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Psychological Distress, Drug Use, Sexual Risks and Medication Adherence among Young HIV-Positive Black Men Who Have Sex with Men: Exposure to Community Violence Matters

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Psychological distress, drug use, sexual risks and medication adherence among young HIV-positive Black men who have sex with men: exposure to community violence matters

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Abstract

In the United States, Black males are disproportionately affected by community violence and HIV. The aim of this study was to assess whether exposures to community violence are related to psychological distress, drug use, sexual risk behaviors, and medication adherence among a sample of HIV positive young Black MSM (YBMSM). Data is from 98 YBMSM ages 18 to 29 years recruited from Chicago who completed measures on demographics, exposures to community violence, psychological distress, drug use, condomless anal intercourse and medication adherence. Rates of exposure to community violence were high and youth reported victimization and witnessing numerous types of violence in their lifetime. In adjusted logistic regression analyses, models indicate that YBMSM reporting higher levels of exposure to community violence had significantly higher rates of condomless anal intercourse in the previous 6 months (AOR: 5.33, 95%CI: 1.38–20.55). Additionally, exposure to community violence was positively associated with psychological distress, hard drug use, and use of marijuana as a sex drug. Adherence to HIV antiretroviral medication was negatively associated with community violence (AOR: 0.36, 95%CI: 0.13–0.97). Rates of exposure to community violence are especially high in urban communities. Overall findings suggest that treatment, intervention and programmatic approaches that include initiatives to address exposure to community violence might correlate with better health related outcomes for HIV positive YBMSM.

Introduction

In the United States (U.S.), rates of new HIV infections among young non-Latino Black men who have sex with men (YBMSM) ages 15 to 29 are three and five times higher than their Latino and White counterparts, respectively (G. Millett, 2015). Between 2006 and 2009,

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there was a 48% increase in HIV incidence among YBMSM ages 13 to 29, while rates among Latino and White male counterparts have remained unchanged (Prejean et al., 2011). In fact, Black MSM in the U.S. now experience rates of HIV infection that rival those among the general population in resource restricted settings internationally (Centers for Disease Control and Prevention (CDC), February 2014). Although early research focused on individual risk behaviors, it is now widely recognized that structural factors such as unemployment, poverty, low educational attainment, history of incarceration, childhood sexual abuse, and barriers to healthcare are key social drivers of HIV/AIDS among Black MSM (Levy et al., 2014; G. A. Millett et al., 2012).

Growing evidence documents that exposure to community violence is another structural factor associated with HIV-related drug and sexual risk behaviors (Albus, Weist, & Perez-Smith, 2004; Berenson, Wiemann, & McCombs, 2001; Brady & Donenberg, 2006; Brady, Tschann, Pasch, Flores, & Ozer, 2008; Stiffman, Dore, Cunningham, & Earls, 1995; D. Voisin, Chen, Fullilove, & Jackobson, 2015; D. R. Voisin, 2003; D. R. Voisin et al., 2007; Wilson, Woods, Emerson, & Donenberg, 2012). Community violence refers to violence taking place outside the home, including witnessing and victimization among persons who may be familiar or unfamiliar with each other and often includes acts such robberies, mugging, gang and gun violence (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002). Exposure to community violence, tends to be disproportionately higher in resource-constrained communities of color in the United States (Centers for Disease Control and Prevention, 2010), and Black youth are significantly more likely to witness and be victims community violence than their Caucasian and Hispanic counterparts (Crouch, Hanson, Saunders, Kilpatrick, & Resnick, 2000).

