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Risk Factors for Gun-Related Behaviors Among Urban Out-of-treatment Substance Using Women

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Abstract

We examine the prevalence and factors associated with lifetime gun-carrying among 858 urban out-of-treatment substance using women using data collected between 2000 and 2004 in a large Midwestern city. Instruments assessed gun ownership, carrying and access, psychopathology and personal lifestyle risk factors. Analyses were conducted using logistic regression. Illegal activities for income and lifetime violent victimization were the most significant predictors of gun carrying. The implications for practice and future research are discussed along with the study’s limitations. The work was supported by grants from the National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Alcoholism.

RÉSUMÉ

Facteurs de risque de comportements liés à l’ arme à feu chez les urbain substance-traitement à l’aide de femmes

Nous examinons la prévalence et les facteurs associés à la durée de vie transportant des armes à feu parmi 858 urbain-traitement substance à l’aide des femmes à l’aide des données collectées entre 2000 et 2004 dans une grande ville du Midwest. Instruments évalués à la possession d’armes, transportant et accès, psychopathologie et facteurs de risque de style de vie personnel. Les analyses ont été effectuées à l’aide de la régression logistique. Les activités illégales de victimisation violente de revenu et de la durée de vie ont été les plus importants prédicteurs de transporter des armes à feu. On discute des implications pour la pratique et la recherche future avec les limites de l’étude. Le travail a été soutenu par des subventions de le National Institute on Drug Abuse et le National Institute on Alcohol Abuse and Alcoholism.

RESUMEN

Factores de riesgo de los comportamientos relacionados con armas de fuego entre zonas urbanas fuera del tratamiento de sustancias con las mujeres

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

Se examina la prevalencia y los factores asociados con la vida de la pistola de transporte de entre los 858 urbanos fuera del tratamiento de sustancias con las mujeres que utilizan los datos recogidos entre 2000 y 2004 en una ciudad grande del Medio Oeste. Instrumentos evaluar la posesión de armas, el transporte y el acceso, la psicopatología y factores de riesgo personales de estilo de vida. Los análisis se realizaron mediante regresión logística. Las actividades ilegales de los ingresos y la victimización violenta de por vida fueron los predictores más importantes de llevar arma de fuego. Las implicaciones para la práctica y la investigación futura se discuten junto con las limitaciones del estudio. El trabajo fue apoyado por subvenciones del Instituto Nacional sobre Abuso de Drogas y el Instituto Nacional sobre el Abuso de Alcohol y Alcoholismo.

Keywords

gun carrying; alcohol dependence; cocaine dependence; violent victimization; sex-trading; women; lifestyle risk factors; trauma

INTRODUCTION

The proliferation of guns within the United States and subsequent impact of their presence is often a subject of research, debate and a target for policy development (Webster & Vernick, 2009). Research, however, is often hindered by a lack of consistent estimations of firearm possession. In a recent study, it was found that 38% of households reported owning at least one firearm (Hepburn, Miller, Azrael, & Hemenway, 2007). Not surprisingly, attempts to examine the validity of self-report among firearm owners have found that registered owners are most likely to report ownership (Kellerman, Rivara, Bunton, Reay, & Fligner, 1990). Nevertheless, research efforts have attempted to assess firearm possession among the population including the general public and populations considered at elevated risk for negative outcomes in the presence of firearms including adolescents, psychiatric patients, and battered women (Steinman & Zimmerman, 2003; Sorenson & Weibe, 2004; McNiel et al., 2007; Sorenson & Cook, 2008).

The debate surrounding this topic centers on whether gun possession, and particularly carrying a gun, should be a legal privilege of U.S. citizens. While the deterrence of crime committed by individuals who unlawfully carry guns is a primary argument for the need for the general public to carry, there is uncertainty about the protective benefits that result from widespread gun possession. According to Southwick (2000), being in possession of a gun during criminal victimization can reduce property loss and lessen injury rates, but there is also evidence that being in possession of a firearm may increase the likelihood of the victim actually being physically harmed (Branas, Richmond, Culhane, Ten Have, & Wiebe, 2009). In addition, there is evidence that the presence of a firearm increases the likelihood of homicide and suicide (Dahlberg, Ikeda, & Kresnow, 2004; Grassel, Wintemute, Wright, & Romero, 2003; Hemenway & Miller, 2002; Miller & Hemenway, 2008; Weibe, 2003) and that firearm presence escalates gun-related injuries (Narang et al., 2010). In fact, Miller, Azrael, and Hemenway (2002) found that women were more likely to die from suicide, homicide, and unintentional firearm injuries if they lived in geographic areas with higher rates of household gun availability.

