# Posttraumatic Stress Disorder and HIV Risk Among Poor, Inner-City Women Receiving Care in an Emergency Department

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The relationship between posttraumatic stress disorder (PTSD) and HIV risk behaviors remains relatively underresearched. However, several studies have shown that PTSD is associated with sexual HIV risk behaviors and HIV seropositive status.[1–3] Emergency departments have been identified as the first and primary source of medical treatment of many women infected with or at high risk for HIV[4–6] and for those with high rates of interpersonal violence and trauma, including those suffering from PSTD.[7–11]

Hutton et al. found that, after adjustment for potentially confounding factors, a PTSD diagnosis was associated with engaging in anal intercourse and exchanging sex for money or drugs in a sample of 177 female inmates.[12] High rates of PTSD have also been found among HIV-positive women,[3,13,14] many of whom have experienced repeated traumas associated with PTSD, such as childhood sexual abuse and intimate partner violence (IPV).[3,13,14] In a study of HIV-positive women, 35% of those with a trauma history met the criteria for PTSD,[15] a rate far exceeding both the lifetime PTSD rate (10.4%) among women in the general population[16] and the PTSD rate (4.6%) in a nationally representative sample of female crime victims.[17]

The relationship between PTSD and HIV risk behaviors has been found to vary according to the presence of different PTSD symptoms (avoidance, hyperarousal, and re-experiencing trauma). In their study of 64 HIV-positive women and men, Gore-Felton and Koopman found that moderate to severe reexperiencing symptoms were associated with multiple sexual partners and unprotected sex during the preceding 3 months.[18] Individuals with avoidant symptoms were less likely to have engaged in unprotected sex, possibly as a result of deficits in establishing and maintaining intimate partnerships.[18] The presence of

*Objectives.* We examined the associations between posttraumatic stress disorder (PTSD) and HIV risk behaviors among a random sample of 241 low-income women receiving care in an urban emergency department.

*Methods.* We recruited participants from the emergency department waiting room during randomly selected 6-hour blocks of time. Multivariate analyses and propensity score weighting were used to examine the associations between PTSD and HIV risk after adjustment for potentially confounding sociodemographic variables, substance use, childhood sexual abuse, and intimate partner violence.

*Results.* A large majority of the sample self-identified as Latina (49%) or African American (44%). Almost one third (29%) of the participants met PTSD criteria. Women who exhibited symptoms in 1 or more PTSD symptom clusters were more likely than women who did not to report having had sex with multiple sexual partners, having had sex with a risky partner, and having experienced partner violence related to condom use in the preceding 6 months.

*Conclusions.* The high rate of PTSD found in this sample and the significant associations between PTSD symptom clusters and partner-related risk behaviors highlight the need to take PTSD into account when designing HIV prevention interventions for low-income, urban women. (*Am J Public Health.* 2011;101: 120–127. doi:10.2105/AJPH.2009.181842)

hyperarousal symptoms may trigger individuals to seek sexual stimulation and engage in riskier sex, and they may experience difficulty in problem solving and negotiating safe sex.[19]

The research just described highlights mechanisms of how different PTSD symptom clusters may increase the likelihood of engaging in HIV risks. However, it should also be acknowledged that the relationship may be bidirectional: a traumatic experience (e.g., forced unprotected sex) associated with a risk of HIV may lead to PTSD.

Furthermore, research suggests that the relationship between PTSD and HIV risk may be mediated by several factors, including childhood sexual abuse, IPV, and substance abuse. Those who have experienced childhood sexual abuse are at increased risk of developing PTSD,[20–22] engaging in subsequent sexual HIV risk behaviors, and HIV transmission.[3,23] Similarly, IPV has been found to increase the risk of both developing PTSD and engaging in a range

of HIV risk behaviors, including unprotected sex,[24–38] sexual practices leading to a high risk of sexually transmitted infections,[6,32,39–42] sex with multiple partners,[31,32,43] trading of sex for money or drugs,[40,44] sex with risky partners,[38,45] and sex with HIV-positive partners.[38] Finally, substantial research indicates that drug and alcohol dependencies are associated with both PTSD[46,47] and engaging in a range of HIV risk behaviors.[48–51]

We examined the relationship between PTSD (and the symptom clusters of avoidance, reexperiencing trauma, and hyperarousal) and sexual HIV risk behaviors in a random sample of 241 women attending an emergency department in a low-income neighborhood of the Bronx, New York. We hypothesized that women who met the criteria for PTSD and the symptom clusters of hyperarousal, reexperiencing trauma, or avoidance would be more likely than women who did not meet these criteria to engage in sexual HIV risk behaviors

after adjustment and matching for potentially confounding factors such as sociodemographic characteristics, childhood sexual abuse, substance abuse, and IPV.

