

Examining the Association between Posttraumatic Stress Disorder and Intimate Partner Violence Perpetration

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Abstract This study investigated the relationship between lifetime DSM-IV posttraumatic stress disorder (PTSD) and intimate partner violence (IPV) perpetration in a representative sample of self-identified heterosexual adult men in the U.S. Analysis was conducted using data from two waves of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) among 11,625 heterosexual men to test the hypothesis that heterosexual men in the general population with lifetime PTSD were more likely to perpetrate IPV than their non-PTSD counterparts. In adjusted models, heterosexual men who reported lifetime PTSD showed significantly higher risk of IPV perpetration (OR=2.36, 95 % CI=1.56–3.57, $p<0.001$), compared to men without PTSD. Results call for increased attention to assessment and treatment of mental health problems and trauma among male perpetrators of IPV, as a means to prevent the re-occurrence of violence.

Keywords Intimate partner violence · Perpetration · Mental health · Posttraumatic stress disorder

Intimate partner violence (IPV)¹ is a serious public health issue. The 2010 National Intimate Partner and Sexual Violence Survey estimates that about 5.9 % of women experience IPV (i.e., physical violence, sexual assault, and/or stalking) each year, and over a third (35.6 %) of women report IPV in their lifetime (Black et al. 2011). Although IPV occurs across heterosexual, lesbian, gay, bisexual, and transgender relationships, and by perpetrators of all gender identities (Alexander 2002; Greenwood et al. 2002; Turell 2000), this study focuses on heterosexual male IPV perpetration against women. Understanding factors that contribute to male IPV perpetration is necessary to lower IPV rates and potentially halt future violence. Although considerable amounts of research has focused on risk factors such as depression, substance abuse and dependence, and anger/aggression (Kessler et al. 2001; as reviewed by Aldarondo and Castro-Fernandez 2011), mental health outcomes like posttraumatic stress disorder (PTSD) have received less attention (Bell and Orcutt 2009; Orcutt et al. 2003; Rhodes et al. 2009).

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¹ According to the Centers for Disease Control and Prevention (CDC), IPV includes four types of behavior: a) physical abuse, when a person hurts or tries to hurt a partner by hitting, kicking, or other physical force; b) sexual abuse, when one forces a partner into any sexual act without consent; c) threats of physical or sexual abuse that include the use of words, gestures, weapons, or other means to communicate the intent to cause harm; d) emotional abuse, when one threatens a partner with his or her possessions or loved ones, or harming a person's sense of self-worth, including stalking, name-calling, or intimidation (see Saltzman, Fanslow, McMahon, and Shelley 2002).

PTSD develops as a response to a traumatic event. Symptoms include re-experiencing the trauma, avoiding triggers of the trauma, numbing, and hyperarousal (e.g., hypervigilance, exaggerated startle response, or lack of concentration; American Psychological Association [APA], 2013). Left untreated, PTSD has been associated with the development of comorbid conditions, such as depression and substance abuse (APA, 2004; Breslau et al. 2000; Kessler et al. 1995), impaired functioning in daily life (e.g., limited physical or mental functioning, inability to maintain stable employment, educational attendance or interpersonal relationships; Breslau 2001; Kessler 2000), as well as aggression and violence (Orcutt et al. 2003). For this study, we hypothesize that PTSD increases the risk of IPV perpetration among heterosexual men in the general population.

Literature Review

PTSD and IPV in Veteran Samples

The relationship between PTSD and IPV has been explored in the U.S. primarily through studies of veteran samples and combat-related diagnoses (Bell and Orcutt 2009; Orcutt et al. 2003; Savarese et al. 2001; Taft et al. 2007a, b). In their literature review, Bell and Orcutt (2009) concluded that most studies involving Vietnam male veterans with higher PTSD symptomology, especially those reporting hyperarousal symptoms, were more likely to report anger, hostility, aggression, and IPV perpetration than those without PTSD symptoms. Orcutt et al. (2003) evaluated a subset of male veterans ($n=376$) from a representative sample of Vietnam veterans. They found that veterans who reported more severe PTSD symptoms were significantly more likely to report IPV perpetration than those without symptoms. The authors highlighted this relationship as a key finding for treatment, where reductions in PTSD symptoms may lead to decreases in IPV perpetration.