While estimations of possession are less certain, the negative outcomes associated with the presence of guns make it important to understand the factors that contribute to gun-related behaviors. Distinguishing individuals who are likely to demonstrate gun-related behaviors is not a new area of inquiry but studies vary in the type of behavior being assessed. The evidence that is available indicates that gun possession is more likely among men (Ludwig, Cook, & Smith, 1998), the middle aged and older adults and those who are married or cohabitating (Hepburn et al., 2007). Minorities, particularly, African Americans are more likely to report lifetime gun carrying than Whites (Shenassa, Daskalakis, & Buka, 2006). In a national study, threatening behaviors involving a gun was associated with male gender, minority status, and limited education (Casiano, Belik, Cox, Waldman, & Sareen, 2008).

In addition to the above associated demographic factors, individuals who engage in certain types of illegal activities such as drug selling may also carry a firearm (Kacanek & Hemenway, 2006). Studies also reveal that increased likelihood of gun possession is influenced by lack of confidence in the government, lack of trust in people, and the belief that guns have value in deterring victimization (Bankston & Thompson, 1989; Hemenway, Kennedy, Kawachi, & Putnam, 2001; Jiobu & Curry, 2001). For the latter, research indicates that both personal and vicarious victimization influences individuals and particularly women's decisions to carry a weapon or use some type of weapon for protection purposes (Runyan, Casteel, Moracco, & Coyne-Beasley, 2007). But, the presence of a firearm within a household does not mean that a person, particularly women, will actually carry or use a firearm. For instance, though households where battering takes place are more likely than general households to have handguns in the home, few women in these households report using a firearm as a self-defense strategy (Sorenson & Wiebe, 2004).

Research indicates that the association of psychopathology with gun-related behaviors varies significantly depending on the disorder assessed and the specific measure of gun-related behavior. It was found that psychopathology such as anxiety disorder, mood disorders, and substance abuse and dependence is not associated with the presence of firearms in the home and ownership of a handgun is not related to lifetime rates of major depression (Miller, Barber, Azrael, Hemenway, & Molnar, 2009). Kaplan, McFarland, & Huguet (2009) found that individuals who had been treated for a DSM-IV diagnosed disorder were less likely to use firearms. Further, rates of past 30-day gun-carrying within the National Comorbidity Survey: Replication (NCR-S) were found to be unrelated to any of the examined lifetime psychiatric disorders assessed including suicide thoughts, plans or attempts (Ilgen, Zivin, McCammon, & Valenstein, 2008). However, Casiano et al. (2008) found that threatening someone with a gun (lifetime rates) was associated with the presence of substance use disorder and impulsive control disorder; PTSD and conduct disorder were also strongly associated with such threats. In addition, among an international sample of adolescent females, it was found that higher rates of threatening or trying to hurt someone with a gun were more likely among heavy alcohol users (Erickson et al., 2006).

There are gaps in the current knowledge base on factors associated with gun-related behaviors. Though attempts try to discern as to which factors are more relevant for certain types of behaviors, few studies have examined the association of this practice among high-risk populations (Webster & Vernick, 2009). Evidence indicates that while men are more

likely to be in possession of guns, a factor such as prior victimization increases the likelihood of women possessing guns. Few studies have attempted to tease out the importance of victimization and lifestyle risk factors¹ when women are at enhanced risk of victimization because of their active substance using lifestyles. The present study advances current knowledge by simultaneously examining victimization with other factors particularly demographics, psychopathology, and personal lifestyle risk factors among a sample of out-of-treatment substance using women.

METHOD

Design

Data for these analyses were collected during two concurrent St. Louis community-based HIV prevention studies focused on reducing high-risk sexual and drug use behaviors among drug using females (Women Teaching Women-WTW-NIDA funded) and heavy alcohol using females (Sister to Sister –STS-NIAAA funded). Under the auspices of Dr. Linda Cottler (PI), the two studies were theory-based, peer-delivered, gender and culture relevant intervention trials to reduce alcohol, and drug use-related high risk sexual behaviors. Changes in risk were assessed with standardized assessments at baseline, at a 4 month followup and at a 12 month followup. The same battery of assessments was administered within both studies. Only baseline data were utilized in the present analyses.

