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Alcohol Price Considerations on Alcohol and Illicit Drug Use in University Students

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Abstract

Background: This study investigates alcohol price and proposed substance use amongst Australian tertiary students.

Methods: Participants were recruited in 2009 via facebook, and were asked to complete a 34-item internet-based survey. 512 people took part, 485 fit the inclusion criteria.

Results: The sample consisted predominately of young (mean age 20.3 years), female (66%) university students. Higher alcohol prices resulted in increased consideration of illicit substances as an alternative indicating a substitution effect, although the majority (60%) of respondents would never consider using ecstasy.

Conclusion: Results indicate substantial room to increase the price of alcohol to achieve alcohol consumption reduction without likely substitution behavior.

Keywords: Alcohol; Substance use; Price; Economics; Substitution

Introduction

Understanding how price changes will impact on alcohol and other drug use is of great importance. Alcohol use is associated with a range of harms that mostly reflect a dose response model and there is strong evidence that increasing alcohol price is the most effective way of reducing alcohol consumption [1]. However, a possible unintended consequence of an increase in alcohol unit price is that people may switch from alcohol to other drugs or adopt more dangerous forms of consumption. This study investigates the effect of proposed alcohol price changes upon a university student sample, a demographic which has an established precedent of higher risk alcohol and drug use and a high sensitivity to economic restrictions. A recent study found that 50% of Australian university students were drinking at least once a week, 54% had used cannabis and 13% had used ecstasy at least once in their life, suggesting that substance use is a part of the student culture [2]; therefore the sample will provide a sensitive gauge of substance replacements patterns as a function of alcohol price increase.

Alcohol price and taxation

Numerous studies have reported reduced alcohol use [3], violence [4,5] and injury [6] when alcohol price is increased. A broad international body of research concludes that excise taxation appears to be the most successful alcohol policy in terms of cost-effectiveness, reductions in level of consumption, and overall social benefit [3]. Further, the tax-approach to reducing alcohol consumption generally yielded considerably larger effect sizes than any other prevention policies or programs [1]. While the relationship between price and consumption is clear, there is little evidence regarding how increase price affects consumption levels and which people are most likely to be affected by price change [7].

Economics of alcohol use

Previous research has predicted that the likelihood of drug use increases when there are 'minimal' constraints on drug availability and decreases when constraints are present [8]. Certainly, substance use decreases or changes with constraints on access (mainly price) to the substance [9-12]. As price is a major constraint, there is merit in investigating the relationship between substance use patterns among Australian university students as a result of hypothetical changes to alcohol price.

Previous research has demonstrated how demand for alcohol decreases as price increases [13]. Certainly, this effect was seen during the recent introduction of the 'alcopops' tax in Australia, a specific tax on pre mixed spirits or RTDs (Ready-To-Drinks), whereby there was an overall drop in alcohol consumption and people generally consumed less alcohol [14]. Chikritzhs et al. [15] reported that in the 3 months after the April 2008 tax increase, 91 million fewer standard drinks were sold as than in the same months in the previous year. However, substitution of one substance for another can also occur when the price of one substance increases [16]. This was also observed in regards to the introduction of the alcopopstax, where some drinkers substituted alcopops with beer or spirits [14]. While standard drinks sold as spirits and beer increased (48 million standard drinks), the increase was only 53% of the 91 million fewer RTD drinks sold [15].

There is also a small body of research exploring substitution with other drugs, although the link between changes in the price of alcohol and other substance use has not being directly made. In America, alcohol was made less accessible for most university students as a result of raising the legal drinking age to 21. It was found that while alcohol consumption decreased, use of cannabis increased at a one-for-one rate in high school seniors [17]. Another study in the UK found that as price of cocaine and amphetamine increased, alcohol was used as a substitute [16]. This suggests that people may substitute substances on the basis of price and availability.

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This study will sample from a population known to participate in higher risk substance use and exhibit consumption patterns sensitive to economic change. This sample provides a sensitive indicator of whether unit increase in alcohol price will result in decreased alcohol consumption and possible substitution.

Method

Participants

Five hundred and twelve students from Australian Universities responded to the online survey. The study was approved by Deakin University's Human Research Ethics Committee. The selection criteria for participation were that the participants must be students at Australian universities and must have used drugs or alcohol at some stage of their life. The study was advertised on facebook, as well as on the Deakin University Portal, inviting people to 'have their say on the alcopops tax'. The facebook advertisement was viewed on 4,763,550 occasions. Of those viewings, 1,561 (0.031%) individuals followed the link. There is no reference data to know whether this response rate is normal from facebook advertisements at the current time.

