Physical and Sexual Abuse among Homeless and Unstably Housed Adults Living with HIV: Prevalence and Associated Risks

Kirk D. Henny and **Daniel P. Kidder**

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, 1600 Clifton Road, NE MS E-37, Atlanta, GA 30333, USA

Ron Stall

Graduate School of Public Health, University of Pittsburgh, Pittsburgh, PA, USA

Richard J. Wolitski

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, 1600 Clifton Road, NE MS E-37, Atlanta, GA 30333, USA

Abstract

We examined the prevalence and risks associated with interpersonal (physical and sexual) abuse among HIV-seropositive homeless or unstably housed adults. Data were obtained from the Housing and Health Study of participants living in Baltimore, Chicago, and Los Angeles ($n =$ 644). We used logistic regression to identify risks associated with abuse. About 77% of men and 86% of women reported ever experiencing abuse. Women were at greater risk than men for intimate partner physical abuse, childhood sexual abuse (CSA), and adulthood sexual abuse. Men and women experiencing intimate partner physical abuse reported increased risk of unprotected sex. Other risks associated with abuse include sex exchange; lifetime alcohol abuse; and depressive symptoms. Abuse prevalence among sample exceeds those found in other samples of general USA, HIV-seropositive, and homeless populations. Identifying persons at risk of abuse is needed to reduce risk among homeless or unstably housed persons living with HIV.

Keywords

Violence; Housing; HIV/AIDS; Childhood sexual abuse; Homeless; Physical abuse; Sexual abuse; IPV; CSA

Introduction

Interpersonal abuse, homelessness, and living with HIV represent public health conditions that potentially exacerbate each other. Much work has been done on each individual problem but little research has investigated the interrelationships between these health threats. Multiple health problems can be caused by common underlying factors and can synergistically worsen the overall health for persons at risk for each condition (Singer,

khenny@cdc.gov.

1994). This paper examines the interrelationship between various form of abuse, homelessness, and HIV by examining the prevalence and associated risk factors for abuse within a particularly vulnerable population-homeless or unstably housed persons living with HIV.

Many men and women in the US experience interpersonal abuse, which includes both physical and sexual abuse. Many previous studies use these two distinct measures because of differences in the prevalence and public health impact of physical and sexual abuse. Among men, a national survey reported that 66% reported experiencing physical abuse, and 3% reported sexual abuse during their lifetimes (Tjaden & Thoennes, 2000). In contrast to men, fewer women reported physical abuse (52%), but more women (17%) reported sexual abuse during lifetime (Tjaden & Thoennes, 2000). Furthermore, women experience higher levels of intimate partner violence (IPV) than men do (Coker et al., 2002), and young African-American women are at greatest risk of IPV (Tjaden & Thoennes, 2000).

Prevalence of abuse also has been reported among persons living with HIV and other STDs. In a study of HIV seropositive women, over 35% reported being raped during adulthood (Zierler, Witbeck, & Mayer, 1996). Among men who have had sex with other men (MSM) living with HIV, 15% reported having a history of childhood sexual abuse (CSA) (O'Leary, Purcell, Remien, & Gomez, 2003). In addition to lifetime abuse prevalence, over 20% of women, 11% of MSM, and 7% of heterosexual men reported physical harm since receiving their HIV diagnosis with approximately half of persons attributing IPV as a direct result of HIV status disclosure to partner (Zierler et al.,2000). Among women who reported having a recent male sex partner and having an STD, 11% reported IPV during last 12 months and 24% reported lifetime IPV (Bauer et al., 2001).

Homeless persons are particularly vulnerable to physical abuse (Burt, Aron, & Lee, 2001). Although data on abuse among homeless persons are limited, one of the largest studies found that 22% of homeless persons had experienced physical assault, and 7% had experienced sexual assault (Burt et al., 2001). Among single homeless women, 28% reported physical assault and 16% reported sexual assault in their lifetimes (Burt et al., 2001). Homeless women were more likely than men to report IPV as the primary reason for homeless status (Burt et al., 2001). Single homeless men reported lower rates of victimization, with 24% reporting physical assault and 4% reporting sexual assault (Burt et al., 2001). In addition, 25% of all homeless clients reported histories of childhood physical or sexual abuse (Burt et al., 2001).

Interpersonal abuse has serious effects on victims' physical and mental health and results in nearly two million injuries and 1,300 deaths in the United States every year (CDC, 2003). In addition, to serious physical injury and death (Campbell et al., 2002), interpersonal abuse can lead to short-term psychological effects (e.g., emotional withdrawal, shock, anxiety) and long-term effects such as posttraumatic stress disorder (Bergen, 1996).

Interpersonal abuse can also have various behavioral sequelae. Interpersonal abuse can affect risk behaviors such as substance use and sexual practices that increase the risk of acquiring

and transmitting human immunodeficiency virus (HIV) and other sexually transmitted diseases (STDs) (Jewkes, Sen, Garcia-Moreno, 2002; Raj, Silverman, & Amaro, 2004).

In particular, CSA has long-lasting negative consequences including reduced ability to maintain healthy and non-abusive relationship (Bassuk et al., 1997; English, 1998). CSA has been associated with more sexual partners, unprotected sex, and sex trading (Newman, Rhodes, & Weiss, 2004; Senn, Carey, Vanable, Coury-Doniger, & Urban, 2006). In addition, CSA initially occurring at age ten or younger was associated with increased likelihood of having an STD diagnosis during adulthood (Ohene, Halcon, Ireland, Carr, & McNeely, 2005) and increased adult drug use (Liebschutz et al., 2002).

Homelessness also affects HIV risk and has broader negative health consequences. Homelessness has been associated with increased HIV risk behaviors such as commercial sex work and substance use (Allen, Lehman, & Green, 1994; Smereck & Hockman, 1998; Surratt & Inciardi, 2004; Susser, Valencia, & Conover, 1993). In addition, homeless persons are more likely to be mentally ill compared to low-income housed persons (Burt et al., 2001), which further increases persons' risk of engaging in high-risk behaviors (Aidala, Cross, Stall, Harre, & Sumartojo, 2005; Schutt & Goldfinger, 1996; Susser et al., 1993).

The shared risk factors reported among abused persons, HIV-seropositive persons, and homeless persons could potentially increase risk for transmitting HIV among persons experiencing all three conditions. However, few studies have addressed the effects of interpersonal abuse among homeless and unstably housed persons living with HIV. The goal of our study was to examine the prevalence and risk associations of interpersonal abuse among homeless and unstably housed persons living with HIV.

Methods

We used baseline data from the Housing and Health Study (Kidder et al., 2003). The Housing and Health Study is a multi-site, longitudinal, randomized controlled trial investigating the effects of providing access to immediate housing rental assistance on the health and HIV risk behaviors of HIV-seropositive persons who were homeless or at severe risk of homelessness. Study sites were Baltimore, MD; Chicago, IL; and Los Angeles, CA.

