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Correlates of Sexually Transmitted Infection Testing Following Women's Release from Jail

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Abstract

Given incarcerated women's frequent transitions between jail and community, it is important to seize opportunities to provide comprehensive health care. A potential time to provide care might be when getting tested for sexually transmitted infections (STIs). Our objective was to determine the proportion of women receiving STI testing and correlates, following jail release. This secondary analysis was of one-year follow-up data from women who participated in a jail-based cervical health literacy intervention in three Kansas City jails from 2014–2016. Most (82%) completed the survey in the community. The analysis included 133 women. Mean age 35 years (19–58 years). Sixty-two percent obtained STI testing within one-year post-intervention. Using logistic regression this was associated with younger age (odds ratio [OR] = 0.87; 95% confidence interval [CI] 0.80, 0.95), receiving high school education (OR = 4.33; 95% CI 1.00, 18.74), having insurance (OR = 4.32; 95% CI 1.25, 14.89), no illicit drug use (OR = 0.09; 95% CI 0.01, 0.81), and no drinking problem (OR = 0.04; 95% CI 0.00, 0.45). In this study, many women sought STI testing following jail release. Clinicians/public health practitioners may find it useful to engage these high-risk women in broader women's health services seeking STI testing.

Keywords

Sexually transmitted infections; incarceration; jail; women's health

Introduction

Women with criminal justice histories bear a disproportionate burden of sexual health risks. They are twice as likely as women without criminal justice histories to test positive for sexually transmitted infections (STIs), two times as likely to have an unintended pregnancy,

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Declaration of Conflicting Interests

The authors declare that there is no conflict of interest.

four times as likely to have cervical cancer, three times as likely to have multiple recent partners, and five times as likely to report five or more sexual partners in the past year (Binswanger, Krueger, and Steiner 2009, Clarke et al. 2006, Rogers et al. 2012). As this vulnerable population leaves jail, many barriers exist to engagement in women's healthcare. In fact, many barriers exist prior to incarceration, but jail disconnects these women from their community and the healthcare services it provides. After leaving jail, because of the circumstances of women who move between jail and community, many of these women lack health insurance, stable housing and transportation, which limits their ability to obtain quality healthcare (Binswanger et al. 2011, Ahmed et al. 2016, Ramaswamy et al. 2015, Colbert et al. 2013). Additionally, previous literature has shown that incarceration itself is independently associated with healthcare disparities (Kulkarni et al. 2010).

Although women leaving jails are high-risk women disconnected from healthcare, they may actually have a greater need to access the healthcare system. It is important to note that jail stays, unlike prison, are short-term incarcerations, often housing women awaiting trial, conviction or sentencing, or with sentences of less than one year (Zeng 2018). Therefore, women in jail often move between the criminal justice system and the community. In theory, jail may serve as a critical public health opportunity, unfortunately though, in many jails, including the jails in which our study was conducted, women are only tested for STIs if they are symptomatic at intake and if testing is requested (McIntyre et al. 2009). At the locations of our study, women must also pay a \$5.00 co-pay for clinic visits.

National data about STI testing in the community is limited, but one national survey found about 25% of young adult women had been tested in the prior year (Cuffe et al. 2016). The Behavioral Model for Vulnerable Populations (BMVP) suggests that vulnerable populations, such as women leaving jail, have unique factors that affect an individual's use of health services, such as victimization, substance abuse, and competing needs (Gelberg, Andersen, and Leake 2000). While the BMVP is usually used within the context of homelessness, it has previously been applied to women re-entering the community following incarceration (Oser et al. 2016). These unique factors, along with this population's higher risk and need of health care services, makes it imperative that clinicians provide comprehensive care when interacting with women with criminal justice histories, as they are in frequent transition between incarceration and community and do not always seek preventive care. With potentially limited self-efficacy when re-entering the community, it is important to seize opportunities of health care engagement in women with criminal justice involvement. Understanding this high-risk population's use of STI testing and correlates of seeking such care may help improve both patient-physician encounters and public health interventions. Thus, the primary aim of this study was to determine the proportion of women who obtained STI testing following release from jail, as this may serve as an opportunity to address more health care issues than just STI testing. The secondary aim was to describe factors, adapted from the BMVP, associated with increased STI testing among women following release from jail.