In another study of Vietnam male veterans ($n=1168$) receiving Veteran Affairs (VA) services, Taft et al. (2007a) found a significant positive relationship between higher levels of PTSD hyperarousal symptoms and aggressive behaviors (e.g., threatening someone with physical violence or a weapon, verbal abuse, or physical violence) among men. The authors posited that hyperarousal symptoms may contribute to impaired attention and lack of emotional control, which may lead to impulsive and aggressive behaviors. In a convenience sample of 60 male Vietnam veterans, Taft et al. (2007b) also found that veterans with PTSD reported higher levels of anger and reactivity, which may contribute to the relationship between PTSD and IPV.

More recent studies involving Iraq and Afghanistan veterans have found a similar relationship between PTSD and male IPV perpetration. Jakupcak et al. (2007) conducted a small study ($n=117$) with Iraq and Afghanistan veterans receiving treatment in a VA health clinic. Men with higher levels of PTSD symptoms, and those who met criteria for PTSD, were more likely to report anger and hostility, and endorse recent acts of aggression, compared to those without these conditions. Both groups with PTSD-related outcomes were also more likely to report clinical impairments, including limitations in interpersonal relationships and social functioning, and trouble attending work. Authors stressed the need for early intervention for PTSD and PTSD symptoms. Given the severity of PTSD and associated impairments, comorbidities may increase over time when left untreated.

PTSD and IPV in Civilian Samples

Only a few studies have looked at the interaction between PTSD and IPV among civilian samples. Among studies about batterer interventions, Rosenbaum and Leisring (2003) showed that perpetrators in treatment programs ($n=118$) were twice as likely to suffer PTSD compared to estimates from men in the community. Men meeting criteria for PTSD reported more aggression and endorsed more IPV on the Conflict Tactics Scale (Straus and Gelles 1990) in the past year, compared to IPV perpetrators without PTSD. These experts cited the need to identify risk factors, such as early childhood trauma, and related outcomes like PTSD, as critical in the development of effective interventions for men who batter. Dutton (1995a) conducted a study using a small convenience sample ($n=176$), where male IPV perpetrators reported higher rates of chronic trauma compared to matched controls in the community. IPV perpetrators were also more likely to report personality patterns related to PTSD in prior studies.

Among larger studies, Rhodes et al. (2009) conducted a hospital-based study examining the relationship between mental health outcomes and IPV perpetration. The sample consisted of 1669 men assessed after hospital discharge. Men who reported IPV perpetration also reported higher scores for multiple mental health outcomes, including PTSD and depression. The authors called for identifying comorbid conditions associated with trauma and IPV to tailor interventions to specific subgroups of IPV perpetrators. Finally, Kessler et al. (2001) conducted analyses using epidemiologic data from the National Comorbidity Study (NCS; $n=3537$) to examine a wide range of premarital mental health diagnoses as predictors of IPV in current relationships (defined as married or cohabitating). Though depression and alcohol dependence were significantly associated with minor IPV perpetration, researchers found no relationship between PTSD and IPV.