A growing number of cross-sectional and longitudinal studies conducted mostly with heterosexual youth document that exposure to community violence is positively associated with sexual risk behaviors among diverse populations (Albus et al., 2004; Berenson et al., 2001; Brady & Donenberg, 2006; Brady et al., 2008; Stiffman et al., 1995; D. Voisin et al., 2015; D. R. Voisin, 2003; D. R. Voisin et al., 2007; Wilson et al., 2012). Among African American adolescent males, exposure to community violence was related to higher rates of having sex without condoms, multiple sexual partners, and drug use during sex (D. R. Voisin, 2003). Additionally, adolescents with juvenile justice involvement histories who report witnessing community violence have significantly higher levels of alcohol and marijuana use and using alcohol and drugs during sexual intercourse (D. R. Voisin et al., 2007). Moreover, in a study of urban Mexican-American and European-American adolescents, independent of age, gender, ethnicity, family socioeconomic status, and previous levels of health risk behavior, adolescents who had been victimized by or perpetrated violence at age 18 had a greater number of sexual partners at age 19 (Brady et al., 2008). Longitudinal research has also documented that 31% of the variance in HIV-related risk behaviors among inner-city young adults (N = 603) was predicted by a combination of adolescent risk behaviors, personal variables and community factors, which included the number of neighborhood murders and the interaction of such murders with family stressors (Stiffman et al., 1995).

In one of the only studies examining exposure to community violence among young, HIV-infected, racial and ethnic minority MSM, results indicated that witnessing violence with a deadly weapon was significantly associated with alcohol and drug use and fear of community violence was associated with depressive symptoms (Phillips et al., 2014). In a related study, exposure to community and interpersonal violence among a racially and sexually diverse sample of HIV-infected youth has also revealed an association between witnessing or experiencing violence and mental health disorders and substance abuse (Martinez, Hosek, & Carleton, 2009), which are known variables that affect antiretroviral (ARV) nonadherence in HIV-infected youth (Martinez et al., 2009; Murphy, Wilson, Durako, Muenz, & Belzer, 2001). Thus, it is possible that exposure to community violence is not only associated with risk for HIV among youth, but also health outcomes for HIV-infected youth.

Collectively, although the above findings are informative, few studies to date have examined the relationship between exposure to community violence and STI sexual risk behaviors among HIV-infected YBMSM. This represents a significant gap in the extant literature given that many YBMSM may reside in low-resourced urban environments where rates of exposure to community violence are extremely high (Centers for Disease Control and Prevention, 2010). In addition, few studies have examined this relationship among HIV positive populations or explored how such violence exposures might be related to a broad spectrum of health-related factors such as ARV medication adherence, which has been shown to increase life expectancy and decrease onward HIV transmission (Quinn et al., 2000). Given that Black adolescents are at heightened risk of violent exposure and victimization (Buka, Stichick, Birdthistle, & Earls, 2001) and HIV (G. Millett, 2015), this study seeks to better understand exposure to community violence in the lives of HIV-infected YBMSM. Based on the extant literature, we hypothesized that high rates of exposure to community violence would be related to poorer psychological health, greater drug use, condomless anal intercourse, and lower ARV medication adherence.

Materials and Methods

Data were collected between October 2012 and November 2014 and included baseline and 12-month follow up data as part of Project nGage, a preliminary efficacy randomized controlled trial. Project nGage was developed to explore the role of organic social support in improving HIV care for YBMSM. The intervention included the identification and engagement of a youth-identified support confidant to help promote adherence to HIV primary care. Two face-to-face meetings with a social work interventionist, as well as 11 brief booster sessions delivered via telephone and text messaging, provide support confidants with information on the importance of HIV care and ARV adherence and helps the dyad create a personalized care and support plan to increase or sustain HIV medical care. The control group received treatment as usual for this population, which includes routine case management. Study design and intervention details are described in more depth elsewhere (Bouris et al., 2013). Participants were recruited at two study sites; a university hospital and a federally qualified health center. Eligibility included being born biologically male; self-identifying as Black or African American, between the ages of 18 and 29, inclusive; having an HIV diagnosis for greater than three months (confirmed via clinic

records and laboratory testing), and having disclosed their status to at least one person in their close social network. Two transgender women were included in the sample but excluded from these analyses given their limited sample. Interviews were conducted on laptop computers in an interview format by research assistants who read survey questions aloud and recorded participant responses in REDCap (Harris et al., 2009). Participants received $25 for completing each baseline and follow-up survey. Primary measures utilized in this study were from the final wave of data collection at the 12 month period given that this was when exposure to community violence was assessed. All study protocol and procedures were approved by the *Blinded* Institutional Review Board.

