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Abstract | There is considerable evidence of the impact of methamphetamine use on violent behaviour. This paper presents findings from a review of existing research on the association between methamphetamine use and domestic violence.

Eleven studies met the criteria for inclusion. Domestic violence is common among methamphetamine users; however, methamphetamine users account for a small proportion of all domestic violence offenders.

There is evidence that methamphetamine users are more likely than non-users to perpetrate domestic violence. Importantly, methamphetamine use is frequently present along with other risk factors. This means methamphetamine use probably exacerbates an existing predisposition to violence, rather than causing violent behaviour.

Is methamphetamine use associated with domestic violence?

Christopher Dowling and Anthony Morgan

Reducing domestic violence is a priority for all levels of government in Australia. The high rates of physical, psychological and emotional abuse, particularly among women (Australian Bureau of Statistics (ABS) 2017; Ayre et al. 2016; Cox 2016), create financial costs for victims and put pressure on health, legal and government services (KPMG 2016; PricewaterhouseCoopers 2015). This has led to growing investment in a wide range of criminal justice interventions and perpetrator programs. Research into the individual, interpersonal and broader socio-economic factors that increase the risk of domestic violence has also intensified as a result.

Research has shown that substance use, including both alcohol and illicit drug use, is a risk factor for many forms of violence (Boles & Miotto 2003; Exum 2006), including domestic violence (Capaldi et al. 2012; Choenni, Hammink & van de Mheen 2017; de Bruijn & de Graaf 2016; Moore et al. 2008; Shorey, Stuart & Cornelius 2011; Stith et al. 2004). While further research is needed to understand the mechanisms underlying this association, particular attention has been paid to the pharmacological effects of alcohol and illicit drugs. The prevailing view is that these substances reduce inhibition by weakening the cognitive mechanisms restraining violent or otherwise inappropriate actions, while also exaggerating certain emotional states (Boles & Miotto 2003).

Broader contextual factors related to substance use can also influence the likelihood of violence. Of particular relevance to domestic violence are the lifestyle stressors and relationship pressures that emerge from or are exacerbated by substance use. These stressors include financial strain, relationship breakdown and family conflict (Boles & Miotto 2003; Shorey, Stuart & Cornelius 2011). Finally, research has found that both substance use and violence are influenced by a similar set of developmental risk factors, including abusive or neglectful parenting, impulsivity and other antisocial traits (Boles & Miotto 2003; Menard, Mihalic & Huizinga 2001). However, different substances have different pharmacological and behavioural effects, and the profiles of users can vary by substance, meaning the association of different substances with the risk of violence also varies.

Amphetamine-type stimulants are a series of synthetic central nervous system stimulants which accelerate the release of certain neurotransmitters (dopamine, serotonin and noradrenaline), along with adrenaline and other stress hormones throughout the body (eg Berman et al. 2009). They include, principally, amphetamine, the more potent methamphetamine ('speed' or 'ice'), and 3,4-methylenedioxymethamphetamine (MDMA or 'ecstasy').

Over the past decade the use of amphetamines, particularly methamphetamine, has increased both in Australia and internationally. In 2015–16 amphetamine-type stimulants accounted for the highest proportion of illicit drug seizures by weight in Australia, and the second highest proportion of seizures by number, with increases in both since 2006–07 (Australian Criminal Intelligence Commission (ACIC) 2017a). Surveys also indicate that the use of methamphetamine in its most potent, crystalline form (crystal methamphetamine), has increased (Australian Institute of Health and Welfare 2017; Stafford & Breen 2017). Additionally, analysis of wastewater from 54 sites across Australia indicates that, out of the 13 licit and illicit drugs examined (which did not include cannabis), methamphetamine was the most consumed illicit drug in 2016 (ACIC 2017b).

The increased availability and use of crystal methamphetamine has also been linked to a range of harms, indicated by increases in amphetamine-related treatment, arrests and hospital admissions (Degenhardt et al. 2016). More so than other illicit drugs, methamphetamine has become popularly associated with violent behaviour, particularly in the context of methamphetamine-induced psychotic episodes. Indeed, a large number of case-control and cohort studies have found that methamphetamine use can impact social-cognitive functioning and increase violence, even though much of this research fails to establish a direct, causal relationship (for reviews of this research see Homer et al. 2008; Tyner & Fremouw 2008).