Materials and Methods

Original Study

This study was a secondary analysis of data collected from women who participated in the Sexual Health Empowerment (SHE) project, a jail-based cervical health literacy intervention program. The SHE project was a five day, 10-hour intervention, waitlist control design, which took place at three Kansas City (Kansas and Missouri) jails, two urban and one suburban, between August 2014 and March 2016 (Ramaswamy et al. 2017). The waitlist control design allowed women initially assigned to the control group in week one to then be in the intervention group in week two, thus allowing all women to benefit from the education (Ramaswamy et al. 2017). The detailed intervention has been described in detail elsewhere (Ramaswamy et al. 2017). However, it is important to note, that although this curriculum focused on cervical health literacy which does include decreasing risk exposure (ie condom use), STI testing (the main outcome of this current analysis) was not stressed during the intervention. Cervical health literacy, as operationalized in the intervention, encompassed the knowledge, beliefs, self-efficacy, and confidence for obtaining cervical cancer screening and appropriate follow-up. The intervention, rooted in social and feminist theory, emphasized the reality of justice-involved women's lives, that is their trauma, drug use, and sex work histories (Ramaswamy et al. 2017). The SHE Project was found to be feasible and demonstrated that women in the intervention group, compared to the control, had increased knowledge about cervical health, reduced barriers to screening, reduced perception of seriousness of cervical cancer, reduced susceptibility to cervical cancer, and greater self-efficacy for cervical cancer screening (Ramaswamy et al. 2017). The study protocol was approved by the authors' institutional review board with written consent obtained from all participants prior to baseline survey.

Study Participants

In the original study, women were recruited by posting flyers and word-of-mouth recruitment from jail programming staff, jail case managers, correctional officers, and other participants (Ramaswamy et al. 2017). They were eligible to participate if they were 18 years old or older and anticipated to remain in jail for the entire week but were excluded if jail if they exhibited obvious psychological distress which would have made it impossible to obtain consent (Ramaswamy et al. 2017). The recruitment process entailed study staff showing up to the housing pods at the jail three days before recruitment to introduce themselves and describe the study. During this 5-minute introduction, study staff emphasized the low-risk nature of the education program on women's health and that women did not have to participate (Ramaswamy et al. 2017). If women were interested, they could sign up with their case worker at the jail or other programs staff. To minimize coercion, when study staff met with participants prior to study start, they explained during the consent process that the study was totally voluntary, they were not required to speak, could skip questions that made them uncomfortable and that women could leave at any time. No women left for this reason during recruitment. This was all reiterated after consent was obtained and throughout the study. Additionally, there was no mention of the incentive during the sign-up/recruitment process (Ramaswamy et al. 2017). All women wanting to participate were allowed to do so, except for one who was exhibiting obvious psychological distress at the time of the

intervention and would have been unable to provide informed written consent (Ramaswamy et al. 2017). Of the 283 women who signed up for SHE, 182 women took the baseline survey, completed the SHE Project, and were asked to complete a one-year post-intervention follow-up survey. Twenty-two did not provide consent (reasons unknown) and the rest were lost to attrition during the intervention (either released/transferred from jail prior to/during the intervention, where unavailable at the time of the intervention or the intervention was cancelled by research staff) (Ramaswamy et al. 2017). Participation rates were estimated to be about a quarter of all women incarcerated on any given day.

