



Australian Government

Australian Institute of Criminology

Trends & issues in crime and criminal justice

ISSN 0817-8542

No. 573 March 2019

Abstract | The consumption of alcohol mixed with energy drinks (AmED) has become popular in Australia, particularly among young people. AmED research suggests there are associations between AmED consumption and harmful behaviours, including criminal offences. This study investigated the behaviours of a group of AmED consumers known to engage in high-risk activities—police detainees. It found most detainees had recently consumed energy drinks, but consumption of AmED was less common than in community samples.

The study also compared the behaviours of AmED consumers with alcohol consumers, and analysed how AmED consumers behaved in AmED sessions versus alcohol sessions. It found AmED consumers reported drinking more alcohol in a usual alcohol session than in a usual AmED session. AmED consumers were also significantly less likely to report being assaulted or committing a traffic offence in an AmED session, compared with an alcohol only session.

Is alcohol and energy drink consumption associated with antisocial behaviour?

Tom Sullivan and Fergus English

An emerging focus of drug and alcohol research has been the harmful effects of the consumption of alcohol mixed with energy drinks (AmED). Energy drinks are caffeinated beverages that can improve physical performance, mood and body movements associated with mental activity, but they can also have adverse physiological and psychological outcomes (Alford, Cox & Wescott 2001; Peacock, Bruno & Martin 2012; Seidl et al. 2000). Popular among people aged 18 to 35 years, energy drinks are mixed with alcohol for reasons such as a desire for energy or endurance, to compensate for a lack of sleep, or because of the taste (Lubman et al. 2013). Research that has analysed AmED use by adolescents and young people suggests widespread co-consumption of energy drinks and alcohol in Australia and elsewhere (Brache & Stockwell 2011; Lubman et al. 2013; Peacock, Bruno & Martin 2012).

Two recent reviews of AmED research have suggested AmED consumers generally drink more alcohol and are more likely to engage in harmful behaviours, such as drink-driving, than alcohol consumers (McKetin, Coen & Kaye 2015; Peacock et al. 2014). Evidence suggests AmED consumption increases stimulation and alertness, reduces fatigue from drinking and increases the desire to keep drinking (McKetin, Coen & Kaye 2015). Thus, AmED consumption is likely to lead to increased alcohol consumption and is associated with related harms, although no causal link has been confirmed (McKetin, Coen & Kaye 2015).

AmED studies frequently compare the past or planned future behaviours of AmED consumers with those of alcohol-only consumers (de Haan et al. 2012; Marzell et al. 2014; Snipes et al. 2015; Thombs et al. 2010). These are referred to as between-subject comparisons. In contrast, within-subject studies compare the behaviours of the same individuals during AmED sessions and alcohol sessions.

Comparing AmED and alcohol consumers

Peacock et al.'s (2014) systematic review of the outcomes of mixing alcohol with energy drinks found that between-subject comparisons generally showed increased odds of general risk-taking, tobacco use and illicit drug use among AmED users, relative to alcohol-only users. For example, Brache and Stockwell's (2011) survey of Canadian university students found AmED consumers were at increased risk of harms such as injury, heavy episodic drinking, stimulant use, and driving home after drinking. Some of these relationships disappeared when factors such as age, gender and heavy drinking were controlled for. This suggests between-subjects analysis may be limited by the differences between AmED consumers and alcohol users. For example, risk-taking propensity is a continuum and consumers of AmED may have a higher propensity for risk-taking. Some studies comparing AmED and alcohol-only consumers have controlled for individual differences, such as risk-taking propensity and level of alcohol consumption (Peacock et al. 2014). These studies have shown increased odds of general risk-taking (Brache & Stockwell 2011) and specific alcohol-related risks (O'Brien et al. 2008) among AmED users.

Comparing AmED sessions and alcohol sessions

Within-subject studies avoid the problems associated with comparing different groups of subjects by comparing the behaviour of the same individuals during alcohol-only sessions and AmED sessions. This research has produced mixed findings. Some studies have found greater alcohol consumption during AmED sessions (Brache & Stockwell 2011; Peacock, Bruno & Martin 2012) while others have found lower alcohol consumption during AmED sessions (de Haan et al. 2012; Lubman et al. 2013).