Limitations of Current Literature

With a few exceptions (e.g., Kessler et al. 2001; Orcutt et al. 2003), studies examining the relationship between PTSD with IPV perpetration have relied on veterans receiving services at VA medical facilities (Jakupcak et al. 2007; Taft et al. 2007a, b), perpetrators in treatment (Rosenbaum and Leisring 2003; Dutton 1995a), or hospital-based samples (Rhodes et al. 2009). Except for the study conducted by Rhodes et al. (2009), both veteran and civilian samples were predominantly white men. Study findings based on specialized groups were not generalizable. For example, veterans may have had greater violence history and trauma exposure than that anticipated in a non-military sample due to their combat experiences. In addition, but for a few studies that assessed PTSD directly (Jakupcak et al. 2007; Kessler et al. 2001; Rhodes et al. 2009; Rosenbaum and Leisring 2003), studies either examined the relationship between PTSD symptoms (Orcutt et al. 2003; Taft et al. 2007a) or did not directly measure PTSD (Dutton 1995a). Further, except for Rhodes et al. (2009), other IPV investigators have not controlled for co-occurring mental disorders, such as major depressive disorder and substance abuse (Kessler et al. 2001; Orcutt et al. 2003; Taft et al. 2007a), which are commonly associated with chronic and severe PTSD (Bremner et al. 1996; Franklin and Zimmerman 2001; Kessler et al. 1995; McFall et al. 1992) and may increase the risk of IPV perpetration (Dinwiddie 1992; Feldbau-Kohn et al. 1998; Field et al. 2004; Maiuro et al. 1988; Thomas et al. 2013; as reviewed in Foran and O’Leary 2008).

PTSD Among Males in the General Population

According to Kessler et al. (1995), the lifetime prevalence of PTSD among men in the general population ($n=2812$) was 5 % in the National Comorbidity Study (NCS). Among men reporting PTSD, the worst traumas commonly reported were combat exposure (28.8 %) and witnessing violence (24.3 %). The risk of lifetime PTSD was higher among men who were currently or previously married, compared to those never married. Common comorbidities included major depression (47.9 %), drug abuse or dependence (34.5 %), and alcohol abuse or dependence (51.9 %). However, as seen in the literature review above, little is known about the relationship between PTSD and IPV among men in community settings.

To address key limitations of prior research, including the use of specialized samples and limited study of co-occurring mental health outcomes, we conducted a study to test the hypothesized relationship between lifetime PTSD and past-year IPV perpetration in heterosexual adult men. We used data from the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC), a nationally representative sample of the US population. These analyses were among the first

epidemiologic studies to examine the association between PTSD and IPV perpetration among adult men in the community. Using current data, we analyzed key IPV risk factors, including demographics (e.g., age, education, and income), as well as comorbid mental health outcomes like major depression and substance abuse. Consistent with studies of IPV veterans and perpetrators in treatment, we hypothesized that PTSD will show a significant positive relationship with IPV perpetration in a general population sample of heterosexual men.

Method

Sample

We conducted secondary data analysis testing the relationship between PTSD and IPV perpetration among heterosexual men. The sample came from NESARC, a longitudinal study of non-institutionalized U.S. adults (≥ 18 years) that included two waves of face-to-face interviews conducted in respondents’ homes. NESARC employed a multistage sampling design in order to achieve a representative sample (Grant and Dawson 2005; Grant and Kaplan 2005). Wave 1 data included measures of alcohol and drug disorders, as well as mood disorders (e.g., major depression), anxiety disorders, and personality disorders. Wave 2 data included the same information as Wave 1 and added measures for sexual orientation, additional mental health outcomes like PTSD, as well as for child abuse and IPV perpetration (e.g., physical, sexual, and psychological abuse). Below, we describe the data selected for this study.

This study provided information on key factors related to prior PTSD and/or IPV perpetration, including basic demographics, major depressive disorder and substance abuse or dependence data from Wave 1 (2001–2002; $n=43,093$; 81.2 % of eligible respondents), and sexual orientation from Wave 2, as well as PTSD and IPV perpetration data from Wave 2 (2004–2005; $n=34,653$; 86.7 % of Wave 1 respondents and 70.2 % of all eligible) (Grant and Kaplan 2005; Ruan et al. 2008). We restricted study to 11,625 self-identified heterosexual men who reported being in a relationship in the past year at Wave 2, as only these individuals were eligible to respond to IPV measures in NESARC.