## METHODS

We collected data for this study in a Bronx, New York, hospital emergency department that serves a catchment area of 1.1 million residents. Participants were recruited during randomly selected 6-hour blocks of time from August 2001 through April 2003. In 2002, 18 045 unduplicated female patients aged 18 years or older visited the emergency department (unpublished data from the emergency department's 2002 records). A total of 215 blocks of time were selected as follows: 9 AM to 3 PM, 7 blocks (3%); 3 PM to 9 PM, 118 blocks (55%); 9 PM to 3 AM, 77 blocks (36%); and 3 AM to 9 AM, 13 blocks (6%).

Among the selected blocks, 29% occurred on a weekend. The probability of a specific block being selected was adjusted to match the proportion of patients seen in the emergency department (according to emergency department census data from the preceding year) based on the day of the week and time of day. Of the 6422 female patients admitted to the emergency department during the selected time blocks, 1251 were approached and 452 refused to participate. A sample of 799 women participated in the screening interview, of whom 396 met the study's eligibility criteria. Of these eligible women, 241 (61%) agreed to participate and completed the study questionnaire a week after being screened.

Recruitment procedures were based on success with similar studies in other emergency department settings.[52–54] Female research assistants, fluent in Spanish and English, attempted to approach every woman who was admitted to the emergency department during the designated time blocks prior to or immediately after medical care. Interested potential participants provided informed consent before completing a face-to-face screening interview in a private room.

To be eligible, patients had to be older than 18 years, female, and admitted to the emergency department during one of the time blocks selected for study inclusion. In addition, they were required to have had a sexual relationship (at least 3 months in duration) during the preceding year with someone they described as their boyfriend, ex-boyfriend, spouse, ex-spouse, the father of their children, or a regular nonpaying sexual partner, and they had to have had vaginal sex in the preceding 6 months with that partner. Women who were admitted for psychiatric emergencies and women who demonstrated severe cognitive or psychological impairments were excluded because of their inability to provide informed consent.

In the case of moderate or severe triage patients who required hospitalization, screening interviews were conducted within 2 weeks of their hospital admission. Eligible women were asked to participate in the study interview within 10 days of being screened.

### Measurement

*HIV risk behaviors.* We used 2 continuous measures to capture the number of unprotected acts of vaginal or anal sex and the percentage of condom-protected sexual encounters across all partners (i.e., intimate, casual, paying) in the preceding 30 days. Also, we used several dichotomous measures to assess HIV risks in the preceding 6 months, including having had unprotected anal sex, having had multiple sexual partners, having had sex with a risky partner (i.e., a partner with HIV, an injection drug user, or a partner who had sex with multiple partners), having used alcohol or drugs immediately before or during sex, having experienced violence related to condom use (i.e., being forced to have sex without a condom), and having exchanged sex for money or drugs. To facilitate more accurate reporting of sexual behaviors, we used the timeline follow-back method, in which calendar techniques are used to enhance recall.

*Posttraumatic stress disorder.* We used the PTSD Checklist–Civilian (PCL-C), a 17-item self-report scale, to assess PTSD. Respondents were asked to use a 5-point scale to describe the extent to which they experienced each symptom during the time frame.