In addition, some studies have shown that people report being less likely to engage in risk-taking behaviours during AmED sessions than during alcohol-only sessions (de Haan et al. 2012; Peacock, Bruno & Martin 2012; Peacock et al. 2015). These behaviours include licit and illicit drug use, driving or being driven by someone over the legal alcohol limit, riding in a speeding vehicle or a vehicle with an illegal number of passengers, physically fighting, and being physically injured.

There is also some evidence that the amount of energy drinks consumed in a session is associated with the likelihood of engaging in harmful behaviours (Peacock et al. 2015). For example, a study has shown that, after controlling for alcohol intake and risk-taking in alcohol sessions, greater energy drink intake was associated with increased likelihood of engaging in certain risk-taking behaviours in a sample with the same frequency of AmED and alcohol use (Peacock et al. 2015).

Furthermore, the behaviours of AmED consumers post-consumption suggest they are a heterogeneous group, comprising three sub-groups: low risk-taking consumers, high risk-taking consumers, and disinhibited intake consumers (Peacock & Bruno 2015). While these different groups all drink AmED, high risk-taking consumers are likely to report risk-taking behaviours during AmED sessions, while low risk-taking AmED consumers are unlikely to do so (Peacock & Bruno 2015). Disinhibited intake consumers are likely to report excessive alcohol consumption and excessive spending, but low-level engagement in other risk-taking behaviours (Peacock & Bruno 2015).

The current study

This study focuses on a high risk-taking population—individuals detained by the police. The Drug Use Monitoring in Australia (DUMA) program surveys detainees who agree to take part about their drug use and offending behaviours. Police detainees in Australia consume alcohol at high-risk levels and about one-fifth report that their alcohol use contributes to their detention (Patterson et al. 2018). In addition, they have been detained by police for one or more criminal offences, further suggesting they have a high propensity for risk-taking.

Consistent with earlier research, this study investigated the extent to which detainees reported having drunk alcohol and energy drinks at high-risk levels, and compared this with the high-risk drinking of detainees who reported having consumed alcohol but not energy drinks. The study also compared the extent to which alcohol-only and AmED consumers reported engaging in harmful and criminal behaviours such as using illicit drugs, speeding, driving while intoxicated, committing property offences, getting involved in verbal and physical fights and being assaulted. Additionally, the study compared these reported behaviours of AmED consumers during alcohol-only sessions with their reported behaviours during AmED sessions.

Methodology

The DUMA program surveyed 459 detainees aged 17 years or over about aspects of their consumption of alcohol and energy drinks separately, and their co-consumption of AmED. The DUMA program routinely collects information about drug use and offending behaviours from individuals detained by the police to assist with policy and program development. The alcohol and energy drink data were collected in a special addendum to the program at watch houses or police stations in New South Wales, Queensland, Western Australia and South Australia in April and May 2017. Offenders detained by police at these sites were eligible to participate in the DUMA program unless they were excluded for particular reasons, such as being highly intoxicated. See Patterson et al. (2018) for more information about the DUMA program.

The survey asked detainees how frequently they consumed alcohol, energy drinks and AmED. The study categorised frequency of energy drink, alcohol and AmED consumption into 'monthly or less' and 'more than monthly'. The survey also asked about the amounts that detainees consumed in a typical session. The study converted the quantities of alcoholic drinks reported by detainees to standardised units of alcohol using the standard drinks guide (one standard drink=10 g alcohol; Australian Institute of Health and Welfare 2017). Detainees reported the quantity of the energy drinks they had consumed (60 mL shot/250 mL drink/500 mL drink) and these were converted to standard

units. A standard energy drink was defined as equivalent to a 250 mL energy drink containing 80 mg caffeine, consistent with previous research (Peacock & Bruno 2015; Peacock et al. 2015; Peacock et al. 2014). Further, the study defined AmED as 'drinking alcohol and energy drinks in the same beverage or as separate drinks in the same drinking session'. The analysis excluded 10 detainees who reported consuming more than two standard deviations above the mean number of standard alcoholic drinks during usual alcohol (SD=24) or AmED sessions (SD=8).