The 182 women who completed the SHE Project were asked to complete a one-year post-intervention follow-up survey. One hundred thirty-three (73%) women completed the one-year post-intervention surveys and were included in this secondary analysis. Eighty-two percent of women were in the community during the time of the one-year follow-up survey; 18% had been re-incarcerated and completed the survey in jail or prison. Women were compensated \$25 for participation in the baseline survey and intervention, and then \$50 for completing the one-year follow-up survey. To facilitate outreach for the one-year follow-up survey, participants performed quarterly check-ins to update their contact information, for which the women received \$10 per check-in.

Data Collection

The baseline survey, given prior to the SHE intervention, included 158 questions and was conducted in-person with paper and pencil (Ramaswamy et al. 2017). The one-year follow-up survey included 146 questions and was conducted in person in a community setting, by phone if participants preferred this method, or in the jail or prison for those who were re-incarcerated. Participants in state prisons were allowed to complete the survey through mail correspondence. All answers were self-reported.

Data Analysis

Variables for the current analysis were chosen based on the BMVP framework (predisposing factors, enabling factors, needs factors, and health service outcomes) and factors known to be associated with sexual health risk among women with criminal justice involvement (Oser et al. 2016). Specifically, those variables reflected life circumstances at one-year post-intervention follow-up. Along with the traditional predisposing factors, the vulnerable domain also includes homeless and victimization, thus the predisposing factors included in this study are: age in years, race/ethnicity (Black, White, Latina, or Other), education (high school or more vs. less than high school), employment (employed full-time, part-time, or on and off vs. no employment), living arrangement (steady housing vs homeless, shelter or institutionalized) and victim of intimate partner violence (IPV) within the past year (yes vs. no) (Oser et al. 2016). Enabling factors included: insurance status (has insurance vs. no insurance), recipient of public benefits (yes vs. no) and reliable source of transportation (yes vs. no) (Oser et al. 2016). Need factors include those of subjective and objective need regarding conditions of special importance to vulnerable populations such as mental health, substance abuse and STIs (Oser et al. 2016). Need factors included in this analysis: mental health diagnosis within the past year (yes vs. no), illicit drug use in the past 30 days (yes vs. no), drinking problem within the past year (yes vs. no), condom use at last sex (yes vs. no)

and exchange of sex for drugs, money, or life necessities within the past year (yes vs. no). Illicit drug use included methamphetamines, phencyclidine, heroin, cocaine and crack cocaine. Marijuana was not included as the effects are not as destructive. A drinking problem was defined as 7 drinks on a typical day in the past year per the World Health Organization (Babor et al. 2001). Lastly, health services outcomes included: STI testing within the past year (yes vs. no) and STI treatment (yes vs. no). Both STI testing and STI treatment were participant reported. STI testing was asked as a broad question and did not specify for which infections they were tested, as this was not the focus of the original study.

Additionally, the four SHE intervention components (cervical health knowledge, beliefs, self-efficacy and confidence navigating the health system) were also included as variables in this secondary analysis to test for intervention effect on the primary outcome. The intervention effect questions focused on knowledge, beliefs, self-efficacy and confidence around cervical health screening and follow up (Ramaswamy et al. 2017). Questions for knowledge, beliefs and self-efficacy were adapted from validated scales: Pap Knowledge Scale, Health Belief Model Scale for Cervical Cancer and Pap Smear Test, and Self-Efficacy Scale for Pap Smear Screening Participation (Fernández et al. 2009, Guvenc, Akyuz, and Açikel 2011, Hogenmiller et al. 2007). Three questions were derived from the SHE team's previous work about confidence navigating health systems that were specific for women with criminal justice involvement (Ramaswamy and Kelly 2015).

Descriptive statistics and bivariate tests were used to illustrate study variables and their associations with the primary outcome, STI testing within the past year. Then, logistic regression was conducted to identify specific (predisposing, enabling, need, and personal health practice) factors and intervention components (cervical health knowledge, beliefs, self-efficacy, and confidence) that significantly predict STI testing within the one-year follow-up period. Statistical significance was determined at 0.05 alpha level, and all analyses were conducted using SAS 9.3.