The PCL-C mirrors the criteria of the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders*,[55] which include the following: experiencing or witnessing a stressful life event involving a threat of serious injury or death or a threat to the physical integrity of oneself or others, a diagnosis of reexperiencing symptoms (indicated by 1 or more of the 5 items of the PCL-C reexperiencing subscale), a diagnosis of avoidance symptoms (indicated by 3 or more of the 7 items of the PCL-C avoidance subscale), a diagnosis of arousal symptoms (indicated by 2 or more of the 5 items of the PCL-C arousal subscale), and symptoms of disturbance. With the exception of disturbance, each symptom was required not to have been present before the trauma; symptoms of disturbance had to have persisted for more than 1 month. The PCL-C has an alpha reliability of 0.97 and has been cross validated with related measures.[56]

*Covariates.* Our data analyses included covariates that have been found to be associated with PTSD and HIV risk outcomes. In addition to collecting data on sociodemographic characteristics such as age, race/ethnicity, education level, homelessness, employment status in the preceding 6 months, and receipt of public assistance within 12 months of the screening interview, we assessed whether participants had a history of childhood sexual abuse, physical or injurious IPV, sexual IPV, illicit drug use, and heavy episode drinking.

We measured childhood sexual abuse using the Childhood Sexual Abuse Interview.[57,58] This instrument evaluates history of sexual experiences during childhood and includes 2 subscales assessing touching: exposure (6 items) and penetration (3 items). Participants were classified as having been sexually abused if they reported that someone who was a relative or 5 or more years older than they were had subjected them to either of these forms of abuse before the age of 16 years or if the sexual experience was unwanted or coerced.

We assessed history of IPV using the minor and severe sexual, physical, and injurious subscales of the Revised Conflict Tactics Scales.[59] Sexual IPV scale items focus on coercive acts intended to engage a partner in unwanted sexual activity. Physical IPV scale items focus on physical assaults perpetrated against the partner, and injurious IPV scale items focus on the consequences of violence. The internal consistencies of the instrument's subscales are high, ranging between 0.79 and 0.95.[59]

Drug use was assessed according to whether the participant reported having used crack, cocaine, heroin (not injected), or marijuana in the preceding 6 months. Participants who

reported having had 4 or more drinks on the same occasion in the preceding 6 months were categorized as having engaged in heavy episode drinking.

### Data Analysis

We used multiple imputation via the multivariate imputation by chained equations module in Stata (StataCorp LP, College Station, TX) to reduce the potential bias resulting from missing data for 19 women who refused to answer PTSD questions.[60–63] Multiple imputation procedures generated 5 imputed data sets to replace each missing value and account for the uncertainty about the missing values.

We used negative binomial regression to examine the associations between PTSD variables and occurrences of unprotected vaginal sex, multiple ordinary least square regression to assess the associations between PTSD variables and proportion of protected vaginal sex, and multiple logistic regression to examine the associations between PTSD and dichotomous HIV riskdependent variables. The adjusted covariates were age, ethnicity, homelessness, employment, years of schooling, heavy episode drinking, drug use, childhood sexual abuse, and history of physical or injurious IPV.

All of the multivariate linear models were estimated with propensity score weights, a well-established method of estimating treatment effects (i.e., the presence of PTSD in this study) in observational studies to reduce selection bias. This aproach minimizes the likelihood that pretreatment covariates will confound the treatment effect by selecting groups that are similar on average with respect to all covariate values.[64–68] The propensity score is the probability that a respondent is assigned to the pretreatment group (e.g., women who exhibited PTSD symptoms) rather than to the comparison group (e.g., women without PTSD symptoms). The propensity score is a 1-dimensional variable that represents the selected pretreatment covariates. Among respondents with a given propensity score, the distribution of these covariates is the same on average in the treatment and comparison groups.

Propensity score models can reduce selection bias in observational studies, especially when the variable of interest was not a key factor in sample selection.[64–68] In our analyses, the PSMATCH2 (Stata shareware, StataCorp LP,

College Station, TX) module[69] was used in calculating propensity scores. Also, balance diagnostics were conducted for all covariates to verify that the treatment and comparison groups had similar distributions for the set of covariates.[70] We used propensity score weighting to reweight treatment and comparison observations so that they would be representative of the population of interest.

## RESULTS

Figure 1 shows that 30% of the sample met PTSD criteria. Two thirds of the participants met the criteria for reexperiencing trauma, 40% met the criteria for avoidance symptoms, and 48% met the criteria for hyperarousal symptoms.