Measures

Independent variable

Exposure to community violence: Exposure to community violence was measured using the modified Exposure to Violence Probe (Stein, Walker, Hazen, & Forde, 1997) a ten-item scale assessing the number of times participants had been exposed to various types of community violence in their lifetime. For example, participants were asked, *How many times have you had a close relative or friend die due to community violence?* Responses ranged from 0 to 6 or more times. The community violence scale had sound internal consistency (Cronbach's Alpha=0.847). Raw scores were computed by taking the mean of all item scores. Raw scores were converted to T-scores and dichotomized as high and low exposure to community violence based on the median split, following the strategy of previous studies (Chen, Voisin, & Jacobson, 2013; D. Voisin et al., 2015; D. R. Voisin, Jenkins, & Takahashi, 2011).

Dependent variables

Substance use: Participants were asked how many times in the past three months they used specified drugs. Response categories were 1) never, 2) once or twice, 3) monthly, 4) weekly, 5) daily or almost daily. Given the frequency with which participants noted tobacco and marijuana use, we assessed participants who reported daily tobacco use and daily or weekly marijuana use. Hard drug use in the past 3 months includes use of any of the following drugs in the previous 3 months: cocaine, amphetamines, inhalants, sedatives or sleeping pills, hallucinogens, or opioids (Bouris, Hill, Fisher, Erickson, & Schneider, 2015). Lifetime hard drug use was only collected at baseline, and referred to the use of any of the aforementioned drugs at least once in their lifetime.

Medication adherence: Participants were asked whether they were currently taking HIV ARV medications and to identify which medications they were taking.. Participants who reported currently taking medication were then asked to identify how often they took their medications as prescribed: "In the last 30 days, on how many days did you miss at least one dose of any of your HIV medicines" and "What percent from 0 to 100 did you take your medication as prescribed in the last 30 days? Zero percent would mean 'none of the time', 50% time indicated 'half of the time', and 100% indicated 'all of the time'.

Psychological distress: The Brief Symptom Inventory-18 (BSI-18) scale was used to assess psychological distress in the previous 7 days. The BSI-18 includes 18 items and

assesses Global Severity Index (GSI). Each item is rated on a 5-point Likert scale ranging from 0 "not at all" to 4 "extremely." The raw GSI score was computed using the mean of all item scores. Raw scores were converted to T-scores. T-scores were dichotomized and participants were considered to be experiencing psychological distress if T>62, as indicated by BSI-18 scoring instructions. The psychological distress scale demonstrated sound internal consistency (Cronbach's Alpha=0.853).

Sexual risk behaviors: There were several measures of sexual risk behaviors. (Schneider et al., 2013) Participants were presented with a list of substances and asked, "Have you ever used any of these substances as 'sex drugs', that is to make sex easier, better, last longer, or something similar?" (yes/no/refuse). They were asked the same question about whether their sexual partners had ever used sex drugs. If yes, participants identified substances used, including cocaine/crack, heroin, marijuana, psychedelics, opiates, benzodiazepines, methamphetamines, poppers, other inhalants, antidepressants, erectile dysfunction drugs, or any other drugs. Given the frequency with which participants used marijuana was used as a sex drug compared to other drugs, we limited our analyses to whether individuals or their partners had ever used marijuana as a sex drug. Condomless anal intercourse was assessed by asking "Have you had condomless anal sex with a male partner of unknown or different HIV-status in the past six months" (yes/no).