Sample Description

Table 1 presents descriptive data in the study. Most self-identified heterosexual men were white, married or in a relationship, had completed some college education or less, and reported an annual household income of less than \$50,000. The average age was 44 years old. The vast majority of men did not report receiving welfare, government aid, or food stamps (i.e., poverty measures) in the past-year.

Table 1 Distribution of key covariates, mental health diagnoses, and outcomes among non-institutionalized heterosexual men participating in the NESARC

Variable	%
Age	
1. 18–34 years	32.0
2. 35–49 years	30.9
3. 50–64 years	21.7
4. ≥65 years	13.5
Race/ethnicity	
1. White	72.0
2. Black	9.3
3. Latino	12.3
4. Asian	4.4
5. Native American	2.0
Current relationship status	
1. Married	72.6
2. Have a partner	3.6
2. Divorced or separated	6.4
3. Widowed	0.7
4. Never Married	16.7
Education	
1. Less than high school diploma	13.9
2. High school graduate/GED	27.6
3. Some college or associates	29.7
4. College graduate or more	28.8
Annual household income	
1. < \$10,000	4.5
2. \$10,000–\$29,999	20.2
3. \$30,000–\$49,999	25.0
4. \$50,000–\$69,999	18.7
5. \$70,000–\$99,999	16.1
6. ≥\$100,000	15.6
Past-year poverty	3.4
Lifetime MDD at Wave 1	5.0
Past-Year substance abuse and dependence at Wave 1	13.3
Lifetime PTSD at Wave 2	3.2
IPV perpetration in the past year at Wave 2 ^a	4.0

N=11,625

^aN=11,598

Measures

IPV Perpetration In this study, IPV perpetration was assessed using six items of the widely used Conflict Tactics Scale (CTS) to assess whether respondents had done the following to their partner: 1) pushed, grabbed, or shoved; 2) slapped, kicked, bit, or punched; 3) threatened with a weapon, like a gun or knife; 4) cut or bruised; 5) forced sex; and/or 6) caused injury that required medical care (Straus and Gelles 1990). Respondents were asked how often in the past year

they had perpetrated the above acts. Due to a negative skew in responses, we dichotomized IPV perpetration as “Yes IPV” to indicate minor to severe violence or “No IPV.”

Mental Health Diagnoses All mental health outcomes were assessed using modules from the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV Version (AUDADIS-IV; Grant et al. 2003), a structured interview to assess alcohol, drug, and mental health outcomes using diagnostic criteria established by the American Psychiatric Association DSM-IV criteria (APA 1994). The AUDADIS-IV modules measured alcohol, tobacco and drug use disorders, major mood, anxiety, and personality disorders, and are designed to assess mental health outcomes in the general population. Forced responses in these modules necessitated responses before proceeding to subsequent items and contributed to less missing data. Modules could be administered by laypersons, as seen in NESARC (Grant et al. 2003).

For this study, we focused on the following modules: lifetime posttraumatic stress disorder (PTSD) at Wave 2, lifetime major depressive disorder (MDD) at W1, and substance abuse and dependence at Wave 1. Though other anxiety disorders were considered, we selected MDD and substance-related outcomes due to the strong relationship demonstrated with PTSD (Bremner et al. 1996; Franklin and Zimmerman 2001; Kessler et al. 1995), and between IPV and all three mental health outcomes (Feldbau-Kohn et al. 1998; Foran and O’Leary 2008; Rhodes et al. 2009).

Lifetime PTSD was assessed at Wave 2 with the AUDADIS-IV module (Ruan et al. 2008). The module includes 18 items measuring responses to a series of 27 stressful or traumatic events (e.g., physical assault, sexual assault, war, and natural disasters). PTSD symptoms based on DSM-IV criteria were assessed based on the worst event reported by the participant. Respondents met criteria for PTSD if they experienced the following: they were exposed to a traumatic event that involved actual or threatened death or serious injury, and caused fear, helplessness or horror (i.e., DSM-IV Criterion A); had experienced one or more symptoms of re-experiencing (i.e., DSM-IV Criterion B); three or more symptoms of avoidance (i.e., DSM-IV Criterion C); and two or more symptoms of hyperarousal (i.e., DSM-IV Criterion D) for at least 1 month (i.e., DSM-IV Criterion E), and experienced functional impairment due to symptoms (i.e., DSM-IV Criterion F; APA 1994; Roberts et al. 2010; Ruan et al. 2008; Shevlin et al. 2009). For the lifetime PTSD module, the test-retest reliability coefficient ($\kappa=0.64$) and internal consistency (ICC=0.69) were good (Ruan et al. 2008). We dichotomized PTSD to indicate “Yes PTSD” for