Australian research has produced similar findings. In a study comparing users of methamphetamine and heroin, Darke, Torok, Kaye, Ross and McKetin (2010) concluded that methamphetamine users were more likely to have committed violence in the previous 12 months, controlling for other group differences. In a longitudinal cohort study, McKetin et al. (2014) observed a significant dose-related increase in violent behaviour among methamphetamine-dependent users while under the influence of methamphetamine, particularly when psychotic symptoms or heavy alcohol consumption were also present.

While some research has examined the association between methamphetamine use and domestic violence, there have been no previous attempts to synthesise the available evidence. Reviews have tended to focus on the role of other substances in domestic violence, while either neglecting methamphetamine use, or aggregating it into broader categories of substance use. In a meta-analysis of 96 studies, Moore et al. (2008) found a significant association between drug use or drug-related problems and domestic violence. Critically, the use of cocaine, a stimulant similar to methamphetamine, was the strongest predictor of increased psychological, physical and sexual aggression, while cannabis use was also significantly related to domestic violence (Moore et al. 2008). In a more recent review, de Bruijn and de Graaf (2016) found that men and women who had consumed cocaine, particularly at high levels, were significantly more likely to perpetrate domestic violence on the same day. Like Moore et al. (2008), they also concluded that cocaine plays a greater role in domestic violence than many other illicit substances, including cannabis, opiates, sedatives and hallucinogens.

This paper presents the results from a rapid evidence assessment of empirical research on the association between methamphetamine use and domestic violence offending—specifically, any violence against a current or former intimate partner—along with the factors that moderate this association. In order to properly assess the contribution of methamphetamine to the problem of domestic violence, this review examines both the extent to which methamphetamine use increases the likelihood of domestic violence offending and the prevalence of methamphetamine use among domestic violence offenders.

Method

Search strategy

Rapid evidence assessments are systematic reviews of a body of research undertaken in an accelerated manner within a restrictive time frame (ie four weeks to six months; Booth, Sutton & Papaioannou 2016). Despite the speed at which these reviews are completed compared to other systematic reviews, the methods used to search, collate and synthesise existing research are similarly pre-determined, rigorous, explicit and reproducible.

Eleven criminology, social science and health research databases were searched as part of this rapid evidence assessment, including:

- SocINDEX;
- Criminal Justice Abstracts;
- ProQuest;
- International Security and Counter Terrorism Reference Center;
- National Criminal Justice Reference Service Abstracts;
- Violence and Abuse Abstracts;
- Psychology and Behavioral Sciences Collection;
- E-Journals;
- PubMed;
- Australian Drug Foundation; and
- SAGE.

The reference lists of all studies published between 2016 and 2017, and all systematic reviews of research on substance use and domestic violence published between 2005 and 2017 (inclusive), identified in the initial search were also searched. Additionally, targeted follow-up searches of the academic journals *Addiction* and *Drug and Alcohol Review* were conducted. Standard search terms were used across all searches, incorporating terms for both methamphetamine and domestic violence (see Figure 1).

Searches were restricted to peer-reviewed studies, English language studies and studies published from 1990 onwards where possible, and only studies that met these criteria were eligible for inclusion. Study suitability was initially assessed on the basis of title and abstract information, while a second full-text screening was subsequently carried out to determine final inclusion in the review (see Figure 2). While inclusion was limited to peer-reviewed studies reporting quantitative findings on the association between methamphetamine use and domestic violence offending involving adult current or former intimate partners, and factors moderating this association, some of these studies also included qualitative findings. The literature search was conducted in November 2017.

