

Alcohol mixed with energy drinks

Exploring patterns of consumption
and associated harms

Research summary

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- Deakin University
- La Trobe University, Centre for Alcohol Policy Research
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Introduction

Energy drinks (ED) are caffeinated beverages that typically contain 80mg of caffeine per 250mL container, which is approximately the same as one cup of instant coffee or one shot of espresso. ED have become increasingly widespread since their introduction to the Australian market in the 1980s, and in the early 2000s the combination of alcohol mixed with energy drinks (AmED) became popular; both in pre-mixed cans or mixed together in a glass. AmED have now become an ingrained feature of the night-time economy in Australia and many other countries (Oteri et al. 2007; Pennay and Lubman 2012; Wells et al. 2013), which has led to widespread concern about possible health and social risks of this combination of substances.

Research suggests that AmED are popular among consumers for a number of reasons: the stimulant properties of caffeine facilitate wakefulness and energy, the sweet palatable taste of AmED is appealing and disguises the flavour of alcohol, and ED can mask alcohol-related inebriation enabling greater alcohol intake and a more desirable state of intoxication (O'Brien et al. 2008; Brache and Stockwell 2011; Peacock et al. 2013).

Consumption of ED above recommended levels can result in symptoms consistent with caffeine toxicity which can include anxiety, insomnia, gastrointestinal upset and tachycardia (Reissig et al. 2009). Adding alcohol to ED raises additional concerns, with stimulation enabling greater alcohol intake and potentially increasing alcohol-related risk, and increasing dehydration as caffeine and alcohol are both diuretics (O'Brien et al. 2008; Brache and Stockwell 2011; Pennay and Lubman 2012). A large body of research also suggests that AmED consumers report more hazardous alcohol consumption patterns and greater engagement in risk-taking behaviour than straight alcohol consumers (Peacock et al. 2014).

There has been an increase over time in AmED-related research, as seen in Australian poison centre data (Gunja and Brown 2012) and US emergency department data (Drug Abuse Warning Network 2013). This highlighted the need for greater understanding of AmED users in Australia – such as in what contexts they consume AmED and experience AmED-related consequences – in order to inform the development of targeted interventions.

To advance understanding of these issues in the Australian context, VicHealth funded researchers from Monash University, Turning Point, Deakin University and the University of Melbourne in a successful Australian Research Council Linkage Project Grant, the outcomes of which are described below.

Project aim and objectives

This project aimed to advance understandings about who is using AmED in Australia, and the social and environmental contexts associated with consumption and related harm through:

- exploring the consumption of AmED in the social lives of young people
- describing the social, cultural and economic contexts of AmED consumption
- investigating patterns of AmED consumption and related risks and harm
- identifying the behavioural dynamics of AmED interactions and how these dynamics affect specific risks and harm
- detecting the prevalence and patterns of harms relating to ambulance attendances where AmED had reportedly been consumed.

Methodology

This three-year project (2012–15) involved six arms of data collection to gain a comprehensive understanding about the uses of AmED and the associated harms.

1. Analysis of observational data collected in licensed venues (2011–12)

Between December 2011 and June 2012, sessions of structured covert observation were undertaken on more than 100 occasions in 68 licensed venues in five Australian cities. Observers worked in teams to record hourly information (in four shifts from 9pm to 3am) on patron demographics, patron capacity, types of alcohol consumed (including ED and AmED), signs and extent of patron intoxication, signs of illicit drug use, alcohol promotions and staff serving practices. In total, 898 separate hourly observations were recorded. This data was collected as part of the POINTED study (Miller et al. 2013).

2. Deakin student web survey with AmED consumers (2012)

A sample of 1837 Deakin University students completed an online survey between August and October 2012. Participants were recruited via an institution-wide email and social media campaign. Participants answered detailed questions on the use of AmED, motivations for use and harms associated with use.