symptoms that met PTSD diagnosis at or before Wave 2, in accordance with prior study (Grant et al. 2009).

Lifetime MDD was assessed with the MDD AUDADIS-IV module. As depression measures were included in NESARC in both waves, we elected to use Wave 1 MDD to establish a clear temporal relationship between MDD and PTSD, and between MDD and IPV, as such an opportunity was not possible for the PTSD analysis (Grant et al. 2009). To assess MDD, participants were asked about symptoms, such as if they had ever experienced a 2-week period of being depressed or down most of the time, as well as periods over 2 weeks of lost appetite, weight loss, weight gain, trouble falling asleep, or sleeping more than usual. The MDD AUDADIS-IV module had been validated in a number of general population and clinical reappraisal studies (Grant et al. 2003; Ruan et al. 2008). In this study, lifetime MDD was examined as a dichotomous variable (i.e., the presence or absence of MDD at some point in life at or before Wave 1), consistent with previous analyses (Grant et al. 2009). Major depressive episodes due to a medical condition or bereavement were outside of the scope of this study and were excluded (Compton et al. 2006; Rhodes et al. 2009; Ruan et al. 2008). Test-retest reliability was good for lifetime MDD ($\kappa=0.65$; Grant et al. 2003).

Past-year substance abuse or dependence was assessed at Wave 1, using an extensive list of symptom questions that assessed DSM-IV criteria for the following: alcohol, sedatives, tranquilizers, painkillers, heroin, opiates (other than heroin), stimulants, hallucinogens, cannabis, cocaine (including crack cocaine), and inhalants/solvents (Grant et al. 2004). Analyzing past-year substance abuse or dependence at Wave 1 established a clear temporal relationship from PTSD and IPV, both measured at Wave 2. Consistent with the DSM-IV, 12-month AUDADIS-IV diagnoses of alcohol abuse required a respondent to meet at least one of the four criteria defined for abuse in the 12-month period preceding the interview. The AUDADIS-IV dependence diagnoses required the respondent to satisfy at least three of seven DSM-IV criteria for dependence in the past year (Grant et al. 2003; Grant et al. 2004). The drug-specific diagnoses of abuse and dependence came from the same algorithm previously described for alcohol use disorders. Past-year substance abuse or dependence was dichotomized to indicate “Yes” or “No alcohol or drug abuse and dependence.” The test-retest reliabilities of AUDADIS-IV alcohol ($\kappa=0.74$) and drug measures ($\kappa=0.79$) were very good (Chatterji et al. 1997; Grant et al. 2003; Grant et al. 2004).

Demographic Covariates Demographics were captured as separate measures of gender (“What is your sex?”), age (“What is your age as of today?”), race/ethnicity (“Are you of Hispanic or Latino origin?” “Please select 1 or more categories to describe your race.”), and sexual orientation (“Which of the categories on the card best describes you?”).

In addition, socioeconomic status among participants was captured via separate measures of education (“Highest grade in school completed”), annual household income (“Total household income in the last 12 months, including any income from food stamps?”), and past-year poverty. The poverty measure was based on responses to three items assessing whether the respondent had received welfare, aid (“Personally received Traditional Aid to Families with Dependent Children, Employment Services Program or Emergency Assistance Program”; “Personally received Women, Infants & Children program benefits?”), or any food stamps in the last 12 months. Any positive response to these three items was categorized as “Yes past-year poverty.”