The majority of participants heard about the study on facebook (93%), were from Victorian universities (53%), and were living at home with their parents (56%). The age of participants ranged between 17 and 38 (M=20.31, SD=2.46) and participants were predominately female (66% female, 34% male). Twenty seven participants were excluded for not meeting selection criteria, leaving a sample of 485 participants.

Materials

To test for the impact of the increased alcohol price on alcohol and substance use, an online survey was used. The survey consisted of eight sections: 1) basic demographic information; 2) questions pertaining to substance (including alcohol) consumption patterns now and based upon a hypothetical unit price increase of alcohol; 3-4) participants' desired effects from alcohol and ecstasy; 5-7) participant's awareness of and/or experienced of effects associated with drinking alcohol, taking ecstasy, and using cannabis, and; 8) questions taken directly from the World Health Organisation-Alcohol, Smoking and Substance Involvement Screening Test (WHO-ASSIST) V3.0.

The questionnaire also contained questions adapted from the Desired Effects of Drinking Scale (DEoDS) [18]. The remaining 25 questions were constructed by the research team based on ideas from [13,19,20].

Questions related to alcohol price and consumption were expressed in terms of Australian 'standard drinks' and participants were supplied with reference information about how standard drinks related to the beverages they typically consume (i.e. a glass of beer).

Procedure

When participants clicked on a weblink to access the questionnaire, they were taken to an introductory page, which contained the plain language statement. By agreeing to the terms of the plain language statement, participants were then able to access the online questionnaire. On completion of the questionnaire, participants were given the option of obtaining a summary of the results.

Results

General consumption trends

As shown in table 1, alcohol, followed by tobacco, then cannabis were found to be the most commonly used drugs in this survey. Amphetamine type substances (ATS), which include ecstasy, also ranked highly among participants with almost one third (28%) of participants having ever used them (Table 1). A nightclub was the most common venue attended on a night out by people who had ever used alcohol, cannabis or amphetamines (including ecstasy) (Table 2). White spirits (self mixed) ranked as the most common drink of choice by 61% of participants, while 49% reported alcopops as their preferred drink, followed by 40% reporting beer. When asked about what they normally drink on a night out, 55% of participants reported white spirits (self mixed), 43% reported beer and 34% reported alcopops (Table 3).

	Ever			Last 3 months		
	Male	Female	Total	Male	Female	Total
Alcohol	173 (99%)	329 (98%)	502 (98%)	169 (98%)	325 (99%)	494 (98%)
Tobacco	115 (66%)	198 (60%)	313 (62%)	88 (52%)	122 (37%)	210 (42%)
Cannabis	99 (57%)	170 (51%)	269 (53%)	67 (39%)	80 (24%)	147 (29%)
Amphetamine	51 (29%)	91 (27%)	142 (28%)	39 (23%)	65 (20%)	104 (21%)
Sedatives	16 (9%)	49 (15%)	65 (13%)	3 (4%)	15 (8%)	18 (6%)
Hallucinogens	34 (20%)	32 (10%)	66 (13%)	7 (8%)	6 (3%)	13 (5%)
Cocaine	23 (13%)	34 (10%)	57 (11%)	12 (7%)	17 (5%)	29 (6%)
Inhalants	18 (10%)	20 (6%)	38 (8%)	1 (1%)	1 (1%)	2 (1%)
Opioids	10 (6%)	21 (6%)	31 (6%)	1 (1%)	7 (4%)	8 (3%)

Table 1: Self reported drug use (N=512).

	Bar	Nightclub	Pub	Friend's House	Other
Alcohol	140 (29%)	182 (38%)	75 (15%)	73 (15%)	13 (3%)
Cannabis	70 (30%)	104 (40%)	38 (15%)	36 (14%)	6 (2%)
Amphetamine	32 (23%)	69 (50%)	19 (14%)	13 (10%)	4 (3%)

Table 2: Usual venue on a typical night out by drug type ever used.