Statistical Analyses

Statistical analyses were conducted using SPSS, version 22.0 (IBM, Chicago, IL.). Univariate analyses were used to examine demographic and variables of interest. Median and range were computed for continuous variables. Raw scores for each of the relevant measures (community violence and psychological distress) were converted to T-scores. Individual logistic regression models examined the hypothesized relationships between exposure to community violence and health and psychosocial factors. All regressions controlled for the effects of age, education level, and the intervention condition (Bouris et al., 2013). Odds ratios and 95% confidence intervals are reported. Statistical significance was calculated at $p < .05$. The aim of these analyses was to explore exposure to community violence among HIV-infected YBMSM, with a specific focus on risk behaviors and HIV medication adherence.

Results

As indicated in Table I, the analytic sample included 92 young Black MSM. At baseline there were 98 participants, 6 of whom were lost to follow-up at the 12 month point. The sample had an average age of 23.8 years (SD=2.88). Over 90% of participants had at least a high school degree and two-thirds were working full- or part-time.

Over one-third of YBMSM reported any lifetime use of hard drugs and 15.2% reported hard drug use in the previous 3 months, which included the use of cocaine, amphetamines, inhalants, sedatives or sleeping pills, hallucinogens, or opioids. Over 40% of participants reported daily tobacco use, and just over half reported daily or weekly marijuana use. Marijuana was also frequently used as a sex drug. Approximately 25% reported using marijuana as a sex drug and 23.9% reported partner use of marijuana as a sex drug. In the

previous three months, 20.7% of YBMSM reported having condomless anal intercourse with an unknown or different status partner.

There were 78 participants (84.8%) currently taking HIV medications. Just over half (54%) of participants reported an adherence level of approximately 90% in the previous 30 days and 45% of participants reported taking their medications 95% of the time in the previous 30 days. The median number of days participants missed at least one dose of their HIV medications in the last month was 1, with a range of 0 to 30. Fourteen participants indicated they were not currently taking HIV medications, although they had been prescribed.

Exposure to community violence was high among this sample. Rates of various violent exposures are presented in Table II. While only a few participants experienced serious injury due to community violence (17%), nearly half of participants (40%) noted having a close relative or friend die due to community violence, with eleven participants experiencing the violent death of 3 or more individuals. Over half of the sample (52%) had been a victim of violence themselves at least once and 53% noted having been robbed or attacked.42% of the sample had witnessed a gun-related incident in their community and over three-quarters (78%) had heard gunshots in their community.

Community violence and health-related factors

Nine separate regression analyses were conducted to explore the relationship between exposure to community violence and various health-related factors (psychological distress, substance use, condomless anal intercourse, and ARV adherence). Controlling for the effects of age, education level, and the intervention effect, Table III presents the findings of several individual logistic regressions.

As hypothesized, findings revealed that high levels of exposure to community violence were significantly and positively associated with psychological distress; YBMSM who experienced greater community violence had nearly five times the odds of reporting feelings of psychological distress (AOR: 4.64, 95%CI: 1.00–21.44). In addition, exposure to community violence was positively associated with daily tobacco use, daily or weekly marijuana use, lifetime hard drug use, and hard drug use in the previous 30 days. Participants who reported high levels of community violence had over six times the odds of using hard drugs in the previous 3 months (AOR: 6.73, 95%CI: 1.45–31.35) and over three times the odds of using marijuana on a daily or weekly basis (AOR: 3.87, 95%CI: 1.31–11.51).

Examining sexual risk behaviors, findings revealed community violence was positively related to partner use of marijuana as a sex drug (AOR: 4.15, 95%CI: 1323–13.11) and condomless anal intercourse in the previous 6 months (AOR: 5.33, 95%CI: 1.38–20.55). Adherence to ARV also was associated with community violence. Compared with participants who had low levels of community violence exposure, exposure to high levels of community violence was associated with significantly lower odds of medication adherence (AOR: 0.36, 95%CI: 0.13–0.97).

