

Regular article

The relationship between sexual and physical abuse and substance abuse consequences

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Abstract

This study examines the relationship between a history of physical and sexual abuse (PhySexAbuse) and drug and alcohol related consequences. We performed a cross-sectional analysis of data from 359 male and 111 female subjects recruited from an inpatient detoxification unit. The Inventory of Drug Use Consequences (InDUC), measured negative life consequences of substance use. Eighty-one percent of women and 69% of men report past PhySexAbuse, starting at a median age of 13 and 11, respectively. In bivariate and multivariable analyses, PhySexAbuse was significantly associated with more substance abuse consequences ($p < 0.001$). For men, age ≤ 17 years at first PhySexAbuse was significantly associated with more substance abuse consequences than an older age at first abuse, or no abuse ($p = 0.048$). For women, the association of PhySexAbuse with substance use consequences was similar across all ages ($p = 0.59$). Future research should develop interventions to lessen the substance abuse consequences of physical and sexual abuse. © 2002 Elsevier Science Inc. All rights reserved.

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1. Introduction

Studies of interpersonal trauma and substance abuse in women have shown a strong association between the two conditions. The nature of the association appears to be complex, in that a history of interpersonal trauma increases the risk for substance abuse, and substance abuse increases the risk for interpersonal trauma.

There is a great deal of evidence showing a close link between interpersonal violence and substance abuse (Resnick, Acierno, & Kilpatrick, 1997). The vast majority of studies have been cross-sectional studies of women, although a few have looked at the association in men. In a prospective study of 3000 women followed for two years,

interpersonal assault increased subsequent use of alcohol and drugs even in those women without prior history of substance abuse. Women who used drugs at study entry had an increased risk of subsequent assault, although women who used alcohol alone did not have this increased risk (Kilpatrick, Acierno, Resnick, & Saunders, 1997). Other investigators have looked retrospectively at histories of interpersonal violence among both male and female clients of drug treatment programs and found that, while prevalent, histories of interpersonal violence do not appear to correlate with worse treatment outcomes (Gil-Rivas, Fiorentine, Anglin, & Taylor, 1997; Hien & Scheier, 1996).

In an attempt to clarify the mediating factors between trauma and substance abuse outcomes, Clark and colleagues stratified 150 male and female methadone maintenance clients into those with no history of interpersonal or environmental trauma; those with past trauma but no Posttraumatic Stress Disorder (PTSD); those with trauma and PTSD but no recent symptoms; and those with trauma, PTSD

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and recent symptoms. They found that 72% of the sample reported traumatic events, 29% had a lifetime diagnosis of PTSD, and 16% had recent PTSD symptoms (Clark, Masson, Delucchi, Hall, & Sees, 2001). Recent PTSD symptoms predicted increased drug use severity as measured by the Addiction Severity Index (ASI) and a greater prevalence of depression. Trauma without PTSD did not appear to worsen severity.

Measures of severity, primarily based on consumption, may be relatively independent of consequences of substance abuse, particularly if measuring lifetime consequences. Therefore, the present study was done to examine the association between past interpersonal trauma and drug and alcohol consequences in both male and female patients recruited from an urban alcohol and drug detoxification unit. We hypothesized that alcohol, heroin or cocaine dependent male and female patients with past interpersonal trauma would have more substance use related life consequences than subjects without this history.

2. Methods

2.1. Subjects and study site

Subjects were enrolled at the River Street Detoxification Unit in Mattapan, Massachusetts between June 1997 and April 1999. The unit is a 35-bed inpatient facility in the metro-Boston area serving mostly uninsured and Medicaid-eligible patients. Referrals to this site come from a wide variety of sources including local emergency departments, homeless shelters, community-based treatment programs and self-referral. The standard recommended length of stay was 6 days for opiate and 4 days for alcohol dependence. Subjects were patients who did not have an established primary care provider, as recruitment was primarily for enrollment into a randomized controlled trial (The Health Evaluation and Linkage to Primary care [HELP] Study) of an intervention to link patients to primary medical care (Samet et al., 2000). The Institutional Review Board at Boston University Medical Center approved the study, and all subjects provided written informed consent.

Subjects met the following entry criteria: 1) Not having a primary care provider or not having seen that provider at least one time in the last two years; 2) willingness to be connected to a new primary care provider; 3) heroin, alcohol or cocaine as either first or second drug of choice; 4) willingness to provide at least three contacts for tracking purposes; 5) score of 21 or greater on the mini-mental state exam (Folstein, Folstein, & McHugh, 1975); 6) fluent in either English or Spanish; 7) living in the metro-Boston area with no definite plans to move in the next two years; and 8) not pregnant.

