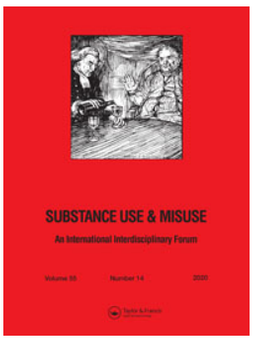

Substance Use & Misuse

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/isum20

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To cite this article: Rita C. Seabrook , Tova B. Walsh , Richard M. Tolman , Shawna J. Lee , Quyen Ngo & Vijay Singh (2020) Prescription Opioid Misuse and Intimate Partner Violence Perpetration among a Nationally Representative Sample of Young Men, Substance Use & Misuse, 55:14, 2251-2257, DOI: 10.1080/10826084.2020.1784945

To link to this article: https://doi.org/10.1080/10826084.2020.1784945

Published online: 12 Oct 2020.

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SUBSTANCE USE & MISUSE
2020, VOL. 55, NO. 14, 2251–2257
https://doi.org/10.1080/10826084.2020.1784945

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ORIGINAL ARTICLE

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Prescription Opioid Misuse and Intimate Partner Violence Perpetration among a Nationally Representative Sample of Young Men

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ABSTRACT

Background: Drug use is associated with intimate partner violence (IPV) perpetration among men, but few studies have examined the relation between prescription opioid misuse and IPV perpetration. *Objectives*: The purpose of this study is to examine the relation between prescription opioid misuse and IPV perpetration while controlling for demographic, depression, alcohol, and illicit drug use risk factors among a non-clinical, nationally representative sample of young men aged 18–35. *Methods*: Cross-sectional survey in August 2014 of 1,053 partnered men aged 18–35 in a nationally representative sample of the adult U.S. population. The survey assessed physical IPV perpetration, depressive symptoms, alcohol misuse, marijuana use, illegal drug use, prescription opioid misuse, and demographic characteristics. We calculated descriptive statistics and conducted weighted bivariate and multivariate logistic regression to assess associations of IPV perpetration with prescription opioid misuse and other known IPV risk factors. *Results*: Weighted analyses show 19.4% of men reported IPV perpetration in the current or most recent relationship, and 7.3% reported prescription opioid misuse in the past year. After controlling for marijuana use, illegal drug use, depressive symptoms, and demographic characteristics, prescription opioid misuse in the past year (A.O.R. = 1.94, 95% CI = 1.33–2.84) was associated with increased odds of young men's physical IPV perpetration in the current or most recent relationship. *Conclusions/importance*: Prescription opioid misuse is associated with IPV perpetration at a population-level among young men and is not unique to clinical samples. Prevention and intervention strategies should be developed to simultaneously target prescription opioid misuse and IPV perpetration.

KEYWORDS
Intimate partner violence perpetration; prescription opioid misuse

Intimate partner violence (IPV) is a major public health problem, with 32.4% of women over their lifetimes experiencing physical violence from an intimate partner (Smith et al., 2017) and between 15% and 19% of men reporting IPV perpetration (Kessler et al., 2001; Singh, Tolman, et al., 2014; Whitaker et al., 2007). Although many studies examine risk factors for female IPV victimization, fewer examine male IPV perpetration. Studies assessing men for IPV perpetration have identified experiences of child abuse, depression, binge drinking, marijuana, and illicit drug use as associated factors (Chermack et al., 2008; Choenni et al., 2017).

Drug use and IPV perpetration

Researchers have consistently found an association between drug abuse and IPV perpetration (Arteaga et al., 2015; Epstein-Ngo et al., 2014; Smith et al., 2012; Stith et al., 2004; Taft et al., 2010). For example, among a nationally representative sample of 530 married or cohabitating men, those with a lifetime diagnosis of alcohol or substance abuse or dependence were almost two times more likely to perpetrate physical IPV than men without alcohol/substance abuse or dependence (Singh, Tolman, et al., 2014). Many studies group together all legal and illegal drugs rather than distinguishing between drug classes; however, results can vary by drug class (Choenni et al., 2017). For example, several researchers have found a correlation between IPV perpetration and cocaine use (Crane et al., 2014; El-Bassel et al., 2007; Smith et al., 2012) and alcohol use (Chermack et al., 2008; Crane et al., 2014; Smith et al., 2012; Subodh et al., 2014). Similarly, Chermack et al. (2008) found binge drinking and cocaine use to be the strongest predictors of IPV perpetration, when controlling for family history of drug use, childhood abuse, depression, and other drug use.