Table 1 presents data on sociodemographic characteristics, substance abuse history, and history of violence according to PTSD diagnosis. Participants ranged in age from 18 to 61 years, with a mean of 33 years (SD=10, median=32). The majority of the participants identified themselves as Latina or African American. About half had a high school diploma and had been employed in the preceding 6 months. Fewer than 20% had been homeless in the preceding 6 months. The only significant association found between PTSD criteria and sociodemographic characteristics

was that women who met all of the PTSD criteria were less likely to have been employed in the preceding 6 months than were women who did not meet any of the criteria.

One quarter of the women reported heavy episode drinking, and 43% had used drugs in the preceding 6 months. Women who met PTSD criteria were significantly more likely to report heavy episode drinking and drug use than were their counterparts who did not meet these criteria.

Two fifths of the women reported experiencing childhood sexual abuse. More than two thirds had experienced sexual, physical, or injurious IPV. Women who met PTSD criteria were more likely than those who did not to report experiencing childhood sexual abuse and sexual, physical, or injurious IPV.

### HIV Risk Behaviors

On average, participants had used condoms 33% of the time during vaginal sex in the preceding 30 days, and only 25% of the women reported always using condoms during vaginal sex (Table 2). Only 10% reported unprotected anal sex in the preceding 30 days. More than half of the women indicated that they had not used condoms in the preceding 30 days. On average, the participants reported 10 acts of unprotected vaginal sex in the past 30 days. More than two fifths (43%) reported



**FIGURE 1—Posttraumatic stress disorder (PTSD) and symptom clusters.**
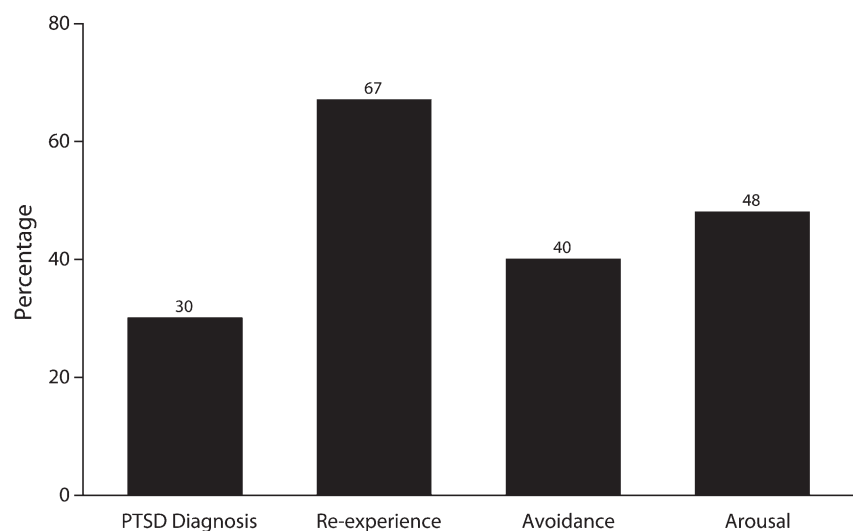
Note. The sample size was n=241.

**TABLE 1—Sociodemographic Characteristics, Substance Abuse History, and History of Violence: Low-Income Women Seeking Emergency Care in the Bronx, NY, 2001–2003**

| | Total (n = 241) | Participants Not Meeting PTSD Criteria (n = 169) | Participants Meeting PTSD Criteria (n = 72) |
|---|---|---|---|
| Sociodemographic characteristics | | | |
| Age, y, mean (SD) | 33 (10) | 33 (10) | 33 (10) |
| Race/ethnicity, no. (%) | | | |
| Latina | 119 (49) | 81 (48) | 38 (53) |
| African American | 105 (44) | 75 (44) | 30 (42) |
| Other | 17 (7) | 13 (8) | 4 (6) |
| High school diploma, no. (%) | 127 (53) | 93 (55) | 34 (47) |
| Employed in past 6 mo, no. (%) | 111 (46) | 86 (51) | 25* (35) |
| Homeless in past 6 mo, no. (%) | 38 (16) | 23 (14) | 15 (21) |
| Substance abuse in past 6 mo, no. (%) | | | |
| Heavy episode drinking | 57 (24) | 30 (18) | 27** (38) |
| Illicit drug use | 104 (43) | 61 (36) | 43** (60) |
| History of violence, no. (%) | | | |
| Childhood sexual abuse (before age 16 y) | 99 (41) | 50 (30) | 49** (68) |
| Lifetime sexual IPV | 167 (69) | 107 (63) | 60** (83) |
| Lifetime physical or injurious IPV | 165 (68) | 103 (61) | 62** (86) |