3. Street intercept study with young Victorian Schoolies (Year 12 school leavers) (2012)

Teams of researchers attended two popular destinations on Victoria's surf coast – Lorne and Torquay – during Schoolies in November 2012. Street intercept surveys were conducted with 752 young people (aged 17–19 years) over four nights between 7pm and 11pm. Participants were asked about their alcohol and AmED use, as well as other drug use and experience of harm, and offered a blood alcohol concentration (BAC) reading.

4. Australian population level survey (2013)

A computer-assisted telephone interview survey was undertaken with 2000 Australians aged 18 years and over in March and April 2013. Half of the interviews were obtained through randomly generated landline telephone numbers and half through mobile phones. Just over half of the sample was female (55.5%) and the mean age was 45.9 years (range 18 to 95, SD 20.0). Questions were asked about use of AmED in the past three months, as well as a range of general lifestyle topics.

5. Analysis of Ambulance Victoria data (2012–14)

Two years of ambulance data (July 2012–June 2014) where ED were reported as a contributing factor by paramedics were extracted from Patient Care Records held by the Population Health program at Turning Point. Demographic data, location of ambulance (metropolitan or regional), day of week and time of day were recorded. Analysis of this data is not included within this report due to awaiting journal publication at the time of writing this report.

6. Qualitative interviews with young AmED consumers in Victoria (2015)

Semi-structured qualitative interviews were undertaken with 25 young AmED consumers in Victoria, recruited through advertising on Deakin University noticeboards and in surrounding cafes and bars. Participants were encouraged to describe their own typical alcohol and AmED consumption practices, contexts of use, and social scenarios where consumption occurred.

Key findings

Through this research we:

- assessed the prevalence of AmED use at the Australian population level
- identified that young people located predominantly in metropolitan areas use AmED significantly more than the general Australian population
- identified two predictors not previously associated with ED and AmED use: psychological distress and gambling
- identified four distinct motives for AmED use: taste preference, energy seeking, hedonism (pleasure seeking), and intoxication-related outcomes
- identified a potentially important link between hedonistic motives and increased AmED consumption, intoxication-reduction efforts, risk of alcohol dependence, experience of harm and aggression
- confirmed a link between AmED consumption and increased intoxication using self-report and objective data (blood alcohol concentration (BAC) tests).

Prevalence of AmED use

Findings from the population survey show that AmED are used at fairly low levels among the Australian population, with one in twenty (4.6 per cent) survey respondents aged 18 to 95 (mean age 45.9 years, SD 20.0) reported AmED use in the past three months. Just over one in twenty males (6.9 per cent) reported AmED use in the past three months compared to one in forty females (2.7 per cent). Young adults reported the highest use of AmED with one in five 18 to 24-year olds (20.1 per cent) and just under one in ten 25 to 39-year-olds (7.5 per cent) consuming AmED within the past three months. This study found that during a typical AmED drinking session, participants reported consuming 4.7 alcoholic drinks and 2.1 energy drinks. Compared to non-AmED users, AmED users were more likely to be young, experience moderate levels of psychological distress¹, binge drink², engage in problem gambling³, and not know their income.

Our findings suggest that while most Australian adults are not consuming AmEDs at risky levels, the use of AmED is much higher among certain groups. For example,

- almost a third (32 per cent) of Deakin survey participants reported AmED use in the past three months

¹according to frequency of experience as per Kessler 6-6 (Kessler et al., 2003)

²drinking more than 5 drinks on a day as per the National Health and Medical Research Council guidelines (NHMRC, 2009)

³ moderate risk as per the *Problem Gambling Severity Index – 9 questions about gambling scored according to frequency* (Ferris and Wynne 2001)

- approximately 16 per cent of Victorian Schoolies reported AmED use in the past 12 hours
- just over one in five (21 per cent) Australian adults interviewed in the night-time entertainment precincts of five Australian cities (the POINTED study) reported AmED consumption on the current night out (Pennay et al. 2015).

In the observational study, AmED consumption was observed in just over a third (35 per cent) of all hourly observations in licensed venues, and just over one in twenty (6 per cent) patrons were consuming AmED in licensed venues at any one time.