Figure 1: Search terms

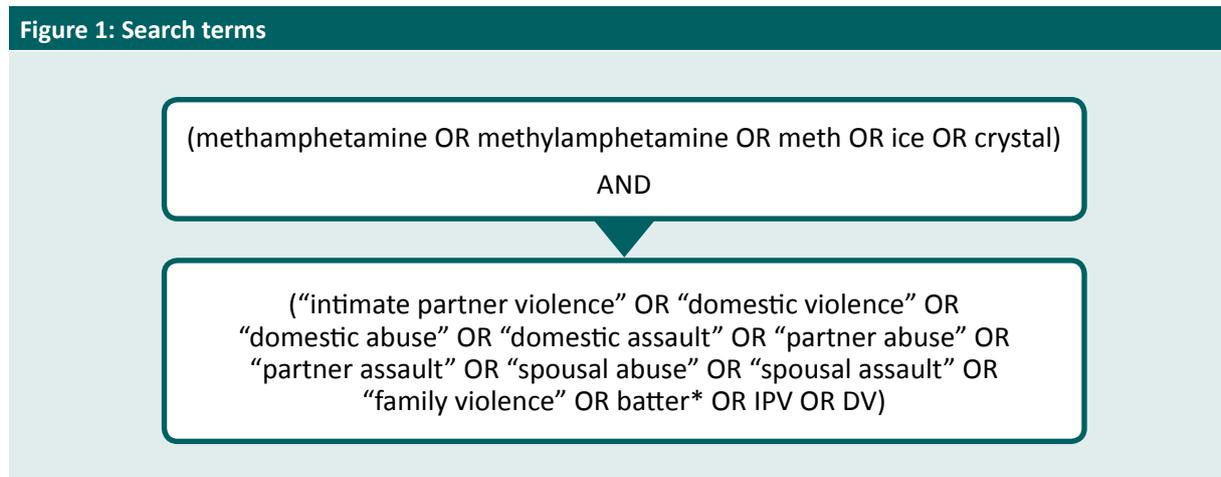
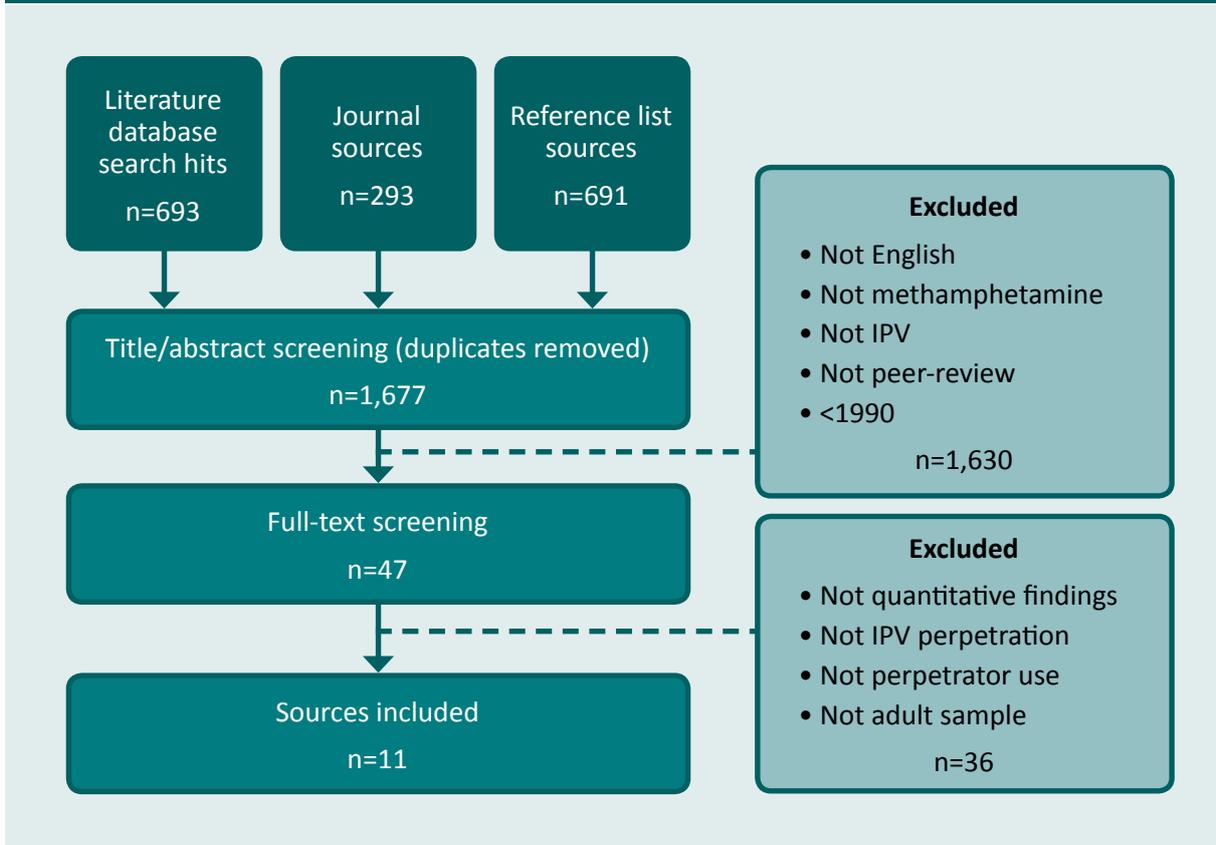