Results

Of the 182 women who participated in SHE, 133 (73.1%) completed the one-year post-intervention survey and were included in these analyses. Participants who completed the follow-up survey and those who were lost to follow-up did not differ in terms of baseline sociodemographic characteristics and sexual health risk factors—i.e., age ($p = 0.39$), race ($p = 0.29$), Hispanic ethnicity ($p = 0.98$), education ($p = 0.17$), employment ($p = 0.18$), mental health ($p = 0.88$), health insurance ($p = 0.60$), IPV ($p = 0.20$), drinking problem ($p = 0.75$), and condom use during the last intercourse ($p = 0.08$).

Of these 133 women, the mean age was 35.1 (± 9.6) years old with almost half being White (Table 1). Twenty-seven percent of the women were victims of IPV within the one-year follow-up period. Only a quarter (24.1%) used a condom the last time they had sex, and 12.8% had exchanged sex for drugs, money, or life necessities during the one-year follow-up period. Almost one-third (62.1%) of women reported a STI test within the one-year follow-up period. Of those with a positive STI test, 87.1% reported treatment of their STI.

The results of logistic regression predicting STI testing within one-year post-intervention (outcome) are summarized in Table 2. Although the individual variables included in the model did not have a significant bivariate correlation with the outcome ($r = -0.24$ – 0.27 , all $p > 0.05$), the variables together (i.e., the model) yielded large explainability (max-rescaled $R^2 = 0.41$), excellent discriminatory power (area under the curve [AUC] = 0.83), and adequate model fit ($\chi^2 [77] = 1.22$, $p = 0.09$). In this model, five variables were statistically significant at 0.05 alpha level. Specifically, the odds of receiving a STI test increased by 15% for each one-year decrease in age ($p < 0.01$)—younger women had increased odds of having a STI test. Participants were 4.33 times more likely to have a STI test if they received high school education or more ($p < 0.05$); 4.32 times when they had health insurance ($p < 0.05$); 3.44 times when they did not use illicit drugs ($p < 0.05$); and 25 times as likely to have a STI test when they did not have a drinking problem ($p < 0.01$). Nointervention components achieved statistical significance in predicting STI testing within one-year follow-up period (all $p > 0.05$).

Discussion

Despite barriers to health care, such as lack of insurance, homelessness, and mental illness, the present analyses found that close to one-third (62.1%) of women received a STI test within one-year after release from jail. The women engaged in high risk behaviors but demonstrated self-efficacy by seeking testing. Unfortunately, the literature has not always shown this group to be self-efficacious in health care seeking, because many underuse preventive services and health is often not a priority upon jail release (Nijhawan et al. 2010, Ramaswamy et al. 2015). This is important to note because locations at which these women obtain STI testing may serve as an opportunity to engage women in other forms of health care, such as preventive screening services and treatment of substance disorders.

Using the BMVP as a framework, factors associated with likelihood of receiving a STI test included younger age, having insurance, having a high school education or more, no illicit drug use and not having a drinking problem. In the United States, the highest rates of STIs are in adolescents and young adults, aged 15–24 years old (Centers for Disease Control and Prevention 2018). This is why the Centers for Disease Control and Prevention (CDC) recommends annual screening for all sexually active women under 25 years old, regardless of risk and only screening women aged 25 years and older if at increased risk (new sex partner, more than one sex partner, a sex partner with concurrent partners or a sex partner who has a sexually transmitted infection) (Workowski and Bolan 2015).

While it is not surprising that in our population being younger was associated with obtaining a STI test, it is interesting that our population, as a whole, was older than the age for recommended yearly STI screening, regardless of risk. Women were not asked why they received STI testing, as that was not the focus of the original study. But, the mean age of this population was 35 years old (± 9.6 years), which is older than the CDC recommended annual screening (up to 25 years old), and still almost two-thirds received STI testing. Therefore, these women were being tested because either they are at increased risk (as defined by the CDC), have a known exposure or were symptomatic. Our data has shown that women were engaging in risky behaviors such as use of drugs/alcohol, lack of condom, and exchange of

sex, all of which may necessitate STI screening. Prior literature has shown that incarcerated individuals have up to 32 times the rate of some STIs within one year after release from jail compared to the general population (Wiehe et al. 2015). The high rates of STIs following jail release coupled with other high risks behaviors suggests a jail-based/post-release intervention on STI risk reduction, may be beneficial from a public health perspective.