The survey also asked detainees whether they had been involved in specific criminal or other harmful behaviours during a usual session of drinking alcohol, energy drinks or AmED in the last 12 months. The study reviewed previous Australian and international studies of the consumption of AmED to identify harmful behaviours measured in earlier research, and replicated these in the survey of detainees (Lubman et al. 2013; Peacock et al. 2015; Peacock, Bruno & Martin 2012; Snipes et al. 2015). The study compared the type and range of harmful behaviours reported by detainees who had consumed AmED in the previous 12 months with the same behaviours reported by detainees who had consumed alcohol only. It also compared behaviours of AmED consumers during a usual AmED session with their behaviours during a usual alcohol session. The results excluded offending behaviours reported by fewer than 10 percent of the sample because of low prevalence. Percentages are expressed as the proportion of detainees asked specific questions, with missing data excluded.

Results

Characteristics of the sample

Most of the sample were male (83%; n=381) and non-Indigenous (78%; n=355). The median age of the sample was 30 years and the mean was 32. The interquartile range, which describes the middle 50 percent of a variable's values when ordered from lowest to highest, was 25 to 39 years. Ages ranged from 17 to 70 years. Most detainees were single and had never been married (55%; n=252), while 29 percent (n=132) identified as being married or in a de facto relationship and 15 percent (n=69) identified as being separated or divorced. The majority of the sample lived in stable housing (83%; n=381) and half of the detainees were unemployed (50%; n=226).

Alcohol consumption

Seventy-six percent (n=347) of the sample had drunk alcohol in the past 12 months and, of these, 59 percent (n=201) had drunk alcohol more frequently than monthly. As the number of standard drinks consumed in a usual session of drinking alcohol did not follow the normal pattern of distribution, the median was calculated. Detainees reported drinking a median (interquartile range) of eight standard drinks (4 to 17 standard drinks) in a usual session of drinking (mean=13), with a range of 0.5 to 61 standard drinks. Both the median and mean amounts were greater than the level recommended by the national alcohol consumption guidelines to reduce the risk of injury or disease (no more than four standard drinks on a single occasion; National Health and Medical Research Council 2009). More than three-quarters (77%; n=262) of recent alcohol consumers had drunk more than the maximum recommended by the national guidelines in a usual session of drinking. Detainees aged 17–20 years consumed a median (interquartile range) of 11 standard drinks (4 to 17 standard drinks) in a usual session (mean=14). Female detainees in this age group consumed a median

(interquartile range) of 15 standard drinks (4 to 17 standard drinks) in a usual session of drinking (mean=18), but the number of respondents was small (n=6). Male detainees in this age group consumed a median (interquartile range) of 10 standard drinks (4 to 17 standard drinks) in a usual session of drinking (mean=13).

