Association Between Gambling and Exposure to Guns Among Cocaine-Using Women

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Abstract

The purpose of this study is to assess the association between gambling severity and exposure to guns among substance-using women recruited in the community. Data for these analyses come from the baseline phase of two community-based HIV prevention interventions conducted among alcohol and drug-using women in St. Louis, MO. Gun exposure was assessed using the Violence Exposure Questionnaire (VEQ), and DSM-IV pathological gambling (PG) symptoms and other psychiatric symptoms were assessed using the Computerized Diagnostic Interview Schedule; The Composite International Diagnostic Interview Substance Abuse Module assessed DSM-IV substance dependence, including cocaine dependence and alcohol dependence. Women in the study were predominantly African American (80%), mean age was 35.70 years $\pm$ 8.8. Women exposed to guns were significantly more likely than women not exposed to guns to have gambled with all consequences: without meeting PG criteria (21% vs. 15%); to meet 1 to 4 PG criteria (22% vs. 12%), and to report 5 or more PG criteria (10% vs. 5%). These differences were significant at $p < 0.0001$. Based on the multivariate analysis, women who gambled without PG symptoms (OR = 1.77; 95% CI = 1.10–2.85) were nearly twice more likely to have exposure to guns than women who did not gamble. The risk for gun exposure increased with severity of gambling. Women who gambled and reported one to four PG criteria were twice as likely to have had an exposure to guns (OR 2.04; 95% CI = 1.45–3.06) and this risk increased to nearly threefold among women who met five or more criteria of PG (OR 2.65; 95% CI = 1.32–5.32). In addition, endorsing five or more criteria for major depressive disorder (OR 1.44; 95% CI = 1.00–2.06) and three or more criteria for antisocial personality adult criteria (OR 3.78; 95% CI = 2.03–7.02) were strong predictors for gun exposure among these women. The findings indicate that substance-using women with gambling behavior are at an enhanced risk to have exposure to guns.

Keywords: drug use, firearms, gun carrying, pathological gambling, problem gambling, women

Introduction

OUR UNDERSTANDING OF gun-related behaviors among women is limited since most research in the United States predominantly focuses on youth, men, and criminals (Erickson et al. 2006). The existing literature on gun-related behaviors indicates that men are more likely than women to possess and use a gun to commit a crime or threaten someone (Brennan and Moore 2009; Felson and Pare 2010), as well as to use it to harm themselves (Anglemyer et al. 2014). However, women are more likely than men to use a gun against their partner in situations of intimate partner violence and victimization (Brennan and Moore 2009; Erickson et al. 2006; Fowler et al. 2015; Jadack et al. 2000; Wilkinson and Hamerschlag 2005). It is reported that more than half of the self-defense use of a gun among women occurred at home (Hemenway and Solnick 2015). In spite of

these reports, much remains unknown regarding gun behaviors among women.

The research on gun-related behaviors has not distinguished gendered behaviors, but has indicated that exposure to gun/firearm violence is associated with drugs and alcohol (Garbarino et al. 2002; Nielsen and Martinez 2003; Scribner et al. 1995; Shepherd et al. 2006), as well as illegal activities (Blumstein 1995; Blumstein and Cork 1996; Kacanek and Hemenway 2006). Data from incarcerated women showed that gun carrying among women was associated with selling and use of crack cocaine and other drugs (Kacanek and Hemenway 2006). Spunt et al. (1996), in their interviews with female homicide offenders in New York, found that nearly two-thirds of the homicides committed by women were drug related. Alcohol, crack, and powdered cocaine were the drugs associated with these homicides. Data from our group have indicated that engaging in illegal

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activities to produce income as well as lifetime victimization are the strongest predictors of gun carrying among community-recruited substance-using women in St. Louis City (Johnson et al. 2012). Mental health problems, lower education, and unemployment have also been related to gun-related behaviors in general (WHO 2002). Threatening someone with a gun has been strongly associated with substance use disorders, impulse control disorders, and posttraumatic stress disorder (Casiano et al. 2008).