Opioid use and IPV perpetration

The U.S. Department of Health & Human Services declared the opioid crisis a public health emergency in 2017, with 2.5

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million people between the ages of 18 and 25 (7.1% of the population) and 8.2 million adults age 26 or older (3.9% of the population) reporting having misused pain relievers in the past year (Substance Abuse & Mental Health Services Administration, 2017). According to the Centers for Disease Control and Prevention, sales of opioid pain relievers quadrupled between 1999 and 2010, while the overdose death rate nearly quadrupled between 1999 and 2008 and the substance abuse treatment admission rate increased by nearly six times between 1999 and 2008 (Centers for Disease Control & Prevention, 2011).

Few studies have assessed for opioid use among male IPV perpetrators. Those studies that have examined opioid use have been among clinical samples, such as methadone treatment clinics or court-mandated substance abuse treatment programs (Chermack et al., 2008; Crane et al., 2014; El-Bassel et al., 2007). For example, marijuana use, non-prescription opiate/sedative use, heroin use, and non-prescription stimulant use were not associated with IPV perpetration when controlling for other known correlates (Chermack et al., 2008). In their meta-analysis on drug abuse and IPV perpetration, Moore et al. (2008) found only nine studies that examined the relation between opioid use and IPV perpetration, compared to 17 studies on cocaine use and IPV perpetration and 15 studies on marijuana use and IPV perpetration. The effect sizes across those studies on opioid use and IPV were small ($d = -0.14$ to 0.17, depending on the type of IPV). All of the studies on opioids and IPV included in the meta-analysis were published before 2004, and 40% were published in the 1990s, well before the height of the opioid epidemic (Rudd et al., 2016). Moreover, many of these studies measured only heroin use rather than prescription opioid misuse. Although there currently no known pharmacological explanations for an association between prescription opioid misuse and IPV, prescription opioid misuse, in particular, may be indicative of a cluster of problem behaviors including IPV or other illicit drug use (Boyd et al., 2009; Fergus & Zimmerman, 2005; Jessor, 1991). Alternatively, individuals may use prescription opioids as a method of coping with the aftermath of IPV (Setchell et al., 2017; Wong et al., 2013). Since 2004, more studies on opioid use and IPV perpetration have been conducted, however, most of the studies either do not distinguish between heroin and prescription opioids (e.g. Gilchrist et al., 2015) or focus only on heroin (e.g. El-Bassel et al., 2007). In a study of opioid-dependent (i.e. heroin and other opioids) versus non-drug abusing fathers, Moore et al. (2011) found that opioid-dependent fathers were more likely to perpetrate IPV in their lifetimes and in the last year, as compared to non-drug abusing fathers. However, in a study of 1,584 male and female criminal offenders with a suspected substance use disorder and for whom a substance use evaluation was ordered and performed, Crane et al. (2014) found that men with an opioid (i.e. heroin and other opioids) use disorder were less likely to report IPV perpetration in the past year, even after controlling for legal history and other demographic factors. Similarly, in one study in the general population, Smith et al. (2012) found that among 25,778 U.S. adults in a romantic relationship in the past year, prescription opioid use disorder was associated with less IPV perpetration, even after controlling for IPV victimization.

Summary and purpose

Few studies have examined prescription opioid misuse and IPV perpetration in the general population. Deeper understanding of the relationship between prescription opioid misuse and IPV perpetration is essential in light of the prescription opioid public health emergency. This knowledge is necessary to inform prevention and intervention efforts in both clinical practice and public policy. The purpose of this study is to examine the relation between prescription opioid misuse and IPV perpetration while controlling for known associations of IPV perpetration, such as socioeconomic status and race (e.g. Capaldi et al., 2012), depression (e.g. Kessler et al., 2001; Singh, Walton, et al., 2014), alcohol (e.g. Crane et al., 2014), and illicit drug use (e.g. Chermack et al., 2008) among a non-clinical, nationally representative sample of young men aged 18–35. This study addresses a gap in the literature for the association between prescription opioid misuse and IPV perpetration, and further investigates whether known risk factors, such as comorbid psychiatric disorders, might account for the relation between substance use and IPV (Choenni et al., 2017). The research question driving the current study is: Is prescription opioid misuse related to IPV perpetration among a nationally representative sample of young men?

Method

The research study was reviewed and approved by the University's Institutional Review Board and conforms to all APA guidelines about the ethical treatment of research participants.