Analysis Plan

For statistical analysis, we employed SUDAAN software (Research Triangle Institute 2008) in our analyses to account for NESARC’s multi-stage sampling design using a robust variance estimator (Stetser et al. 2002). To test the hypothesis that heterosexual men with PTSD were more likely to perpetrate IPV than their non-PTSD counterparts, we conducted analysis in two stages.

First, we conducted bivariate analyses to determine which covariates were significantly associated with both PTSD and IPV perpetration. The NESARC weighting algorithm was used to adjust for sampling variation between Wave 1 and Wave 2 (Grant et al. 2009). Second, we used multivariable logistic regression analyses to assess whether heterosexual men with PTSD were more likely to commit IPV than those without PTSD. Finally, we calculated odds ratios (OR) and 95 % confidence intervals (CI) from a series of regression models estimating the association between PTSD and IPV at Wave 2, adjusting for potential confounders (Rothman et al. 2008) of age, race-ethnicity, socioeconomic status, MDD, and substance abuse or dependence, as these variables have demonstrated a relationship with PTSD (Breslau et al. 2004; Chilcoat and Breslau 1998; Kessler et al. 1995) and/or IPV perpetration (as reviewed in Aldarondo and Castro-Fernandez 2011; Capaldi et al. 2012; Foran and O’Leary 2008).

Results

Models of Mental Health Outcomes and Risk of IPV Perpetration

As seen in Table 2, adjusted models showed that the presence of PTSD significantly increased the risk of male IPV perpetration (OR=2.36, 95 % CI=1.56–3.57, $p<0.001$), compared to those without PTSD, when controlling for age, race/ethnicity, education, annual household income, and

Table 2 Risk of Lifetime PTSD on male IPV perpetration in adjusted models among heterosexual men participating in NESARC^a

Variable	Model 1		Model 2		Model 3	
	OR	95 % CI	OR	95 % CI	OR	95 % CI
Lifetime PTSD at Wave 2	2.36 ^{***}	1.56–3.57	2.24 ^{**}	1.47–3.39	2.19 ^{**}	1.44–3.34
Lifetime MDD at Wave 1	–		1.58 [*]	1.05–2.38	1.44 ⁺	0.95–2.19
Past-year substance abuse or dependence at Wave 1	–		–		1.78 ^{***}	1.38–2.31

OR odds ratio, CI confidence interval

N=11,598. ⁺ $p < 0.10$; ^{*} $p < 0.05$; ^{**} $p < 0.01$; ^{***} $p < 0.001$

^a All models control for age, race/ethnicity, educational attainment, annual household income, and past-year poverty in categories seen in Table 1

past-year poverty measures. Similar results were seen when adjusting for the above control variables, as well as lifetime MDD and past-year substance abuse or dependence at Wave 1. Of note, MDD was no longer a significant predictor of IPV perpetration when past-year substance abuse or dependence was added to the model (see Table 2).

Discussion

To our knowledge, this study is among the first to demonstrate a significant association between PTSD and IPV perpetration using an epidemiologic sample. These findings confirm our hypothesis that lifetime experience of PTSD may predict IPV perpetration by heterosexual men, even after adjustment for key demographics and prior mental health diagnoses. Of note, the impact of PTSD on IPV perpetration remains stable, when controlling for prior MDD and substance abuse. However, MDD drops out of significance when substance abuse is entered in the model, which may indicate that the relation between MDD and IPV is accounted for by substance abuse or that substance abuse mediates the relationship between MDD and IPV. Our statistical model does not distinguish between these possibilities. (See Table 2).