Discussion

This is among the few studies that explore whether exposures to community violence were related to psychological problems, substance use, condomless anal intercourse, and medication adherence among HIV positive YBMSM. Exposure to community violence among this sample was high; over half the sample had been a victim of violence and 17% had been seriously injured because of community violence. Furthermore, hearing gunshots, witnessing gun-related incidents, and witnessing someone being beaten were not uncommon occurrences. These findings are important as exposure to community violence is associated with numerous mental health and substance use outcomes in youth (Buka et al., 2001; Martinez et al., 2009), as was also corroborated in this study. Furthermore, as we have established here, exposure to community violence was also a significant correlate of low medication adherence, and unprotected anal sex among YBMSM.

Major findings indicated significant differences among HIV positive YBMSM with regards to poor mental health, higher substance use, condomless anal intercourse and lower medication adherence based on levels of exposures to community violence. This study corroborates previous findings documenting significant relationships between exposure to community violence and sexual risk behaviors among diverse populations (Albus et al., 2004; Berenson et al., 2001; Brady & Donenberg, 2006; Brady et al., 2008; Stiffman et al., 1995; D. Voisin et al., 2015; D. R. Voisin, 2003; D. R. Voisin et al., 2007; Wilson et al., 2012). In addition, these findings extend these prior studies by documenting that such violence exposures were negatively associated with ARV adherence. Such adherence is critical to promote quality of life, suppress viral replication, avoid resistance (Centers for Disease Control and Prevention (CDC), February 2014; G. A. Millett et al., 2012), and curtail onward HIV transmission. However, no known studies to date have examined whether sub-optimal medication adherence is related to exposures to community violence, both concerns that disproportionately impact young BMSM (Centers for Disease Control and Prevention, 2010; Rosenberg, Millett, Sullivan, del Rio, & Curran, 2014). Consequently, these findings have significant implications for treatment and future research. However, prior to such a discussion several study limitations warrant mention. The present study is based on primarily self-report data from a clinic-based sample of YBMSM living with HIV. Therefore overall findings may have limited generalizability for other populations of YBMSM living with HIV. The survey was conducted in an interview format, which can facilitate question clarity but can also introduce the potential for response bias due to social desirability. In addition, all observed relationships are correlational and do not imply any causal inferences, and some relationships might be bidirectional, such that higher drug use might lead to greater exposures to community violence and vice-versa.

Temporal stems for dependent variables were set based on previously validated measures so that the findings from this study could be compared with that of prior studies. This, however, resulted in dependent constructs being assessed at different time periods. Future studies, using larger samples and longitudinal designs, might better estimate whether lifetime or past 12 month exposure to community violence is associated with health-related outcomes across varying time intervals for this populations. Future longitudinal approaches are also needed to establish the temporal ordering between exposures to community violence and the health-

related factors observed among this study, although prior research has established such temporal frames with other populations (D. R. Voisin, 2005; D. R. Voisin et al., 2007). Additionally, this study is limited by its small sample size, which may influence the power of the study and the confidence intervals. Large confidence intervals for several of the variables also suggest there are likely additional factors influencing those relationships and additional research is needed to fully understand those relationships. Finally, future research needs to better understand the mechanisms linking exposures to community violence and health-related factors among this population. Asset Theory, which has previously been used to explain risky sexual behaviors (Ssewamala, Alicea, Bannon, & Ismayilova, 2008; Ssewamala, Han, & Neilands, 2009) and posits that individuals who view themselves as having human capital are more inclined to engage in self-protective behaviors (Sherraden, 1990) might provide one theoretical explanation for the study findings.

Despite the above limitations, overall study findings suggest that health care providers screen YBMSM for exposures to community violence and those reporting high exposures should be assessed for psychological concerns, drug use, risky sex and the extent to which they are complying with medication adherence. In clinical practice, childhood sexual abuse and intimate partner violence screens have become part of some regular health screening forms, these findings suggest that exposure to community violence screens should also become routinized, especially in low-resourced communities were such rates of violence are disproportionately high.