Sample

Men aged 18–35 were selected for participation from GfK's KnowledgePanel, a probability-based web panel designed to be representative of the United States (GfK, 2013). The panel is selected using address-based sampling methods. Post-stratification weights were used in order to ensure that the sample was representative of the U.S. population. Weighting was based on gender, age, race, education, census region, annual household income, homeownership status, metropolitan area (yes/no), and internet access (yes/no) from the most recent (based on time of data collection) March supplement of the Current Population Survey (CPS).

The survey was administered online and households without internet access were given a device on which to complete the survey at no cost. The survey was fielded in August 2014. Reminder emails were sent twice during the survey administration; a third reminder email was sent to non-respondents toward the end of the fielding period. GfK

Table 1. Unweighted and weighted characteristics of a nationally representative sample of 1,053 young men age 18–35 (non-imputed data).

Characteristic	Unweighted	Weighted[a]
	N (%)	*N* (%)
Annual household income		
$0–$24,999	171 (16.2)	116 (12.2)
$25,000–$49,999	260 (24.7)	222 (23.3)
$50,000–$74,999	236 (22.4)	207 (21.8)
$75,000–$99,999	164 (15.6)	189 (19.9)
$100,000+	222 (21.1)	217 (22.8)
Education		
Less than high school	46 (4.4)	100 (10.6)
High school	237 (22.5)	281 (29.5)
Some college	333 (31.6)	326 (34.3)
Bachelor's degree or higher	437 (41.5)	244 (25.7)
Race		
White, non-Hispanic	694 (65.9)	584 (61.4)
Black, non-Hispanic	83 (7.9)	95 (10.0)
Hispanic	192 (18.2)	212 (22.3)
Another, non-Hispanic	84 (8.0)	60 (6.3)
IPV perpetration (at least once)	191 (18.1)	185 (19.4)
	M (*SD*)	*M* (*SD*)
Age	27.07 (5.28)	28.06 (4.66)
Depression symptoms	0.70 (1.30)	0.67 (1.32)
Alcohol use[b]	3.80 (4.32)	3.64 (4.48)
Marijuana use[c]	1.61 (1.54)	1.67 (1.70)
Illegal drug use[c]	1.06 (0.34)	1.06 (0.35)
Prescription opioid misuse[c]	1.12 (0.60)	1.17 (0.76)

[a]Counts rounded to nearest whole number.
[b]Measured on a scale from 1 to 40.
[c]Measured on a scale from 1 to 7.

uses an incentive structure with its panel participants that include raffles with cash and other prizes.

There were 2,889 men selected for the study; of these 1,346 responded (46.6%). Respondents were older than non-respondents, $t(2{,}887) = 4.00$, $p < .001$, less likely to be Hispanic or African-American, $\chi^2(4) = 47.75$, $p < .001$, had a higher annual household income, $\chi^2(7) = 42.32$, $p < .001$, and were more educated, $\chi^2(3) = 65.90$, $p < .001$. There was no significant difference between respondents and non-respondents on marital status (married/living together vs. widowed/divorced/never married), $\chi^2(1) = .66$, $p = 42$. Post-stratification weights (detailed above) were applied to reduce nonresponse bias and create a nationally representative sample. Demographic characteristics of the unweighted and weighted sample are presented in Table 1.

Measures

IPV perpetration

IPV perpetration was measured using physical violence items from the Conflict Tactics Scale (CTS; Straus, 1979) as adapted for use by the National Comorbidity Survey (Kessler, 2008, 2015). Participants were presented with a list of behaviors from CTS minor and severe physical violence sub-scales, and they were asked how frequently they had done each of the things on the list to their current or previous spouse/partner. The minor physical violence subscale included "Pushed, grabbed or shoved; threw something; slapped or hit," and the severe physical violence subscale included "kicked, bit or hit with fist; beat up; choked; burned or scalded; threatened with knife or gun." Participants reported frequency using a 4-point Likert-type scale from 1 = never to 4 = often. IPV perpetration was dichotomized into no IPV perpetration (responded never to all items) versus any IPV perpetration (responded something greater than never to one or more items) for the purpose of analysis.

Depression symptoms

Symptoms of depression were measured using the Patient Health Questionnaire-2 (Kroenke et al., 2003). Participants were asked how often in the last 2 weeks they had been bothered by (1) little interest or pleasure in doing things, and (2) feeling down, depressed, or hopeless. Participants responded on a 4-point Likert scale ranging from 0 = not at all to 3 = nearly every day. A mean score is calculated across 2 items, with higher scores indicating greater depression symptoms. Internal reliability was acceptable (alpha = 0.86).

