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HIV and STI knowledge, testing, and risk among adult crack users in Mexico City: Baseline findings from a feasibility study

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Abstract

Recent research has documented crack cocaine's increasing spread in Mexico, which is likely to contribute to the rapid transmission of HIV and other sexually transmitted infections (STIs). In Mexico, crack use is increasing most rapidly in vulnerable, hard to reach populations, where little is known about risk behaviors. This report aims to present baseline data regarding HIV and STI knowledge and testing prevalence from an innovative projection mapping HIV intervention, in which 3-D illusions, animation, and visual text graphics and sound are projected onto buildings with health messages that were designed to disrupt everyday life and connect with the target population. Fifty-eight men and women who used crack in the past month without receiving drug treatment were recruited and interviewed before the projection mapping intervention took place. Testing instruments included a socio-demographic assessment, drug use and treatment profile, HIV and STI knowledge questionnaires, and a sex and drug risk assessment. The mean scores for

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respondents on the HIV Knowledge Questionnaire (10.5 out of 18, 58.3%) and STD Knowledge Questionnaire (9.5 out of 27, 35.2%) were both low. Respondents also reported high rates of sexual risk behaviors, with 73% reporting never using a condom and 64% never being tested for HIV. This report provides a portrait of STI and HIV risk among a vulnerable population in Mexico City and the need for urgent interventions to prevent the spread of STIs and HIV. The associated projection mapping intervention will seek to increase HIV and STI knowledge and reduce risk in this hard to reach population.

Keywords

Condoms; Knowledge; HIV; HIV Testing; Intervention Studies; Sexually Transmitted Infections

Introduction

Recent research has documented an emergent crack cocaine diffusion in Mexico (Valdez et al., 2015). Psychopharmacological effects of crack smoking are associated with increased infections and sexual risk practices (Narvaez et al., 2004; Khan et al., 2013; Fischer et al 2013), thus users in Mexico are approaching an epidemic that can contribute to a rapid transmission of HIV, viral Hepatitis, and sexually transmitted infections (STIs). Although Mexico's national HIV prevalence (.3%) is low (USAID, 2016), almost 60% of HIV/AIDS infected people do not know their infection status (PAHO 2012). While government-funded community facilities provide testing and treatment, substantial barriers prevent crack users from services including accessibility in isolated and marginalized communities, social stigma, punitive drug laws and limited knowledge (Valdez et al., 2015). Thus, prevention efforts among crack smokers should be a public health priority.

Although crack use has been documented in this highly marginalized population in Mexico City, little is known about HIV/STI knowledge, testing, and risk behaviors. *Tirando Esquina: Interviniendo Muros de Salud* (TE:IMS), is an innovative intervention providing a "behavioral nudge" promoting HIV health seeking behaviors to active crack smokers in Mexico City. Using projection mapping technology, in which 3-D illusions, animation, and visual text graphics and sound are projected onto buildings, health messages were designed to disrupt everyday life and connect with the target population. Health materials and safe smoking supplies (i.e., crack kits) were also distributed. This brief public health report presents a baseline profile of HIV/STI knowledge, testing, and risk among crack users in Mexico City to identify future intervention targets.

Methods

A street-based sample of 58 adult crack users in a highly impoverished *colonia* (neighborhood) of the Iztapalapa *delegación* in Mexico City were recruited for TE:IMS between June–July 2015. Using elements of chain referral and snowball sampling techniques, trained field interviewers recruited participants with the following inclusion criteria: 18 years of age or older; residing in the *delegación*; self-report crack use at least once in the past month and no participation in formal drug treatment in previous 30 days.

Participants were surveyed at baseline to effectively assess preexisting knowledge, medical history, and risk behaviors.

Surveys were conducted in Spanish, lasted 20–30 minutes, and took place in a private space in the field, free from frequent interruptions (i.e. field staff car, park bench, playground, etc.). Data collected included:

Sociodemographics included age in years, a binary gender variable (1=male, 2=female), and marital status. Employment was characterized as full or part-time with regular or irregular hours. A binary incarceration variable of ever incarcerated (1=yes, 0=no) was used. *Drug Use* frequency included past 30 days and lifetime for drugs, such as marijuana, crack, inhalants, heroin, etc. Lifetime *drug treatment* was a binary variable (1=yes, 0=no). *Sexual risk behaviors* was assessed by the individual's number of partners and condom use frequency during the last 30 days. Preexisting knowledge was measured using the HIV Knowledge Questionnaire (HIV-KQ-18) (Carey & Schroder, 2002) and the Sexually Transmitted Diseases Knowledge Questionnaire (STD-KQ-27) (Jaworski & Carey, 2007), respectively (See Table 2). *Testing* of HIV, Hepatitis B, and Hepatitis C was determined by the respondent's answer to "Have you ever been tested for [infection]?" with the most recent test date collected. If tested, infection status was the result of the most recent test (1=positive, 0=negative). STI infection was determined by the answer to "To the best of your knowledge, have you ever had [infection]?" (0=no, 1=yes). STI's assessed included gonorrhea, chlamydia, syphilis, herpes, and genital warts or HPV. All study protocols and recruitment were approved by the Institutional Review Board at the University of Southern California.

