



## Full length article

## Broken lives: Fights, fractures, and motor vehicle accidents among heroin users entering detoxification

Michael D. Stein<sup>a,b,\*</sup>, Bradley J. Anderson<sup>a</sup>, Genie L. Bailey<sup>c,d</sup><sup>a</sup> General Medicine Research Unit, Butler Hospital, Providence, RI, 02906, United States<sup>b</sup> Boston University School of Public Health, Boston, MA, 02118, United States<sup>c</sup> Warren Alpert Medical School of Brown University, Providence, RI, 02912, United States<sup>d</sup> Stanley Street Treatment and Resources, Inc., Fall River, MA, 02720, United States

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## ABSTRACT

**Background:** The lives of persons who use illicit substances are filled with physical adversities and negative outcomes.**Objectives:** The purpose of this study was to determine: 1) the frequency of substance-related fights, fractures, and driving accidents in the past year among heroin users entering an inpatient detoxification program, and 2) to determine demographic and recent substance use factors associated with the most common of these physical traumas.**Methods:** Between May 2015 and December 2015, we surveyed 433 persons entering a short-term inpatient detoxification program that reported heroin use in the last month and recorded their experiences of physical traumas in the last year.**Results:** Among participants (72% male; 74% heroin injectors), more than a quarter (28.6%) reported a substance-related fight in the past year. Multivariate modeling revealed cocaine use, hazardous alcohol use, and younger age were significantly associated with fighting, but gender was not. Forty-five (10.4%) persons reported a fracture in the past year, with 64% of fractures related to a substance-related fall or fight. Additionally, 9.0% reported being a driver in a car accident after drinking or using drugs in the past year. Trauma rates were not significantly different from a contemporaneous cohort seeking alcohol detoxification at the same facility.**Conclusion:** Heroin users, both men and women, lead physically traumatic lives, interrupted by interpersonal violence, falls, fractures, and motor vehicle accidents.

## 1. Introduction

The lives of persons who use illicit substances are filled with adversity. Persons who use heroin are beset with the emotional traumas of unstable housing, relationship, and financial worries, and health problems, including the risk of overdose, and for injectors, the heightened risk of HIV, hepatitis C infection and painful skin infections (Stein, 1999; Stein et al., 2015). Physical trauma is less well-studied in this high-risk population, in particular, fractures, fights, falls, and accidents while driving. Given the challenges in treating pain in this population, physical trauma that causes pain has particular relevance to clinical providers, as well as those personally affected.

In the only cohort study of heroin users and injuries, Regidor et al. compared the prevalence of injuries that led to medical treatment among out-of-treatment heroin users, recruited by target sampling, and the general population (Regidor et al., 1996). The investigators

reported that heroin users had several times the rate of injury (defined as assaults, burns, and accidental poisoning excluding overdose). The study reported higher rates in male heroin users and also persons who concurrently used alcohol and tranquilizers. Regidor et al. did not specify types of injuries and did not evaluate a multivariate model of factors related to injury (Regidor et al., 1996).

Because most heroin users commonly also use other substances that have been associated with aggression, violence, injury (Cherpitel et al., 2003), and accidents (Hingson et al., 2009; Nunn et al., 2016), such as alcohol, we might expect high rates of trauma in opioid users. However, opioid use itself may lead to physical trauma through its central nervous system depression effects, cognitive impairment, or disinhibiting effects. Indeed, trauma and accidents are the fourth leading cause of death among young drug injectors in San Francisco (Evans et al., 2012). Prescription opioid use predisposes drivers to road trauma (Gomes et al., 2013). More broadly, persons with orthopedic trauma had higher

\* Corresponding author at: Health Law, Policy and Management, Boston University School of Public Health, Talbot Building 250, 715 Albany Street, Boston, MA 02118, United States.  
E-mail address: [mdstein@bu.edu](mailto:mdstein@bu.edu) (M.D. Stein).

rates of prescription opioid use in the 3 months before their injury than the general population (Holman et al., 2013). Whether these high, pre-injury use rates reported from samples using prescription opioids apply to heroin users remains unclear.

The primary purpose of this analysis was to determine the frequency of fractures, including fractures involving falls related to substance use, substance-related fights, and motor vehicle accidents after drinking or using drugs in the past year among heroin users entering an inpatient detoxification program. To provide context, we compare these trauma frequencies with alcohol users entering the same detoxification program during the same period. The secondary purpose was to determine demographic and recent substance use factors associated with the most common of these traumatic outcomes among heroin users.

## 2. Methods

### 2.1. Recruitment

Between May 2015 and December 2015, consecutive persons seeking opioid detoxification were approached within the first 24 h of admission to participate in a survey research study. The detoxification program, one of the largest in Southeastern New England, has 38 beds and is a 24-h medically supervised treatment facility that provides evaluation and withdrawal management with a mean length-of-stay of 4.9 days using a methadone protocol (as well as individual and group counseling and case management referral for aftercare).

Of patients admitted to the program during the recruitment period, 487 were opioid users who were 18 years or older, English-speaking, and able to provide verbal informed consent as approved by the Institutional Review Board of the authors' affiliated hospital. Nine refused study participation or were discharged before staff could interview them. The remaining 478 persons completed a face-to-face interview and were not incentivized. All surveys were administered by non-treating research staff and required approximately 15 min. Four hundred thirty seven persons reported heroin use in the past 30 days, and analyses were limited to the 433 who had complete data.