Patients were approached by trained research associates on or after the second day of their stay, allowing subjects time to move beyond the most acute period in their detoxification process. Those who met entry criteria and agreed to

participate completed a 60–90 minute standardized interview with a research associate concerning behavioral, addiction, medical and social history. A fluent Spanish-speaking research associate administered interviews in Spanish. Some standardized scales were previously translated and validated in Spanish, and the remaining sections of the research instrument were translated into Spanish, back-translated into English to check for accuracy, and then corrected.

2.2. Dependent variable

The primary measure for this analysis was a 50-item validated instrument, The Inventory of Drug Use Consequences (InDUC) (Blanchard, Morgenstern, Morgan, & Labourie, 2001; Tonigan & Miller, in press). The InDUC measures negative life consequences of substance use and is comprised of five subscales. For each subscale, a higher score indicates worse life consequences. The Impulse Control subscale (range 0–12) included risky or illegal behaviors such as driving and accidents after substance use, trouble with the law, inflicting injury to others or damage to property, and exacerbation of other substance use. The Interpersonal subscale (range 0–10) focused on the impact of substance use on the subject's relationships. The Intra-personal subscale (range 0–8) reflected negative self-perceptions as a result of drinking. The Social Responsibility subscale (0–7) examined role-fulfillment consequences that could be observed by others, including work/school problems. The Physical subscale (range 0–8) indicated adverse physical states that resulted from substance use, including both acute and chronic effects.

The subscales can be used in aggregate to create a total score. The range of the total score is 0–45 with a higher score representing more negative life consequences. The instrument is comprised of 50 yes/no questions, 5 of which are not scored. In analyses, we used the total InDUC score as a continuous variable.

Secondary analyses considered two additional outcomes, the Addiction Severity Index drug and alcohol scores (McLellan et al., 1985). The drug and alcohol scores can each range from 0–1, where higher values indicate greater addiction severity. These scores are derived from items on the amount of alcohol/drugs consumed in the last 30 days and the number of years of regular use. Items in these two scales also measure physical effects, money spent on alcohol and drugs, and number of days with problems due to these substances.

2.3. Main independent variable

A history of sexual and physical abuse was elicited during the interview. The following specific questions were asked, and if answered yes, the age at first experience was asked:

1. Have you ever been physically abused or assaulted by a family member or someone you know (for example:

kicked, hit, choked, shot, stabbed, burned, or held at gunpoint)?

2. Have you ever been sexually assaulted by a family member or someone you know (for example: unwanted sexual touching anywhere on your body, touching of genitals and/or breasts, or made to have oral sex or vaginal or anal intercourse against your will by force or threat of force)?

The same questions were asked substituting “stranger” for “family member” or “someone you know.” In bivariate and multivariable analyses we combined any physical or sexual abuse experience by any perpetrator to create a single dichotomous variable. We also did the same calculations based on 3 categories of violence (None, Physical only, Sexual with or without physical). In addition, we divided the subjects that reported abuse into 3 categories based on age of first experience: <13, 13–17, or 18 and above.

2.4. Other independent variables

In order to assess the relationship between sexual and physical abuse and the substance use consequences, we attempted to control for possible confounders. We considered the following continuous and categorical variables: age, race, highest annual income in last 5 years, education, country of birth (USA vs. other), current partner, children, homeless at least one night in last six months, primary drug of choice, polysubstance use (problems with greater than 1 substance), depressive symptoms as measured by the Center for Epidemiologic Studies Depression Scale (CES-D) [continuous score (range 0–60)], and physical functioning as measured by the Short Form Health Survey Physical Component Summary (SF-36 PCS) (Ware, Kosinski, & Keller, 1994; Radloff, 1977).