Energy drink consumption

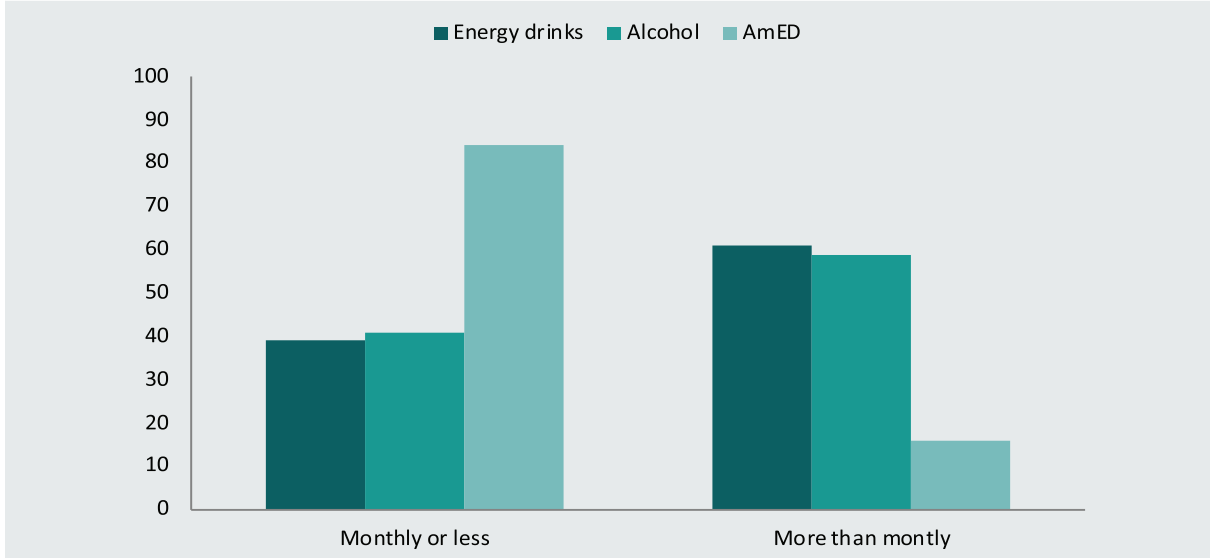
Seventy-eight percent (n=353) of detainees had consumed an energy drink in their lifetime, and 55 percent (n=248) had consumed an energy drink in the last 12 months. Of these recent users, 61 percent (n=151) had consumed energy drinks more frequently than monthly.

Consumption ranged from 0.5 to 12 standard energy drinks in a usual session, with a median (interquartile range) consumption of two standard drinks (1 to 2 standard drinks) in a usual session (mean=2). Most users (84%; n=208) consumed no more than two standard energy drinks in each usual session of consuming energy drinks, the recommended maximum daily consumption limit in Australia (Peacock et al. 2016). The median (interquartile range) number of days respondents had consumed energy drinks in the last 30 days was four (1 to 15 days), and the mean was nine days.

AmED consumption

Forty-four percent (n=203) of the sample had ever consumed AmED and 14 percent (n=65) had consumed it in the last 12 months. These 65 detainees had also separately consumed alcohol in the last 12 months. This represented 19 percent of detainees who had consumed alcohol in the last 12 months and 26 percent of those who had recently consumed an energy drink. Of these recent AmED users, most (84%; n=54) had consumed AmED monthly or less frequently (Figure 1).

Figure 1: Usual frequency of energy drink, alcohol and AmED drinking sessions in the last 12 months (% of groups)



Source: AIC DUMA collection quarter 2 2017 [computer file]

Almost all AmED consumers reported they had drunk alcohol and energy drinks simultaneously. Most AmED consumers had mixed energy drinks with a spirit (66%; n=42) and 25 percent (n=16) had dropped a measure of alcohol into an energy drink (making what is known as a 'bomb'). Six percent (n=4) had consumed spirits with energy drink 'chasers', meaning the energy drinks were consumed immediately after the spirits.

The number of standard drinks of alcohol consumed in a usual AmED session ranged from one to 22, with a median (interquartile range) of four standard drinks (2 to 10 standard drinks) in a usual session (mean=7). Detainees aged 17 to 20 years consumed a median (interquartile range) of nine standard drinks of alcohol (2 to 10 standard drinks) in a usual AmED session (mean=9). Age was a statistically significant predictor of AmED consumption, such that younger age was associated with consumption of AmED (OR=0.95, $p=0.02$). The number of energy drinks consumed in a usual AmED session ranged from 0.25 to 10 standard drinks. Almost two-thirds (63%; n=40) consumed no more than two standard energy drinks in a usual session.

Comparing AmED consumers with alcohol-only consumers

Alcohol use

Sixty percent (n=275) of detainees had consumed alcohol in the 12 months before detention, compared with 14 percent (n=65) who had consumed AmED. Table 1 shows detainees who had recently consumed AmED were significantly younger than those who had consumed alcohol only. Two-thirds (66%; n=43) of AmED consumers were aged 30 or under, compared with 48 percent (n=131) of alcohol only drinkers.