Participants

Eligibility criteria included that participants were currently homeless or at severe risk of homelessness. An individual was considered *homeless* if he/she resided (1) in places not meant for human habitation, such as cars, parks, sidewalks, and abandoned buildings; or in an emergency or overnight shelter; (2) any one of the above places but was spending a short time (up to 30 consecutive days) in a hospital or other institution.

An individual was considered to be at severe *risk of homelessness* (i.e., unstably housed) if he/she frequently relocated or who moved between temporary housing situations, so that housing was neither appropriate nor stable.

To satisfy study eligibility criteria, participants also had to be at least 18 years old, speak English or Spanish, have low income (less than 50% of the area median income), be able to provide proof of identity, and have HIV-seropositive status.

Data collection

Participants completed three baseline sessions. The first visit involved verification of eligibility and consent to participate in the study. The second visit, approximately one to two weeks later, involved a 90-min face-to-face Computer Assisted Personal Interviewing (CAPI) and Audio Computer Assisted Self-Interviewing (ACASI) methods. The second visit also included blood specimen collection (to test for CD4 and viral load), and participation in the first of two HIV prevention-counseling sessions.

The third visit, approximately 2 weeks later, involved receiving lab test results, the second HIV prevention counseling session, and random assignment to either treatment (immediate housing rental assistance) or comparison (customary housing assistance normally available at site). Follow-up study data collection periods occurred at 6, 12, and 18 months. Only baseline data were analyzed for this paper. The total sample for baseline was 644 people. Each site contributed approximately one-third of the sample.

Measures

Several items were used to measure interpersonal abuse experiences. Two measures were used to ascertain interpersonal abuse experience occurring during childhood. These measures included the following:

> *Childhood physical abuse* "Have you ever experienced a physical assault or abuse as a child or teenager, that is, when you were 17 years of age or younger?" (Yes/No) *Childhood Sexual Abuse (CSA):* "Have you ever experienced a sexual assault or rape as a child or teenager, that is, when you were 17 years of age or younger?" (Yes/No)

The measures used to ascertain both lifetime and recent (last 6 months) experiences of interpersonal abuse during adulthood were the following:

> *Adulthood intimate partner physical abuse:* "Have you ever experienced a physical assault or abuse by your partner in your adult life?" (Yes/No)

> "Did this happen in the last 6 months?" (Yes/No)

> *Adulthood non-partner physical abuse*: "Have you ever experienced a physical assault or abuse by someone other than your partner in your adult life?" (Yes/No)

> "Did this happen in the last 6 months?" (Yes/No)

> *Adulthood sexual abuse*: "Have you ever experienced sexual assault or rape in your adult life?" (Yes/No)

> "Did this happen in the last 6 months?" (Yes/No)

Demographic variables included gender; race/ethnicity (black, non-black); age (dichotomized for descriptive data using <40, 40, and continuous for multivariate

analyses); gay/bisexual identity (yes, no/not specified); homeless during past 90 days (yes, no); education (high school/GED or greater, less than high school/GED); any insurance coverage (yes, no); current employment (yes, no); ever having stable employment (<1 year, 1 year); and household income (<$600 per month, $600 per month). Alcohol use was the CAGE questionnaire with "possible alcohol abuse during lifetime" for participants scoring 2 on the 4-item scale (Buchsbaum et al., 1991; Ewing, 1984). Any illicit drug use (e.g., marijuana, cocaine) during past 90 days (yes, no) and ever injection drug use (yes, no) also was included. Additional variables included whether participants had ever been incarcerated in jail or prison for greater than 24 h (yes, no); had unprotected anal or vaginal sex during the past 90 days (yes, no); and ever exchanged sex for money, drugs, or shelter (yes, no).

The mental health variables included depressive symptoms measured by the Center for Epidemiologic Studies-Depression Scale (CES-D) (Radloff, 1977). A clinically significant level of symptoms likely indicating depression is indicated by scores 10 (range = 0–30) on the CES-D 10 (Andresen, Malmgren, Carter, & Patrick, 1994). Self-perception of stress was measured using the Perceived Stress Scale (PSS), which yields a continuous scale from 10 to 50 with higher scores indicating more perceived stress (Cohen, Kamarck, & Mermelstein, 1983).

The sample included 15 male-to-female transgender persons, comprised of 14 pre-operation and one post-operation transgender persons. Descriptive data about transgender persons' experience with abuse are provided in Table 1. For other analyses, the 14 pre-operation male-to-female transgender persons were recategorized as males and the one post-operation transgender person was recategorized as a female. The transgender participants were recategorized because (1) the low sample size ($n = 15$) does not have the statistical power for separate analyses for this group and (2) transgender persons in the Housing and Health Study received gender-specific sex behavior questions based on their genitalia.

Data analysis

The primary goal of this analysis was to identify demographic, substance abuse, incarceration, sexual behavior, and mental health variables associated with the experiences of interpersonal abuse among homeless or unstably housed persons living with HIV. We developed the model based on previous studies indicating associations between these variables and abuse victimization in other populations (CDC, 2003; Jewkes et al., 2002; Raj et al., 2004).

First, we conducted bivariate logistic regression models to assess differences on the five "ever" interpersonal abuse experiences measures (i.e., outcome measures). Measures of recent abuse experiences (i.e., "last 6 months") were not included in the logistic regression analyses due to low frequency counts. The five measures of abuse experiences were Childhood Physical Abuse, CSA, Adulthood Intimate Partner Physical Abuse, Adulthood Non-Partner Physical Abuse, and Adulthood Sexual Abuse. It should be noted that these categories were mutually exclusive, but individuals could report having experienced multiple forms of abuse.

Bivariate logistic regression analyses conducted for each "abuse" outcome measure included demographic variables (gender, race, age, gay/bisexual identify, housing status, education, income, insurance status, current employment, ever having stable employment); substance use variables (ever possible alcohol abuse, recent drug use, ever injected drug use); sexual behavior variables (recent unprotected sex, sex exchange); and mental health variables (symptoms indicating the likelihood of depression and perceived stress).

Backwards-stepwise logistic regression analysis also was conducted for each of the five "abuse" outcome measures to identify independent associations among the variables examined in the bivariate models. The inclusion criterion of the initial model was p .10. Variables were systematically excluded from the model using a significance threshold of a = .05 and weighted point estimates with 95% confidence intervals. Stratified analyses by gender also were performed for any statistically significant associations between an "abuse" outcome measure and gender in the multivariate models.

