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The Intersection of Violence, Substance Use, Depression, and STDs: Testing of a Syndemic Pattern among Patients Attending an Urban STD Clinic

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Abstract

Objectives—High rates of psychosocial and health problems have been identified among patients attending sexually transmitted disease (STD) clinics, who are disproportionately urban, low-income, and racial/ethnic minorities. This study sought to determine whether these problems co-occurred, and whether they indicated the presence of a syndemic.

Methods—Patients (*N* = 1557, 46% female, 64% African American) attending an urban STD clinic completed a computerized survey assessing childhood sexual abuse (CSA), depressive symptoms, binge drinking, marijuana use, intimate partner violence (IPV), and sexual risk behavior. Medical records were reviewed to determine incident STD diagnosis.

Results—The psychosocial and health problems were interrelated. Endorsing more psychosocial problems was associated with a greater likelihood of having multiple sexual partners and STD diagnosis. Interactions between CSA and marijuana use, and between CSA and IPV, predicted STD diagnosis.

Conclusions—Numerous psychosocial and health problems co-occur among urban STD clinic patients. There was some evidence of a syngergistic relationship (i.e., a syndemic) between these conditions, resulting in worsened sexual health outcomes. Health care needs to be multidisciplinary to address the multiple psychosocial and health problems faced by STD clinic patients. Research needs to identify factors that may underlie these comorbid conditions.

Keywords

STD; Violence; Substance use; Depression; Sexual risk behavior

Background

Leading social scientists have argued that the racial disparities in health outcomes in the U.S. reveal a public health syndemic.[1] In public health, a syndemic refers to a set of co-occurring psychosocial health conditions or diseases; one of the key requirement of a syndemic is that these conditions interact, resulting in magnified or worsened health consequences.[2] The conditions that interact may be biological, as in the case of the sexually transmitted disease (STD)/HIV syndemic, where STDs facilitate the acquisition and the transmission of HIV,[3] or the conditions may be psychosocial. Syndemics theory postulates that a common cause, such

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as poverty or discrimination, underlies the co-occurring conditions in a syndemic.[4] If syndemics are to be addressed and prevented, the underlying conditions that led to the syndemic must be identified and addressed.[5]

Several syndemics associated with HIV have been postulated. In qualitative interviews with women reporting sex trading, Romero-Daza, Weeks, and Singer[6] identified a cycle linking violence, substance use, trauma, and HIV. Studies with men who have sex with men (MSM) have identified substance use, psychological distress, partner violence, sexual assault, child sexual abuse, sexual risk behavior, and HIV as co-occurring conditions in this population; moreover, endorsing more of these psychosocial risk factors was associated with greater odds of engaging in sexual risk behavior and being HIV positive, suggesting that these co-occurring conditions additively increase the risk of HIV.[7,8] However, none of these studies investigated whether the co-occurring conditions interacted to result in worsened negative sexual health outcomes.

Patients attending public STD clinics, who tend to be disproportionately low socioeconomic status (SES) and African-American, often report numerous psychosocial and health problems, suggesting that there may be a syndemic among these patients. For example, patients tend to report high levels of sexual risk behavior,[9,10] and to have higher rates of HIV and other STDs compared to individuals in the general population.[11] Patients attending STD clinics also report high rates of depression and other mental health symptoms[12–14] and substance misuse[15,16] as well as histories of intimate partner violence (IPV)[17,18] and childhood sexual abuse.[19,20] Further, many of these problems co-occur; for example, engaging in sexual risk behavior and STD diagnosis have been associated with IPV,[21–23] depression and mental health problems,[14,24–27] child abuse,[20,28,29] and substance use.[15,16,30–33] Child abuse is associated with IPV,[21,34] depression and mental health problems,[35–37] and substance use.[38,39] IPV is associated with mental health problems[36,40] and substance use;[41–43] depression and other mental health problems are associated with substance use.[41,44]