Baselines were conducted between 2000 and 2004 after Washington University School of Medicine Institutional Review Board approval was obtained. Protocol for both studies involved nonprobability sampling methods as women were simultaneously recruited through a street outreach method to identify women who were most at-risk for high risk sexual and drug use behavior. Community health outreach workers familiar with the targeted neighborhoods and the drug culture approached women and provided a brief description of the study. The women were given a voucher with information for the study and the women's contact information was obtained. When contact was made by project staff, women were screened for study eligibility.

Sample

Criteria for eligibility for the WTW study included being female; at least 18 years of age, testing HIV seronegative at baseline, and testing positive through urine analysis for cocaine, heroin or amphetamines in the past 30 days. STS women also had to be at least 18 years of age and had to meet the threshold for problem drinking as determined by the Alcohol Use Disorders Identification Test (AUDIT) while testing negative for cocaine, heroin, and amphetamine use. Contact through street outreach was made with 5,551 women. Forty-nine percent (N = 2,717) of these women were initially eligible based on study criteria. Of the

¹The reader is reminded that concepts and processes such as “risk factors” and “protective factors are often noted in the literature, without adequately noting their dimensions (linear, non-linear; rates of development, growth, cessation, etc.) their “demands”, the critical necessary conditions (endogenous and exogenous ones; micro to macro levels) which are necessary for either of them to operate (begin, continue, become anchored and integrate, change as de facto realities change, cease, etc.) or not to and whether their underpinnings are theory-driven, empirically-based, individual and/or systemic stake holder- bound, based upon “principles of faith” or what. This is necessary to clarify, and to understand, if these terms are not to remain as yet additional shibboleths in a field of many stereotypes. Editor's note

women deemed eligible, the projects were unable to make later contact with 27%; 26% were invited but did not show for interviews; 13% had no interest in participating in the study; and another 2% did not complete the interview process. The remaining 32% (N = 858) completed baseline assessments. We are not able to comment on how satisfactory such a response rate is as rarely do studies even track such information.

Measures

Gun-Related Behaviors—The following items from the Violence Exposure Questionnaire assessed gun-related behaviors among the sample: “Do you now own a gun?,” “Would you have immediate access to a gun if you wanted one?,” and “Have you ever carried or packed a hand gun (excluding work-related carrying)?.”

Demographics—The Washington University Risk Behavior Assessment for Women (RBA; Needle et al., 1995) queried information regarding demographic factors each stratified into two groups: age (18–44 and 45 and older), ethnicity (African American and Caucasian), educational attainment (attainment of a GED or higher education and less than GED or high school education), homelessness, economic status (welfare dependent or nonwelfare dependent), employment status (employed full or part-time versus no employment), marital status (never married versus all others), and health status (self-reported poor health versus non-poor health).

Psychopathology—The study assessed, via the Computerized Diagnostic Interview Schedule Version IV (C-DIS IV), DSM-IV PTSD, depressive disorder, and antisocial personality behaviors (Robins, Cottler, Bucholz, & Compton, 1996). Normative data for the C-DIS IV was obtained in a study of substance abusers revealing fair to excellent reliability for depressive disorder ($\kappa = .67$; 95% CI = .55–.80); and antisocial personality behaviors ($\kappa = .49$; 95% CI = .27–.71) (Horton, Compton, & Cottler, 1998). The Composite International Diagnostic Interview (CIDI) Substance Abuse Module (SAM) elicited DSM-IV substance dependence criteria. The nonclinical SAM was found to have good agreement for alcohol and cocaine dependence with a clinical comparator among populations of active substance users (Cottler, Robins, & Helzer, 1989; Compton et al., 1996).