Results

Descriptive data

As presented in Table 2, the overall sample was 30% female and 79% black. A majority of participants were 40 years of age or older (63%) ranging from 19 to 63. Most participants reported having a high school education (65%), and 27% of the participants reported homelessness in the past 90 days.

As illustrated in Table 1, prevalence of lifetime abuse was 77% among men, 86% among women, and 93% among transgenders. Slightly more than half (53%) of the sample experienced childhood physical abuse. CSA was reported by 39% of participants. The prevalence of CSA was 33% for men and 52% for women, respectively, χ^2 (1) = 21.4, $p <$. 05. Approximately 46% of participants reported adulthood intimate partner physical abuse. Women experienced more intimate partner physical abuse compared to men (62% vs. 39%), χ^2 (1) = 29.5, $p <$ .05. Approximately 55% of the sample reported non-partner physical abuse. Approximately 29% of the overall sample reported adulthood sexual abuse. Sexual abuse during adulthood was reported by 21% of men and 46% of women, $\chi^2(1)$ = 41.4, $p <$. 05.

Bivariate and multivariate analyses

We conducted bivariate and multivariate analyses for the five measures of lifetime abuse. The results are presented by the five primary abuse measures.

Childhood physical abuse—The multivariate analysis results for childhood physical abuse are shown in Table 3. We found that victims of childhood physical abuse were more likely to be non-black race, more likely to never have had stable employment, and more likely to have possibly abused alcohol. Persons experiencing childhood physical abuse also were twice as likely to report symptoms indicating depression and to have ever exchanged sex for money, drugs, or shelter.

Childhood sexual abuse (CSA)—As shown in Table 4, victims of CSA were nearly three times as likely to be female. In addition, victims of CSA were more likely to be younger; self-identify as gay or bisexual; have ever exchanged sex for money, drugs, or shelter; and report symptoms indicating depression.

Because rates of CSA differed by gender, we stratified our multivariate analyses of CSA for males and females (results not shown in tables). Among females, being younger (AOR = .95, 95% CI = .92, .99, p .05), never having had stable employment (AOR = .43, 95% CI = .21, .91, p .05), and having possible alcohol abuse during lifetime (AOR = 2.07, 95% CI = 1.01, 4.23, p .05) were associated with CSA. Among males, being younger (AOR = .97, 95% CI = .95, 1.00, p .05); self-identifying as gay/bisexual (AOR = 1.88, 95% CI = 1.18, 3.00, p .05); reporting symptoms likely indicating depression (AOR = 2.30, 95% CI = 1.38, 3.84, p .05); and ever exchanging sex for money, drugs, or shelter (AOR = 2.14, 95% CI = 1.36, 3.36, p .05) were associated with CSA.

Adulthood intimate partner physical abuse—As shown in Table 3, we also reported results from bivariate and multivariate logistic regression analysis of adulthood physical abuse by type of perpetrator. We found that victims of adulthood intimate partner physical abuse were five times more likely to be female and more likely to be non-black race. Victims of adulthood intimate partner physical abuse also were more likely to self-identify as gay/ bisexual; have possibly abused alcohol during lifetime; had unprotected sex during the past 90 days; exchanged sex for money, drugs, or shelter; and report symptoms likely indicating depression.

We also stratified by gender our multivariate analyses of adulthood intimate partner physical abuse (results not shown in tables). Among men, we found that self-identifying as gay/ bisexual (AOR = 2.05, 95% CI = 1.29, 3.28, p .05), ever possibly abusing alcohol (AOR = 2.16, 95% CI = 1.39, 3.35, p .05), and reporting symptoms likely indicating depression (AOR = 2.17, 95% CI = 1.34, 3.53, p .05) were associated with adulthood intimate partner physical abuse. We also found that being non-black race (AOR = .59, 95% CI = .36, .96, p .05) and having unprotected sex during past 90 days (AOR = 1.62, 95% CI = 1.00, 2.65, p .05) to be associated with males experiencing adulthood intimate partner physical abuse. Like men, women who experienced IPV more likely to be non-black race (AOR = .08, 95% CI = .01, .67, p .05), have unprotected sex during the past 90 days (AOR = 2.48, 95% CI = 1.04, 5.94, p .05), and ever exchange sex for money, drugs, or shelter (AOR = 4.51, 95% CI = 2.12, 9.57, p .05). Unlike men, however, women who experienced adulthood intimate partner physical abuse were more likely to report perceived stress (AOR = 1.05, 95% CI = 1.00, 1.11, p .05).

Adulthood non-partner physical abuse—As shown in Table 3, we found that victims of non-partner physical abuse were more likely to have possibly abused alcohol during lifetime; and to have been incarcerated. In addition, non-partner physical abuse was associated with ever exchanging sex for money, drug, or shelter; reporting symptoms likely indicating depression; and being unemployed. No differences by gender were found.

Adulthood sexual abuse—As shown in Table 4, we also reported results from bivariate and multivariate logistic regression analysis of adulthood sexual abuse experiences. Victims of adulthood sexual abuse were four times more likely to be female. Victims of sexual abuse also were more likely to self-identify as gay/bisexual; have possibly abused alcohol during lifetime; ever exchange sex for money, drugs, or shelter; and report symptoms likely indicating depression.

We stratified our analysis of adulthood sexual abuse by gender (results not shown in tables). Among males, we found that self-identifying as gay/bisexual (AOR = 2.62, 95% CI = 1.50, 4.58, p .05) and never having stable employment (AOR = .48, 95% CI = .25, .93, p .05) to be associated with adulthood sexual abuse. In addition, we also found that having no insurance (AOR = .47, 95% CI = .23, .98, p .05); ever exchanging sex for money, drug, or shelter (AOR = 1.92, 95% CI = 1.14, 3.25, p .05); and reporting symptoms likely indicating depression (AOR = 2.58, 95% CI = 1.38, 4.83, p .05) to be associated with males experiencing adulthood sexual abuse. Among females, we found that having health insurance (AOR = 2.57, 95% CI = 1.02, 6.45, p .05); exchanging sex for money, drugs, or shelter (AOR = 3.03, 95% CI = 1.49, 6.16, p .05); and reporting symptoms indicating depression (AOR = 4.40, 95% CI = 1.84, 10.50, p .05) to be associated with females experiencing adulthood sexual abuse.

Discussion

The primary goals of this study were to report the prevalence and the associated demographic and risk characteristics of persons at increased risk of various types of interpersonal abuse among homeless or unstably housed adults living with HIV. For prevalence, we found substantially higher levels of lifetime interpersonal abuse in our sample of homeless or unstably housed persons living with HIV compared with other national studies of interpersonal abuse among the general population (Tjaden & Thoennes, 2000). We found even more striking differences in levels of CSA in this sample compared to national surveys. A CDC study reported prevalence rates for CSA of 6.1 and 11.9% among adult males and females in the US, respectively (CDC, 2004). These rates stand in stark contrast to the 33% reported for men and 52% reported for women in this study. These rates are particularly troubling given that reports of sexual abuse often underestimate the true magnitude of sexual abuse due to evidence of victim underreporting (DOJ, 2003).