	Drink of choice	Drink on a night out
White Spirit (mixed)	294 (61%)	267 (55%)
Alcopops	236 (49%)	166 (34%)
Beer	195 (40%)	206 (43%)
Wine	180 (37%)	127 (26%)
Brown Spirit (mixed)	113 (23%)	90 (19%)
White Spirit (straight)	91 (19%)	80 (17%)
Brown Spirit (straight)	37 (8%)	26 (5%)
All	8 (2%)	4 (1%)
Other	13 (3%)	12 (3%)

Table 3: Participant's alcoholic drink of choice and drink typically purchased on a night out.

Desired intoxication level

Of the 485 participants in the current study, 54 (11%) report that they drink to get drunk 'always' and 75 (16%) report that they 'never' drink to get drunk. As shown in table 4, participants reporting that they drink to get drunk 'always' are more likely to report illicit substance use in the past 3 months. Substance use (ever) for participants reporting that they drink to get drunk 'always' is significantly different from substance use (ever) for the rest of the participants, $\chi^2(7, N=484)=14.35$, $p<.05$. However, substance use (past 3 months) for participants reporting that they drink to get drunk 'always' is not significantly different from substance use (past 3 months) for the rest of the participants($\chi2(7, N=484)=8.014$, $p>.05$).

Participant price choices

As shown in figure 1, while almost 100% of participants reported

	Drink to Get Drunk			
Substance Use (past 3 months)	**Never**	**Sometimes**	**Frequently**	**Always**
Tobacco	15 (21%)	81 (40%)	69 (45%)	34 (64%)
Cannabis	8 (11%)	52 (26%)	47 (31%)	32 (59%)
Amphetamine	7 (10%)	36 (18%)	34 (23%)	24 (45%)
Cocaine	1 (1%)	10 (5%)	11 (7%)	7 (13%)
Inhalants	-	-	-	1 (3%)
Sedatives	1 (3%)	6 (5%)	7 (8%)	4 (13%)
Hallucinogen	1 (3%)	4 (4%)	3 (3%)	4 (13%)
Opioids	-	4 (4%)	3 (3%)	1 (3%)

Table 4: Desired intoxication level of participants by substance use (past 3 months).

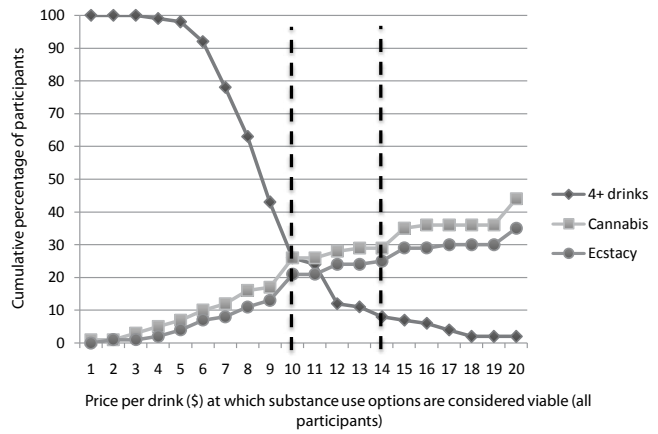

Figure 1: Cumulative percentage of all participants reporting viability of substance use options at proposed per drink price points (dashed line indicates significant cut-off points).

that they would pay up to $4 for a drink when drinking four or more drinks, less than 25% of participants were willing to pay $10 or more for a drink.

Almost half (49%) of all participants reported that they would never opt to use cannabis at any of the 20 proposed price points. The percentage of participants who reported cannabis as a viable option increased when the price per drink rose above $10. Of those participants that would consider cannabis a viable option, 83% (N=203) had used cannabis before, while 17% (N=41) had never used cannabis before but would consider it a viable option as drink prices rose to $20.

Over half (58%) of all participants, reported that they would never use ecstasy. The percentage of participants who reported ecstasy as a viable option increased sharply when the price per drink rose above $10. Of those participants that would consider ecstasy a viable option, 62% (N=124) had used ecstasy before, and only 15% of the sample who had never used ecstasy before would consider it a viable option as drink prices rose to $20.