Personal Lifestyle Risk Factors—Personal risk factors were selected based on previous research indicating their association with gun-carrying behavior. The RBA (Needle et al., 1995) included single items assessing personal risk behaviors: residential mobility (“How often in the past 12 months have you changed residences”), lifetime sex trading, and other illegal activity for income within the past 12 months. Violent victimization was stratified from C-DIS IV items that asked respondents about their exposure to potentially traumatic events ($\kappa = .61$; 95% CI = .33–.89; Horton et al., 1998). Items included being shot or stabbed, mugged, raped, held captive, diagnosed with a life threatening illness, exposed to a disaster or radiation, experiencing the untimely death of a close friend or relative, or serious accident, witnessing a serious injury or killing, discovering a dead body, and military combat related events. Women who reported lifetime events of being shot or stabbed, being mugged, or being raped were considered victims of violence.

Analysis

Logistic regression analyses assessed the odds of demographic, psychopathology, and personal risks associated with gun carrying. A multivariate logistic model was performed using gun-carrying as the dependent variable controlling for the influence of significant bivariate level demographic, psychopathology, and personal risks.

RESULTS

The majority of women were African American (81%) and ranged in age from 18 to 67 years with a mean age of 35.83 ($SD = 8.88$). Forty-three percent of the women had not obtained a high school diploma or GED. A small proportion of the women (21%) were employed either full or part-time and almost half (48%) received income from welfare, public assistance or AFDC over the previous 12 months. A significant percentage of the women (64%) had never been married; the sample had a mean of 2.77 ($SD = 2.29$) children. A small percentage of women (7%) reported poor health. Nearly a third (29%) of the women considered themselves to be homeless; 40% reported residing in their own home or apartment while 63% had resided in their current residence for less than one year.

While only 4% ($N = 30$) of the women reported that they currently owned a gun, 32% ($N = 267$) of the women reported that they had immediate access to one. Twenty-two percent ($N = 190$) of the women said that they had carried a gun in their lifetime. These characteristics are not mutually exclusive, and some overlap in behaviors is likely. The analyses, however, sought to determine the factors that were associated with women's reports of ever having carried a gun to try to understand what demographic, psychopathic, or lifestyle factors increase the likelihood of handgun carrying by substance-using women.

As indicated in Table 1, age, ethnicity, educational attainment and homeless status were demographic factors that distinguished women who had ever carried a gun from those who did not. Those who carried a gun were slightly older ($M = 37.18$; $SD = 8.44$) than those who had not carried ($M = 35.24$; $SD = 9.00$) ($t = -2.66$; $p = .01$). After stratifying the sample on age, it was found that gun carrying was more likely among women who were at least middle aged (over 45) than it was among younger women ($OR = 1.63$; 95% $CI = 1.04$ – 2.54). Carrying a gun was more likely among African American women ($OR = 1.62$; 95% $CI = 1.03$ – 2.55) and women who reported being homeless ($OR = 1.50$; 95% $CI = 1.06$ – 2.12). Women with no high school diploma or GED were less likely to report ever carrying a gun compared to women with higher educational attainment ($OR = .61$; 95% $CI = .43$ – $.85$).

Psychopathology was more likely among women who carried with antisocial personality behaviors being the most highly related ($OR = 13.17$; 95% $CI = 5.32$ – 32.55). Other associated psychopathology included depressive disorder ($OR = 1.76$; 95% $CI = 1.27$ – 2.44), alcohol dependence ($OR = 1.45$; 95% $CI = 1.05$ – 2.01), and cocaine dependence ($OR = 1.57$; 95% $CI = 1.13$ – 2.17). Traumatic events (including those that were violent in nature) were more prevalent among women who had ever carried a gun ($M = 5.91$; $SD = 2.79$) than those who had not ($M = 4.06$; $SD = 2.71$) ($t = -8.21$; $p < .0001$). PTSD, among women who had experienced a qualify-ing traumatic event, was only slightly more likely among women who carried than those who did not ($OR = 1.65$; 95% $CI = 1.16$ – 2.33). Lifetime violent

victimization was three times more likely among carriers than noncarriers (OR = 3.01; 95% CI = 1.90–4.77). Lifetime sex trading was also more likely among gun carriers (OR = 1.85; 95% CI = 1.34–2.57). Women's involvement in illegal activity for money was over four times more likely among women who carried guns than women who did not (OR = 4.74; 95% CI = 2.93–7.67).