The prevalence of interpersonal abuse reported in our sample exceeded the rates of a representative study HIV-seropositive women reported other studies (Zierler et al., 1996), with 46% women reporting sexual abuse during adulthood in our study compared to 35% in the aforementioned study. Our findings also exceeded abuse prevalence reported among HIV-seropositive men who experienced CSA (O'Leary et al., 2003). Our findings indicated that 33% of HIV-seropositive men reported having a CSA history compared with 15% reported in the aforementioned study. In addition, our abuse prevalence rate exceeded those among persons after receiving their initial HIV diagnosis reported in a representative study of HIV-seropositive persons (Zierler et al., 2000). Among men, we found that intimate partner physical abuse was reported by 39% in our sample compared to 7–12% in the representative study of HIV-seropositive adults aforementioned. For women, we found that

intimate partner physical abuse was reported by 62% of sample compared with 20% in the aforementioned HIV study.

Our prevalence rates of interpersonal abuse also exceeded those found among the homeless population in general. Our findings that 77% of participants reported physical abuse and 48% reported sexual abuse far exceeded other prevalence data on interpersonal abuse among the homeless population in general. For example, one study reported that 22% experiencing physical assault, and 7% experienced sexual assault (Burt et al., 2001). Our findings also exceeded the physical and sexual abuse rates among single homeless women and men reported in the aforementioned homeless study (Burt et al., 2001).

We also found gender differences in examining the prevalence levels of abuse. Our findings indicated that women were more likely to report IPV, CSA, and adulthood sexual abuse. These patterns are consistent with what has been reported in the literature showing the vulnerability of women to these types of interpersonal abuse (Tjaden & Thoennes, 2000).

For other risk factors of abuse, we found that interpersonal abuse was associated with depressive symptoms, engaging in high HIV transmission risk-related behavior, and among persons who abused alcohol during their lifetimes. Depressive symptoms were associated with each of the five primary measures of interpersonal abuse. These findings are consistent with other studies (Jewkes et al., 2002; Raj et al., 2004). However, these cross-sectional data limited our ability to determine the directionality of the relationship. Depression was found to be both a contributor and outcome of abuse in other studies (Jewkes et al., 2002; Raj et al., 2004; Senn et al., 2006). We suspect that we might find differences in directionality between persons experiencing only one episode of abuse (abuse contributing to depression) and persons experiencing multiple episodes (in which case, depression might lead to future episodes of interpersonal abuse vulnerability). However, we do not have the data to examine this association in more depth. The significant associations with CSA and childhood physical abuse strongly suggest that depression was a lasting result of having survived abuse in the past.

We also found an association between interpersonal abuse and HIV transmission risk-related behaviors. These associations are especially important for prevention efforts given the ability of HIV-seropositive persons to transmit the virus to others. We found that sex exchange for money, drugs, or shelter was associated with interpersonal abuse; a finding consistent with other studies (Brener, McMahon, Warren, & Douglas, 1999; Lang et al., 2003). This finding provides support for other studies identifying the vulnerability of this population both in acquiring HIV/STDs and experiencing multiple episodes of abuse victimization associated with sex exchange and commercial sex work (Surratt & Inciardi, 2004).

In addition to sex exchange, all but one measure of abuse used in this study (CSA) were associated with increased odds of engaging in unprotected sex in our bivariate analyses. With the exception of IPV during adulthood, these associations were not significant in the multivariate analyses. The association between IPV and unprotected sex existed for both men and women after stratifying analyses by gender. This risk association among the study's

homeless sample is consistent with findings from other populations (Coker et al., 2002; El-Bassel, Witte, Wada, Gilbert, & Wallace, 2001; Tjaden & Thoennes, 2000).

The difficulty with interpreting this association is determining whether unprotected sex is directly coerced or uncoerced by the abusive partner. We know from previous studies that abused women face challenges in negotiating condom use with partners (El-Bassel et al., 2001). Teasing the direction of this association can be challenging given the conceptual entanglement involved with this issue. We found unprotected sex to be associated with CSA and adulthood sexual abuse in our bivariate analyses similar to findings in other studies (Senn et al., 2006). However, these findings did not remain statistically significant in the multivariate models. One possible explanation for our findings is that that mental health measures partially mediate the effects of other forms of abuse on unprotected sex among HIV-seropositive men who have sex with men (MSM) as found in other studies (O'Leary et al., 2003). Thus, the inclusion of depression in the multivariate model may have masked the more distal effect of CSA on sexual risk behavior.

In addition to depression and sex exchange, we found that alcohol abuse during lifetime to be a risk factor associated with interpersonal abuse. We found this risk factor to be associated with every measure of abuse except for CSA. In the multivariate analyses stratified by gender, alcohol abuse also was found to be a risk factor among men reporting intimate partner physical abuse during adulthood and among women reporting CSA. These findings were consistent with other studies (Liebschutz, Geier, Horton, Chuang, & Samet, 2005; Wyatt, Carmona, Loeb, & Williams, 2005) and underscore the potential importance of alcohol abuse treatment in this population.

Interestingly, we did not find that the use of other substances (i.e., recent drug use and lifetime injection drug use) to be associated with interpersonal abuse (Raj et al., 2004). Our findings indicated comparable levels of drug use across all abuse experience categories. We suspect that this similarity across these selected variables between victims and non-victims of abuse was due to the homogeneity of the sample given their homeless/unstable housing status. We suspect that we would most likely have had a significant association if stably housed persons were included in the sample.

We also found that self-identifying, as gay or bisexual was associated with interpersonal abuse. We found this association only for men who reported intimate partner physical abuse, CSA, and sexual abuse during adulthood. Other studies have found elevated rates of CSA and IPV among gay and bisexual men (Herek et al., in press; Purcell et al., in press). Although a small sample, findings from another study (Heintz & Melendez, 2006) indicating a high prevalence of sexual abuse among gay men is consistent with our findings. Due to our multivariate analytical approach, we believe that our findings provide even stronger evidence that sexual abuse among gay and bisexual men is a serious matter even among the homeless population.

There are several limitations of our study. We were not able to measure specific points in time that interpersonal abuse experiences occurred for each participant. The lack of specific time measures limited our findings in several aspects. First, we were not able to determine if

HIV infection occurred before or after abuse experience(s), or whether homelessness occurred before or after abuse experience(s). In most cases, we expect that childhood victimization preceded these events, but we cannot determine this with certainty for either childhood or adulthood abuse. Lastly, we also were not able to examine the attributes of homelessness in relationship to abuse. Such an analysis would have provided opportunities to discover other covariates that would be informative for developing programs and HIV risk interventions for this population.