During this recruitment period at the same detoxification program, we also approached, within the first 24 h of admission, 78 consecutive persons seeking alcohol withdrawal management for alcohol use disorder. Three persons were also opiate dependent and excluded from analyses, leaving sixty-eight who provided complete data in a face-to-face interview using measures identical to those answered by the heroin group, administered by non-treating research staff without incentives.

### 2.2. Measures

Sample descriptors included age, gender, race/ethnicity, employment (part- or full-time vs. unemployed), and years of education. Regarding previous opioid treatment, we asked if participants had ever been in opioid detoxification in the past, or had ever received methadone or been prescribed buprenorphine. Participants were classified as recent cocaine and/or benzodiazepine users if they reported any use of these substances during the past 30 days. Participants also reported frequency and usual quantity of alcohol use during the past 30 days; hazardous drinking according to NIAAA guidelines was defined as > 7 drinks/week for females or > 14 drinks/week for males (National Institute on Alcohol Abuse and Alcoholism, 2005). To assess a history of serious mental health problems, we asked, "Have you ever been seen in a psychiatric emergency room or been hospitalized for psychiatric reasons."

Our physical trauma questions included several questions assessing fractures. First, respondents were asked, "In the past year have you fractured or broken a bone?" Response options included *yes* or *no*, and those answering *yes* were then asked to report on the number of times, if any of the fractures or broken bones were the result of an accidental trip, slip or fall (indicating *yes* or *no*), and "For how many of these were

you using alcohol or drugs within two hours of the injury?" Responses to this item included alcohol, drugs, alcohol and drugs, neither alcohol nor drugs. Next, respondents were asked if any of the fractures or broken bones were the result of a physical fight. Those responding *yes* were asked, "For how many of these were you using alcohol or drugs within two hours of the injury?" Respondents were also asked the following two questions: "In the past year, have you gotten into a physical fight when using drugs or drinking?" and "In the past year, have you been the driver in a car accident within two hours of using drugs or drinking?" each of which included *yes* and *no* response options.

### 2.3. Analytical methods

We report descriptive statistics to summarize the characteristics of the sample. We use the *t*-test for differences in means and the  $\chi^2$ -test of independence to evaluate the statistical significance of bivariate associations, and multivariate logistic regression to estimate the adjusted associations of background characteristics and substance use behaviors of the heroin users with the likelihood of reporting substance-related physical fights, fractures, falls, and driving accidents. We conducted an auxiliary analysis comparing heroin users' demographic characteristics and rates of substance-related fights, fractures, falls, and driving accidents in the alcohol detoxification sample.

## 3. Results

Participants averaged 31.7 ( $\pm$  8.49) years of age, 72.3% were male, 9.0% were Hispanic, 85.9% were White, 5.8% were Black, 8.3% were of other racial origins. Race/Ethnicity was dichotomized to contrast non-Hispanic Whites (81.8%) to all minorities in subsequent analyses. Mean years of education was 11.8 ( $\pm$  1.98), 16.2% were employed either part- or full-time, and (12.2%) reported spending 1 or more nights on the street or in a shelter during the past 90 days. Nearly 3 in 4 persons (73.9%) reported recent injection drug use. Mean frequency of heroin use was 26.9 ( $\pm$  6.65, Median = 30) days in the last month. About 43.6% reported using cocaine in the past month; mean days of cocaine use were 4.47 ( $\pm$  8.51). Nearly half (48.7%) reported using benzodiazepines in the past month on an average of 6.12 ( $\pm$  9.68) days. About 23.3% of the participants reported using alcohol at levels exceeding NIAAA recommended guidelines, and 75.1% had previously been in either methadone or buprenorphine treatment programs.

More than a quarter (28.6%) of heroin detoxification participants reported a substance-related fight, 10.4% reported a fracture in the past year, and 9.0% reported a substance-related driving accident. In our analysis comparing persons in detoxification for heroin to the 68 persons with alcohol use disorder, persons in the alcohol cohort did not differ significantly from those in the heroin group with respect to gender, ethnicity, race, homelessness, frequency of cocaine use, or frequency of benzodiazepine use. Persons in the alcohol group were significantly older (43.1 vs 31.7,  $t = 10.05$ ,  $p < 0.001$ ), had higher mean years of education (12.4 vs 11.8;  $t = 2.10$ ,  $p = 0.036$ ), and were more likely to be employed part- or full-time (29.4% vs 16.2%;  $\chi^2 = 7.00$ ,  $p = 0.008$ ). Persons in alcohol detoxification did not differ significantly from those in heroin detoxification with respect to the likelihood of substance-related fights (23.5% vs 28.6%;  $\chi^2 = 0.76$ ,  $p = 0.383$ ), fractures (13.2% vs 10.4%;  $\chi^2 = 0.49$ ,  $p = 0.482$ ), or substance-related driving accidents (7.4% vs. 9.0%;  $\chi^2 = 0.20$ ,  $p = 0.654$ ). To determine if these comparisons were sensitive to alcohol use among person in heroin detoxification we removed persons meeting NIAAA criteria for hazardous alcohol use ( $n = 111$ ) and re-evaluated these associations. Between group differences in substance related fights were smaller (23.5% among persons in alcohol detoxification and 23.2% among those persons in heroin detoxification not meeting criteria for hazardous alcohol use [ $\chi^2 = 0.00$ ,  $p = 0.958$ ]). Between group differences with respect to substance related accidents ( $\chi^2 = 0.08$ ,  $p = 0.782$ ) and fractures ( $\chi^2 = 0.11$ ,  $p = 0.745$ ) were

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