The multivariate model predicting gun-carrying behavior included only factors that had a significant bivariate association with gun-carrying (age, ethnicity, educational attainment, homeless status, depressive disorder, alcohol dependence, cocaine dependence, PTSD, violent victimization, sex trading, and illegal activity). Table 2 indicates results for the multivariate analysis of significant bivariate level factors (minus antisocial personality behavior). Being African American (AOR = 1.77; 95% CI = 1.10–2.86) and educational attainment (AOR = .57; 95% CI = .40–.82) were the only demographic factors that remained significant within the model. Interestingly, psychopathology did not maintain significance when those factors were considered simultaneously with other factors. The personal lifestyle risk factors remained significant. Lifetime sex traders (AOR = 1.65; 95% CI = 1.13–2.39) were slightly more likely to be gun-carriers. Women who experienced a violent victimization (AOR = 2.36; 95% CI = 1.44–3.86) were more than two times more likely to be a gun carrier than women who had not experienced such events. Women who were involved in illegal activity for income (AOR = 4.64; 95% CI = 2.75–7.83) were over four times more likely to engage in gun carrying than women not involved in such activity. Although not shown, it is important to note that when the multivariate model included antisocial personality behaviors, this was the only factor that maintained association with women's gun carrying behavior.

DISCUSSION

Previous research provides evidence that gun-related behaviors can have negative consequences not only for those who are targeted as victims but also for those who are the initiators of the behavior. The present effort was an attempt to build on the available evidence concerning gun-related behaviors among a high-risk population. By examining demographics, psychopathology, and related risks such as prior victimization and involvement in illegal activity, we are able to differentiate as to which factors are the most salient for gun-carrying behavior among a high-risk urban sample of out-of-treatment substance-using women. Gun carrying within the present effort was measured as a lifetime occurrence and thus it cannot be compared to the NCR-S national results which were based on the last 30 days; however, the 32% prevalence rate of having immediate access to a gun found within this sample is similar to the rate of access found within the NCR-S (35%) (Ilgen et al., 2008).

Our attempt to distinguish gun carriers based on demographics was partially supported by previous research. Within the NCS-R, a higher rate of threatening with a gun was found for Blacks and other minorities (Casiano et al., 2008), which gives some support to our finding of gun carrying being associated with African American women in the present study. Gun carrying was also more likely among those who were age 45 or older and this is also supported in previous findings (Hepburn et al., 2007). There was no previous support for our finding that gun carrying was slightly more likely among individuals reporting

homelessness. It is possible that this reflects an area of concern that is yet to be explored within existing literature. The finding that lack of education was negatively associated with carrying a handgun was somewhat surprising as results from the NCS-R found that having less than 13 years of education was related to higher rates of threatening others with a gun (Casiano et al., 2008).

Even within this higher than average risk sample, diag-nosable psychopathology including depression, PTSD, alcohol dependence, and cocaine dependence only slightly increased the likelihood of gun carrying. The overwhelming association of antisocial personality behaviors likely indicates that gun-carrying among the sample is the result of a pattern of antisocial behaviors. It is also probable that this association may result from the lifetime measure of weapon carrying and the necessary criteria for antisocial personality disorder (ASPD) being conduct disorder which has a criterion of using a weapon that can cause serious physical harm to others (American Psychiatric Association, 1994). Previous research indicates that among adolescents, gun carrying is significantly related to conduct disorder (Loeber, Burke, Mutchka, & Lahey, 2004). While men are significantly more likely to have ASPD than women, when comorbid substance use is considered, women are significantly more likely to have the comorbidity (Compton, Conway, Stinson, Colliver, & Grant, 2005) and this was an out-of-treatment substance using sample.

Because each of the personal lifestyle risk factors may manifest as a result of antisocial personality behavior, for the final analyses, this factor was excluded in an attempt to determine as to which of the personal risk factors were more likely to co-exist with gun-carrying. The finding that women who were involved in illegal activity for income were over four times more likely to have ever carried a gun is indicative of a pattern of behavior that increases the level of risk for these women. It is plausible that these women are likely to depend on weapon carrying as a protective mechanism for their illegal activity. Women who reported prior violent victimization were more than two times as likely to report ever carrying a gun. This finding may indicate that lifetime carrying behavior may result from lifetime victimization and women may believe that carrying will decrease the likelihood of a repeat victimization. However, without being able to determine a time sequence of events, it is also possible that gun carrying contributed to the enhanced likelihood of victimization. Nevertheless, there is support and previous research confirms that prior victimization enhances the likelihood of gun-related behaviors among women and there is evidence that while men on average are more likely to experience violent victimization by an armed offender, one in five female victims faced an armed assailant (Perkins, 2003). In addition, intimate partner victimization is more prevalent among women than men (Catalano, Smith, Snyder, & Rand, 2009).