Participants who self-report that they drink to get drunk 'always' were significantly more likely to consider cannabis and ecstasy as viable options as the price of alcohol increases ($\chi^2(1, N=483)=9.39$, $p<.001$ and $\chi^2(1, N=484)=20.50$, $p<.001$ respectively). Seventy percent of the participants that report drinking to get drunk 'always' would consider cannabis and ecstasy a viable option as drink prices increase, compared to 48% of the rest of the participants for cannabis and 38% for ecstasy. Participants who had ever used amphetamines were willing to consider substituting ecstasy for alcohol at a lower mean price per standard drink ($9.66) than those who had never tried ecstasy ($12.82, $t(210)=-4.68$, $p<0.001$). Similarly, participants who had ever used cannabis were willing to consider substituting cannabis for alcohol at a lower mean price per standard drink ($10.31) than those who had never tried cannabis ($13.17, $t(255)=-2.708$, $p<0.01$).

Discussion

As expected, higher risk substance use is consistent with previous samples of university students. Over half (58%) of the sample had used any drug, 53% had tried cannabis and 28% had tried amphetamines in their lifetime, which reflect findings of previous international and Australian studies [2,21,22]. These heavy substance use patterns are also reflected in alcohol consumption figures where 98% of the sample had consumed alcohol within the past three months.

Alcohol consumption and price

Consistent with Babor et al. conclusions [3], unit price and proposed alcohol consumption are negatively related. The results clearly show a downward sloping demand curve, with demand for alcohol decreasing as price rises. These results are consistent with a number of other studies that also found increasing drink prices leads to reduced consumption in university students [13,23]. Figure 1 shows a consistent decline in likely consumption as drink price is raised from $3 to $10 per drink. Further, they were virtually no participants who reported that they were engaged in a session of four or more drinks (the current Australian National Health and Medical Research Council guideline for episodic drinking) once the price went above $14 per standard drink. This suggests that the price of around $14 per standard drink is likely to result in drinking levels consistent with public health guidelines. In this context, it is worth also considering that bottle shops currently sell heavy beer on special at around $1 per standard drink, dark spirit RTDs at around $2 per standard drink and cheap vodka at around $1.25 per standard drink (http://www.danmurphys.com.au).

Alcohol price and other drug use

While the majority of the sample (58%) would never consider using ecstasy or cannabis (49%), there was a positive relationship between unit price for alcoholic drinks and likely ecstasy and cannabis use. As price per drink rose, so too did the number of participants who would consider ecstasy and cannabis as a viable option. People who had previously used ecstasy or cannabis were likely to substitute for alcohol at a significantly lower price (around $10 per standard drink) compared to those who had never used either drug (around $13 per standard drink). For those that would consider switching to other drugs, the price of alcohol would need to exceed $14 per standard drink before one third would consider ecstasy a viable alternative and 42% would consider cannabis a viable alternative (Figure 1). This is especially significant given that substitution and price elasticity effects are exaggerated due to the higher financial restrictions associated with student life, and those base levels of consumption and acceptance of illicit substance use amongst this population are higher. Therefore, to see significant changes in illicit drug use related to alcohol price, the price per standard drink would have to be between 10 and 14 times more expensive than current sale prices from bottle shops.

Limitations

This study relied on self-report data, making it possible for participants to distort their answers and answer untruthfully. The sample for this study was largely drawn (85%) online via facebook,

and the recruitment method targeted participants who were interested enough to 'have their say' regarding the alcopop tax. This sampling method was effective in recruiting a participant demographic which traditionally has higher risk substance use patterns than the general population. While this has resulted in findings which are sensitive to economic change and which highlight the economic choices associated with substance use, a much broader recruitment method would be preferable in future studies. As this was the first study of its kind in Australia, it highlights the need for further research to be conducted in this area, in an attempt to address these limitations and replicate the findings. Future research could also focus on the impact of variation in price of illicit substances upon consumer viability. Finally, females were over-represented in the sample and future studies should attempt to achieve similar numbers of male and female participants.

Conclusion

The findings from this study indicate that increasing the price of alcohol will decrease consumption, with the greatest effect noticeable between the $9-14 per standard drink. Even amongst a demographic that has a precedent of higher risk illicit substance use, the majority of participants would not consider substituting ecstasy or cannabis for alcohol. A substantial minority of young people report that they would consider substituting alcohol with other drugs once price per standard alcoholic drink reached $14. Given heavy beer can be purchased for as little as one dollar per standard drink in Australia at the moment, this finding suggests there is substantial room to increase the price of alcohol before substitution becomes an issue, even more so amongst the general population. However, further study is required in a more representative population, as substance use and financial constraints are skewed in the current sample.