Although we were able to distinguish between partner and non-partner physical abuse, we were limited in the extent of our analysis of IPV. Regrettably, we did not have measures to distinguish between partner and non-partner sexual abuse. These limitations restrict the utility of our findings to design appropriate interventions based on the history of interpersonal abuse history and other conditions (e.g., homelessness attributes, timing of HIV-seroconversion).

Conclusions

Our findings lead to several conclusions and recommendations for public health practitioners. From an epidemiological standpoint, there is a need for improved surveillance and research data about the homeless population. Due to limited surveillance data, estimates of HIV/AIDS prevalence among homeless persons vary widely (Allen et al., 1994; Fournier et al., 1996; Magura, Nwakeze, Rosenblum, & Joseph, 2000; Meyer, Cournos, & Empfield, 1993; Paris, East, & Toomey, 1996; Robertson et al., 2004; Smereck & Hockman, 1998; Susser et al., 1993; Zolopa, Hahn, Gorter, Miranda, & Wlodarczyk, 1994). Improved surveillance and research data are needed for homeless populations to (1) more accurately measure HIV prevalence and HIV risk behaviors; (2) understand abuse in the context of being unstably housed and living with HIV; and (3) use these data to develop appropriate interventions.

Although our study identifies important risk factors associated with abuse, future studies should include expanding the analysis of interpersonal abuse experiences with specific attributes of homelessness (e.g., reasons for homeless status, length of time), time of HIV seroconversion, and other covariates. Analyzing these attributes would provide more in-depth information to design appropriate interventions.

Persons who are homeless, especially those persons infected with HIV, should be screened for experiences of violence and effects of violence. Persons with a history of abuse should be further evaluated for potential need for mental health services and HIV prevention programs. Any persons with histories of interpersonal abuse and alcohol abuse should be considered even further at risk of acquiring HIV. Finally, targeting homeless persons actively engaged in street prostitution and other forms of sex exchange (i.e., survival sex) would be ideal not only for abuse prevention but also for HIV transmission risk reduction.

Acknowledgments

References

Aidala A, Cross J, Stall R, Harre D, & Sumartojo E (2005). Housing status and HIV risk behaviors: Implications for prevention and policy. AIDS and Behavior, 9, 251–265. [PubMed: 16088369]

Allen D, Lehman S, & Green T (1994). HIV infection among homeless adults and runaway youth, United States 1989–1992. AIDS, 8, 1593–1598. [PubMed: 7848596]

Andresen E, Malmgren J, Carter W, & Patrick D (1994). Screening for depression in well older adults: evaluation of a short form of the CES-D (Center for Epidemiologic Studies Depression Scale). American Journal of Preventive Medicine, 10, 77–84. [PubMed: 8037935]

Bassuk E, Buckner J, Weinrab L, Browne A, Bassuk S, Dawson R, et al. (1997). Homelessness in female-headed families: Childhood and adult risk and protective factors. American Journal of Public Health, 87(2), 241–248. [PubMed: 9103104]

Bauer H, Gibson P, Hernandez M, Kent C, Klausner J, & Bolan G (2001). Intimate partner violence and high-risk sexual behaviors among female patients with sexually transmitted diseases. Sexually Transmitted Diseases, 29(7), 411–416.

Bergen RK (1996). Wife rape: Understanding the response of survivors and service providers. Thousand Oaks, CA: Sage.

Brener N, McMahon P, Warren C, & Douglas K (1999). Forced sexual intercourse and associated health-risk behaviors among female college students in the United States. Journal of Consulting and Clinical Psychology, 67, 252–259. [PubMed: 10224736]

Buchsbaum D, Buchanan R, Centor R, et al. (1991). Screening for alcohol abuse using CAGE scores and likelihood ratios. Annals of Internal Medicine, 115, 774–777. [PubMed: 1929025]

Burt M, Aron L, & Lee E (2001). Helping America's homeless: Emergency shelter or affordable housing? Washington, DC: The Urban Institute Press.

Campbell J, Jones A, Dienemann J, Kub J, Schollenberger J, O'Campo P, et al. (2002). Intimate Partner Violence and Physical Health Consequences. Archives of Internal Medicine, 162, 1157–1163. [PubMed: 12020187]

Catz S, Kelly J, Bogart L, et al. (2000). Patterns, correlates, and barriers to medication adherence among persons prescribed new treatments for HIV disease. Health Psychology, 19, 124–133. [PubMed: 10762096]

CDC. (2003). Costs of intimate partner violence against women in the United States Atlanta, GA: CDC, National Center for Injury Prevention and Control.

CDC. (2004). Youth risk behavior surveillance-United States, 2003. Morbidity and Mortality Weekly Report, 53(SS-02), 1–96. [PubMed: 14724557]

Chander G, Lau B, & Moore R (2006). Hazardous alcohol use: A risk factor for non-adherence and lack of suppression in HIV infection. Journal of Acquired Immune Deficiency Syndromes 43(4), 411–417. [PubMed: 17099312]

Cohen S, Kamarck T, & Mermelstein R (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 385–396. [PubMed: 6668417]

Coker A, Davis K, Arias I, Desai S, Sanderson M, & Brandt H (2002). Physical and mental health effects of intimate partner violence for men and women. American Journal of Preventive Medicine, 23(4), 260–268. [PubMed: 12406480]

Department of Justice. (2003). Criminal victimization 2002. Washington: Government Printing Office.

El-Bassel N, Witte SS, Wada T, Gilbert L, & Wallace J (2001). Correlates of partner violence among female street-based sex workers: Substance abuse, history of childhood abuse, and HIV risks. AIDS Patient Care and STDs, 15, 41–51. [PubMed: 11177587]

English D (1998). The extent and consequences of child maltreatment. The Future of Children, Protecting Children from Abuse and Neglect, 8(1).

Ewing J (1984). Detecting alcoholism: The CAGE questionnaire. Journal of the American Medical Association, 252, 1905–1907. [PubMed: 6471323]

Fournier A, Tyler R, Iwasko N, LaLota M, Shultz J, & Greer P (1996). Human immunodeficiency virus among the homeless in Miami: A new direction for the HIV epidemic. American Journal of Medicine, 100, 582–584. [PubMed: 8644772]

Heintz A, & Melendez R (2006). Intimate partner violence and HIV/STD risk among lesbian, gay, bisexual, and transgender individuals. Journal of Interpersonal Violence, 21(2), 193–208. [PubMed: 16368761]

Herek GM, & Sims C (in press) Sexual orientation and violent victimization: Hate crimes and intimate partner violence In Wolitski RJ, Valdiserri RO, & Stall R (Eds.), Unequal opportunity: Health disparities affecting gay and bisexual men in the United States. New York, NY: Oxford University Press.