Prior studies have shown a similar relationship between trauma and violence (Dutton 1995a, b, 1999). Mechanisms that may link PTSD to IPV include higher levels of anger, dysregulation, and hostility, which are commonly reported among individuals with PTSD who commit violence (Dutton 1995a, b; Novaco and Chemtob 2002; Orcutt et al. 2003; Taft et al. 2007a, b). Experts posit that IPV is often motivated by power and control, where male perceptions of powerlessness and lack of self-esteem may lead to anger, aggression, and coercive control (Maiuro et al. 1988; Stark 2007). A small body of research also indicates that if trauma symptoms are unaddressed, they may feed into continuing cycles of violence and poor health outcomes (e.g., recurrent injury, substance abuse, school dropout, unemployment, and violent behavior; Abram et al. 2004; Ford et al. 2000; Rich 2009; Rich and Grey 2005; Song et al. 1998).

Limitations and Strengths

Limitations and strengths of this study include the following. First, the observational study design limits our ability to make conclusions about causation. This study, like other PTSD studies (Jakupcak et al. 2007; Orcutt et al. 2003; Rhodes et al. 2009; Taft et al. 2007a, b), is limited to retrospective reporting of lifetime PTSD, so we cannot establish temporal order between lifetime PTSD and IPV perpetration. Second, the co-occurrence of PTSD and MDD, of PTSD with substance abuse or dependence, and a clear temporal order between MDD and substance-related measures are not assessed in our study. Given these limitations, we have conducted analyses to adjust for both MDD and substance abuse dependence at Wave 1, and to establish clear temporality with PTSD at Wave 2.

Third, NESARC uses retrospective self-report measures, which may have resulted in lower rates of mental health outcomes like PTSD, given that retrospective recall of traumatic events may result in underreporting and lower rates of diagnoses (Orcutt et al. 2003). In terms of key measures, 3.8 % of NESARC males met criteria for lifetime PTSD at Wave 2, compared to lifetime estimates of 5 % among men in the National Comorbidity Study (NCS; Kessler et al. 1995). Only 5 % of NESARC males met criteria for lifetime MDD at Wave 1, lower than lifetime estimates of 12.7 % among men in NCS. Over 13 % of NESARC males met criteria for past-year substance abuse or dependence at Wave 1, slightly lower than 16.1 % of men with any past-year substance abuse or dependence in NCS (Kessler et al. 1994). The use of validated DSM-IV assessments for PTSD, MDD, and substance-related measures (Grant et al. 2003; Ruan et al. 2008) was a strength, but this study was conducted prior to the DSM-V release (APA 2013). Existing relationships might differ based on the updated criteria.

Fourth, respondents may have also underreported IPV perpetration on face-to-face interviews, due to recall or social desirability bias. Only 4 % of heterosexual men who reported being in a relationship endorsed IPV perpetration in the past year, lower than estimates ranging from 5.2 to 13.61 %

(Schafer et al. 1998). This may have contributed to measurement error and attenuated the relationship between the exposure and the outcome (Rothman et al. 2008). Further, some contextual-level information is not available. As the measure of IPV, the Conflict Tactics Scale (CTS) does not include necessary measures of emotional abuse and coercive control, lacks information on the context of IPV (e.g., the history or pattern of violence), and assumes gender symmetry though males are more likely to perpetrate more chronic and severe IPV that causes injury (Melton and Belknap 2003) or use tactics to exert coercive control (Dobash and Dobash 2004; Stark 2007). NESARC does not include partner reports to confirm IPV perpetration or to understand the context of IPV perpetration. Despite these limitations, the CTS is a validated measure to assess the presence of past-year IPV perpetration in range of behaviors and relationship types (Straus and Gelles 1990). NESARC also does not provide contextual factors, such as neighborhood disadvantage, that are key correlates of trauma exposure (Breslau et al. 2004) and IPV (Benson et al. 2004). However, testing empirically-supported risk factors for PTSD and IPV perpetration is a key strength.

Finally, the most severe IPV perpetrators may have been missing due to detention or incarceration during Waves 1 and 2 (Garner and Maxwell 2009; Hirschel et al. 2007). Given that literature points to higher rates of PTSD and trauma among detained or incarcerated samples (Gibson et al. 1999; James and Glaze 2006; Neller et al. 2006), the true relationship between PTSD and IPV perpetration may have been underestimated (Rothman et al. 2008).