Descriptive and frequency analyses were performed on baseline data using SPSS Statistics 22. HIV/STI knowledge scores were calculated by summing the number of correct answers (True/False) in the HIV-KQ-18 and STD-KQ-27. Independent sample t-tests evaluated the association between knowledge and HIV testing.

Results

A total of 52 male and 6 female crack users completed baseline interviews. Ages ranged from 17 to 69 with a mean age of 39.7 years (*S.D.* = 12.0). Table 1 includes socio-demographic characteristics, drug and sexual risk behaviors and treatment history. Overall, this sample demonstrates low knowledge of HIV and STIs. Of 18 true/false questions specific to HIV, the average number of correct responses is 10.4 (median = 11, interquartile range (IQR) = 8 to 13) with a pass rate (70% of items correct) of 30%. Thus, 70% of participants demonstrated insufficient knowledge of HIV transmission. On average, participants got 58% of items correct. An item-level analysis (Table 2) reveals that there are 5 items where less than half of participants answered correctly with one item - a woman cannot get HIV if she has sex during her period - having exactly 50% correct responses. Participants had exceptionally low knowledge about transmission through coughing and sneezing, signs of HIV, condom types, HIV testing, and the consequences for babies born to mothers with HIV.

STI knowledge was even lower. Out of 27 true/false items participants averaged 9.5 correct responses (median = 10, IQR = 7 to 13). Participants averaged 35% correct items and the highest percent correct is 59%. All of the 58 participants demonstrated insufficient knowledge of STIs. An item-level analysis (Table 2) reveals 21 items were answered correctly by less than 50% of participants and 7 items were answered correctly by less than 20% of participants. These items concern transmission methods and symptoms such as an individual can tell by the way their body feels that they have a STI and a man must have vaginal sex to get genital warts. When the HIV-KQ-18 and STD-KQ-27 are combined, the average correct among this sample is 44% (Table 2).

Regarding services utilization, less than half of participants reported HIV testing (46%), with their most recent test ranging from 0 to 8 years and an average of 2.6 years ago. Only 15% and 10% reported hepatitis B and hepatitis C testing, respectively. No participants reported HIV infection while 2 reported viral hepatitis. Seven participants self-reported infection with one or multiple STIs in their lifetime including Gonorrhea, Syphilis, Herpes, and HPV/genital warts. Participants with a higher percentage of correct responses on the combined HIV/STI knowledge questionnaires were more likely to have had an HIV test (49% vs. 40%, $t = 2.07$, $p < 0.05$).

Discussion

This brief public health report provides a descriptive profile of baseline knowledge, testing, and risk among a sample of adult crack users in Mexico City. The low general knowledge of HIV/STIs is disconcerting given the high levels of drug and sex related risk for transmission and infection coupled with their low levels of testing.

Findings indicate low HIV knowledge. While not directly comparable, in a sample of Puerto Rican and Mexican adults in the United States none of the 12 HIV knowledge items used had less than 50% correct responses and participants answered 78% of items correctly, on average (Loue, Cooper, & Fiedler, 2003). In a sample of adolescents in León, Nicaragua, 44% indicated insufficient knowledge of HIV (Manji, Pena, & Dubrow, 2007). Finally, young urban drug users in Vancouver, Canada had a median of 15 correct responses using the HIV-KQ-18 (Johnston et al., 2011). Compared to these other international contexts, participants in this study demonstrate very poor HIV knowledge.

Similarly, this sample demonstrated lower STI knowledge than other groups. In a study of college students using the 27-item STD-KQ in Portugal, authors report that 52% of participants had insufficient knowledge while 30% answered between 15 and 25 questions correctly (Pereira & Carmo, 2014). Among U.S. black men who have sex with men in Massachusetts, participants answered an average of 16.8 of 27 questions correctly (Mimiaga et al., 2009). These low levels of HIV/STI knowledge are particularly concerning given testing and sexual risk behaviors. While higher knowledge was associated with HIV testing, this finding may be limited by the overall low knowledge of the sample and the lack of accessible HIV/STI testing and services. Future research should provide blood and urine testing to assess objective infection status.

Generalizability is limited to samples and settings identified in this manuscript. Findings require further epidemiological study to estimate the prevalence and nature of HIV/STI knowledge and related infection and testing status. In addition, the relatively small predominantly male sample, requires further study of crack smokers with larger diverse samples in diverse regions in Latin America.