Jewkes R, Sen P, & Garcia-Moreno C (2002). Sexual violence. In Krug E, Dahlberg LL, & Mercy JA (Eds.), World Report on violence and health (pp. 213–239). Geneva: World Health Organization.

Kidder D, Wolitski R, Stall R, Harre D, Royal S, & Aidala A(2003). The role of housing on health and HIV/AIDS risk behaviors in people living with HIV Paper presented at the New Partnerships for Ending Homelessness: Housing, Services, and Employment, Washington, D.C.

Lang A, Rodgers C, Laffaye C, Satz L, Dresselhaus T, & Stein M (2003). Sexual trauma, posttraumatic stress disorder, and health behavior. Behavioral Medicine, 28(4), 150–158. [PubMed: 14663922]

Liebschutz J, Geier J, Horton N, Chuang C, & Samet J (2005). Physical and sexual violence and health care utilization in HIV-infected persons with alcohol problems. AIDS Care, 17, 566–578. [PubMed: 16036243]

Liebschutz J, Savetski J, Saitz R, Horton N, Lloyd-Travaglini C, & Samet J (2002). The relationship between sexual and physical abuse and substance abuse consequence. Journal of Substance Abuse Treatment, 22, 121–128. [PubMed: 12039614]

Magura S, Nwakeze PC, Rosenblum A, & Joseph H (2000). Substance misuse and related infectious diseases in a soup kitchen population. Substance Use and Misuse, 35, 551–583. [PubMed: 10741541]

Meyer I, Cournos F, & Empfield M (1993). HIV seroprevalence and clinical characteristics of severe inpatient mentally ill homeless. Journal of Social Distress and the Homeless, 2(2), 103–116.

Newman P, Rhodes F, & Weiss R (2004). Correlates of sex trading among drug-using men who have sex with men. American Journal of Public Health, 94, 1998–2003. [PubMed: 15514243]

O'Leary A, & Martins P (2000). Structural factors affecting women's HIV risk: A life-course example. AIDS, 14(suppl 1), S68–S72.

O'Leary A, Purcell D, Remien R, & Gomez C (2003). Childhood sexual abuse and sexual transmission risk behaviour among HIV-positive men who have sex with men. AIDS Care, 15(1), 17–26. [PubMed: 12655830]

Ohene S, Halcon L, Ireland M, Carr P, & McNeely C (2005). Sexual abuse history, risk behavior, and sexually transmitted diseases: The impact of age at abuse. Sexually Transmitted Diseases, 32(6), 358–363. [PubMed: 15912082]

Paris N, East R, & Toomey K (1996). HIV seroprevalence among Atlanta's homeless. Journal of Health Care for the Poor and Underserved, 7(2), 83–93. [PubMed: 8935384]

Purcell DW, Patterson JD, & Spikes PS Jr. (in press) Childhood sexual abuse experienced by gay and bisexual men: Understanding the disparities and interventions to help eliminate them In Wolitski RJ, Valdiserri RO, & Stall R (Eds.), Unequal opportunity: Health disparities affecting gay and bisexual men in the United States. New York, NY: Oxford University Press.

Radloff L (1977). The CES-D Scale: A self-report depression scale for research in the general population. Applied Psychological Measurement, 1, 385–401.

Raj A, Silverman J, & Amaro H (2004). The relationship between sexual abuse and sexual risk among high school students: Findings from the 1997 Massachusetts youth risk behavior survey. Maternal and Child Health Journal, 2, 125–134.

Robertson M, Clark R, Charlebois E, Tulsky J, Long H, Bangsberg D, et al. (2004). HIV seroprevalence among homeless and marginally housed adults in San Francisco. American Journal of Public Health, 94, 1207–1217. [PubMed: 15226145]

Schutt R, & Goldfinger S (1996). Housing preferences and perceptions of health and functioning among homeless mentally ill persons. Psychiatric Services, 47, 381–386. [PubMed: 8689368]

Senn T, Carey M, Vanable P, Coury-Doniger P, & Urban M (2006). Childhood sexual abuse and sexual risk behavior among men and women attending a sexually transmitted disease clinic. Journal of Consulting and Clinical Psychology, 74(4), 720–731. [PubMed: 16881780]

Singer M (1994). AIDS and the health crisis of the US urban poor: the perspective of critical medical anthropology. Social Science and Medicine, 39, 931–948. [PubMed: 7992126]

Smereck G, & Hockman E (1998). Prevalence of HIV infection and HIV risk behaviors associated with living place: on-the-street homeless drug users as a special target population for public health intervention. American Journal of Drug and Alcohol Abuse, 24, 299–319. [PubMed: 9643467]

Surratt H, & Inciardi J (2004). HIV risk, seropositivity and predictors of infection among homeless and non-homeless women sex workers in Miami, Florida, USA. AIDS Care, 16, 594–604. [PubMed: 15223529]

Susser E, Valencia E, & Conover S (1993). Prevalence of HIV infection among psychiatric patients in a New York City men's shelter. American Journal of Public Health, 83, 568–570. [PubMed: 8460736]

Tjaden P, & Thoennes N (2000). Full report of the prevalence, incidence, and consequences of violence against women: Findings from the national violence against women survey (No. NCJ183781). Washington, DC: Department of Justice.

Tucker J, Burnam M, Sherbourne C, et al. (2003). Substance use and mental health correlates of nonadherence to antiretroviral medications in a sample of patients with human immunodeficiency virus infection. American Journal of Medicine, 114, 573–580. [PubMed: 12753881]

Wyatt G, Carmona J, Loeb T, & Williams J (2005). HIV-positive black women with histories of childhood sexual abuse: patterns of substance use and barriers to health care. Journal of Health Care for the Poor and Underserved, 16(4 Suppl B), 9–23. [PubMed: 16327104]

Zierler S, Cunningham W, Andersen R, Shapiro M, Nakazono T, Morton S, et al. (2000). Violence victimization after HIV infection in a US probability sample of adult patients in primary care. American Journal of Public Health, 90, 208–215. [PubMed: 10667181]

Zierler S, Witbeck B, & Mayer K (1996). Sexual violence against women living with or at risk for HIV infection. American Journal of Preventive Medicine, 12, 304–309. [PubMed: 8909637]

Zolopa A, Hahn J, Gorter R, Miranda J, & Wlodarczyk D (1994). HIV and tuberculosis infection in San Francisco's homeless adults. Journal of the American Medical Association, 272(6), 455–461. [PubMed: 8040981]