Conclusion

We found support for the hypothesis that there is a positive relationship between PTSD and IPV perpetration among heterosexual men in the general population. This study adds to growing literature examining mental health and trauma, and calls for trauma-informed care (i.e., where service delivery occurs with an understanding of victimization and trauma on individual development) to address PTSD as a means to prevent and intervene against IPV. The need for trauma-informed services is increasingly recognized in social services and treatment models for women and children (Abram et al. 2004; Elliot et al. 2005; Harris and Fallet 2001; Ko et al. 2008), as well as in service delivery and violence interventions with youth and men (Corbin et al. 2013; Ford and Hawke 2013).

The effectiveness of various interventions with men who batter continues to be a subject of debate, especially for cognitive behavioral informed approaches (Aldarondo 2002, 2012; Babcock et al. 2004; Dutton and Corvo 2006; Gondolf 2004). Experts have called for batterer interventions to address mental health outcomes and violent behaviors in

ways that are culturally competent, tailored to individuals and their communities, and hold perpetrators accountable for their actions, while addressing root causes of violence, including issues specific to communities of color and other marginalized populations (Aldarondo 1998; Aldarondo and Castro-Fernandez 2008; Marshall et al. 2005; Rhodes et al. 2009).

Programs addressing IPV perpetration must also integrate trauma-informed practices. These include comprehensive screening and assessment for IPV risk and mental health, specifically PTSD, in medical, military, criminal justice, and other service delivery settings related to IPV (Wathen and MacMillan 2003; Whitfield et al. 2003). Staff training, trauma resources, and organizational policies must be implemented to identify PTSD and trauma among IPV perpetrators, and to account for context and individual needs, including reviewing practices in outreach, engagement, screening, and services that may cause triggering and revictimization (Elliot et al. 2005).

In order to fill critical gaps in current domestic violence knowledge, IPV researchers should build on existing work by conducting mixed methods studies that use longitudinal data, multivariable (e.g., risk factors such as demographics, trauma histories, and mental health outcomes), multilevel (e.g., family and community factors like family stability, neighborhood poverty, and crime rates) and qualitative analyses (Aldarondo and Castro-Fernandez 2011). Research should be conducted with diverse community samples across a range of perpetrators, relationships, and age groups. Additional studies should investigate the etiology of PTSD (Fu et al. 2007; Marshall and Schell 2002), sub-threshold PTSD (Jakupcak et al. 2007; Orcutt et al. 2003; Rhodes et al. 2009), and what mechanisms may link PTSD to IPV perpetration, as little is known about the link between trauma and violence, especially in the general population (Aldarondo 1998; Dutton 1995b; Marshall et al. 2005). Thus far, studies with veterans indicate that anger, aggression, and hostility following trauma exposure may play a significant role in violence perpetration (Bell and Orcutt 2009; Jakupcak et al. 2007; Maiuro et al. 1988; Novaco and Chemtob 2002; Orcutt et al. 2003; Taft et al. 2007a, b). Further research is needed to understand the impact of correlates like comorbid MDD and substance abuse, including the relationships between these conditions (e.g., relative impacts of each, or substance abuse as a potential mediator; Chilcoat and Breslau 1998; Fu et al. 2007). Research should also be conducted on any cumulative impact of comorbid conditions on IPV perpetration (see Aldarondo and Castro-Fernandez 2011).

Finally, the evaluations of trauma-informed interventions for IPV perpetrators must be conducted in both legal and non-legal settings. In addition to quantitative analysis of behavior changes, any subsequent IPV (that is not exclusive to physical assault), and re-arrest outcomes of participants, researchers should conduct qualitative interviews and surveys among stakeholders, program staff, perpetrators, survivors, and support persons. Used together, research can be used to identify

best practices and promising programs that engage and retain IPV perpetrators, address violence and other damaging behaviors, and halt future perpetration.

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