Pathological gambling (PG) is highly comorbid with mood disorder and substance use, which is associated with increased perpetration of violence, including gun-related behaviors (Afifi et al. 2010; Black and Moyer 1998). Among Canadian sample of problem gamblers, 56% reported perpetration of violence in the past year and 70% of female problem gamblers had clinically significant anger problems compared with nonproblem gambling women in this study (Korman et al. 2008). Anger problems and perpetration of violence among problem gamblers were reported by other studies as well (Bland et al. 1993). According to the National Comorbidity Survey (NCS) of nationally representative households, over 78% of the US population has ever gambled; 3% met DSM-IV criteria for PG (Kessler et al. 2008). Women compared with men were less likely to develop problem gambling. The onset of gambling among women tended to be later than that of men, but after onset, the progression to PG was much faster (Tavares et al. 2001). Thus, the authors conceptualized gambling and gun possession/carrying/using a gun to be co-occurring. In spite of high rates of anger problems and violence perpetration, no study was attempted to understand gun behaviors based on gambling problem severity. Based on the Problem Behavior Theory (PBT) (Jessor 1987, 1991, 1998; Jessor and Jessor 1977), we hypothesized that gambling severity based on DSM-IV PG criteria would be associated with exposure to guns (own/have access/carry) among substance-using women. PBT assumes that problem behaviors are related and are likely to co-occur within a complex system of adaptive and maladaptive behaviors and personality. To our knowledge, this is the first report on gambling behavior and its association with exposure to guns among women.

Materials and Methods

Study description

Data for these analyses come from the baseline phase of two community-based studies, The National Institute on Alcohol Abuse and Alcoholism (NIAAA) funded Sister to Sister (STS) and the National Institute on Drug Abuse (NIDA) funded Women Teaching Women (WTW), conducted to reduce HIV risk among alcohol and drug-using women in St. Louis, MO. STS included women who tested negative for cocaine, opiates, and amphetamines, but scored 4 or more on the Alcohol Use Disorders Identification Test (AUDIT) (Babor and Higgins-Biddle 2001), whereas WTW included women who were urine test positive for cocaine, heroin, or amphetamines. Additional eligibility criteria for both studies included age of at least 18 years of age, being sexually active in the past 4 months, and not being in substance use treatment.

Participants for both studies were recruited by Community Health Workers in high-risk neighborhoods of St. Louis, Missouri. The Washington University Institutional

Review Board-approved informed consent was obtained from the participants. All interviews were conducted at Health-Street, the authors' community-based office. The methods of STS and WTW were described elsewhere (Johnson et al., 2012). In the analyses presented here, to maintain homogeneity of the sample, we included only women who reported lifetime cocaine use. Thus, the sample of 838 women was reduced to 586 cocaine-using women.

Assessments

Gun exposure was assessed using the Violence Exposure Questionnaire (VEQ), which was modified from the Conflict Tactics Scale (Straus 1979). Women in the study were asked if they currently owned a gun, ever carried a gun (not for job purposes), and if they had immediate access to a gun if they needed one. Responding positively to any of these gun-related items was considered exposed to guns.

DSM-IV PG symptoms were assessed using the Computerized Diagnostic Interview Schedule-IV (CDIS-IV). Similarly, DSM-IV major depressive disorder (MDD) and antisocial personality disorder (ASPD) were assessed using the CDIS-IV (Robins et al. 1996). The Composite International Diagnostic Interview Substance Abuse Module (CIDI-SAM) assessed DSM-IV substance dependence, including lifetime cocaine dependence and binge drinking in the week before the interview (Cottler 2000; Cottler et al. 1989).

Analyses

All analyses were performed using SAS 9.3. Descriptive statistics were computed on demographic and other risk factors to understand differences between women exposed to guns (Gun Exposure+) and women never exposed to guns (Gun Exposure-). Initial bivariate analyses were conducted, followed by multivariate logistic regression, to predict gun exposure by severity of gambling as determined by PG criteria. Since all participants were cocaine users, the dependence criteria were assessed conditional on use.

Results

Demographics

The women in the study were predominantly African American (80%) and between the ages of 18 and 67 (mean age of 35.70 years ± 8.8). Although not shown, gun ownership was reported by 3% of the women; however, 24% of women carried a gun in their lifetime and 31% reported having immediate access to one if they needed it. These behaviors were not mutually exclusive; thus, we focused on the association between gambling behaviors and gun exposure among cocaine-using women. As shown in Table 1, 41% of women were positive on the exposure to gun variable. No differences were found in demographic characteristics between women who were or were not exposed to guns; women exposed to guns were more likely to report current binge drinking ($p = 0.0022$), to meet criteria for DSM-IV MDD ($p = 0.0006$), and to meet criteria for DSM-IV adult antisocial personality disorder ($p < 0.0001$) than women not exposed to guns. Women in the Gun Exposure+ group were significantly more likely than the Gun Exposure- group to have gambled with all consequences: without meeting PG criteria (21% vs. 15%); to meet 1 to 4 PG criteria (22% vs. 12%), and to report