Declaration of Interest

The authors declare that there are no competing interests.

References

1. Wagenaar AC, Salois MJ, Komro KA (2009) Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. Addiction 104: 170-190.
2. Davey J, Davey T, Obst P (2002) Alcohol consumption and drug use in a sample of Australian university students. Youth Studies Australia 21: 25-32.
3. Babor T, Caetano R, Casswell S, Edwards G, Giesbrecht N, et al. (2010) Alcohol: no ordinary commodity: research and public policy. (2nd edn), Oxford: Oxford University Press.
4. Cook PJ, Moore MJ (1993) Violence reduction through restrictions on alcohol availability. Alcohol Health & Research World 17: 151-156.
5. Matthews K, Shepherd J, Sivarajasingham V (2006) Violence-related injury and the price of beer in England and Wales. Applied Economics 38: 661-670.
6. Gray D, Chikritzhs T, Stockwell T (1999) The Northern Territory's cask wine levy: health and taxation policy implications. Aust N Z J Public Health 23: 651-653.
7. Booth A, Meier P, Stockwell T, Sutton A, Wilkinson A, et al. (2008) INDEPENDENT REVIEW OF THE EFFECTS OF ALCOHOL PRICING AND PROMOTION. Part A: Systematic Reviews. Sheffield, UK: school of health and related research. University of Sheffield, UK.
8. Vuchinich RE, Tucker JA (1988) Contributions from behavioral theories of choice to an analysis of alcohol abuse. J Abnorm Psychol 97: 181-195.
9. Ainslie MB (2006) Higher alcohol tax will cut underage drinking. Minn Med 89: 18.
10. RJ, Bickel WK, Hughes JR, Higgins ST (1992) Behavioral economics of drug self-administration. III. A reanalysis of the nicotine regulation hypothesis. Psychopharmacology(Berl) 108: 1-10.
11. DeGrandpre RJ, Bickel WK, Hughes JR, Layng MP, Badger G (1993) Unit price as a useful metric in analyzing effects of reinforcer magnitude. J Exp Anal Behav 60: 641-666.
12. Petry NM (2001) A behavioral economic analysis of polydrug abuse in alcoholics: asymmetrical substitution of alcohol and cocaine. Drug Alcohol Depen 62: 31-39.
13. Murphy JG, MacKillop J (2006) Relative reinforcing efficacy of alcohol among college student drinkers. Exp Clin Psychopharmacol 14: 219-227.
14. Hall W, Chikritzhs T (2010) The Australian alcopops tax revisited. The Lancet 377: 1136-1137.
15. Chikritzhs TN, Dietze PM, Allsop SJ, Daube MM, Hall WD, et al. (2009) The "alcopops" tax: heading in the right direction. The Medical Journal of Australia 190: 294-295.
16. Sumnall HR, Tyler E, Wagstaff GF, Cole JC (2004) A behavioural economic analysis of alcohol, amphetamine, cocaine and ecstasy purchases by polysubstance misusers. Drug Alcohol Depend 76: 93-99.
17. DiNardo J, Lemieux T (2001) Alcohol, marijuana, and American youth: the unintended consequences of government regulation. J Health Econ 20: 991-1010.
18. Miller WR (2004) Combined behavioural intervention manul: A clinical research guide for theraposts treating people with alcohol abuse and dependence. Bethesda, Maryland: National Institute on Alcohol Abuse and Alcoholism.
19. Tucker JA (2004) Contributions of behavioral economics for understanding and resolving substance use disorders. Nordic Studies on Alcohol and Drugs 44: 35-48.
20. Tucker JA, Foursheе HR, Black BC (2008) Behavioral economic analysis of natural resolution of drinking problems using ivr self-monitoring. Exp Clin Psychopharmacol 16: 332-340.
21. Boyd CJ, McCabe, SE, d'Arcy H (2003) Ecstasy use among college undergraduates: gender, race and sexual identity. J Subst Abuse Treat 24: 209-215.
22. Webb E, Ashton CH, Kelly P, Kamali F (1996) Alcohol and drug use in UK university students. Lancet 348: 922-925.
23. Grossman M, Chaloupka FJ, Saffer H, Laixuthai A (1994) Effects of alcohol price policy on youth: A summary of economic research. Journal of Research on Adolescence 4: 347-364.