Having a drinking problem and illicit drug use was associated with women being less likely to obtain STI testing. Women without drinking problems or drug use may be more apt to seek medical care and be tested when needed. More importantly, the use of alcohol and drugs impairs judgment and puts women at risk for STIs, and this study shows these high-risk group of women are not getting tested as much as women without problematic drinking or illicit drug use. Clinicians who do care for women with substance abuse problems should have heightened awareness about their STI risk and provide STI testing in this group, as literature has shown an association between problematic drinking or illicit drug use and STIs (Cook and Clark 2005, Centers for Disease Control and Prevention 2020, Khan et al 2013). While it is important to consider broadening health care services at STI testing clinics, providing STI testing information and/or services at locations frequented by women with a substance abuse problem may be a way to engage this high-risk population and provided needed services.

Women with insurance were also more likely to have a STI testing within the one-year follow up period. This is not unexpected as having insurance allows women to go to free testing venues in addition to places where insurance is required and accepted. Studies have shown that having insurance not only increases access to but also consumption of health care and preventive services (Gaudette, Pauley, and Zissimopoulos 2018, Okoro et al. 2017). This study also found that women with at least a high school education were more likely to have a STI test within the one-year follow up. This could be because having a high school diploma allows women to have jobs which are more likely to offer health insurance than jobs that women without a high school degree have. As described above, women with health insurance were more likely to have a STI test.

Perhaps equally interesting was that being a woman who exchanged sex for drugs, money, or goods was not associated with increased STI testing. These women are at high risk for STIs, although this analysis did not find an association with STI testing. While this is discouraging, it is not unexpected. Women who engage in these risky behaviors may not prioritize sexual health care or not understand their behaviors place them at more risk. Also, access to healthcare in this marginalized group is limited and sexual health care is no exception. This notion is supported by a recent study that found sub-optimal access and barriers to healthcare among sex workers (Argento, Goldenberg, and Shannon 2019). Engaging these women at places they visit, such as venues in which women sell sex to provide STI testing, may be a good public health intervention to increase STI screening. This study did not find an association between IPV and STI testing within the one-year follow-up period. These results are not supported by previous literature which has demonstrated increased reproductive healthcare utilization among women who experience IPV (Brown, Weitzen, and Lapane 2013, Dichter et al. 2018, McCall-Hosenfeld, Chuang, and Weisman 2013, Prosman et al. 2012).

The limitations to this study are inherent to any secondary data analysis and patient self-report method. The questions on the one-year post intervention follow-up survey were mainly about cervical health literacy and not specific to STI risk and testing. Data was not collected on participant's time in the community since release. This may be associated with STI testing, as there are more opportunities for testing the longer women are free in the community. Additionally, women self-reported the receipt of STI testing. It is unknown if their self-report reflected what might be ascertained from medical records. Likewise, we do not know the reason for STI testing, for example whether it was for screening purposes or because symptomatic or exposure, or which STIs were tested. The abuse of prescription drugs was not included as illicit drug use despite the high prevalence of their abuse in justice involved women (Hall et al, 2018). Finally, the results of this study may not be generalizable, as jails were located within the Kansas City area only, but, our sample did include women from both urban and suburban jails and the ethnic/racial diversity of our population was similar to national jail samples (Zeng 2018). This study may not be generalizable outside of women with criminal justice involvement. Although 27% of the baseline cohort was lost to follow up, those lost did not differ in terms of sociodemographic characteristics and sexual health risk factors compared to the participants included in this secondary survey.