STUDY LIMITATIONS

The implications of the current findings must be understood in light of several limitations. First, these data are limited in their ability to test nonstudy specific hypotheses as data were collected to examine high-risk sexual and drug use behaviors in response to an intervention and not gun-related behaviors, thus limiting the measures available to assess gun ownership, carrying, and access. In addition, the current analyses are not based on controlled conditions

in which we were able to determine causality between gun carrying and psychopathology or personal risk factors. This is a particular concern given that the assessment of gun carrying was a lifetime measure and measures of personal risk factors such involvement in illegal activity for income and residential mobility were assessed within the past 12 months.

Notwithstanding the importance of the limitations and the lack of causal inference that can be made from the data, the findings do add to the relatively small body of existing literature on gun-related behaviors among high-risk populations. While demographics and psychopathology were associated with gun-carrying behavior among the sample, the associations did not remain when simultaneously assessed with personal risk factors particularly prior violent victimization and engagement in illegal activity for income. This out-of-treatment substance using sample overall had high levels of traumatic event exposure and was at high risk for victimization; thus it is probable that the association among the factors may not be as strong in other substance using populations and certainly not among women in general. Yet, for similar populations with prior victimization, it may be important to assess for gun-related behaviors and to provide information on the associated dangers.

CONCLUSIONS

These findings provide evidence that substance using women's gun carrying behavior is more associated with their engagement in illegal activity than with associated psychopathologies and violent victimization. Not being able to establish a time sequence of events tempers the implications of this finding but it does support the need for additional research in this area. Public health messages that are targeted toward women who are substance users could be beneficial in addressing the personal behavior choices these women make. Most importantly, these analyses indicate that there should be concern that substance using women may be engaging in multiple risky behaviors that should be targeted within treatment planning, implementation, and evaluation efforts.

THE AUTHORS

Sharon Johnson is an Associate Professor and Director of the Center for Family Research and Policy within the School of Social Work at the University of Missouri-St. Louis. Her research interests are in psychopathology, health disparities, and community-based intervention effectiveness. She has published articles examining violence, HIV-risk, trauma exposure, post-traumatic stress disorder, sexual dysfunction, and substance use disorders among varying community and at-risk populations.

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GLOSSARY

Dependence

a maladaptive pattern of substance use leading to clinically significant impairment or distress

Psychopathology	the manifestation of a mental or behavioral disorder
Victimization	a crime as it affects one individual person or household