Shapiro-Francia's *W'* test suggested data for the number of alcoholic drinks consumed in a usual session and the number of days of alcohol consumption in the past 30 days were not normally distributed. Thus a Wilcoxon test was used to test for significant differences between AmED consumers and alcohol-only consumers. It found no statistically significant difference between the number of alcoholic drinks consumed by AmED consumers and alcohol-only consumers. A Wilcoxon test also found no significant differences between the median number of days alcohol was consumed by each group.

Table 1: Characteristics of alcohol-only and AmED consumers			
	Alcohol only	AmED	Statistical test
Median age (mean)	32 (33)	27 (28)	$z=3.66, p<0.001$
Gender			
Male	81%	19%	$\chi^2(1)=0.0208, p=ns$
Female	82%	18%	
Indigenous status			
Indigenous	22%	15%	$\chi^2(1)=1.2250, p=ns$
Non-Indigenous	78%	85%	
Alcohol consumption			
Median standard drinks of alcohol in usual alcohol session (interquartile range)	8 (4–17 drinks)	11 (6–22 drinks)	$z=-1.747, p=ns$
Median days of alcohol use in past 30 days (interquartile range)	4 (2–15 days)	7 (3–15 days)	$z=-1.945, p=ns$

Source: AIC DUMA collection quarter 2 2017 [computer file]