*Note.* IPV = intimate partner violence; PTSD = posttraumatic stress disorder.
*$P < .05$; **$P < .01$.

that either they or their partners were under the influence of drugs or alcohol during sexual encounters in the preceding 6 months. Almost one third (29%) of the women reported having had sex with a risky partner. Twenty-two percent reported IPV related to condom use, and 18% reported more than 1 sexual partner in the preceding 6 months. Eight women reported sex trading in the past 6 months.

Relative to women who did not meet PTSD criteria, those who did were more likely to report multiple sexual partners, having a risky partner, experiencing violence related to condom use, and trading sex in the preceding 6 months. Eight participants (3%) reported being HIV positive.

### Multivariate Analyses

Table 3 shows the estimates of the effects of PTSD and the 3 symptom clusters on different HIV risk behaviors after adjustment for the study covariates (sociodemographic characteristics, substance abuse, childhood sexual abuse, and physical or injurious IPV). We estimated each multivariate model with propensity score weights.

The findings from the multivariate analyses showed that those who met PTSD criteria were more likely than those who did not to report having a risky partner (adjusted odds ratio [OR] = 2.3) in the preceding 6 months. In comparison with their counterparts, women who met criteria for reexperiencing symptoms were more likely to report having multiple sexual partners (adjusted OR = 5.9), having a risky partner (adjusted OR = 4.7), and experiencing violence related to condom use (adjusted OR = 3.4) in the preceding 6 months.

**TABLE 2—Descriptive Statistics for HIV Risk Behaviors and Posttraumatic Stress Disorder (PTSD): Low-Income Women Seeking Emergency Care in the Bronx, NY, 2001–2003**

| | Total (n = 241) | Participants Not Meeting PTSD Criteria (n = 169) | Participants Meeting PTSD Criteria (n = 72) |
|---|---|---|---|
| No. of unprotected vaginal sex acts with all partners in past 30 d, mean (SD) | 10 (15) | 10 (15) | 10 (16) |
| Percentage of protected vaginal sex acts with all partners in past 30 d, mean (SD) | 33 (43) | 33 (43) | 35 (44) |
| Condom use during vaginal sex in past 30 d, no. (%) | | | |
| Never | 138 (57) | 99 (59) | 39 (54) |
| Sometimes | 43 (18) | 29 (17) | 14 (20) |
| Always | 60 (25) | 41 (24) | 19 (26) |
| Unprotected anal sex in past 30 d, no. (%) | 24 (10) | 14 (8) | 10 (14) |
| Multiple sex partners in past 6 mo, no. (%) | 43 (18) | 21 (12) | 22** (31) |
| Risky partners in past 6 mo, no. (%) | 70 (29) | 40 (24) | 30** (42) |
| Sex under the influence of drugs or alcohol in past 6 mo, no. (%) | 103 (43) | 66 (39) | 37 (51) |
| Violence related to condom use in past 6 mo, no. (%) | 52 (22) | 25 (15) | 27** (38) |
| Sex trading in past 6 mo, no. (%) | 8 (3) | 2 (1) | 6** (8) |

**$P < .01$.

**TABLE 3—Associations Between Posttraumatic Stress Disorder (PTSD) and HIV Risk Behaviors: Low-Income Women Seeking Emergency Care in the Bronx, NY, 2001–2003**