The Schoolies study found that those who reported AmED consumption in the past 12 hours had consumed significantly more alcoholic drinks (11.3 versus 8.3) and recorded a significantly higher BAC reading (0.059 versus 0.045). This is consistent with reports from the POINTED study, which found that AmED consumers interviewed in the entertainment precincts of five Australian cities were more likely to be younger (aged 18–19 years), engage in pre-drinking (and report more drinks during pre-drinking), be out later at night, have a higher BAC and report longer sessions of drinking (Pennay et al. 2015). Finally, the observational study found that AmED consumption was significantly associated with observations occurring after midnight, participants stockpiling drinks, observed or suspected illicit drug use, overall venue intoxication levels and staff serving alcohol to highly intoxicated patrons.

The social and environmental contexts of AmED use

The 25 young AmED consumers interviewed reported that they reserved AmED consumption for ‘big’ nights out and only used AmED in specific social contexts. AmED were reserved for use in party contexts – in licensed venues or private parties – and use outside of these contexts, such as weddings or at home, were frowned upon. AmED were reported to strengthen social bonding and group cohesion in appropriate contexts. The ritualistic aspect of consumption, particularly with respect to ‘Jägerbombs’ (dropping a shot of Jägermeister in an ED and drinking quickly), was described as a key element of consumption, and often used in night time celebrations.

These interviews also revealed that although demographically heterogeneous, when consuming AmED, users adopt a distinct social identity associated with high levels of extroverted and risky drinking behaviour. AmED use was defined as being deliberately and purposefully reserved for heavy drinking sessions in the context of binge drinking and a ‘big night out’ where the drinker adopted a persona as the ‘life of the party’.

Our analysis found that AmED consumption was significantly associated with intoxication and other risky alcohol practices. However, after controlling for demographic and other environmental factors, AmED consumption no longer predicted intoxication. This is consistent with street interview findings from the POINTED study (Pennay et al. 2015) and the in-depth interviews. What this suggests is that AmED use is strongly associated with intoxication, but is not the driver of this intoxication – AmED products may appear more attractive to consumers who are deliberately seeking intoxication or to be perceived as the ‘life of the party’.

Motivations for AmED use

Our research identified four discrete motives for AmED consumption;

1. taste preference: consumers who like the taste of AmED and/or choose ED as their preferred mixer
2. energy seeking: consumers who choose AmED for energy or endurance motives, for example to compensate for lack of sleep, to stay awake or to ‘party longer’
3. hedonism: consumers who use AmED for sensation or pleasure seeking motives, for example they like the ‘buzz’, seek increased pleasure of intoxication or to get the night started
4. intoxication-related outcomes: consumers who use AmED to either increase/accelerate intoxication or decrease/decelerate intoxication and to appear less drunk.

It is important to note that some consumers endorsed all motives, while others endorsed just one or two. Our analysis suggests that these consumers do not differ with regards to demographic, alcohol/AmED use or risk-taking, suggesting that there aren’t particular groups of people that always use AmED for particular purposes such as energy seeking/wakefulness or an attempt to reduce the effects of alcohol. It suggests that AmED consumers tend to change their motives for AmED use depending on the individual occasion such as, a ‘big night out’ or longer drinking sessions.

With regards to harm, motivation appears to matter, with our analysis finding that hedonistic motives significantly predicted alcohol and energy drink consumption during AmED episodes, risk of alcohol dependence, episodes of injury and experience of aggression. Energy seeking motives, while strongly endorsed by the sample, were not significant predictors of these outcomes. Finally, intoxication-related motives (e.g. using AmED to feel less drunk) were found to predict alcohol-related injuries. This suggests that people who use AmED to sober up are mistaken in believing it can do so.

Our research highlights the need to conceptualise AmED drinkers as a diverse consumer group who exhibit varying antecedents and consumption patterns and subsequently experience different

outcomes. Choice to consume AmED is not a fixed characteristic of the drinker, rather motives for AmED consumption are context specific.