Figure 2: Literature search and appraisal process



Data extraction and analysis

Details on study location, design, sampling and data collection methods, along with results regarding the association of methamphetamine use and domestic violence, were extracted from each study. Narrative synthesis was used to summarise and critique this information. Narrative synthesis is an analytic approach that allows for a relatively broad description and critique of a body of research (Booth, Sutton & Papaioannou 2016).

Findings

Search results

Eleven studies were identified for inclusion in the review. Eight of these were carried out in the United States, with one carried out in Iran, one in South Africa and one in Australia. Publication dates ranged from 1991 to 2017. However, most studies were recent, and four were published in 2016 or 2017. Sample sizes ranged from 20 to 1,712. Two studies focused exclusively on female perpetrated domestic violence, one on male perpetrated domestic violence, and the remainder included both male and female perpetrators.

Methamphetamine use

Methamphetamine use was ascertained across included studies in various ways. Some studies asked participants whether they or their partner had recently used methamphetamine (four studies), had ever used methamphetamine (one study), or had used methamphetamine for a minimum period of time in the past (three studies). The other three studies relied on toxicological analysis of blood, urine and/or saliva. Importantly, none of the studies included in this review specified whether victims were also methamphetamine users, or under the influence of methamphetamine, when the violence occurred.

Domestic violence

The 11 studies included in the review examined different types of domestic violence. Seven studies focused only on threatened and actual physical violence (one of which examined only intimate partner homicide), one separately examined physical and sexual domestic violence, and three did not specify, meaning they may have examined a range of physical, verbal, sexual and psychological forms of violence. However, all studies examined some form of violence perpetrated against a current or former intimate partner.

Additionally, while most studies examined instances of violence in which there was a clear offender and victim, one also examined bidirectional domestic violence, or intimate partner relationships in which partners perpetrated violence against each other. Another did not distinguish between offending and victimisation in its measure of domestic violence experience. Most studies relied on self-report methods (ie interviews and questionnaires) to ascertain the prevalence of domestic violence, with two drawing on information from police records of reported domestic violence incidents.

Study design and data analysis

All but two of the studies provided descriptive quantitative findings on the association between methamphetamine use and domestic violence offending. Four studies compared methamphetamine users and non-users in terms of domestic violence offending (case-control studies). Three of these studies controlled for the use of other substances. Critically, only three studies (two of which used different subsets of the same sample) specifically examined domestic violence perpetrated while under the influence of methamphetamine, as distinct from recent methamphetamine use.

Table 1: Studies included in the rapid evidence assessment

Source	Sample	Type of DV	Meth. users who perpetrate DV	DV offenders who use meth.	Odds ratio ^a
Baskin-Sommers & Sommers 2006a	n=106, 59% male Drug treatment/ community sample of users	Physical violence (offender-reported)	35% violent while under the influence (61% of these incidents were DV)	–	–
Baskin-Sommers & Sommers 2006b	n=243, 49% male University students	Non-specific (offender-reported)	71% in the past year	24% ever used	6.5**
Ernst et al. 2008	n=1,712 Victims of police-reported domestic violence incidents	Non-specific (victim-reported)	–	9% using around time of reported DV incident	–
Hamilton & Goeders 2010	n=30, 100% female Drug treatment sample of users	Physical violence (offender-reported)	57% any prior violence (mostly domestic violence)	–	–
Hayashi et al. 2015	n=30, 100% female Community sample of users	Non-specific (offender-reported)	50% in past year	–	–
Khalkhali et al. 2016	n=120, 100% male Psychiatric treatment and healthy sample	Physical violence (victim-reported)	90% in past year	–	vs Psychiatric controls= +10.0*** vs Healthy controls= +10.0***
Khalkhali et al. 2016	n=120, 100% male Psychiatric treatment and healthy sample	Sexual violence (victim-reported)	37% in past year	–	vs Psychiatric controls=5.2* vs Healthy controls= +10.0***
Mouzos & Smith 2007	n=631 Police detainees (any crime)	Physical violence (offender-reported)	–	–	1.13