The present phase one feasibility intervention will seek to increase knowledge while reducing HIV/STIs myths, reduce behavioral risk through a risk-reduction approach, and increase testing and treatment among this high risk group. Future work with this population needs to consider Latina's circumstances characterized by high levels of stigma, trauma and victimization in a patriarchal context that creates unique barriers in seeking out HIV and related health services. Considering the findings, innovative public health interventions should target crack users in low resource areas in impoverished areas of Mexico City. Forthcoming articles will evaluate the effectiveness of the TE:IMS projection mapping intervention on HIV/STI knowledge and risk behaviors. If successful, the intervention will be taken to scale.

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References

- Carey MP, Schroder KEE. Development and psychometric evaluation of the brief HIV knowledge questionnaire. *AIDS Education and Prevention*. 2002; 14(2):172–182. [PubMed: 12000234]
- Fischer B, Santos Cruz M, Bastos FI, Tyndall M. Crack across the Americas - A massive problem in continued search of viable answers: Exemplary views from the north (Canada) and the south (Brazil). *The International Journal of Drug Policy*. 2013; 24(6):631–633. [PubMed: 24120442]
- Jaworski BC, Carey MP. Development and psychometric evaluation of a self-administered questionnaire to measure knowledge of sexually transmitted diseases. *AIDS and Behavior*. 2007; 11:557–574. [PubMed: 17016760]
- Johnston CL, Marshall BDL, Qi J, Zonneveld CJ, Kerr T, Montaner JSG, Wood E. HIV knowledge and perceptions of risk in a young, urban, drug-using population. *Public Health*. 2011; 125:791–794. [PubMed: 21996528]
- Khan MR, Berger A, Hemberg J, O'Neill A, Dyer TP, Smyrk K. Non-injecting and injection drug use and STI/HIV risk in the United States: The degree to which sexual risk behaviors versus sex with an STI-infected partner account for infection transmission among drug users. *AIDS and Behavior*. 2013; 17(3):1185–1194. [PubMed: 22890684]
- Loue S, Cooper M, Fiedler J. HIV knowledge among a sample of Puerto Rican and Mexican men and women. *Journal of Immigrant Health*. 2003; 5(2):59–65. [PubMed: 14512759]
- Manji A, Pena R, Dubrow R. Sex, condoms, gender roles, and HIV transmission knowledge among adolescents in Leon, Nicaragua: Implications for HIV prevention. *AIDS Care*. 2007; 19(8):989–995. [PubMed: 17851995]
- Mimiaga MJ, Reisner SL, Cranston K, Isenberg D, Bright D, Daffin G, ... Mayer KH. Sexual mixing patterns and partner characteristics of black MSM in Massachusetts at increased risk for HIV infection and transmission. *Journal of Urban Health*. 2009; 86(4):602–623. [PubMed: 19466554]

- Narvaez JC, Jansen K, Pinheiro RT, Kapczynski F, Silva RA, Pechansky F, Magalhaes PV. Violent and sexual behaviors and lifetime use of cocaine: A population-based study in Brazil. *Social Psychiatry and Psychiatric Epidemiology*. 2014; 49(8):1249–1255. [PubMed: 24519271]
- Pan American Health Organization. *Health in the Americas: Country Edition*. Washington, DC: Pan American Health Organization; 2012. Mexico.
- Pereira H, Carmo A. Sexually transmitted diseases: Knowledge and perceived prevalence of symptoms in university students. *International STD Research and Reviews*. 2014; 2(1):1–11.
- Strathdee SA, Magis-Rodriguez C. Mexico's evolving HIV epidemic. *Journal of the American Medical Association*. 2006; 300(5):571–573.
- USAID. HIV/AIDS: Mexico. 2016. Mar 2, Retrieved from <https://www.usaid.gov/mexico/hiv/aids>
- Valdez A, Kaplan C, Nowotny KM, Natera-Rey G, Cepeda A. Emerging patterns of crack use in Mexico City. *International Journal of Drug Policy*. 2015; 26(8):739–745. [PubMed: 26003928]

Table 1

Sociodemographic Characteristics, Drug Use, Sexual Risk Behaviors, and Treatment History (%) (n=58)

Male	90
Average Age	39.7
Type of Residence	
House	60
Apartment	24
Room	14
Employment Status	
Stable full or part-time job	31
Part-time job with irregular hours	57
Student	3
Unemployed	9
Sector of Employment	
Transportation & Material Moving	23
Construction	18
Sales (Formal and Informal)	16
Production of goods	15
Food Service	7
Other	21
Influence of Religion	
Very influential	48
Somewhat influential	19
Slightly influential	17
Not at all influential	16
Lifetime Incarceration	52
Drug Use in Last 30 Days	
Marijuana	62
Inhalants	21
Hypnotics (Prescriptions)	12
Powdered Cocaine	5
Hallucinogens	2
Polydrug Use	70
Frequency of Crack Use	
Daily	33
Weekly	43
Monthly	24
Lifetime Drug Treatment	51
Sexual Behaviors in Last 30 Days	
Sexually Active	71
Average number of partners	2.1
Condom Use	