Table 1

Lifetime and last 6-month experiences of interpersonal abuse by gender

N(%)	All 644 (100.0%)	Male 436 (67.7%)	Female 193 (30.0%)	Transgender 15 (2.3%)
Lifetime				
Any physical or sexual abuse	517 (80.3%)	337 (77.3%)	166 (86.5%)	14 (93.3%)
Both physical and sexual abuse	286 (44.4%)	160 (36.7%)	117 (60.9%)	9 (60.0%)
Physical abuse				
Childhood	341 (53.0%)	220 (50.5%)	110(57.0%)	11 (73.3%)
Adulthood*	441 (68.5%)	285 (65.4%)	142 (73.6%)	14 (93.3%)
Partner*	299 (46.4%)	169 (38.8%)	120 (62.2%)	10 (66.7%)
Non-partner	350 (54.3%)	241 (55.3%)	98 (50.8%)	11 (73.3%)
Either childhood/adulthood	495 (76.9%)	325 (74.5%)	156 (80.8%)	14 (93.3%)
Both childhood/adulthood*	159 (24.7%)	91 (20.9%)	62(32.1%)	6 (40.0%)
Sexual abuse				
Childhood*	249 (38.7%)	143 (32.8%)	100 (52.4%)	6 (40.0%)
Adulthood*	188 (29.2%)	92 (21.1%)	89 (46.4%)	7 (46.7%)
Either childhood/adulthood*	308 (47.8%)	172 (39.4%)	127 (66.1%)	9 (60.0%)
Both childhood/adulthood*	129 (20.0%)	63 (14.4%)	62 (32.5%)	4 (26.7%)
Last 6 months				
Any physical/sexual Abuse	104 (16.1%)	62 (14.2%)	35 (18.1%)	7 (46.7%)
Physical abuse				
Adulthood	100 (15.5%)	60 (13.8%)	34 (17.6%)	6 (40.0%)
Partner	53 (8.2%)	24 (5.5%)	27 (14.0%)	2 (13.3%)
Non-partner	59 (9.2%)	43 (9.9%)	11 (5.7%)	5 (33.3%)
Sexual abuse	11 (1.7%)	5 (1.1%)	5 (2.6%)	1 (6.7%)

Note:

*
$p < .05$ (for Gender differences—Transgenders were excluded due to low cell counts)

Table 2

Percentages of participants who experienced various types of interpersonal abuse by selected variables

	All participants		Physical abuse		Sexual abuse	
	During childhood	During adulthood	During adulthood by partner	by non-partner	During adulthood	During adulthood
	(n = 644)	(n = 341)	(n = 299)	(n = 350)	(n = 249)	(n = 188)
Sociodemographic						
Gender (Female)†	194 30.1%	110 32.3%	121 40.5%	99 28.3%	149 59.8%	99 52.7%
Race (Black)	504 78.3%	249 73.0%	222 74.2%	263 75.1%	191 76.7%	143 76.1%
Age (< 40)	405 62.9%	203 59.5%	176 58.9%	223 63.7%	135 54.2%	104 55.3%
Gay/bisexual identity	272 42.2%	158 46.3%	131 43.8%	159 45.4%	118 47.4%	84 44.7%
Recently homeless	176 27.3%	106 31.1%	82 27.4%	105 30.0%	76 30.5%	51 27.1%
Education (< High school)	417 64.8%	214 62.8%	187 62.5%	230 65.7%	158 63.5%	120 63.8%
Household income (< $600/mo.)	322 50.0%	168 49.3%	154 51.5%	173 49.4%	121 48.6%	86 45.7%
Insurance (Yes)	550 85.4%	287 84.2%	252 84.3%	300 85.7%	205 82.3%	159 84.6%
Current employment (Yes)	113 17.5%	56 16.4%	47 15.7%	50 14.3%	43 17.3%	34 18.1%
Job stability (Ever held < 1 year)	514 79.8%	255 74.8%	229 76.6%	278 79.4%	185 74.3%	139 73.9%
Substance use/abuse						
Potential alcohol abuse (CAGE)—Ever	279 43.3%	164 48.1%	151 50.5%	169 48.3%	116 46.6%	96 51.1%
Recent drug use—past 90 days	263 40.8%	147 43.1%	130 43.5%	151 43.1%	104 41.8%	82 43.6%
Injection drug use—Ever (Yes)	184 28.6%	102 29.9%	89 29.8%	110 31.4%	62 24.9%	48 25.5%
Jail/prison—Ever (Yes)	432 67.1%	244 71.6%	214 71.6%	257 73.4%	168 67.5%	123 65.4%
Sex behavior						
Unprotected sex (past 90 days)	165 25.6%	102 29.9%	98 32.8%	103 29.4%	67 26.9%	59 31.4%
Sex exchange (Money, Drugs, Shelter)	332 51.6%	219 64.2%	190 63.5%	214 61.1%	160 64.3%	127 67.6%
Mental health						
Depressive symptoms (score >10)	447 69.4%	264 77.4%	236 78.9%	265 75.7%	196 78.7%	156 83.0%
Perceived stress scale (Mean)	$\bar{x}$ = 30.0 (SD = 7.38)	$\bar{x}$ = 31.1 (SD = 7.10)	$\bar{x}$ = 31.2 (SD = 7.00)	$\bar{x}$ = 31.0 (SD = 7.06)	$\bar{x}$ = 31.5 (SD = 7.21)	$\bar{x}$ = 32.2 (SD = 7.32)

Note:

† Gender includes 15 male to female transgenders: 14 pre-operation (coded as male) and 1 post-operation (coded as female). $\bar{x}$ = mean, SD = standard deviation