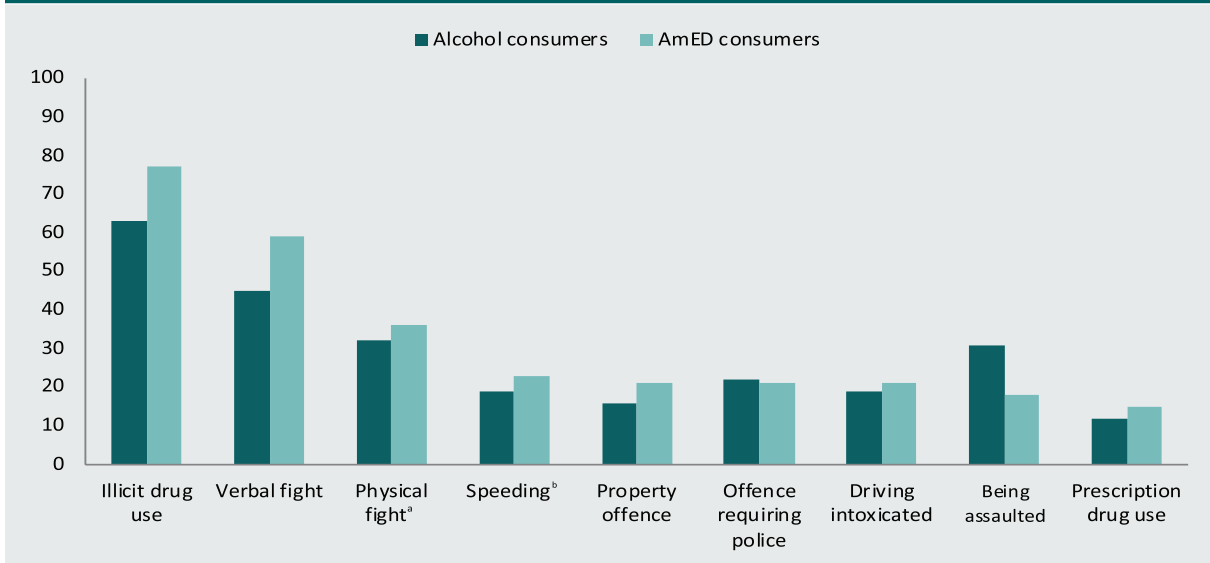
Use of illicit drugs

Among the sample of detainees, more than three-quarters of AmED consumers (77%; $n=30$) reported using illicit drugs during a usual AmED session, as did almost two-thirds (63%) of alcohol-only consumers ($n=117$; Figure 2). AmED consumers most commonly reported having used cannabis (53%; $n=16$), methamphetamine (47%; $n=14$), ecstasy (23%; $n=7$) and heroin (7%; $n=2$) during an AmED session. Of the alcohol-only consumers, 62 percent ($n=72$) reported having used cannabis during a usual session, 52 percent ($n=60$) methamphetamine, eight percent ($n=9$) heroin and three percent ($n=4$) ecstasy. The proportion of AmED consumers who reported having used ecstasy was significantly greater than the proportion of alcohol-only consumers who reported having used ecstasy ($V=0.3044$; $p<0.001$), but the differences for other drugs were not significant. Thirty-six percent of recent AmED consumers used multiple illicit drugs in a usual session ($n=14$), not significantly different to the 19 percent of alcohol consumers who used multiple illicit drugs in a usual session ($n=35$).

Harms

Most AmED consumers reported having been involved in a verbal fight during a usual AmED session (59%; $n=23$), not significantly different to the 45 percent of alcohol consumers ($n=84$). Thirty-six percent of AmED consumers also reported having been involved in physical fights ($n=14$), similar to the 32 percent of alcohol consumers ($n=60$). Involvement in a physical fight included pushing, slapping or punching someone. Eighteen percent ($n=7$) of AmED consumers reported having been assaulted, not significantly different to the 31 percent ($n=58$) of alcohol consumers.

Figure 2: Alcohol consumers and AmED consumers reporting involvement in offences and harmful behaviours (%)



a: Involvement in a physical fight, including pushing, slapping or punching someone

b: Driving 10 km/h or more over the speed limit

Source: AIC DUMA collection quarter 2 2017 [computer file]

Comparing behaviours during alcohol sessions and AmED sessions

The study also compared the reported behaviours of detainees while drinking alcohol and the same detainees' reported behaviours while drinking AmED. A Wilcoxon signed rank sum test was conducted because the quantities of alcohol drunk by AmED consumers were not normally distributed.

The test indicated that the number of standard alcohol drinks AmED consumers had drunk during usual alcohol sessions was significantly greater than the number of standard alcohol drinks they had consumed during usual AmED sessions ($z=4.713$, $p<0.001$).

McNemar's chi-square test was used to compare the harmful behaviours reported by AmED consumers when they had consumed alcohol and when they had consumed AmED. Exact McNemar significance probability was used because of the sample size. The results suggested a difference in rates of assault victimisation, with AmED consumers significantly more likely to be assaulted during an alcohol session than during an AmED session (see Table 2). The analysis also examined the types of offences detainees reported committing. The results suggested AmED consumers were significantly more likely to report being involved in speeding and/or driving while intoxicated during an alcohol session than during an AmED session.

Table 2: Reported harmful behaviour by AmED consumers, alcohol session vs AmED session

	Alcohol session (%)	AmED session (%)	McNemar proportions test (OR – 95% CI)	
Behaviour type	Illicit drug use ^a	82	76	0.5 (0.05–3.49)
	Verbal/physical fight	71	61	0.33 (0.03–1.86)
	Traffic offence ^b	42	24	0.13* (0.00–0.93)
	Property offence	26	21	0.33 (0.01–4.15)
	Offence requiring police	34	21	0.17 (0.00–1.37)
	Being assaulted	39	18	0.11* (0.00–0.80)

*statistically significant at $p < 0.05$

a: Includes AmED consumers who reported using illicit drugs and/or prescription medication for recreational purposes

b: Includes AmED consumers who reported speeding and/or driving while intoxicated

Note: OR=odds ratio; CI=confidence interval

Source: AIC DUMA collection quarter 2 2017 [computer file]

Discussion

This study contributes to AmED research by analysing behaviours of a group that, as a result of factors such as incarceration or lack of stable accommodation, may be under-represented in studies with community samples or university student populations. Detainees also have charges related to illegal and sometimes high-risk activities, and thus could be thought of as a risk-taking population. Detainees who drink AmED would appear to be part of the group that Peacock and Bruno (2015) defined as high risk-taking AmED consumers.

About three-quarters of detainees had consumed alcohol in the past 12 months, and more than three-quarters of these reported drinking more than the maximum amount recommended by the national guidelines on a single occasion of drinking. For the youngest detainees (aged 17–20 years), the median number of standard drinks consumed in a usual session was almost three times the recommended limit. These findings reflect earlier research suggesting detainees drink quantities of alcohol likely to result in high levels of intoxication (Sweeney & Payne 2011).