TABLE 1. SAMPLE CHARACTERISTICS BASED ON GUN EXPOSURE STATUS (*N*=586)

<i>Characteristics</i>	<i>Gun exposure+ n=241 (41%)</i>	<i>Gun exposure- n=345 (59%)</i>	<i>p</i>
Age (mean), years	38	38	NS
African American, %	82	84	NS
High school diploma or less, %	82	85	NS
Currently unemployed, %	61	60	NS
Spent 1+ nights in jail, lifetime, %	81	77	NS
Binge drinking in past week, %	22	12	0.0022
Nongamblers, %	48	68	<0.0001
Gambled, no PG criteria, %	21	15	
Gambled, 1–4 PG criteria, %	22	12	
Gambled, 5 PG criteria, %	10	5	
DSM IV lifetime cocaine dependence ^a , %	79	71	0.0398
DSM IV major depressive disorder, %	48	34	0.0006
DSM IV 3+ adult criteria for ASPD, %	94	77	<0.0001

^aAmong cocaine users only.

PG, pathological gambling; ASPD, antisocial personality disorder.

5 or more PG criteria (10% vs. 5%). These differences were significant at $p < 0.0001$.

Predictors of gun exposure

The bivariate and multivariate analyses predicting gun exposure among out of treatment substance-using women are presented in Table 2. For multivariate analyses, we included risk factors that were found to be significant predictors of gun exposure in the bivariate analyses. In addition, we also controlled for age and race. Before testing their model, we ensured that the variables in the model were not colinear. While lifetime cocaine dependence was a significant risk factor for gun exposure in the bivariate analysis, it did not retain its significance in the adjusted multivariate model. Binge drinking was a significant risk for gun exposure after controlling for other risk factors (OR = 1.91; 95% CI = 1.19–3.04).

We also tested the effect of gambling severity on gun exposure independently and after controlling for con-

founding variables in a multivariate model. According to multivariate analysis, women who had gambled without PG symptoms (OR = 1.77; 95% CI = 1.10–2.85) were nearly twice as likely to have exposure to guns as women who did not gamble. The risk for gun exposure increased with severity of gambling. According to multivariate analysis, women who gambled and reported one to four PG criteria were two times as likely to have had an exposure to guns (OR 2.04; 95% CI = 1.26–3.30) and this risk increased to nearly threefold among women who met five or more criteria of PG (OR 2.65; 95% CI = 1.32–5.32). Furthermore, endorsing five or more criteria for DSM IV MDD (OR 1.44; 95% CI = 1.00–2.06) and three or more criteria for DSM IV ASP adult criteria (OR 3.78; 95% CI = 2.03–7.02) were strong predictors for gun exposure among these women.

Discussion

Most current research on gun-related behavior has focused on males or high-risk youth, thus our understanding of women's exposure to guns comes from a few isolated reports on weapon use and carrying (Erickson et al. 2006; Jadack et al. 2000). This is the first study to report the association between gambling behaviors and gun exposure among community-recruited cocaine-using women—a population hard to recruit. Gun ownership among this sample of women was minimal (with only 3% reporting current ownership), while rates of ever carrying a gun and having immediate access to one were considerable (24% and 31%). The present analyses focused on exposure to guns—defined as owning, carrying, or having access to a gun. Forty-one percent ($n = 241$) of women in the study had exposure to a gun in their lifetime. The rates of gun ownership, carrying, and access in this study are of significance as they indicate that drug-using women could procure a gun when needed. This pattern is consistent with previous findings among men, which indicate that they often carry guns that belong to others (Callahan and Rivara 1992; Christoffel and Naureckas 1994; Cook et al. 2015).