Conclusions

Incarcerated women are receiving STI testing following jail release. While this secondary data analysis was an exploratory study, its value potentially illuminates leverage points for public health and clinical interventions. Clinical venues where women obtain STI testing may also serve as venues ideal for providing broader preventive health services for women with criminal justice involvement. When clinicians see women with criminal justice involvement, it may be beneficial to consider and probe into these unique risk factors in these women's lives.

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Table 1.

Participant Characteristics at one-year post-intervention (N = 133)

Variable	<i>n</i>	(%)
<i>Predisposing Factors</i>		
Age, years (<i>Mean ± SD</i>)	35.1	9.6
Race		
White	64	(48.1)
Black	40	(30.1)
Other	25	(18.8)
Hispanic	11	(8.3)
High school education or more	91	(68.4)
Employed (full-time, part-time, or on-and-off)	57	(42.9)
Homelessness or institutionalized	29	(21.8)
Intimate partner violence	37	(27.8)
<i>Enabling Factors</i>		
Insured	63	(47.4)
Received public benefits	59	(44.4)
Reliable source of transportation	94	(70.7)
<i>Need Factors</i>		
Mental health problem diagnosis	82	(61.7)
Hard drug use	20	(15.0)
Drinking problem	10	(7.5)
Condom use during last intercourse	32	(24.1)
Exchange of sex for drugs, money, or life necessities	17	(12.8)
<i>Health Services Outcomes</i>		
STI test	82	(62.1)
STI treatment ^{<i>I</i>}	27	(87.1)

^{*I*}The number of women who had a positive STD test result (*n* = 31) was used as the denominator when calculating the percentage.

Table 2.

Parameter Estimates from the Logistic Regression Model for Predicting STI Testing within 1-Year Post-Intervention Variable

	<i>OR</i>	<i>95% CI</i>	<i>P</i>
<i>Predisposing Factors</i>			
Age (years)	0.87	0.80; 0.95	0.002
White (<i>Yes</i>)	0.92	0.16; 5.31	0.921
Black (<i>Yes</i>)	1.05	0.15; 7.32	0.964
Hispanic (<i>Yes</i>)	2.34	0.17; 31.87	0.523
High school education or more (<i>Yes</i>)	4.33	1.00; 18.74	0.050
Employed (<i>Yes</i>)	0.45	0.11; 1.89	0.278
Homelessness or institutionalized (<i>Yes</i>)	2.03	0.37; 11.17	0.416
Intimate partner violence (<i>Yes</i>)	3.08	0.73; 12.88	0.124
<i>Enabling Factors</i>			
Insured (<i>Yes</i>)	4.32	1.25; 14.89	0.020
Received public benefits (<i>Yes</i>)	1.21	0.37; 4.01	0.753
Reliable source of transportation (<i>Yes</i>)	0.21	0.04; 1.29	0.092
<i>Need Factors</i>			
Mental health problem diagnosis (<i>Yes</i>)	2.69	0.76; 9.59	0.126
Hard drug use (<i>Yes</i>)	0.09	0.01; 0.81	0.032
Drinking problem (<i>Yes</i>)	0.04	0.00; 0.45	0.009
Condom use during last intercourse (<i>Yes</i>)	0.54	0.14; 2.15	0.380
Exchange of sex (<i>Yes</i>)	0.32	0.04; 2.52	0.278
<i>Women's Health Literacy Scores</i>			
Knowledge	0.70	0.46; 1.06	0.088
Benefit	1.04	0.31; 3.50	0.952
Barrier	1.06	0.22; 5.04	0.944
Seriousness	0.69	0.27; 1.75	0.434
Susceptibility	0.80	0.37; 1.74	0.569
Motivation	1.53	0.65; 3.59	0.328
Self-efficacy	0.56	0.21; 1.48	0.246
Confidence	0.62	0.27; 1.44	0.268

OR = odds ratio; CI = confidence interval.

Note. *p* values less than 0.05 are in boldface.