Thus, previous research demonstrates that child abuse, partner violence, mental health problems, substance use, and sexual risk behavior frequently co-occur among STD clinic patients, raising the possibility that these inter-related problems represent a syndemic. However, before a syndemic can be identified, research needs to determine whether the interactions among these co-occurring psychosocial and health problems exacerbate or worsen the problems associated with the syndemic. Previous studies have investigated the *additive* effects of different psychosocial and health conditions on STD/HIV risk but, to our knowledge, no previous studies have investigated whether there are *interactive* effects of these psychosocial and health conditions on STD/HIV risk, which is one of the key features of a syndemic. Therefore, the purposes of this study were: (a) to determine whether child sexual abuse (CSA), IPV, depression, substance use, sexual risk behavior, and STD diagnosis were co-occurring problems among patients attending an STD clinic; and (b) to determine whether the interaction of these psychosocial problems (i.e., CSA, IPV, depression, and substance use) was associated with higher rates of sexual risk behavior and STD diagnosis among STD clinic patients (i.e., to determine whether there was a syndemic). We hypothesized that (a) CSA, IPV, depression, substance use, sexual risk behavior, and STD diagnosis would be inter-related, and (b) the two-way interactions between CSA, IPV, depression, and substance use would predict sexual risk behavior and STD diagnosis, such that individuals who reported both of the psychosocial/health conditions would have a greater likelihood of having multiple partners and being diagnosed with an STD than those who reported one or none of the psychosocial/health conditions.

Methods

Participants

Participants were patients attending a walk-in, publicly-funded STD clinic in a medium-sized, northeastern city. All had been recruited to participate in a randomized controlled trial of several risk reduction interventions.[45] To be eligible for the RCT, patients had to: (a) be age 18 or older; (b) capable of providing informed consent; (c) have engaged in sexual risk behavior in the past 3 months (i.e., used condoms less than 100% of the time; and, had sex with more than one person, or had sex with a partner who had sex with others, who injected drugs, or who was diagnosed with an STD); and (d) willing to take an HIV test. Of the 2683 patients who were eligible for and invited to participate in the study, 1557 (58%) agreed to participate.

The sample was 46% female (n = 719), and 64% African American (n = 1003). The average age of participants was 29.2 years (SD = 9.6 years), and most were single (78%; n = 1213). More than one-half of the sample was unemployed (51%; n = 796); 62% had a high school education or less (n = 967), and 56% reported an income of < $15,000 per year ($n$ = 875).

Procedures

Patients were screened by a trained Research Assistant (RA) to determine eligibility (i.e., age 18 or older, not impaired mentally, and had engaged in sexual risk behavior in the past 3 months). The RA explained the study to eligible patients; written, informed consent was obtained from those who were interested in participating. Patients were then asked to complete a calendar of important events over the past 3 months, to orient them to the time frame for many of the questions. Patients then completed a computerized survey, which included questions about CSA, depressive symptoms, substance use, IPV, and sexual behavior. Patients also gave permission for their clinic medical records to be reviewed. They were reimbursed $20 for their time. All procedures were approved by the IRBs of the participating institutions.

Measures

Demographics—Participants were asked to report their age (in years), gender (0 = female; 1 = male), education (recoded 0 = at least some college; 1 = high school or less), income (recoded 0 = ≥ $15,000/year; 1 = < $15,000/year), employment (recoded 0 = employed; 1 = unemployed), and race (recoded 0 = non-Caucasian; 1 = Caucasian).