REFERENCES

- American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed). Washington, DC: American Psychiatric Association.
- Bankston WB, & Thompson CY (1989). Carrying firearms for protection: A causal model. *Sociological Inquiry*, 59(1), 75–87.
- Branas CC, Richmond T, Culhane DP, Ten Have T, & Wiebe DJ (2009). Investigating the link between gun possession and gun assault. *American Journal of Public Health*, 99(1), 2034–2040. [PubMed: 19762675]
- Casiano H, Belik SL, Cox BJ, Waldman JC, & Sareen J (2008). Mental disorder and threats made by noninstitutionalized people with weapons in the National Comorbidity Survey Replication. *Journal of Nervous and Mental Disorders*, 196(6), 437–445.
- Catalano S, Smith E, Snyder H, & Rand M (2009). Bureau of justice statistics selected findings: Female victims of violence Washington, DC: US Department of Justice.
- Compton WM, Cottler LB, Dorsey KB, Spitznagel EL, & Magera DE (1996). Comparing assessments of DSM-IV substance dependence disorders using CIDI-SAM and SCAN. *Drug and Alcohol Dependence*, 41(3), 179–187. [PubMed: 8842630]
- Compton WM, Conway KP, Stinson FS, Colliver JD, & Grant BF (2005). Prevalence, correlates, and comorbidity of DSM-IV antisocial personality syndromes and alcohol and specific drug use disorders in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, 66(6), 677–685. [PubMed: 15960559]
- Cottler LB, Robins LN, & Helzer JE (1989). The reliability of the Composite International Diagnostic Interview Substance Abuse Module-(CIDI-SAM)—A comprehensive substance abuse interview. *British Journal of Addiction*, 84, 801–814. [PubMed: 2758153]
- Dahlberg LL, Ikeda RM, & Kresnow M (2004). Guns in the home and risk of a violent death in the home: Findings from a National study. *American Journal of Epidemiology*, 160, 929–936. [PubMed: 15522849]
- Erickson PG, Butters JE, Cousineau M, Harrison L, Korf D, & Drugs, Alcohol and Violence (DAV) International Team. (2006). Girls and weapons: An international study of the perpetration of violence. *Journal of Urban Health*, 83(5), 788–801. [PubMed: 16937086]
- Grassel KM, Wintemute GJ, Wright MA, & Romero MP (2003). Association between handgun purchase and mortality from firearm injury. *Injury Prevention*, 9(1), 48–52. [PubMed: 12642559]
- Hemenway D, Kennedy BP, Kawachi I, & Putnam RD (2001). Firearm prevalence and social capital. *Annals of Epidemiology*, 11, 484–490. [PubMed: 11557180]
- Hemenway D, & Miller M (2002). Association of rates of house-hold handgun ownership, lifetime major depression, and serious suicidal thoughts with rates of suicide across US census regions. *Injury Prevention*, 8, 313–316. [PubMed: 12460969]
- Hepburn L, Miller M, Azrael D, & Hemenway D (2007). The US gun stock: Results from the 2004 National Firearms Survey. *Injury Prevention*, 13(1), 15–19. [PubMed: 17296683]
- Horton J, Compton WM, & Cottler LB (1998). Assessing psychiatric disorders among drug users: Reliability of the revised DIS-IV. In Harris L (Ed.), *NIDA research monograph-problems of drug dependence* Washington, DC: NIH Publication No. 99–4395.
- Ilgen MA, Zivin K, McCammon RJ, & Valenstein M (2008). Brief report: Mental illness, previous suicidality, and access to guns in the United States. *Psychiatric Services*, 59(2), 198–200. [PubMed: 18245165]
- Jiobu RM, & Curry TJ (2001). Lack of confidence in the federal government and the ownership of firearms. *Social Science Quarterly*, 82(1), 77–88.
- Kacanek D, & Hemenway D (2006). Gun carrying and drug selling among young incarcerated men and women. *Journal of Urban Health*, 83(2), 266–274. [PubMed: 16736375]