2.5. Statistical methods

All analyses were carried out using SAS statistical software (SAS Institute, 2001). Descriptive statistics were generated for each study variable, including means and *SDs* for continuous variables and frequencies for discrete variables. Due to the potential gender-specific nature of the effects of physical and sexual abuse, men and women were analyzed separately in all analyses. We conducted bivariate analyses to assess the relationships between physical and sexual abuse and InDUC score. We also assessed in bivariate analyses the association between potential confounders and the InDUC. We used analysis of variance and Pearson correlations for discrete and continuous variables, respectively. Potential confounding variables that were thought to be clinically important or were significant at $p < 0.10$ level in the bivariate analysis were considered candidates for the multiple linear regression models. We conducted bivariate analyses to assess collinearity between the candidate independent variables using Pearson correlation. A multiple

linear regression model was developed relating physical or sexual abuse to the InDUC score, controlling for potential confounders. A two-tailed $p < 0.05$ was considered statistically significant in the multivariable analyses. Since two of the InDUC’s items are related to physical and sexual abuse (“While using or under the influence of alcohol or drugs, I have been physically hurt, injured or burned”; “I have gotten into a physical fight while drinking or using drugs”), we repeated the multivariable analysis using InDUC scores without these items.

In secondary analyses, we explored the relationship between physical or sexual abuse and substance abuse severity using the Addiction Severity Index Drug and Alcohol Composite scores and the subscales of the InDUC. We also explored the relationship between age of onset of physical or sexual abuse and the substance abuse severity using the InDUC score. We analyzed age of onset of abuse as a categorical variable with four possible values: <13, 13–17, >17 years and no abuse. For each of these outcomes, we used separate linear regression models for men and women, while controlling for the same variables as in the primary model.

3. Results

3.1. Study population

Of the 635 eligible subjects, 470 (75%) were enrolled. Of the 470 enrolled subjects, 465 (99%) answered all questions regarding physical and sexual abuse. These 465 subjects comprise the sample used in all subsequent analyses.

3.2. Subject characteristics

There were 355 (76%) male and 110 (24%) female subjects with a mean age of 36 years ($SD \pm 8$); 46% were black, 15% Hispanic, and a majority (69%) graduated from high school. Drugs of choice were alcohol (39%), cocaine (32%) and heroin (27%). Most (87%) reported problem use of more than one substance. Approximately half (52%) of the sample reported having a partner while 68% had children. When asked about the most money made in any year of the past 5, more than half (57%) made less than \$20,000, while 33% made \$20,000–49,000 and 10% \$50,000 or more. Forty-seven percent reported sleeping in a homeless shelter or on the street at least once in the prior 6 months.

The InDUC scores are listed in Table 1, including the overall score of 36, reflecting significant life consequences of substance use. Men had higher mean InDUC scores than women (36 vs. 32), indicating more substance use related life consequences. As measured by the ASI composite scores, men had greater alcohol (0.51 vs. 0.37, $P = 0.0002$) but similar drug (0.25 vs. 0.26, $P = 0.71$) addiction severity than women. The mean score on self-reported physical

Table 1
Ratings of physical health, depressive symptoms and substance use consequences of 465 clients in an inpatient detoxification unit

Scale	Range	Mean score (SD)
Physical Component Scale (PCS)	0–100*	84 (21)
CES-D Depressive Symptoms	1–60**	33 (12)
InDUC-2L drug and alcohol consequences	***	
Impulse control score	0–12	8 (3)
Interpersonal score	0–10	8 (2)
Intrapersonal score	0–8	7 (1)
Physical score	0–8	6 (2)
Social responsibility score	0–7	6 (1)
Total InDUC score	0–45	36 (7)

* Higher scores indicate better health.
 ** Higher scores indicating more depressive symptoms, >16 associated with diagnosis of major depression.
 *** Higher scores indicate worse consequences.

health status (PCS) was 84 (SD = 21) out of a maximum score of 100, with higher scores indicating better health. The mean score on the CES-D was 33, substantially higher than the cut-off of 16, a value associated with a diagnosis of major depression (Radloff, 1977) (Table 1).

3.3. Sexual and physical abuse

Most (72%, 336/465) of the sample reported past physical or sexual abuse; of these, 75% had experienced abuse for the first time as children (age 17 or under). Mean age of first abuse was 13.7 years (median age 11 years). Forty-four percent of subjects experienced physical or sexual abuse committed by both strangers and someone they knew, while 27% experienced abuse by strangers and 29% only by someone they knew. Fig. 1 depicts interpersonal violence history stratified by gender. Among women, 81% disclosed

a history of sexual and/or physical abuse. Of those women, 25% reported physical abuse only, 70% both physical and sexual abuse, and 5% sexual abuse only. Physical and sexual abuse was disclosed by 69% of men. Most of those men (72%) reported physical abuse only, 26% reported both physical and sexual abuse and 1% sexual abuse only (Fig. 1).