| | No. of Unprotected Vaginal Sex Acts With All Partners[a] | | Proportion of Protected Vaginal Sex Acts With All Partners[a] | | Unprotected Anal Sex[a] | | Multiple Sex Partners[b] | | Risky Partners[b] | | Violence Related to Condom Use[b] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unadjusted IRR (95% CI) | Adjusted IRR (95% CI) | Unadjusted OLS Estimate (95% CI) | Adjusted OLS Estimate (95% CI) | Unadjusted OR (95% CI) | Adjusted OR (95% CI) | Unadjusted OR (95% CI) | Adjusted OR (95% CI) | Unadjusted OR (95% CI) | Adjusted OR (95% CI) | Unadjusted OR (95% CI) | Adjusted OR (95% CI) |
| Model 1: PTSD | 1.0 (0.9, 1.2) | 1.0 (0.8, 1.3) | 0.03 (−0.1, 0.2) | 0.001 (−0.2, 0.2) | 1.8 (0.8, 4.3) | 1.0 (0.4, 2.7) | 3.1** (1.6, 6.2) | 2.1 (0.8, 5.5) | 2.4** (1.3, 4.4) | 2.3* (1.1, 4.8) | 3.7** (1.9, 7.0) | 2.3 (0.98, 5.2) |
| Model 2: reexperiencing | 1.0 (0.8, 1.1) | 0.9 (0.8, 1.1) | 0.03 (−0.1, 0.2) | 0.1 (−0.1, 0.2) | 1.6 (0.6, 4.1) | 1.0 (0.3, 3.2) | 6.1** (2.1, 17.8) | 5.9* (1.4, 24.1) | 3.8** (1.8, 8.2) | 4.7** (1.9, 12.0) | 2.5* (1.1, 5.4) | 3.4** (1.4, 8.6) |
| Model 3: avoidance | 1.0 (0.8, 1.2) | 1.0 (0.8, 1.1) | 0.04 (−0.1, 0.2) | 0.01 (−0.1, 0.2) | 1.3 (0.6, 3.1) | 0.6 (0.2, 1.7) | 4.0** (2.0, 8.2) | 4.3** (1.5, 12.7) | 3.6** (2.0, 6.5) | 3.7** (1.7, 7.8) | 6.7** (3.3, 13.6) | 7.3** (3.1, 17.2) |
| Model 4: arousal | 0.9 (0.8, 1.1) | 0.9 (0.8, 1.1) | 0.04 (−0.1, 0.2) | 0.003 (−0.1, 0.1) | 1.9 (0.8, 4.6) | 0.8 (0.3, 2.2) | 5.4** (2.5, 11.9) | 4.4** (1.6, 12.4) | 2.5** (1.4, 4.7) | 2.3* (1.1, 4.8) | 3.1** (1.5, 6.3) | 3.6** (1.5, 8.6) |

*Note.* CI = confidence interval; IRR = incidence rate ratio; OLS = ordinary least square; OR = odds ratio. Sample size was n = 241. Values were derived from unadjusted and adjusted models with propensity score weighting. The adjusted covariates were age, ethnicity (Black, Latino, other), homelessness, employment, years of schooling, childhood sexual abuse, and physical or injurious intimate partner violence. The same covariates were used for propensity score weighting.

[a]Past 30 days.
[b]Past 6 months.
*P<.05; **P<.01.

Women with avoidance symptoms were more likely to report having multiple sexual partners (adjusted OR=4.3), having a risky partner (adjusted OR=3.7), and experiencing violence related to condom use (adjusted OR=7.3) than women without these symptoms. Similarly, women with hyperarousal symptoms were more likely than their counterparts to report having multiple sexual partners (adjusted OR=4.4), having a risky partner (adjusted OR=2.3), and experiencing violence related to condom use (adjusted OR=3.6).

PTSD was not associated with the number or proportion of protected vaginal sex acts, having unprotected anal sex, or having sex under the influence of drugs or alcohol. Only 8 women reported sex trading in the preceding 6 months, so this variable was not included in the multivariate analyses.

## DISCUSSION

We found remarkably high rates of PTSD in this representative sample of predominantly poor, minority women visiting an urban emergency department; almost one third met full PTSD criteria. We also found low rates of consistent condom use and high rates of HIV risk behaviors.

The multivariate analyses suggest a consistent pattern of associations between PTSD variables and having sex with risky partners. Meeting full PTSD criteria was found to be associated with an increased risk of having sex with a risky partner and experiencing IPV related to condom use. Similarly, the PTSD symptom clusters of hyperarousal, reexperiencing, and avoidance were independently associated with these partner risk factors as well as with participants' reports of having had sex with multiple partners, which is consistent with previous study findings.[1,12,18] No significant associations were found between PTSD symptoms and condom use variables, contrary to some previous research.[18]

Specific mechanisms that may explain the relationships between PTSD and certain HIV risk behaviors remain to be researched. However, several factors may contribute to the increased likelihood of experiencing partner-related risks associated with different PTSD symptom clusters. Symptoms associated with reexperiencing trauma (flashbacks, detachment

from one's own body, emotional unresponsiveness) may result in difficulty in negotiating sexual encounters. As a result, women may acquiesce to a risky partner and have unsafe sex.