In this study, we found a significant association between gambling severity and gun exposure after adjusting for confounding variables in the multivariate model. Although the strength of association between gambling severity and gun exposure was attenuated when adjusted for other confounding factors, the significance of the associations was maintained in the multivariate model. The multivariate analyses showed that even women who gambled without

TABLE 2. PREDICTORS OF GUN EXPOSURE—ADJUSTED RATES (*N*=586)

<i>Predictors</i>	<i>Unadjusted OR</i>	<i>95% CI</i>	<i>Adjusted OR</i>	<i>95% CI</i>
Age of respondent	—	—	1.00	0.98–1.03
African American	—	—	0.94	0.58–1.54
Binge drinking past week vs. everyone else	1.98	1.27–3.07	1.91	1.19–3.04
Gambled, no PG criteria vs. nongamblers	1.99	1.27–3.12	1.77	1.10–2.85
Gambled, 1–4 PG criteria vs. nongamblers	2.51	1.58–4.00	2.04	1.26–3.30
Gambled, 5 or > PG criteria vs. nongamblers	2.92	1.48–5.74	2.65	1.32–5.32
DSM IV lifetime cocaine dependence ^a	1.49	1.01–2.20	1.09	0.71–1.66
DSM IV major depressive disorder	1.80	1.28–2.52	1.44	1.00–2.06
DSM IV 3+ adult ASPD criteria	4.89	2.70–8.87	3.78	2.03–7.02

^aAmong cocaine users only.

reporting PG criteria were nearly twice as likely to have exposure to guns as women who never gambled. The risk for gun exposure increased with severity of gambling. Compared with women who never gambled or gambled below the threshold, those who reported one to four PG symptoms were more than twice as likely to report exposure to guns and this risk increased to nearly three times with increasing criteria (five or more).

The association between gambling severity and gun exposure reported in this study has significant public health and research implications. In view of current gun laws in the United States, gun ownership and carrying within the accepted legal framework are not considered problematic in general. Similarly, recreational gambling is common with 78.4% reporting gambling at least once in a lifetime (Kessler et al. 2008). What is concerning is the increasing odds of exposure to guns with the increase in gambling severity as indicated by the number of DSM-IV PG criteria especially when current literature suggests increased rates of violence perpetration (Afifi et al., 2010) and clinically significant anger problems among problem and pathological gamblers (Korman et al. 2008). Likewise, comorbid psychiatric conditions such as generalized anxiety, posttraumatic stress, mood, impulse control disorders, and substance dependence are common with PG (Kessler et al. 2008) and these conditions are found to increase gun-related violence (Casiano et al. 2008; Erickson et al. 2006). Unfortunately, there are no previous reports to support the findings, but given the high rates of comorbid anger problems and perpetration of violence among problem and pathological gamblers, it is highly relevant to study these associations in a more in-depth manner. These findings indicate that the co-occurrence of gambling severity, depression, and ASPD, especially among substance-using populations, should be researched further to determine patterns of gun and gambling behaviors and other individual and situational factors that are likely to be related with these behaviors to determine the association as well as the extent of risk.

In this study, DSM-IV MDD, ASP, and current binge drinking were significant predictors of gun exposure among cocaine-using women. This finding is in line with earlier research, which indicated that the use of a gun to threaten someone was associated with substance use disorders and impulse control disorders (Casiano et al. 2008; Erickson et al. 2006). Likewise, the World Report on Violence and Health (WHO 2002) indicated that mental health problems in general and substance use, especially alcohol use, were associated with gun access, carrying, and gun-related violence. In contrast, the National Comorbidity Survey: Replication (NCS-R) found no association between psychopathology and gun ownership and possession (Ilgen et al. 2008; Kaplan et al. 2009; Miller et al. 2009). NCS-R reported these findings for men and women combined and therefore the authors do not know for certain if their finding holds true for women alone. The finding that current binge drinking and MDD predicted exposure to guns is important and has high relevance for harm reduction among substance-using women.

The study findings have a few caveats. One is that the sample was geographically limited and focused on substance-using women, thus we cannot generalize the results of this study to women in general. Gambling and gun behaviors in this study were collected retrospective, which may have the

recall bias issue. However, we believe that women in their study would not have responded differentially about their gun exposure or their gambling behaviors since the studies were HIV prevention studies and not gambling or gun behavior studies. The findings presented here are preliminary based on a cross-sectional analysis and thus we cannot make any causal inferences from them.

Conclusions

To our knowledge, this is the first ever study to examine the association between gun exposure and gambling behaviors among women in the community. The findings reported certainly indicate a need for a systematic research to understand the links between gambling, gun exposure, and the underlying mechanisms among substance-using women.

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Author Disclosure Statement

No competing financial interests exist.

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