Table 1: Studies included in the rapid evidence assessment

Source	Sample	Type of DV	Meth. users who perpetrate DV	DV offenders who use meth.	Odds ratio ^a
Petering et al. 2017	n=238, 64% male Homeless young adults with ≥1 sexual relationships in the past year	Physical violence (offender-reported)	–	–	Perpetrated DV=0.5 Bidirectional DV=3.4**
Slade, Daniel & Heisler 1991	n=20 Perpetrators of intimate partner homicide	Homicide (police detected)	–	0% with meth. in their system at time of detection	–
Sommers & Baskin 2006	n=205, 59% male Drug treatment/ community sample of users	Physical violence (offender-reported)	27% violent while under the influence (51% of these incidents were DV)	–	–
Watt et al. 2017	n=360, 56% male Community sample of users	Physical violence (offender-reported)	38% in the past year	–	–

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

a: Where not stated, odds ratios have been manually calculated from available statistics

Note: DV=domestic violence

Association between methamphetamine use and domestic violence

Findings regarding the association between methamphetamine use and domestic violence are summarised according to the type of study: prevalence studies that examined rates of domestic violence offending among methamphetamine users, prevalence studies that examined rates of methamphetamine use among domestic violence offenders, and case-control studies that compared rates of domestic violence among methamphetamine users and non-users.

Prevalence studies: Domestic violence offending among methamphetamine users

There is a high prevalence of domestic violence offending among methamphetamine users. However, rates varied markedly across studies, due largely to differences in sample size and composition, and the definition of key variables. In a sample of young adult college students (aged 18–24), Baskin-Sommers and Sommers (2006b) found that around one-quarter (24%) of those who had ever used methamphetamine had been physically violent towards a partner in the prior six months.

Thirty-eight percent of methamphetamine users in Watt et al.'s (2017) sample had been physically violent towards a partner at some point in the past, with 29 percent reporting having done so in the prior three months. In an older and smaller sample of female methamphetamine users undergoing a residential treatment program, 57 percent had been physically violent at least once in their lifetime, with an unspecified majority indicating that this violence had been directed at their partners (Hamilton & Goeders 2010). Similarly, in a sample of female stimulant users (over 90% of whom indicated using methamphetamine) examined by Hayashi et al. (2015), 50 percent reported having perpetrated domestic violence in the previous year. Finally, Khalkhali et al.'s (2016) study of individuals with a diagnosed methamphetamine-induced psychotic disorder reported much higher rates of physical domestic violence offending (83%), and very high rates of sexual (53%) domestic violence offending.

Sommers and Baskin (2006) reported that 27 percent of their sample of methamphetamine users had perpetrated at least one incident of violence while under the influence. Additionally, of the 80 methamphetamine-influenced incidents of violence they collectively reported, the largest proportion (51%) was domestic violence. Follow-up analyses of a younger subset of this sample (aged 18–25) generated similar findings; 35 percent of the sample had committed at least one incident of violence while under the influence of methamphetamine, and 61 percent of the 54 violent incidents reported by these individuals were domestic violence (Baskin-Sommers & Sommers 2006a).

Prevalence studies: Methamphetamine use among domestic violence offenders

The rate of recent methamphetamine use among domestic violence offenders is comparatively low, although this finding is based on only a small number of studies. An early study of intimate partner homicide by Slade, Daniel and Heisler (1991) found that none of the offenders tested positive for methamphetamine, based on samples collected soon after apprehension. However, these findings are likely anomalous given they concern only the most severe form of domestic violence, and were generated from a small sample (n=20) at a time when methamphetamine availability and consumption were not as widespread as today. More recent research by Ernst et al. (2008) found that nine percent of domestic violence offenders involved in incidents reported to the police were methamphetamine users. Higher rates have also been reported; Baskin-Sommers and Sommers (2006b) reported that 24 percent of domestic violence offenders had used methamphetamine during their lifetime.

Case-control studies

The strongest evidence of the association between methamphetamine use and domestic violence comes from the four case-control studies. Overall, rates of domestic violence offending were found to be higher among methamphetamine users than non-users, even when controlling for other substance use. In their sample of young adult college students, Baskin-Sommers and Sommers (2006b) found that any prior use of methamphetamine significantly and positively predicted domestic violence offending in the prior six months, after controlling for alcohol and cannabis use. The odds of domestic violence offending were 6.5 times higher among participants who reported prior methamphetamine use, compared with non-users.