Women meeting criteria for the avoidance cluster are more likely to report numbing symptoms, emotional detachment, and feelings of disassociation, all of which may prevent them from establishing and maintaining monogamous intimate relationships and make them prone to engaging in concurrent or short-term serial relationships. They may also be more likely to seek out riskier sexual encounters to counter numbing symptoms. Another consequence of avoidance may be the loss of one's ability to recognize or appropriately respond to sexual risk situations.

Women who meet the criteria for hyper-arousal are subject to physiological and emotional dysregulation and may seek sexual stimulation. This can lead to impulsive sexual behaviors and multiple partners. Furthermore, in sexual encounters that trigger additional physical stimulation and chronic arousal, women are likely to have difficulty accessing areas of the brain responsible for the higher order thinking needed to practice safe sex.[19] An alternative explanation for the association between PTSD variables and HIV risk behaviors is that engaging in sex with multiple partners or risky partners increases the likelihood that women will be exposed to trauma that results in PTSD.

## Limitations

This study involved several limitations. First, the exclusion of women who were admitted for psychiatric emergencies may have led to underestimations of the rate of PTSD, childhood sexual abuse, and IPV, which have been found to be associated with a range of mental health problems.[71–73] Second, the study's cross-sectional design and failure to control for all potentially confounding variables limits our ability to draw conclusions about causal relationships between PTSD and HIV risks. Third, the eligibility inclusion criterion requiring women to have had a minimum 3-month sexual relationship with their partner excluded sexually active women who had sex with only casual or paying partners. High rates of PTSD may be more likely among these women because, as a result of

their riskier encounters, they may experience more sex-related trauma than women in steady relationships.

Fourth, our data were collected between 2001 and 2003, which may limit the present-day generalizability of the findings. However, to our knowledge, this is the first study that has examined the relationship between PTSD and HIV risks in a random sample of poor, urban women seeking emergency department care, and thus it has the potential to address gaps in the research on this issue. Finally, although the use of a random sample that included time blocks encompassing all days of the week and times of day was a strength of the study, the 61% participation rate may limit the generalizability of our findings.

## Implications and Conclusions

Despite its limitations, this study has important implications for future research and for HIV prevention interventions with poor, urban women. Future longitudinal research that examines the relationship between PTSD symptomatology and HIV risk behaviors over time is needed to help ascertain the temporal causality between these co-occurring problems.

Further research investigating the specific mechanisms linking different PTSD symptoms and a broad range of risk behaviors would also advance our understanding and help elucidate targeted prevention strategies that are likely to be effective with women who experience PTSD and engage in risky behaviors. Such strategies may synergistically address co-occurring PTSD and HIV risks by raising awareness of the relationship between PTSD symptoms and sexual risk behaviors, assessing patients for PTSD and referring them to clinical treatment services, and developing techniques to avoid PTSD-related triggers for unsafe sex.

Emergency departments remain a primary source of medical care for poor, urban women at risk for HIV as well as for women experiencing PTSD. Low-income women experiencing PTSD may not seek screening or treatment for HIV and sexually transmitted infections elsewhere because of high costs and inadequate access to services. Failure to detect PTSD among emergency department patients may increase the likelihood of repeated emergency department visits, as PTSD has been found to be associated with a broad range of physical

and mental health problems in addition to HIV transmission risks. ∎

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*This article was accepted March 26, 2010.*

## Contributors

N. El-Bassel wrote the first draft of the article. N. El-Bassel and L. Gilbert conceptualized the article, generated the analysis approach, and revised the final version of the article. D. Vinocur, M. Chang, and E. Wu reviewed and provided feedback on the article. M. Chang analyzed the data.

## Human Participant Protection

This study was approved by Columbia University's institutional review board. Participants provided written informed consent.

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