3.4. Bivariate analyses

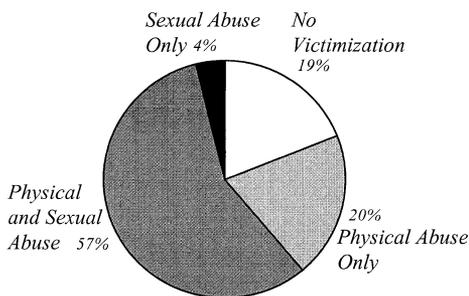
3.4.1. Substance abuse consequences and severity

In bivariate analysis, past physical or sexual abuse was significantly associated with more substance abuse consequences (InDUC score for men 38 vs. 35, $p < .0001$, for women 34 vs. 25, $p = .0008$) (Table 2). When calculated for different types of violence, there were no differences in substance abuse consequences (InDUC score) between physical only vs. sexual with or without physical (InDUC score for men 37 vs. 39, $P = 0.14$, for women 33 vs. 35, $P = 0.32$), whereas there were significant differences between physical only vs. none and sexual only vs. none ($p < 0.001$ in all comparisons both sexes).

In bivariate analyses, there was a nonsignificant trend for the association between higher ASI alcohol composite scores and past physical or sexual abuse for women ($p = 0.08$) but not for men ($p = 0.28$). ASI drug composite scores were not associated with past physical or sexual abuse ($p = 0.52$ for men, $P = 0.65$ for women).

Additional patient characteristics were found to be associated with InDUC scores in bivariate associations as listed in Table 2. In particular, higher scores on the depression measure were found to be significantly associated with worse substance use related life consequences for both men and women.

Women’s Interpersonal Violence History



Men’s Interpersonal Violence History

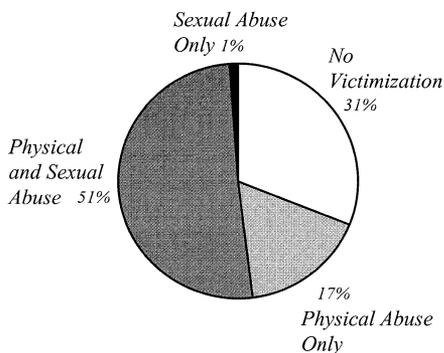


Fig. 1. Women: sexual or physical abuse = 81%. Men: sexual or sphysical abuse = 69%.

Table 2
Unadjusted associations of subject characteristics with substance abuse consequences

Characteristics	Male*			Female*		
	% (N)	Mean InDUC score	P value	% (N)	Mean InDUC score	P value
<i>Lifetime physical or sexual abuse</i>						
No	32% (108)	34.7	<0.001	19% (21)	25.1	<0.001
Yes	69% (238)	37.7		81% (87)	34.2	
<i>Race</i>						
White	38% (132)	38.5	<0.001	32% (34)	34	0.08
Hispanic	12% (40)	36.6		9% (10)	29	
Black	45% (157)	35.3		52% (56)	31	
Other	6% (19)	36.6		7% (8)	37	
<i>Polysubstance problems</i>						
Yes	89% (309)	37.0	0.09	81% (87)	33	0.06
No	11% (39)	35.1		19% (21)	28	
<i>Homeless</i>						
Yes	49% (171)	38.4	<0.001	38% (41)	33.1	0.47
No	51% (177)	35.2		62% (67)	32.0	
<i>Drug of choice</i>						
Alcohol	41% (141)	38.1	0.001	34% (36)	33.6	0.25
Heroin	27% (95)	36.8		28% (30)	33.2	
Cocaine	32% (112)	35.1		38% (41)	30.7	

3.5. Multivariable analyses

For both men (adjusted mean InDUC score 36 vs. 34, $P = 0.001$) and women (adjusted mean InDUC score 33 vs. 28, $P = 0.01$), past physical and sexual abuse was significantly associated with more substance abuse consequences in analyses adjusted for age, race, polysubstance use, homelessness, primary drug of choice, depressive symptoms and physical functioning. We included three clinically important variables in both models that were significant only in the men's bivariate analyses (drug of choice, homeless, and age). We note that the men's analysis had more subjects and, consequently, more power to find a statistically meaningful difference. The R-squared for the men's model was 0.25 and for the women's model was 0.42. The multivariable analysis using a modified InDUC score excluding two items that address physical assault yielded similar results (data not shown). In multivariable analyses adjusting for the same potential confounders, a history of physical or sexual abuse was not significantly related to either the ASI alcohol or ASI drug composite scores.