Alcohol misuse

Alcohol misuse was captured using the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993). The AUDIT includes 10 items to assess alcohol consumption, drinking behaviors, and alcohol-related problems. Each item receives a score between 0 and 4 and all items are totaled (0–40). Sample items include, "How often do you have six or more drinks on one occasion?" and "Have you or someone else been injured because of your drinking?" The AUDIT demonstrated acceptable reliability (Cronbach's alpha = 0.76).

Drug use

Participants were asked how often in the past 12 months they used: (1) marijuana, (2) any kind of cocaine – including crack, freebase, or powder, (3) any other types of illegal drugs, such as LSD, PCP, ecstasy, mushrooms, inhalants, ice, or heroin, and (4) any pain killers or opioids such as Vicodin, OxyContin, Percocet, Demerol, Percodan, or Tylenol with codeine, without a doctor's permission. Responses were given on a 7-point Likert scale ranging from "none" to "every day or almost every day" (Harris et al., 2009). *Illegal drug use* was calculated by taking the mean of the second and third items (cocaine and other illegal drugs); because marijuana is not universally illegal we retained it as a separate item. *Marijuana use* was captured by the first item, and *prescription opioid misuse* was captured by the fourth item.

Demographics

In this study, we assessed race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, another non-Hispanic race/ethnicity), self-reported annual household income (measured from zero to $100,000+ in increments of $25,000), and education level (less than high school, high school graduate, some college, or Bachelor's degree or higher) as categorical variables. Age was assessed as a continuous variable.

Table 2. Weighted bivariate odds ratios showing association of IPV perpetration with demographics, mental health, and alcohol or substance use ($N = 1,053$; imputed data).

Characteristic	Odds ratio	95% Confidence interval
Annual household income		
$0–$24,999	1.62	(0.75, 3.49)
$25,000–$49,999	1.39	(0.80, 2.42)
$50,000–$74,999	Reference	
$75,000–$99,999	1.58	(0.84, 2.96)
$100,000+	1.40	(0.77, 2.53)
Race		
White, non-Hispanic	Reference	
Black, non-Hispanic	2.07	(1.00, 4.30)
Hispanic	0.92	(0.57, 1.50)
Another, non-Hispanic	1.50	(0.71, 3.19)
Alcohol use	1.11***	(1.06, 1.16)
Depression symptoms	1.20**	(1.05, 1.38)
Marijuana use	1.08	(0.97, 1.20)
Illegal drug use	3.50***	(2.02, 6.05)
Prescription opioid misuse	2.32***	(1.51, 3.56)

*$p < .05$; **$p < .01$; ***$p < .001$.

Table 3. Weighted multivariate odds ratios showing association of IPV perpetration with demographics, mental health, and alcohol or substance use ($N = 1,053$).

Characteristic	Odds ratio	95% Confidence interval
Annual household income		
$0–$24,999	0.98	(0.43, 2.26)
$25,000–$49,999	1.34	(0.75, 2.40)
$50,000–$74,999	Reference	
$75,000–$99,999	1.55	(0.82, 2.93)
$100,000+	1.23	(0.66, 2.32)
Race		
White, non-Hispanic	Reference	
Black, non-Hispanic	1.85	(0.91, 3.78)
Hispanic	1.00	(0.60, 1.67)
Another, non-Hispanic	1.67	(0.69, 4.02)
Alcohol use	1.08**	(1.03, 1.13)
Depression symptoms	1.06	(0.92, 1.21)
Marijuana use	0.94	(0.83, 1.06)
Illegal drug use	2.01**	(1.24, 3.25)
Prescription opioid misuse	1.94**	(1.33, 2.84)

*$p < .05$; **$p < .01$; ***$p < .001$.

Analysis plan

Of 1,346 men who completed the survey, only those ever in a romantic relationship (79.6%; $N = 1,072$) were asked questions about IPV perpetration. Most of these men indicated they had been in romantic relationships with women only (93.6%; $n = 985$). Of the 1,072 men who had been in a romantic relationship, those with missing data included 19 (1.8%) on IPV perpetration, 10 (0.9%) on depression symptoms, 19 (1.8%) on alcohol abuse, 13 (1.2%) on marijuana use, 7 (0.7%) on illegal drug use, and 10 (0.9%) on prescription opioid misuse. We conducted multiple imputation with 20 iterations using chained equations in Stata15 (StataCorp, 2017) to account for missing data. We included race/ethnicity, annual household income, education, age, marital status, and current relationship status as auxiliary variables in the imputation analysis. Although the dependent variable of IPV perpetration was included in the imputation, only cases with complete data on IPV perpetration were included in the analysis ($n = 1,053$). We performed weighted bivariate logistic regression to assess correlates of IPV perpetration. We performed weighted multivariate logistic regression to assess whether prescription opioid misuse was correlated with IPV perpetration after controlling for covariates.