Predictors

Childhood sexual abuse. (CSA): Using items adapted from Finkelhor,[46] participants indicated which sexual activities (kissing, fondling, receiving oral sex, giving oral sex, vaginal sex, anal sex, or none of the above) they experienced: (a) before age 13 with someone 5 or more years older; (b) between ages 13 and 16 with someone 10 or more years older; and (c) before age 17, where the experience involved force or coercion. Participants who reported oral, vaginal, or anal sex before age 13 with someone 5 or more years older, between ages 13 and 16 with someone 10 or more years older, or before age 17 involving force were considered to have experienced CSA (coded 1); participants who did not report these experiences were considered non-sexually abused (coded 0). These questions have been used in previous research conducted at the clinic. Participants classified as having experienced CSA based on responses to these questions reported higher rates of adult sexual risk behavior, supporting the validity of the questions.[20,47]

Depressive symptoms: The Center for Epidemiologic Studies Depression Scale, Short Form (CESD)[48] was used to assess depressive symptoms. Participants responded to 9 items (e.g., “During the past week, I felt sad.”) on a 4-point scale, from “rarely or none of the time (less

than 1 day)" to "most or all of the time (5–7 days)." Items were scored so that a higher score indicated more depressed affect. Consistent with prior research, responses of rarely/none or some/little were given a score of 0 whereas responses of occasionally/moderate or most/all were given a score of 1; responses were summed, and participants who endorsed 4 or more items were considered depressed (coded 1; non-depressed were coded 0).[49] Previous research has found good internal consistency reliability and validity for the CESD.[48,49]

Substance use: Using standard items, we assessed binge drinking[50] by asking participants, "How many times during the past 3 months did you have five [four for women] or more drinks on one occasion?" Those who reported at least one occasion on which they consumed five or more drinks (four or more for women) were considered to have engaged in binge drinking (coded 1; those not reporting binge drinking were coded 0).[51] This measure of binge drinking is associated with more alcohol-related problems, supporting its validity.[52]

Participants were also asked, "In the past 3 months, how often have you used marijuana (hash, THC)?"; response options were on a 5-point scale from "about every day" to "never." Participants who reported any marijuana use in the past 3 months (i.e., any response other than "never") were classified as having used marijuana (coded 1; those who reported never using marijuana were coded 0). We chose this classification because research has found that any marijuana use, regardless of the level of use, was associated with sexual risk behavior.[53]

Intimate partner violence: Participants who indicated that they had been hit, kicked, punched, or otherwise hurt by a current or former sexual partner in their lifetime were considered to have experienced IPV. In addition, participants who indicated that a current or previous partner ever threatened them, or prevented them from engaging in a variety of activities, such as seeing friends or getting a job, were considered to have experienced IPV (coded 1; participants not reporting IPV were coded 0). Items have been used in previous research to assess IPV, and are correlated with other measures of IPV.[34,54]

Syndemic: Consistent with prior research,[7] the number of psychosocial health problems endorsed (i.e., CSA, depression, binge drinking, marijuana use, and IPV) was summed to create a syndemic variable.

Outcomes

Sexual risk behavior: Using recommended procedures and items, participants were asked to report their number of sexual partners in the past 3 months.[55] Those who reported two or more sexual partners in the past 3 months were categorized as having multiple sexual partners (coded as 1; those with one or no sexual partners were coded as 0).

STD diagnosis: We reviewed participants' electronic medical records to determine their STD status. Those diagnosed with an incident STD (i.e., gonorrhea, chlamydia, HIV, or trichomonas) at enrollment were categorized as having an STD diagnosis (coded as 1; no STD diagnosis coded as 0).

Data Analysis

Consistent with prior research,[7] we first determined whether the health problems (i.e., CSA, depression, substance use, and IPV) were related to each other, to sexual risk behavior, and to STD diagnosis; odds ratios (unadjusted and adjusted) were calculated. To determine whether there was an *additive* effect of the psychosocial variables on sexual risk taking and STD diagnosis, we conducted logistic regressions with the syndemic variable (the count of psychosocial/health problems endorsed) as the independent variable and (a) multiple partners and (b) STD diagnosis as the dependent variables. To determine whether the psychosocial

variables *interacted* to increase the likelihood of multiple partners and STD diagnosis (the test of a syndemic), logistic regressions were conducted; pairwise interactions of the psychosocial variables were included as predictors of: (a) multiple partners; and (b) STD diagnosis. Each regression included demographic covariates (i.e., gender, age, education, income, employment, and race), psychosocial predictors, and pairwise (i.e., two-way) interactions between the psychosocial predictors. Predictors were grand mean centered.