Khalkhali et al. (2016) also found that patients with a methamphetamine-induced psychotic disorder and no alcohol or other illicit drug use in the past year were significantly more likely than groups of psychiatric patients and healthy participants with no alcohol or illicit drug use in the past year to have been physically violent towards a partner in the year prior (90% vs 27% and 13%, respectively). The odds of prior physical domestic violence offending were over 10 times higher among those in the methamphetamine-induced psychotic disorder group than among healthy controls and other psychiatric patients.

In their analysis of a sample of homeless young adults, Petering et al. (2017) found that those who reported both domestic violence offending and victimisation in their most recent relationship were significantly more likely (odds ratio=3.4) to have used methamphetamine in the 30 days prior than those who reported no history of domestic violence. However, methamphetamine use was not significantly associated with domestic violence offending alone. Conversely, in their examination of an Australian sample of police detainees, Mouzos and Smith (2007) found no significant association between methamphetamine use and experiences of domestic violence offending and/or victimisation in the year prior, controlling for cannabis, heroin and benzodiazepine use. However, the lack of specificity in this study's measure of domestic violence, which does not distinguish between offending, victimisation and both, means these findings should be interpreted with caution.

Factors that moderate the association between methamphetamine use and domestic violence

Gender

While men account for the overwhelming majority of domestic violence offenders (ABS 2017), the studies included in this review found similar rates of domestic violence offending among male and female methamphetamine users (Baskin-Sommers & Sommers 2006a; Sommers & Baskin 2006). At least half of female methamphetamine users within the samples included in these studies had been violent towards their partner (Hamilton & Goeders 2010; Hayashi et al. 2015). Further, Watt et al. (2017) found no significant differences in the rate of domestic violence offending, either overall or in the most recent three months, between male and female methamphetamine users.

Age

There is little evidence available regarding the moderating effect of other demographic factors on the association between methamphetamine use and domestic violence offending. However, Baskin-Sommers and Sommers (2006a) found age to be a factor. Younger methamphetamine users were more likely than older users to be violent while under the influence of methamphetamine (35% vs 27%) and were more likely to be involved in violent incidents in which the violence was directed towards a partner, as opposed to some other victim (61% vs 51%).

Methamphetamine dependency

Evidence regarding the effect of methamphetamine dependency on domestic violence is equivocal, with 'dependency' having been measured using a variety of objective scales (frequency of use, entry into treatment, development of psychosis) and subjective scales (self-reported urge to use). Watt et al. (2017) found that the self-reported strength of participants' addiction to methamphetamine did not significantly predict domestic violence offending among either male or female users. This contrasts with Khalkhali et al.'s (2016) study, which found very high rates of domestic violence relative to other studies (>50%) among those who had used methamphetamine to the point of developing a severe psychotic disorder. The prevalence of domestic violence offending was also comparatively high in Hamilton and Goeders' (2010) sample of female methamphetamine users who had entered treatment due to the severity of their addiction. Two other studies (Baskin-Sommers & Sommers 2006a; Sommers & Baskin 2006) reported lower rates of domestic violence offending than either Khalkhali et al. (2016) or Hamilton and Goeders (2010), but the samples in the former studies included users in treatment and in the community, whose addiction may not have developed to the point of requiring treatment. Importantly, no research has examined whether methamphetamine dependency increases the frequency or severity of pre-existing domestic violence within a relationship.

Developmental and dispositional factors

Finally, Sommers and Baskin (2006), Baskin-Sommers and Sommers (2006a) and Watt et al. (2017) all found that the likelihood of domestic violence offending was significantly higher among methamphetamine users who also had childhood histories of violent offending or victimisation, familial criminality, mental health problems and difficulties with socialisation. Further, Sommers and Baskin (2006) also found that the average age of onset for all forms of violence was younger than the average age of onset for methamphetamine use. Two-thirds of participants who had been violent towards a partner while under the influence of methamphetamine reported having engaged in violence prior to using the drug. In other words, methamphetamine users who had been violent before using methamphetamine were more likely to be violent towards a partner while using it.