Results

Unweighted and weighted descriptive statistics for the non-imputed dataset are presented in Table 1. In total, 92.7% of the sample reported no prescription opioid misuse in the past year, and of the 7.3% who reported past-year prescription opioid misuse, 71.0% had misused prescription opioids once per month or less, 8.5% had misused prescription opioids 2–3 times per month, 15.6% had misused prescription opioids more than once per week, and 4.9% reported misusing prescription opioids every day or almost every day. Nearly three-quarters of the sample (72.7%) was currently in a relationship. Just under 20% of the sample reported at least one act of IPV perpetration in the current or most recent romantic relationship. Specifically, 19.1% of the sample reported that they had pushed, grabbed, or shoved; threw something at; or slapped or hit, their partner. Of these, the majority reported doing so rarely (73.7%), 22.9% sometimes, and 3.5% often. A smaller proportion of the sample reported that they had kicked, bit or hit with a fist; beat up; choked; burned or scalded; or threatened with a knife or gun, their partner; 4.5% of the sample reported engaging in these behaviors at least once. Of those, 67.6% did so rarely, 19.7% sometimes, and 12.7% often.

Weighted bivariate logistic regressions were conducted to examine the associations of each variable with IPV perpetration (Table 2). Education and age were not included in the analysis because they are highly correlated with income level. Alcohol use, depression symptoms, past-year illegal drug use, and past-year prescription opioid misuse were each associated with greater likelihood of perpetrating IPV in the current or most recent relationship. Race/ethnicity, annual household income, and past-year marijuana use were not associated with IPV perpetration.

Finally, a multivariate logistic regression was conducted in order to examine the relation between past-year prescription opioid misuse and IPV perpetration in the current or most recent relationship after controlling for all other variables. The variance inflation factor was less than 1.4 for all independent variables with complete cases. Results of the multivariate logistic regression are presented in Table 3. Alcohol use, past-year illegal drug use, and past-year prescription opioid misuse were significantly related to IPV perpetration in the current or most recent relationship. Misuse of prescription opioids was associated with an increase in odds of IPV perpetration by a factor of about two (OR = 1.94), even when controlling for known risk factors.

Discussion

The purpose of this study was to examine the relation between prescription opioid misuse and IPV perpetration among a nationally representative sample of young men. We found that 7.3% of men ages 18–35 reported prescription opioid misuse at least once in the past year. This statistic is in line with that from the 2015 National Survey on Drug

Use and Health, in which 9.6% of men aged 18–25 reported prescription opioid misuse at least once in the past year (Substance Abuse & Mental Health Services Administration, 2017).

We found that even after accounting for other known risk factors, past-year prescription opioid misuse was associated with greater likelihood of perpetrating physical IPV in the current or most recent relationship. These findings of increased odds of IPV perpetration in those with prescription opioid misuse may reflect co-existing risk behaviors or may indicate a strategy to use prescription opioids to cope with interpersonal conflicts. Our study reaffirms some previous research that has found a relation between opioid use and IPV perpetration (for a review, see Choenni et al., 2017). However, our study is unique in that we study prescription opioid misuse among a nationally representative, non-clinical sample, which increases the generalizability of our results. Further, our data were collected in 2014, during the peak of the opioid epidemic (Rudd et al., 2016). As the USA continuous to struggle with the opioid epidemic as a public health emergency, our results have important practice and policy implications.

Recent review of research on drug use and IPV (Choenni et al., 2017) points to the need for studies to control for other known IPV risk factors in order to isolate the unique effect of drug use on IPV perpetration. In our study, we included demographic factors such as annual household income, education, and race/ethnicity, as well as risk factors such as other drug use, alcohol abuse, and depression. Consistent with previous research, we found that alcohol misuse, illegal drug use, and depression symptoms were all associated with IPV perpetration, and that prescription opioid misuse was also associated with IPV perpetration even after accounting for these known risk factors. While there may be a synergistic effect between demographic factors, drug use, and depression symptoms, our findings suggest that prescription opioid misuse is also independently related to IPV perpetration.