Results

Rates of Psychosocial and Health Problems

Child sexual abuse, depression, substance use, partner violence, and sexual risk behavior were prevalent in this sample (see Table 1). CSA was reported by 50% of participants; 34% of participants met the cut-off for depression; 56% of participants reported recent binge drinking; 46% of participants reported recent marijuana use; 38% of participants reported partner violence; 70% of participants had more than one partner in the past 3 months; and 24% of participants were diagnosed with an incident STD at their clinic visit.

Associations Among Psychosocial and Health Problems

Many of the psychosocial variables were interrelated (Table 1). Participants who reported CSA were more likely to report depression, binge drinking, recent marijuana use, and partner violence. Being depressed was associated with a higher odds of marijuana use and partner violence. Participants who reported binge drinking in the past 3 months were more likely to report marijuana use. Participants who reported marijuana use were more likely to report IPV. In addition, the psychosocial variables were associated with sexual risk behavior. Participants who reported binge drinking or marijuana use had a greater odds of having more than one sex partner in the past 3 months; participants who reported IPV had a reduced odds of having more than one sex partner (unadjusted analyses only). Those who reported CSA, depression, or recent marijuana use were more likely to be diagnosed with an STD (unadjusted analyses only).

Additive Effect of Psychosocial Variables on Sexual Risk Behavior/STD Diagnosis

A count of the number of psychosocial problems (CSA, depression, binge drinking marijuana use, and partner violence) endorsed by participants was associated with having multiple partners, with each additional problem endorsed associated with a 1.20 greater odds of reporting multiple partners (Confidence Interval 1.09 – 1.31), Wald χ^2 (1, N = 1530) = 15.38, $p < .0001$. The syndemic indicator was marginally associated with a greater odds of being diagnosed with an STD, (Odds Ratio = 1.09; Confidence Interval 1.00 – 1.20), Wald χ^2 (1, N = 1528) = 3.43, $p < .10$.

Interactive Effect of Psychosocial Variables on Sexual Risk Behavior/STD Diagnosis

In a series of logistic regressions that included pairwise interactions of each of the psychosocial problems, none of the interactions were associated with having multiple partners (all ps > .05; see Table 2a). However, the interaction between CSA and marijuana use and the interaction between CSA and IPV were associated with STD diagnosis, Wald χ^2 (1, N = 1528) = 5.56, $p < .05$, and Wald χ^2 (1, N = 1528) = 4.90, $p < .05$, respectively (see Table 2b).

The percentage of participants diagnosed with an STD was 21% among those not reporting CSA or recent marijuana use, 21% among those not reporting CSA and reporting recent marijuana use, 23% among those reporting CSA and not reporting recent marijuana use, and 31% among those reporting both CSA and recent marijuana use. In follow-up analyses, marijuana use predicted STD diagnosis only among participants who reported CSA, Wald χ^2

(1, $N = 770$) = 6.19, $p < .05$, and CSA predicted STD diagnosis only among participants who reported recent marijuana use, Wald χ^2 (1, $N = 703$) = 4.57, $p < .05$.

Similarly, the percentage of participants diagnosed with an STD was 21% among those not reporting CSA or IPV, 20% among those not reporting CSA and reporting IPV, 24% among those reporting CSA and not reporting IPV, and 30% among those reporting both CSA and IPV. In follow-up analyses, IPV marginally predicted STD diagnosis only among those who also reported CSA, Wald χ^2 (1, $N = 758$) = 3.57, $p < .06$, and CSA predicted STD diagnosis only among those who also reported IPV, Wald χ^2 (1, $N = 579$) = 5.35, $p < .05$.

