2013; Peltzer & Mlambo, 2010), accessing ART(Arasteh & Des Jarlais, 2009) and ART adherence (Kenya et al., 2013; Lyimo et al., 2012; Nakimuli-Mpungu et al., 2012; Ohl et al., 2013). Brief interventions to reduce alcohol use and risky sexual behaviors, paired with HIV testing, have shown promise in the short term (Edelman et al., 2012). However, interventions with longer follow-up are needed to determine whether reducing alcohol use impacts HIV testing and sexual risk behaviors over time.

Older age has previously been associated with having received an HIV test among women in Kenya (Cherutich et al., 2012). In our study, older age was independently associated with having never tested for HIV, suggesting that efforts to test FSWs may be missing older FSWs. Having a child was associated with prior HIV testing, likely due to being tested during antenatal care (Cherutich et al., 2012; MacPhail, Pettifor, Moyo, & Rees, 2009). The relationship between alcohol use and HIV testing did not differ meaningfully when analyses were restricted to HIV-uninfected women, which may reflect the fact that HIV-infected women were unaware of their status prior to study enrollment.

Our study has several strengths and limitations. Strengths include the large sample of a high-risk population of FSWs attending drop-in centers in Kenya and the use of a validated measure of alcohol use. Limitations include the restricted range of alcohol use (AUDIT 7–19), the fact that alcohol use in the previous 12 months may not impact lifetime HIV testing behavior, inability to draw causal inference due to the cross-sectional design and use of HIV status as a surrogate for knowledge of HIV status.

HIV testing is a critical early step to accessing HIV care and treatment and is of particular importance for high-risk populations, such as FSW. In order to be effective, interventions to improve HIV testing need to target individuals least likely to get tested. In our analyses, individuals with higher levels of drinking were more likely to have never been tested for

HIV. Future interventions to improve HIV testing among FSWs should consider targeting individuals with higher levels of alcohol use.

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Table 1

Baseline alcohol use, demographic, and sexual behavior characteristics of 818 FSWs in Mombasa, Kenya, by HIV testing status.

Characteristics	Never tested for HIV *N* (%) *N* = 93 (11.4)	Ever tested for HIV *N* (%) *N* = 724 (88.6)	Total *N* (%) *N* = 818
Alcohol use			
Hazardous drinking (AUDIT 7–15)	51 (54.8)	477 (65.8)	528 (64.6)
Harmful drinking (AUDIT 16–19)	42 (45.2)	248 (34.2)	290 (35.5)
Age (years)			
18–23	30 (32.3)	215 (29.7)	245 (30.0)
24–26	14 (15.1)	193 (26.6)	207 (25.3)
27–30	14 (15.1)	149 (20.6)	163 (19.9)
31–54	35 (37.6)	168 (23.2)	203 (24.8)
Education			
Never attended school or primary school, any	52 (55.9)	397 (54.8)	449 (54.9)
Secondary or post-secondary school, any	41 (44.1)	328 (45.2)	369 (45.1)
Number of children[a]			
No children	24 (25.8)	101 (13.9)	125 (15.3)
≥1 child	65 (69.9)	597 (82.3)	662 (80.9)
Number of sexual partners in the last 7 days[a]			
0–2	52 (55.9)	421 (58.1)	473 (57.8)
3+	37 (39.8)	278 (38.3)	315 (38.5)
Number of years as a FSW			
≤2.50	29 (31.2)	180 (24.8)	209 (25.6)
2.51–4.00	16 (17.2)	188 (25.9)	204 (24.9)
4.01–7.00	19 (20.4)	186 (25.7)	205 (25.1)
>7.00	29 (31.2)	171 (23.6)	200 (24.5)
HIV status			
Negative	66 (71.0)	586 (80.8)	652 (79.7)
Positive	27 (29.0)	139 (19.2)	166 (20.3)

[a]Missing data by variable and HIV testing history: number of children: 4 (4.3%) never tested, 27 (3.7%) tested; number of sexual partners in the last 7 days: 4 (4.3%) never tested, 26 (3.6%) tested.

Table 2

Multivariable analysis of alcohol use and having never tested for HIV among FSWs in Mombasa, Kenya.

	PR (95% CI)[a]
Alcohol use	
Hazardous drinking (AUDIT 7–15)	1.00
Harmful drinking (AUDIT 16–19)	1.60 (1.07, 2.40)[b]
Age (years)	
18–23	1.00
24–26	0.87 (0.46, 1.63)
27–30	1.07 (0.55, 2.10)
31–54	1.98 (1.06, 3.70)[b]
Education	
Never attended school or primary school, any	1.00
Secondary or post-secondary school, any	0.85 (0.56, 1.30)
Number of children	
No children	1.00
≥1 child	0.39 (0.24, 0.64)[b]
Number of sexual partners in the last 7 days	
0–2	1.00
3+	1.11 (0.73, 1.67)
Number of years as a FSW	
≤2.50	1.00
2.51–4.00	0.65 (0.36, 1.17)
4.01–7.00	0.65 (0.37, 1.13)
>7.00	0.77 (0.43, 1.38)
HIV status	
Negative	1.00
Positive	1.38 (0.85, 2.25)

[a] Prevalence ratios adjusted for drop-in center and all other variables in the table.

[b] Indicates significant at the 0.05 level.