The U.S Department of Health and Human Services specified five priority areas in which to focus prevention efforts for prescription opioid misuse. One area is improving access to treatment and recovery services. Our results suggest that prescription opioid treatment programs may be a point of entry into treatment for IPV perpetrators. Therefore, prescription opioid treatment programs may provide an opportunity to assess men for IPV perpetration and provide IPV interventions. However, results from the National Survey of Substance Abuse Treatment Services reveal that only 38.4% of substance abuse treatment facilities provide IPV-related services (Capezza et al., 2015). Programs that offer both substance abuse and IPV treatment have created better outcomes for clients. For example, Goldkamp et al. (1996) compared clients assigned to an integrated substance abuse and IPV treatment program to those assigned to separate drug abuse and IPV programs. They found that clients assigned to the integrated program were more likely to enroll, less likely to drop out, and were arrested fewer times during the follow-up period than clients assigned to two separate programs. In addition to better outcomes, an integrated program is also more cost-effective than providing two separate programs (Capezza et al., 2015).

The results of our study suggest that the link between opioid misuse and IPV perpetration is a population-level problem and is not unique to clinical samples. While we did not assess men for substance abuse or dependence, our results suggest that prescription opioid misuse is associated with IPV perpetration. Focusing on those who meet the clinical definition of substance dependence is important, but prevention and treatment efforts must also consider recreational users. In addition to focusing on a non-clinical population, our sample was limited to men between the ages of 18–35. For many men, this is a time when they become fathers or are involved in parenting young children. Given that childhood exposure to drug use and IPV is a risk factor for later engagement in these activities (Chermack et al., 2008; Webster & Webster, 2005), the development and availability of drug treatment and IPV prevention programs for young men and fathers may disrupt the intergenerational cycle of drug abuse and violence. Interventions for fathers are crucial for disrupting the intergenerational cycle of drug abuse and violence.

Limitations

There are several limitations of the current study that can be addressed in future research. First, our data are cross-sectional and we can draw no conclusions about the direction of the relation between prescription opioid misuse and IPV perpetration. We also cannot be sure that the prescription opioid misuse and IPV perpetration are occurring in the same period of time. It is possible that prescription opioid misuse causes IPV perpetration, and it is also possible that IPV perpetration leads to prescription opioid misuse, perhaps as a method of self-medicating. Both pathways are logical. Second, there were demographic differences between respondents and non-respondents: respondents were older, less likely to be Hispanic or African-American, had a higher annual household income, and were more educated. Post-stratification weights were applied to reduce bias. Third, our measure of IPV perpetration included only physical violence, and did not account for psychological abuse (e.g. threatening a partner, controlling where a partner goes or who a partner sees; Tolman, 1999), sexual abuse, and technology-facilitated IPV (e.g. monitoring a partner's phone, demanding a partner's password; Reed et al., 2016). These different IPV forms may be differentially associated with prescription opioid misuse, or opioid misuse may be associated with reporting multiple forms of perpetration. Fourth, in this study, IPV is defined by men's self-report, not observed or corroborated by a partner. Since the prevalence of IPV perpetration among the current sample replicates prior estimates, these self-report measures likely reflect an accurate assessment. Lastly, men who report perpetrating IPV may also report being victimized (Marcus, 2012) but we do not know the context in which the IPV perpetration occurred; this is an important area for future research.

Conclusions

The results of our study suggest that among young men, prescription opioid misuse is associated with IPV perpetration, even when controlling for other known IPV risk factors. Both prescription opioid misuse and IPV are significant social and public health problems in the United States. Because prescription opioid misuse is associated with IPV among a general population of young men, clinical practitioners and public health officials can consider how to identify and respond to prescription opioid misuse among men who perpetrate IPV and identify and respond to IPV perpetration among men who misuse prescription opioids. Treatment providers need to understand the interplay between substance use in general, and prescription opioid use in particular, and IPV perpetration in order to assess and intervene comprehensively. Future research is needed to develop strategies that effectively address both prescription opioid misuse and IPV, and to inform the work of both addiction medicine specialists and IPV service providers, and thereby facilitate collaborations between these two sectors. Such research is of critical importance in light of the current prescription opioid crisis.

Declaration of interest

The authors declare that they have no conflict of interest. The authors alone are responsible for the content and writing of the article.

Funding

This research was supported by the Robert Wood Johnson Foundation and Veterans Affairs Clinical Scholars Program.

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