In multivariable analyses for men, first occurrence of physical and sexual abuse as a child was significantly associated with more substance use consequences (adjusted mean increase in InDUC: 2.5 for age <13 years, 3.3 for ages 13–17, $P = 0.001$) compared to those with no abuse. There were no significant differences in InDUC scores for males reporting abuse after age 17 (1.0 points higher, $P = 0.8$) compared with those with no abuse. InDUC scores for subjects reporting abuse before age 18 compared to those

reporting abuse at age 18 or older were significantly higher ($p = 0.048$).

For women, the overall absolute increase in InDUC score was greater than the men in all age categories (adjusted mean increase in InDUC score: 5.8 for age <13 ($p = 0.01$), 5.5 for ages 13–17 ($p = 0.02$), 4.7 for >17 years ($p = 0.04$)) compared to those with no physical and sexual abuse. There was not a significant association between InDUC scores and age of first abuse (less than 18 vs. 18 and older, $P = 0.59$). Thus, for men there was a small but statistically significant impact of age of onset of abuse to substance abuse consequences, whereas for women, the effect of physical and sexual abuse was high and similar for all ages of onset.

Depression as measured by CES-D was the other variable that was independently associated with more severe substance use consequences in the multivariable analyses for both men and women ($p < 0.0001$ and $P = 0.009$, respectively). In addition, two other variables were found to be significantly associated with worse substance use consequences in men: homelessness ($P = 0.002$) and polysubstance problems ($P = 0.005$).

Among men, three of the six InDUC subscales were significantly higher among those with past physical and sexual abuse: Impulse Control (7 vs. 6, $p < 0.001$), Interpersonal (8.8 vs. 8.4, $P = 0.03$) and Physical (6.3 vs. 5.9, $P = 0.01$). Among women, two subscales were significantly higher among those with past physical and sexual abuse: Interpersonal (8 vs. 6, $P = 0.002$), Intrapersonal (7 vs. 6, $P = 0.001$). A third subscale, Physical, trended higher (5.9 vs. 5.2, $P = 0.08$).

4. Discussion

This study reveals an extraordinarily high frequency of physical and sexual abuse among both women and men admitted for detoxification in an urban inpatient facility: 72% experienced interpersonal trauma and 75% of them first experienced it as children. The frequency of physical and sexual abuse is similar to that found in other studies of clients at methadone and detoxification programs (Clark et al., 2001; Gil-Rivas et al., 1997; Hien & Scheier, 1996). The finding of initial occurrence of these traumatic events in childhood in three-quarters of the victimized subjects underscores the multiple challenges faced by patients and staff in detoxification programs.

Interpersonal violence was significantly related to greater substance use consequences for both women and men. Even in a population that is severely affected by substance abuse, this association was strong. We also found that interpersonal violence, in analyses controlled for potentially important confounders, was not significantly associated with addiction severity as measured by the ASI (the secondary outcome), a measure strongly influenced by quantity of substances consumed. Therefore, we speculate that substance use related life consequences are not mediated only by drugs and/or alcohol consumption, but also by other mechanisms related to the experience of interpersonal trauma.

Some of the secondary analyses are useful in suggesting mechanisms for the overall findings. The fact that in both men and women physical consequences were worse in those who experienced abuse is consistent with literature on medical problems among women with trauma and substance abuse (Frayne et al., 1999; Koss, Koss, & Woodruff, 1991; Liebschutz, Feinman, Sullivan, Stein, & Samet, 2000; Liebschutz, Mulvey, & Samet, 1997). Both men and women with past trauma also experienced worse interpersonal relationship consequences of substance use. It seems intuitively likely that substance use would disproportionately affect interpersonal relationships among those with prior interpersonal violence. Trauma's deleterious effect on subsequent interpersonal relationships is well documented (Goodman, Koss, & Russo, 1993; Mullen, Romans-Clarkson, Walton, & Herbison, 1988; Resnick et al., 1997).

That intrapersonal consequences were worse in women with abuse histories is consistent with literature on psychological effects of violence (Goodman et al., 1993; Harrop-Griffiths et al., 1988; Mullen et al., 1988; Walling et al., 1994). Although complementary, the intrapersonal consequences subscale did not focus on depressive symptoms, which were significantly related to greater addiction consequences in both men and women. Others have found that current mental health symptoms are related to substance abuse severity. For example, Clark and colleagues found that current symptoms of PTSD were more closely related to severity of substance abuse than a past trauma history or even past PTSD in a methadone population (Clark et al., 2001).