- Kaplan MS, McFarland BH, & Huguet N (2009). Characteristics of adult male and female firearm suicide decedents: Findings from the National Violent Death Reporting System. *Injury Prevention*, 15, 322–327. [PubMed: 19805601]
- Kellerman A, Rivara F, Bunton J, Reay D, & Fligner C (1990). Validating survey responses to questions about gun ownership among owners of registered handguns. *American Journal of Epidemiology*, 131(6), 1080–1084. [PubMed: 2343860]
- Loeber R, Burke JD, Mutchka J, & Lahey BB (2004). Gun carrying and conduct disorder: A highly combustible combination? Implications for juvenile justice and mental and public health. *Archives of Pediatrics and Adolescent Medicine*, 158(2), 138–145. [PubMed: 14757605]
- Ludwig J, Cook PJ, & Smith TW (1998). The gender gap in reporting household gun ownership. *American Journal of Public Health*, 88, 1715–1718. [PubMed: 9807545]
- McNiel DE, Weaver CM, & Hall SE (2007). Base rates of firearm possession by hospitalized psychiatric patients. *Psychiatric Services*, 58(4), 551–553. [PubMed: 17412859]
- Miller M, Azrae D, & Hemenway D (2002). Firearm availability and suicide, homicide and unintentional firearm deaths among women. *Journal of Urban Health*, 79(1), 26–38. [PubMed: 11937613]
- Miller M, Barber C, Azrael D, Hemenway D, & Molnar BE (2009). Recent psychopathology, suicidal thoughts and suicide attempts in households with and without firearms: Findings from the National Comorbidity Study Replication. *Injury Prevention*, 15(3), 183–187. [PubMed: 19494098]
- Miller M, & Hemenway D (2008). Guns and suicide in the United States. *New England Journal of Medicine*, 359, 989–991. [PubMed: 18768940]
- Narang P, Paladugu A, Manda SR, Smock W, Gosnay C, & Lippmann S (2010). Do guns provide safety? At what cost? *Southern Medical Journal*, 103(2), 151–153. [PubMed: 20065902]
- Needle R, Fisher DG, Weatherby N, Chitwood D, Brown B, Cesari H, et al. (1995). Reliability of self-reported HIV risk behaviors of drug users. *Psychology of Addictive Behavior*, 9, 242–250.
- Perkins C (2003). Bureau of justice statistics special report: Weapon use and violent crime. Washington, DC: US Department of Justice.
- Robins LN, Cottler LB, Bucholz KK, & Compton WM (1996). Diagnostic interview schedule, version 4.0 (DIS 4.0) St. Louis, MO: Washington University.
- Runyan CW, Casteel C, Moracco KE, & Coyne-Beasley T (2007). US women's choices of strategies to protect themselves from violence. *Injury Prevention*, 1, 270–275.
- Shenassa ED, Daskalakis C, & Buka SL (2006). Utility of indices of gun availability in the community. *Journal of Epidemiology and Community Health*, 60, 44–49.
- Sorenson SB, & Cook PJ (2008). "We've got a gun?": Comparing reports of adolescents and their parents about household firearms. *Journal of Community Psychology*, 36(1), 1–19.
- Sorenson SB, & Weibe DJ (2004). Weapons in the lives of battered women. *American Journal of Public Health*, 94(8), 1412–1417. [PubMed: 15284052]
- Southwick L (2000). Self-defense with guns: The consequences. *Journal of Criminal Justice*, 28(5), 351–370.
- Steinman KJ, & Zimmerman MA (2003). Episodic and persistent gun-carrying among urban African-American adolescents. *Journal of Adolescent Health*, 32(5), 356–364. [PubMed: 12729985]
- Webster DW, & Vernick JS (2009). Keeping firearms from drug and alcohol abusers. *Injury Prevention*, 15, 425–427. [PubMed: 19959738]
- Weibe D (2003). Homicide and suicide risks associated with firearms in the home: A national case control study. *Annals of Emergency Medicine*, 41(6), 771–782. [PubMed: 12764330]

Bivariate logistic regression analysis of factors associated with ever carrying a gun among out-of-treatment substance using women $N = 846$

TABLE 1.

	Ever carried gun $N = 190$ (%)	Never carried gun $N = 656$ (%)	Odds ratio (95% CI)
Demographics			
At least middle aged	17	11	1.63 (1.04–2.54)
African American	86	80	1.62 (1.03–2.55)
No GED or higher education	35	47	.61 (.43–.85)
Homeless	35	26	1.50 (1.06–2.12)
Welfare dependent	45	49	.84 (.61–1.16)
Employed	22	20	1.12 (.75–1.65)
Never married	59	66	.73 (.52–1.01)
Poor health	9	7	1.49 (.84–2.65)
Psychopathology			
Antisocial behaviors	97	74	13.17 (5.32–32.55)
Depressive disorder	49	36	1.76 (1.27–2.44)
PTSD	35	25	1.65 (1.16–2.33)
Alcohol dependence	60	50	1.45 (1.05–2.01)
Cocaine dependence	52	41	1.57 (1.13–2.17)
Personal risk factors			
Lifetime sex trading	59	44	1.85 (1.34–2.57)
Violent victimization	87	70	3.01 (1.90–4.77)
Frequent residential mobility	33	39	.76 (.54–1.07)
Illegal activity	22	5	4.74 (2.93–7.67)

TABLE 2.

Multivariate logistic regression model of factors associated with lifetime gun carrying behavior among out-of-treatment substance using women $N = 838$

	<i>Wald Chi-Square = 79.83; df = 11; p = <.0001</i>	
	Adjusted odds ratio	95% Confidence interval
At least middle aged	1.59	.99–2.56
African American	1.97	1.20–3.23
Homeless	1.24	.85–1.81
No GED or higher education	.58	.41–.83
PTSD	1.10	.73–1.66
Depression	1.39	.94–2.05
Alcohol dependence	1.25	.87–1.80
Cocaine dependence	.83	.56–1.23
Lifetime sex trader	1.49	1.01–2.19
Violent victimization	2.40	1.45–3.98
Illegal activity for income	4.64	2.75–7.83

Model includes only factors significant at the bivariate level. The variable for antisocial behaviors is not included due to its over-whelming association with gun carrying behavior.