Table 3

Associations with various types of physical abuse

| | During childhood | | | During adulthood | | | | | |
| | | | | By partner | | | By non-partner | | |
	N	Bivariate	Multivariate (N = 341)*	N	Bivariate	Multivariate (N = 299)*	N	Bivariate	Multivariate (N = 350)*
Sociodemographic									
Gender (Female)†	644	1.38 (CI = 1.02, 1.87)*		644	2.37 (CI = 1.73, 3.24)*	5.08 (CI = 3.11, 8.32)	644	.97 (CI = .72, 1.31)	
Race (Black)	642	.52 (CI = .35, .77)*	.47 (CI = .30, .75)	642	.64 (CI = .44, .94)*	.50 (CI = .31, .79)	642	.64 (CI = .43, .94)*	
Age (≥40)	644	.98 (CI = .96, .99)*		644	.98 (CI = .97, 1.00)		644	1.01 (CI = .99, 1.03)	
Gay/bisexual identity	640	1.42 (CI = 1.03, 1.94)*		640	1.11 (CI = .81, 1.51)	1.80 (CI = 1.17, 2.77)	640	1.32 (CI = .96, 1.81)	
Recently homeless	644	1.50 (CI = 1.06, 2.14)*		644	1.01 (CI = .71, 1.43)		644	1.35 (CI = .95, 1.91)	
Education (≥ High School)	644	.83 (CI = .60, 1.15)		644	.84 (CI = .60, 1.15)		644	1.10 (CI = .79, 1.52)	
Household income (≥ $600/mo.)	590	.87 (CI = .63, 1.21)		590	1.07 (CI = .77, 1.47)		590	.97 (CI = .70, 1.34)	
Insurance (Yes)	644	.81 (CI = .52, 1.26)		644	.85 (CI = .55, 1.31)		644	1.06 (CI = .68, 1.64)	
Current employment (Yes)	644	.85 (CI = .57, 1.27)		644	.79 (CI = .52, 1.19)		644	.61 (CI = .41, .92)*	.55 (CI = .34, .88)
Job stability (Ever held ≥ 1 year)	642	.52 (CI = .34, .77)*	.57 (CI = .35, .92)	642	.69 (CI = .47, 1.01)		642	.92 (CI = .62, 1.35)	
Substance use/abuse									
Potential alcohol abuse (CAGE)—Ever	639	1.52 (CI = 1.11, 2.09)*	1.48 (CI = 1.02, 2.14)	639	1.73 (CI = 1.26, 2.37)*	1.93 (CI = 1.32, 2.83)	639	1.59 (CI = 1.16, 2.18)*	1.44 (CI = 1.01, 2.07)
Recent drug use—past 90 days	640	1.21 (CI = .88, 1.66)		640	1.22 (CI = .89, 1.67)		640	1.22 (CI = .89, 1.67)	
Injection drug use—Ever (Yes)	642	1.15 (CI = .82, 1.62)		642	1.12 (CI = .79, 1.57)		642	1.36 (Q = .96, 1.93)	
Jail/prison—ever (Yes)	638	1.61 (CI = 1.15, 2.25)*		638	1.40 (CI = 1.00, 1.95)*		638	1.89 (CI = 1.35, 2.65)*	1.70 (CI = 1.15, 2.52)
Sex behavior									
Unprotected sex (past 90 days)	625	1.63 (CI = 1.14, 2.35)*		625	2.01 (CI = 1.40, 2.88)*	1.74 (CI = 1.15, 2.65)	625	1.54 (CI = 1.07, 2.21)*	
Sex exchange (Money, Drugs, Shelter)	638	2.96 (CI = 2.15, 4.09)*	2.65 (CI = 1.84, 3.82)	638	2.53 (CI = 1.83, 3.48)*	1.85 (CI = 1.25, 2.73)	638	2.33 (CI = 1.69, 3.20)*	1.88 (CI = 1.31, 2.70)

	During childhood			During adulthood				By non-partner		
				By partner						
	N	**Bivariate**	**Multivariate (*N* = 341)** *		*N*	**Bivariate**	**Multivariate (*N* = 299)** *		*N*	**Bivariate**	**Multivariate (*N* = 350)** *
Mental health										
Depressive symptoms (score >10)	643	2.23 (CI = 1.58, 3.14) *	2.04 (CI= 1.38, 3.02)		643	2.36 (CI = 1.66, 3.36) *	2.15 (CI = 1.42, 3.25)	643	1.94 (CI = 1.38, 2.73) *	2.01 (CI = 1.37, 2.95)
Perceived stress scale (Mean)	642	1.05 (CI = 1.02, 1.07) *			642	1.04 (CI = 1.02, 1.07) *		642	1.04 (CI = 1.02, 1.07) *	

Note:

†Gender includes 15 transgenders: 14 pre-operation (coded as male) and 1 post-operation (coded as female)

*
p .05

Table 4

Associations with various types of sexual abuse

	During childhood			During adulthood		
	N	Bivariate	Multivariate (N = 249)*	N	Bivariate	Multivariate (N = 188)*
Sociodemographic						
Gender (Female)†	642	1.87 (CI = 1.38, 2.53)*	2.90 (CI = 1.82,4.62)	643	2.72 (CI = 1.97, 3.75)*	4.51 (CI =2.73,7.46)
Race (Black)	640	.87 (CI = .60, 1.28)		641	.88 (CI = .58, 1.32)	
Age (40)	642	.95 (CI = .94, .97)*	.97 (CI = .94, .99)	643	.97 (CI = .95, .99)*	
Gay/bisexual identity	638	1.39 (CI = 1.01, 1.92)*	1.84 (CI = 1.21, 2.82)	639	1.14 (CI = .81, 1.61)	2.09 (CI = 1.29,3.39)
Recently homeless	642	1.29 (CI =.91, 1.83)		643	.98 (CI =.67, 1.44)	
Education (High school)	642	.91 (CI = .65, 1.27)		643	.94 (CI = .66, 1.34)	
Household income ($600/mo.)	588	.90 (CI = .64, 1.25)		589	.78 (CI = .55,1.12)	
Insurance (Yes)	642	.68 (CI = .44, 1.06)		643	.91 (CI = .57, 1.47)	
Current employment (Yes)	642	1.00 (CI = .66, 1.52)		643	1.07 (CI = .68, 1.66)	
Job stability (ever held 1 year)	640	.59 (CI = .40, .88)*		641	.61 (CI = .41, .92)*	
Substance use/abuse						
Potential alcohol abuse (CAGE)—ever	637	1.22 (CI = .88, 1.68)		638	1.55 (CI = 1.10, 2.18)*	1.54 (CI = 1.03,2.32)
Recent drug use—past 90 days	638	1.07 (CI = .78, 1.48)		639	1.20 (CI = .85, 1.69)	
Injection drug use—ever (Yes)	640	.75 (CI = .53, 1.08)		641	.82 (CI = .56, 1.21)	
Jail/prison—ever (Yes)	636	1.07 (CI = .76, 1.51)		637	.91 (CI =.63, 1.30)	
Sex behavior						
Unprotected sex (past 90 days)	623	1.14 (CI = .79, 1.64)		624	1.49 (CI = 1.02, 2.17)*	
Sex exchange (Money, Drugs, Shelter)	637	2.26 (CI = 1.63, 3.13)*	1.88 (CI = 1.29, 2.74)	637	2.53 (CI = 1.77, 3.62)*	2.01 (CI = 1.32,3.06)
Mental health						
Depressive symptoms (score >10)	641	2.10 (CI = 1.46, 3.03)*	1.66 (CI =1.10, 2.52)	642	2.76 (CI = 1.80, 4.22)*	2.18 (CI = 1.20,3.99)
Perceived stress scale (Mean)	640	1.05 (CI = 1.02, 1.07)*		641	1.06 (CI = 1.04, 1.09)*	

Note:

†Gender includes 15 transgenders: 14 pre-operation (coded as male) and 1 post-operation (coded as female)

*
p .05