Lastly, another possible mediator among men with abuse histories was worse impulse control, which is consistent with the literature on consequences of childhood abuse on subsequent criminal behavior (Ireland & Widom, 1994; Murphy, Meyer, & O'Leary, 1993). This is substantiated with the finding that age of onset of physical or sexual abuse was significantly associated with severity of substance use consequences in men but not women. This suggests that some of the mediating factors between interpersonal violence and worse substance use consequences begin at an early age in men, findings corroborated by other research studies. A national survey of 8th and 10th graders found that risky behaviors in adolescents correlated with use of alcohol, marijuana, and drugs as well as victimization (Windle, 1994). A prospective cohort study found that childhood abuse and neglect was a significant predictor of adult arrests for alcohol and/or drug related offenses (Ireland & Widom, 1994).

The lack of association between age of onset of physical or sexual abuse and substance abuse in women contradicts other findings that childhood abuse (and earlier onset of violence) is associated with greater risk of substance abuse problems as adults (Bennett & Kember, 1994; Fleming, Mullen, Sibthorpe, Attewell, & Bammer, 1998; Medrano, Zule, Hatch, & Desmond, 1999; Miller, Downs, Gondoli, & Keil, 1987; Miller, Downs, & Testa, 1993; Spak, Spak, & Allebeck, 1998; Walker et al., 1999; Wilsnack, Vogeltanz, Klassen, & Harris, 1997). These studies differed from the study reported here in that they either did not account for the possibility of abuse occurring in adulthood or they measured the risk of developing alcohol abuse, not substance use consequences. Since our study found that for women, all ages at first physical or sexual abuse significantly impacts substance use consequences, future studies in this area should examine both consequences of substance use and adult onset physical and sexual abuse. It may be that women are vulnerable at all ages for developing substance abuse after victimization experiences. This corroborates the findings of Kilpatrick and colleagues that victimization experiences increased substance use (Kilpatrick et al., 1997). If the findings reported here are true, this may indicate gender-specific mechanisms for the relationship between victimization and substance abuse consequences. Or it may be similar mechanisms that change in men after adolescence while remaining stable in women. These findings suggest substance abuse prevention efforts need to incorporate understanding of the effect of physical or sexual victimization on substance abuse. Substance abuse prevention programs for boys could target school age and teenage boys, while those for girls could target not only school age and teenage girls, but also adult women.

At present, standard detoxification treatment, which is the first step toward recovery for many individuals, does not include any assessment for trauma or PTSD. Given the prevalence and burden of interpersonal violence among people with addiction, assessment of substance abuse in

the detoxification settings could also incorporate evaluation for prior trauma. With early identification, postdetoxification treatment plans might include trauma specific services. It is possible if core problems are addressed early on in treatment and continue to be explored throughout the recovery period, it could result in improved addiction and other mental health outcomes.

Limitations of this study deserve attention. First, recall of traumatic events and the time frame in which they occurred may have been difficult and not completely accurate among subjects in this study, who were in the process of substance detoxification. The dichotomous variable we used for past interpersonal trauma does not reflect the wide range of severity and complexity that exists in this experience.

The cross-sectional design does not permit us to assume a causal relationship between victimization and substance abuse consequences. However, as 75% of subjects who experienced interpersonal trauma were children at the onset of abuse, a temporal relationship likely exists, indicating that childhood trauma impacts subsequent substance abuse consequences. Further prospective studies are needed to evaluate this finding.

A strength of this investigation is the main outcome measure, the InDUC, a validated scale which reflects the life consequences as a result of addiction. Its 50 questions (5 subscales) relate to varying types of problems including relationships with others, problems with the law, financial consequences and personal shame. Future studies on the relationship between interpersonal violence and substance abuse should consider using measures of substance use consequences in addition to the ASI because they represent an additional dimension of the range of life experience of substance abusers.

The prevalence and impact of interpersonal violence is substantial in men and women presenting for detoxification at a publicly funded, urban program. These findings corroborate other data and further emphasize the importance of evaluating histories of physical and sexual abuse when studying populations of substance abusers. Past interpersonal violence is associated with increased substance use consequences. The mechanisms by which interpersonal violence influence substance use consequences in men and women may differ, suggesting substance abuse prevention programs consider gender specific components. Substance abuse treatment should be integrated with treatment for trauma; battered women's shelters and professionals addressing childhood abuse should integrate approaches to treat and prevent substance abuse.

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