These study findings also suggest that secondary HIV prevention initiatives for persons living with HIV should address exposure to community violence and its sequelae. Overall, findings highlight the need for city systems that deal with public health concerns and violence and crime be less truncated. Poverty, crime and poor health outcomes are co-occurring syndemics that have profound impacts on individual, community, and population health (Egan et al., 2011; Mustanski, Garofalo, Herrick, & Donenberg, 2007; Stall, Friedman, & Catania, 2008). However, sexual health education has traditionally been delineated to public health clinics and schools, while concerns relating to exposure to community violence have usually been assigned to law enforcement and mental health services (D. R. Voisin, 2007). Greater interagency collaboration is therefore needed among systems of care in order to increase awareness of these intersecting public health concerns and to improve assessment of risk and to develop multi-pronged intervention and prevention strategies (D. R. Voisin et al., 2007; D. R. Voisin, 2007). This approach also is consistent with prior research on the social drivers of HIV among Black MSM in the U.S (G. A. Millett et al., 2012).

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Table I

Sample Characteristics (N=92), project nGage 2012–2014 Chicago.

Variables	N (%)	Median	Range
Age		24	18–29
Education			
Less than HS	9 (9.8%)		
HS Diploma or GED	30 (32.6%)		
Greater than HS	53 (57.6%)		
Employment			
Full-time	30 (32.6%)		
Part-time	22 (23.9%)		
Unemployed	40 (43.5%)		
Exposure to community violence[1]		12.0	0–5.8
Psychological Distress	12 (13.0%)		
Any hard drug use in lifetime	35 (38.0%)		
Hard drug use in previous 3 months	14 (15.2%)		
Daily tobacco use	37 (41.3%)		
Heavy marijuana use[2]	48 (52.2%)		
Marijuana use as a sex drug	24 (26.1%)		
Partner marijuana use as a sex drug	22 (23.9%)		
Condomless anal intercourse	19 (20.7%)		
Number of days at least one dose of HIV medication was missed in the last month		1	0–30

[1] Exposure to community violence scale

[2] Daily or weekly marijuana use

Table II

Exposure to community violence

Violent Exposure	N (%)[1]
Had a close friend or relative die due to community violence	37 (40%)
Had a close relative or friend seriously injured because of community violence	44 (48%)
Been seriously injured because of community violence	16 (17%)
Had a close friend or relative robbed or attacked	52 (57%)
Been robbed or attacked	49 (53%)
Heard gun shots in your community	72 (78%)
Seen someone being beaten	55 (59%)
Been a victim of violence	48 (52%)
Seen a dead body, not at a funeral, due to community violence	27 (29%)
Witnessed a gun-related incident in your community	39 (42%)

[1]Number of participants who experienced the violent exposure at least once

Table III

Logistic regressions modeling the relationships between community violence and health and psychosocial factors of YBMSM in project nGage, 2013–2014, Chicago.

	Adjusted Odds Ratio*	95%CI	P-Value
Psychological distress	4.64	(1.00–21.44)	.049
Any hard drug use in lifetime	4.13	(1.34–12.22)	.010
Hard drug use in previous 3 months	6.73	(1.45–31.35)	.015
Daily Tobacco Use	3.61	(1.05–12.38)	.042
Heavy marijuana use [1]	3.87	(1.31–11.51)	.015
Marijuana as a sex drug	3.51	(1.19–10.39)	.023
Partner use of marijuana as a sex drug	4.15	(1.32–13.11)	.015
Condomless anal intercourse	5.33	(1.38–20.55)	.015
Medication Adherence	0.36	(0.13–0.97)	.043

*All models controlled for the effects of age, education level, and intervention group

[1]Daily or weekly marijuana use