Harms of AmED use

Our survey and interview findings lend support to the theory that AmED consumers drink more and exhibit tendency for greater risk-taking behaviour than non-AmED consumers, but this is likely to be because they choose AmED as part of a repertoire of risky practices associated with a ‘big night out’ – consumers feel less inebriated and drowsy after consuming AmED, enabling them to continue drinking and stay out later than they would otherwise be able to.

However, it is unclear whether the hazardous drinking and risk-taking are driven by AmED consumption, or whether AmED consumers are simply a group of consumers who choose AmED as part of a range of risky practices that may include heavy alcohol use, illicit drug use and risky or impulsive practices.

Recommendations

This research found that most Australians are not consuming AmEDs at risky levels. However, consumption is much higher among young male adults living in metropolitan areas, and is associated with risky drinking behaviours typically undertaken as part of a ‘big night out’ within night time entertainment precincts or celebrations such as schoolies week.

The popular use of AmED as a stimulant to mask the effects of intoxication is a significant hazard as it was found to predict alcohol-related injuries (Droste et al. 2014). Despite a subjective sense of increased alertness, previous experimental research has found that ED consumption does not improve alcohol-impaired psychomotor functioning (Peacock et al. 2014).

As a minimum therefore, it is important the consumers be made aware that combining alcohol with stimulants like caffeine will not make them more sober or clear-headed, and may in fact increase risk of harm. Such messaging could be included in existing guidelines and alcohol-harm reduction campaigns. However, due to the context around and motivators for AmED consumption, provision of consumer information on health risks alone is likely to be ineffective.

The peak time for alcohol-related harms in Victorian NTE precincts is between 12am and 6am on both Saturday and Sunday mornings (Coghlan et al 2016). Research summarised in this report identifies a clear and consistent empirical association between AmED consumption and patterns of risky drinking undertaken as part of a ‘big night out’ within NTE precincts. However, overall levels of

consumption of AmED are relatively low compared to other alcoholic beverages such as bottled wine and beer.

Policymakers should therefore consider the roles of pricing, availability and promotion of AmED prior to and after midnight, on both Saturday and Sunday mornings, as one aspect of wider decision-making regarding legislative and regulatory action to reduce alcohol-related harms. This research shows that there is potential to contribute to reducing alcohol-related harm by specifically considering AmED in late night liquor licensing alcohol control policy and regulation.

While restricting supply, access and promotion of AmED alone is unlikely to lead to an extensive reduction in alcohol-related harm, such policies could reduce the likelihood of particular patterns of high-risk drinking behaviour in the late-night liquor economy. While on-premises AmED availability has been restricted in Western Australia, unfortunately there is no published evaluation to date on the effect of targeted venue regulation, which would be informative for other jurisdictions in Australia. Further work should explore the impact of such regulation.

More broadly, given that AmED use is part of an extensive repertoire of risky drinking practices and alcohol-related harm continues to increase in Australia (Livingston, Matthews et al. 2010), policies with a known evidence base for reducing alcohol-related harm, such as restricted trading hours, reduced outlet density, taxation and restrictions on alcohol advertising (Babor, Caetano et al. 2010), should be supported by state and national governments.

In addition, our findings highlight two interesting avenues for further research: the link between AmED use and psychological distress, and both AmED and ED use and problem gambling, given that these were associations identified in our population sample and have not been previously identified.

Recommendations

- Include evidence-based messages regarding AmED consumption in existing guidelines and alcohol-harm reduction campaigns, particularly to dispel the myth that that caffeinated beverages will sober drinkers up, as they may in fact increase the risk of harm.
- Policymakers should consider the roles of pricing, availability and promotion of AmED prior to and after midnight, on both Saturday and Sunday mornings, as one aspect of wider decision making regarding legislative and regulatory action to reduce alcohol-related harms in the night time economy.
- Further research should be undertaken to:
 - evaluate the impact of AmED regulation in Western Australia
 - investigate the potential links between ED and AmED use, gambling and mental health.

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Further reading

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