Discussion

Patients attending an STD clinic reported high rates of several psychosocial and health problems. Many of these psychosocial and health problems were correlated. In addition, reporting more psychosocial problems was associated with an increased likelihood of having multiple sexual partners and of being diagnosed with an STD. This pattern of findings is consistent with prior research among STD clinic patients,[10,11,13,16,17,20] and has sometimes been interpreted as reflecting a syndemic.[7,8]

However, a strict interpretation of syndemic theory requires an interaction between the co-occurring condition that results in magnified consequences. To our knowledge, this is the first study to investigate whether this key criterion of an STD/HIV syndemic was met. We found some evidence for the presence of a syndemic. Experiencing both childhood sexual abuse and recent marijuana use, or both childhood sexual abuse and intimate partner violence, was associated with a greater likelihood of testing positive for an STD than experiencing only one or neither of those conditions. Thus, a key criterion of a syndemic was met, because sexual health problems were magnified by the interactions of the psychosocial problems.

The clustering of risk-related conditions clearly indicate that STD clinics provide an opportune setting in which to intervene with patients on a variety of psychosocial and health problems. First, the anxiety that occurs when waiting to receive HIV and STD test results may motivate patients to change their behavior,[56] making this an opportune time to counsel patients about behavior change.

Second, some patients may have limited contact with healthcare or social services; thus, their attendance at an STD clinic may be one of the few times these patients can be reached for services. “Bundling of services,” where patients seeking care for one problem also receive care for other problems, has benefits for both patients and providers.[57] HIV testing is commonly bundled with other services; for example, HIV and STD testing are often bundled together, HIV prevention counseling is frequently bundled with HIV testing, and the Centers for Disease Control and Prevention have recommended that HIV testing be included, when indicated, with other routine medical testing.[58] Bundled services are also sometimes provided to individuals who are infected with HIV, including medical care, substance use treatment, and mental health services for individuals who are dually (triply) diagnosed.[59,60] Several recent interventions have bundled primary HIV prevention with other services. Kershaw et al.[61] provided bundled HIV prevention and prenatal care, resulting in less sexual risk behavior and less likelihood of repeat pregnancy. Lane et al.[62] assessed alcohol use among patients attending a sexual health clinic, and provided brief substance use counseling to those in need; the substance use intervention was acceptable to patients, and effective in reducing alcohol consumption.[62] Interdisciplinary STD clinics may provide an opportune setting in which to provide services for multiple psychosocial and health conditions for at-risk adults, in addition to sexual health services. In addition, sexual health providers may want to consider expanding their services to other settings, such as shelters for women who experience IPV or substance use treatment

settings. Further research is needed to determine whether other psychosocial and health services could be provided to individuals who are at risk for contracting HIV (and other STDs) in a way that is acceptable, effective, and cost-effective.

Patients attending STD clinics experience a range of mental health, substance use, and behavioral problems that health care providers should be prepared to address. In addition, STD clinics provide a unique opportunity for scientist-practitioners to investigate brief screening, assessment, prevention, and treatment approaches in a context with the potential for immediate public health impact. STD clinics also offer a valuable training environment where trainees from a variety of disciplines (e.g., nursing, medicine, psychology, social work, public health) can work side-by-side in a truly multidisciplinary setting.

The finding that patients attending an STD clinic experience multiple, co-occurring psychosocial and health problems may help to explain why many STD clinic patients find it difficult to change their sexual behaviors and why STD reinfection is not uncommon;[63,64] it may be difficult for patients to focus on sexual behavior change when they are faced with numerous other daily problems and competing life priorities.[65]

This study benefitted from a large and diverse sample of patients, as well as from the use of a computerized survey, which has been associated with higher rates of reporting of socially sensitive behaviors.[66,67] However, due to time limitations, only brief screening measures, rather than in-depth clinical interviews, were utilized, which may have resulted in less accurate categorization of participants' experiences of each psychosocial/health problem. In addition, there may be other co-morbid problems or conditions that were not identified or investigated in the present study; for example, in a focus group conducted with men attending the clinic, several participants identified heart disease and nutrition as major health concerns for themselves and their communities (Carey, ongoing research). Further research is necessary to fully identify all of the comorbid psychosocial and health problems commonly experienced by STD clinic patients.