Discussion

Current research suggests that there is a high prevalence of domestic violence offending among methamphetamine users, and that methamphetamine users are more likely to be violent towards their partner than non-users. Specifically, between 25 and 50 percent of methamphetamine users across most of the studies included in this review had a history of domestic violence offending, although in a sample of severe and psychotic methamphetamine users the rate of offending exceeded 90 percent. However, rates of domestic violence appear to be lower when participants are asked specifically about violence while under the influence of methamphetamine, and, as expected, about violence within shorter time periods (eg in the last 6–12 months, or in their most recent relationship). As suggested by the literature on substance use and violence more broadly, methamphetamine use likely influences domestic violence offending both directly through its pharmacological effects, and indirectly through its broader lifestyle, relationship and financial effects.

In most of the case-control studies reviewed, rates of domestic violence offending were significantly higher among methamphetamine users than non-users, even after controlling for the use of other substances. Domestic violence offending among methamphetamine users is at least three times more common than among non-users, with a substantially higher likelihood among psychotic users. The limitations of case-control studies must be acknowledged; specifically, they have limited ability to determine the temporal association between methamphetamine use and violence (ie determining the exact order of drug use and violence) or whether there is a direct causal relationship between the two (Tyner & Fremouw 2008). Nevertheless, findings from the small number of case-control studies focused specifically on the role of methamphetamine in domestic violence, coupled with the larger and more robust evidence base on the impact of methamphetamine and violence more broadly (McKetin et al. 2014; Tyner & Fremouw 2008), suggests that methamphetamine use increases the likelihood of domestic violence offending.

However, the rate of recent methamphetamine use among perpetrators of police-reported domestic violence is comparatively low. While a significant proportion of methamphetamine users have a history of recent domestic violence, users account for only a small proportion of domestic violence offenders overall. Australian research has previously shown that methamphetamine use has a limited impact on overall assault trends (McKetin et al. 2006; Payne & Gaffney 2012), although more recent evidence indicates that the proportion of offenders who attribute their offending to methamphetamine use increased significantly between 2009 and 2015 (Goldsmid et al. 2017).

Findings tentatively suggest that methamphetamine use may exert a stronger influence on domestic violence offending among women than men. There are a number of possible explanations. Research has shown that, on average, female methamphetamine users rate higher on measures of dependency, that some of the pharmacological effects of methamphetamine use may be greater among female users, and that female users are more likely to have comorbid mental health issues that could predispose them to violence (Dluzen & Liu 2008). Unfortunately, there is currently insufficient evidence to draw any conclusions on the moderating impact of other demographic factors or degree of dependency.

The increased likelihood of domestic violence among methamphetamine users who exhibit other risk factors for violence—including prior physical violence, familial criminality, mental health problems and childhood histories of violent victimisation—and the particularly high rates of domestic violence among users with symptoms of psychosis, suggest methamphetamine use is an aggravating factor rather than a cause of domestic violence. These findings support the idea that the psychostimulant effect of methamphetamine increases aggression among those individuals who are more likely to exhibit impulsive and aggressive behavior prior to drug use, and that this may be further exacerbated by the presence of methamphetamine-induced psychosis (Hoaken & Stewart 2003; Homer et al. 2008). This is consistent with much of the research on the impact of alcohol on domestic violence, which suggests that it increases the risk of, rather than causes, violent behaviour (eg Langenderfer 2013).

Qualitative interviews with methamphetamine users in Hamilton and Goeders' (2010) and Watt et al.'s (2017) studies support this hypothesis. Many participants acknowledged that their methamphetamine use exacerbated pre-existing problems with anger and violent tendencies, which were commonly attributed to histories of abuse. Additionally, acts of violence were typically a reaction to certain contextual stressors and real or perceived transgressions, including arguments and other relationship problems, financial difficulties and parenting responsibilities, rather than being predatory and premeditated. Some participants in these studies also acknowledged that their methamphetamine use directly or indirectly contributed to these stressors and transgressions emerging in the first place, creating tension with their partners and placing financial and emotional strains on their relationships. This illustrates the cyclical and bidirectional influence of methamphetamine use, lifestyle or contextual stressors and domestic violence, which has also emerged in research on substance use and violence generally (eg Boles & Miotto 2003).

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**Dr Christopher Dowling is a Senior
Research Analyst at the Australian
Institute of Criminology.**

**Anthony Morgan is a Research
Manager at the Australian Institute of
Criminology.**

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GPO Box 1936
Canberra ACT 2601, Australia
Tel: 02 6268 7166

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