Most respondents had also consumed energy drinks in the last 12 months. The majority had drunk quantities equal to or less than Australia’s recommended maximum daily consumption limit, but 16 percent had drunk more than this limit. Fourteen percent of the sample had consumed AmED in the last 12 months. This is a smaller proportion than has been found in prior research: 38 percent of a NSW community sample reported consuming AmED in the past 12 months (Lubman et al. 2013) and 70 percent of a sample of Australian regular ecstasy users reported AmED consumption in the last six months (Sindicich & Burns 2010). These differences may be due to the higher average age of the police detainee sample (mean=32 years) relative to the samples in the studies by Lubman et al. (2013) and Sindicich and Burns (2010), which had means of 27 and 24 years respectively.

The variation may also reflect other differences between the samples, such as income and the extent to which they patronise pubs and nightclubs, where AmED consumption may be likely. The differences may also reflect changes in consumption levels and patterns since the earlier studies. Most detainees who had drunk AmED reported consuming these drinks monthly or less frequently, consistent with Australian community samples (Lubman et al. 2013; Peacock et al. 2015).

When comparing separate groups of AmED consumers and alcohol consumers, the study found no significant difference in the number of alcoholic drinks consumed. This contrasts with research suggesting AmED consumers tend to drink significantly more than alcohol consumers (Peacock et al. 2014). Again, this may be due to differences between this and other AmED research samples. Within-group comparisons suggested AmED consumers drank significantly less alcohol during AmED sessions compared with alcohol sessions. This finding is consistent with two studies showing significantly lower alcohol intake during AmED sessions (de Haan et al. 2012; Woolsey, Waigandt & Beck 2010) but conflicts with other studies' findings (Brache & Stockwell 2011; Peacock, Bruno & Martin 2012).

Researchers have suggested that mixed findings from AmED research may reflect a lack of standardisation in defining AmED (Peacock et al. 2014). As noted, this study defined AmED as drinking alcohol and energy drinks in the same beverage or as separate drinks in the same drinking session. Some studies have more specifically defined 'subsequent use' as consumption within a specific time period such as two hours (de Haan et al. 2012), while others have defined AmED use as simultaneous use only—that is, mixed in a single beverage (Brache & Stockwell 2011; Peacock, Bruno & Martin 2012).

AmED consumers were significantly more likely than alcohol-only consumers to use ecstasy, which may in part be explained by the younger age profile of AmED consumers. Age was a statistically significant predictor of AmED consumption. This finding could also be understood in the context that AmED consumers may use ecstasy for the stimulant effects. Additionally, the results align with research suggesting AmED consumption and the use of ecstasy both often occur at nightclubs (Droste et al. 2016; Uporova et al. 2018).

This study found no other significant differences between the proportion of AmED consumers and alcohol-only consumers reporting harmful behaviours. Previous research has found increased odds of general risk-taking, tobacco use and illicit drug use among AmED users compared with alcohol-only drinkers (Peacock et al. 2014). An explanation for this difference in findings may be the current study's low statistical power as a result of its small sample size. Additionally, all participants in this study had been detained by police and are therefore likely to have a greater propensity for illegal or harmful behaviours. For example, 76 percent of AmED consumers in this study had used illegal drugs in AmED sessions in the past 12 months, compared with 15 percent of AmED consumers in a Tasmanian community sample who had used illegal drugs in AmED drinking sessions in the past six months (Peacock & Bruno 2015). Similarly, 34 percent of AmED consumers in this study reported being involved in a physical fight during an AmED session in the last 12 months, compared with four percent of AmED consumers in a Dutch university student population (de Haan et al. 2012).