In summary, violence, substance use, depression, and sexual risk behavior frequently co-occur among STD clinic patients, and endorsing more of these psychosocial/health problems was associated with greater odds of engaging in sexual risk behavior and being infected with an STD. In addition, we found some evidence for the occurrence of a syndemic, as childhood sexual abuse interacted with both marijuana use and intimate partner violence to result in worsened sexual health outcomes. Interventions are needed not only to address the psychosocial and health problems identified here, but also to address the common issue or issues that underlie the co-occurrence of these conditions.

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Table 1

Unadjusted and Adjusted Odds Ratios Among Psychosocial and Health Problems

	Childhood sexual abuse	Depression	Binge drinking	Marijuana use	Intimate partner violence	Multiple sex partners	STD diagnosis
Prevalence	50%	34%	56%	46%	38%	70%	24%
Childhood sexual abuse	~						
Depression	OR = 1.61 AOR = 1.35	~					
Binge drinking	OR = -- AOR = 1.30	OR = -- AOR = --	~				
Marijuana use	OR = 1.59 AOR = 1.85	OR = 1.53 AOR = 1.59	OR = 2.85 AOR = 2.72	~			
Intimate partner violence	OR = 2.60 AOR = 2.58	OR = 2.22 AOR = 1.97	OR = -- AOR = --	OR = -- AOR = 1.37	~		
Multiple sex partners	OR = -- AOR = --	OR = -- AOR = --	OR = 1.89 AOR = 1.93	OR = 1.80 AOR = 1.72	OR = 0.69 AOR = --	~	
STD diagnosis	OR = 1.41 AOR = --	OR = 1.28 AOR = --	OR = -- AOR = --	OR = 1.31 AOR = --	OR = -- AOR = --	OR = -- AOR = --	~

-- = no association; OR = Odds Ratio; AOR = Adjusted Odds Ratio (adjusted for gender, education, income, employment, race, and age)

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Table 2a

Logistic regressions predicting multiple partners

	Wald χ^2	*p*
Gender	28.95	<.0001
Age	0.17	ns
Education	0.01	ns
Income	1.27	ns
Employment	6.97	<.01
Race	3.96	<.05
Childhood Sexual Abuse (CSA)	1.52	ns
Depression	1.00	ns
Binge drinking	20.63	<.0001
Marijuana use	10.29	<.01
Intimate Partner Violence (IPV)	0.95	ns
CSA × Depression	0.55	ns
CSA × Binge drinking	0.01	ns
CSA × Marijuana use	0.44	ns
CSA × IPV	0.81	ns
Depression × Binge drinking	0.86	ns
Depression × Marijuana use	0.15	ns
Depression × IPV	0.00	ns
Binge drinking × Marijuana use	0.17	ns
Binge drinking × IPV	0.83	ns
Marijuana use × IPV	1.23	ns

Table 2b

Logistic regressions predicting STD diagnosis

	Wald χ^2	*p*
Gender	0.19	ns
Age	16.40	<.0001
Education	0.70	ns
Income	0.00	ns
Employment	2.26	ns
Race	15.57	<.0001
Childhood Sexual Abuse (CSA)	1.12	ns
Depression	0.56	ns
Binge drinking	0.56	ns
Marijuana use	1.73	ns
Intimate Partner Violence (IPV)	1.19	ns
CSA × Depression	0.00	ns
CSA × Binge drinking	1.82	ns
CSA × Marijuana use	5.56	<.05
CSA × IPV	4.90	<.05
Depression × Binge drinking	0.26	ns
Depression × Marijuana use	2.48	ns
Depression × IPV	2.92	ns
Binge drinking × Marijuana use	0.77	ns
Binge drinking × IPV	0.01	ns
Marijuana use × IPV	0.15	ns