Never	73
Sometimes	16
Always	11

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Table 2

Percent Correct Responses to Items Assessing HIV & STI Knowledge (n=58)

HIV Knowledge Items (HIV-KQ-18)		Right (%)
1	Coughing and sneezing do not spread HIV. (T)	36.2
2	A person can get HIV by sharing a glass of water with someone who has HIV. (F)	81.0
3	Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex. (F)	63.8
4	A woman can get HIV is she has anal sex with a man. (T)	75.9
5	Showering, or washing one's genitals/private parts, after sex keeps a person from getting HIV. (F)	74.1
6	All pregnant women infected with HIV will have babies born with AIDS. (F)	8.6
7	People who have been infected with HIV quickly show serious signs of being infected. (F)	45.6
8	There is a vaccine that can stop adults from getting HIV. (F)	60.3
9	People are likely to get HIV by deep kissing, putting their tongue in their partner's mouth, if their partner has HIV. (F)	53.5
10	A woman cannot get HIV if she has sex during her period. (F)	50.0
11	There is a female condom that can help decrease a woman's chance of getting HIV. (T)	70.7
12	A natural skin condom works better against HIV than does a latex condom. (F)	27.6
13	A person will not get HIV if she or he is taking antibiotics. (F)	67.2
14	Having sex with more than one partner can increase a person's chance of being infected with HIV. (T)	91.4
15	Taking a test for HIV one week after having sex will tell a person if he or she has HIV. (F)	27.6
16	A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV. (F)	67.2
17	A person can get HIV from oral sex. (T)	75.9
18	Using Vaseline or baby oil with condoms lowers the chance of getting HIV. (F)	62.1
Mean = 57.7%; Median = 61.1%; IQR = 44.4%–72.2%; $\alpha = 0.76$		
STI Knowledge Items (STD-KQ-27)		Right (%)
1	Genital Herpes is caused by the same virus as HIV. (F)	37.9
2	Frequent urinary infections can cause Chlamydia. (F)	13.8
3	There is a cure for Gonorrhea. (T)	77.6
4	It is easier to get HIV if a person has another sexually transmitted disease. (T)	65.5
5	Human Papillomavirus (HPV) is caused by the same virus that causes HIV. (F)	44.8
6	Having anal sex increases a person's risk of getting Hepatitis B. (T)	36.2
7	Soon after infection with HIV, a person develops open sores on his or her genitals (penis, vagina). (F)	13.8
8	There is a cure for Chlamydia. (T)	34.5
9	A woman who has Genital Herpes can pass the infection to her baby. (T)	65.5
10	A woman can look at her body and tell if she has Gonorrhea. (F)	13.8
11	The same virus causes all of the sexually transmitted diseases. (F)	48.3
12	Human Papillomavirus (HPV) can cause Genital Warts. (T)	43.1
13	Using a natural skin (lambskin) condom can protect a person from getting HIV. (F)	29.3
14	Human Papillomavirus (HPV) can lead to cancer in women. (T)	65.5
15	A man must have vaginal sex to get Genital Warts. (F)	15.5
16	Sexually transmitted diseases can lead to health problems that are usually more serious for men than women. (F)	27.6
17	A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina. (F)	1.7
18	If a person tests positive for HIV the test can tell how sick the person will become. (F)	25.9

HIV Knowledge Items (HIV-KQ-18)		Right (%)
19	There is a vaccine available to prevent a person from getting Gonorrhea. (F)	34.5
20	A woman can tell by the way her body feels if she has sexually transmitted disease. (F)	15.5
21	A person who has Genital Herpes must have open sores to give the infection to his or her sexual partner. (F)	31.0
22	There is a vaccine that prevents a person from getting Chlamydia. (F)	24.1
23	A man can tell by the way his body feels if he has Hepatitis B. (F)	15.5
24	If a person had Gonorrhea in the past he or she is immune (protected) from getting it again. (F)	43.1
25	Human Papillomavirus (HPV) can cause HIV. (F)	32.8
26	A man can protect himself from getting Genital Warts by washing his genitals after sex. (F)	55.2
27	There is a vaccine that can protect a person from getting Hepatitis B. (T)	39.7
Mean = 35.2%; Median = 37.0%; IQR = 25.9%–49.1%; α = 0.73		
Total HIV/STI Knowledge (combined HIV-KQ-18 and STD-KQ-27)		
Mean = 44.1%; Median = 48.9%; IQR = 35.6%–55.6%; α = 0.84		