This study also analysed harmful behaviours of the same group of AmED consumers when they consumed AmED relative to when they consumed alcohol. They were significantly less likely to report having been assaulted or having engaged in a traffic offence when they had consumed AmED compared with when they had consumed alcohol only. Peacock, Bruno and Martin (2012) suggest the lower odds of behavioural risk-taking in AmED sessions may be attributable to greater arousal after energy drink consumption, potentially enhancing an individual's ability to process information. In line with earlier research, this study also found that detainees reported that AmED sessions were less frequent than alcohol-only sessions, meaning these individuals may have had fewer opportunities to be assaulted or to commit a traffic offence in these sessions.

The number of energy drinks consumed may also account for the findings. Research has shown that energy drink intake during AmED sessions is associated with behaviours such as drink-driving, sexual behaviour and aggressive behaviours when participants were matched on frequency of AmED and alcohol-only use (Peacock et al. 2015). Another possible explanation for the lower level of risk-taking in AmED sessions is that, relative to alcohol-only consumption, AmED consumption may be associated with less cognitive impairment and lower levels of intoxication (Forward et al. 2017; Peacock, Cash & Bruno 2015).

These results may also suggest that behavioural differences during alcohol sessions and AmED sessions may be less pronounced for a high risk-taking group such as police detainees than for lower risk-taking groups. For detainees, the extent to which the addition of energy drinks to alcohol contributes to risk-taking behaviour may be modest because they are already engaging in high-risk behaviours while they drink alcohol.

Limitations

Overall, effect sizes in this study were small, reflecting the relatively small sample size. The study's cross-sectional design also means that causal connections cannot be made. Additionally, highly intoxicated detainees were excluded from participation in the DUMA program and these detainees may have had different characteristics to those in the sample. The study is also limited by its reliance on self-reported harmful behaviours, which may be under-reported because of their sensitive nature. However, the impact of relying on self-reported data should be considered in light of evidence suggesting that drug user reports are sufficiently reliable and valid to provide information about drug use, drug-related problems and the natural history of drug use (Darke 1998).

Another limitation is that respondents may have been unclear about the definitions used in this study, leading to inconsistent responses across the sample. For example, some respondents may have included AmED consumption in response to the questions about alcohol consumption. However, the study sought to minimise this problem by defining AmED use for participants at the beginning of the survey.

Conclusion

This study's findings suggest that detainees engage in harmful behaviours, including criminal offences, while they drink alcohol and while they drink AmED. The high-risk drinking and other harmful behaviours that many in the sample reported reinforce the importance of court-based and mandated referral pathways into drug treatment, and prison-based alcohol treatment. The findings also suggest police detainees may be less likely than university students and other young Australian adults to consume AmED. Those detainees who did consume energy drinks reported consumption at or below the Australian recommended daily intake, potentially suggesting an awareness of these recommendations.

The findings were consistent with some research suggesting AmED consumers are less likely to engage in particular harmful behaviours while drinking AmED relative to when they drink alcohol only. This does not imply the overall harm of consuming AmED is less than that of drinking alcohol. Australian research has shown that AmED users have significantly higher odds of experiencing negative physiological and psychological outcomes, such as tension, irritability, tremors, agitation, heart palpitations, sleeping difficulties and ‘jolt and crash’ episodes—a period of increased stimulation followed a sudden drop in energy (Peacock, Bruno & Martin 2012). Thus, following recommendations from Woolsey et al. (2014), healthcare providers working with detainees could assess whether they have consumed AmED and discuss the effects and possible harmful interactions between energy drink ingredients and other drugs, such as antidepressants (Fugh-Berman 2000). Additionally, personal characteristics such as risk-taking propensity and the level of energy drink intake can be associated with side effects (Droste et al. 2017) and with harmful behaviours (Peacock et al. 2015). These findings should be taken into account when assessing detainees and may be useful in targeting education campaigns and intervention programs to reduce the harms associated with AmED consumption.

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General editor, *Trends & issues in crime and criminal justice* series: Dr Rick Brown, Deputy Director, Australian Institute of Criminology. Note: *Trends & issues in crime and criminal justice* papers are peer reviewed. For a complete list and the full text of the papers in the *Trends & issues in crime and criminal justice* series, visit the AIC website at: aic.gov.au

ISSN 0817-8542

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