Alcohol consumption and associated harms among university students in Australia: findings from a cross-sectional study

RUNNING TITLE: Students alcohol consumption and harms

Selita Agnus Tanudjaja MPH\textsuperscript{1}, HuiJun Chih PhD, BSc (Hons)\textsuperscript{1}*\textsuperscript{1}, Sharyn Burns PhD, MPH, PostGradDipHltProm, BEd, DipTch(HPE)\textsuperscript{2}, Gemma Crawford MHP, PGDPubHlth, BA\textsuperscript{2}, Jonathan Hallett PhD, PGDIntHlth, GCertBus, BA\textsuperscript{2}, Jonine Jancey PhD, BSc (Hons)\textsuperscript{2}

\textsuperscript{1}School of Public Health, Faculty of Health Science, Curtin University, Str... Perth, WA.

\textsuperscript{2}Collaboration for Evidence, Impact & Public Health (CERIPH), School of Public Health, Faculty of Health Science, Curtin University, Perth, WA.

*Corresponding author

Email: h.chih@curtin.edu.au

ACKNOWLEDGEMENTS

The authors would like to thank the participants for completing the survey.

CONFLICT OF INTEREST

The authors declare no conflict of interest.
ABSTRACT

Issue addressed: University students regularly report alcohol consumption in excess of Australian guidelines for harm. However, previous studies have overlooked the experiences of mature-aged students. This study assessed alcohol consumption and alcohol-related harms among university students aged 18-50 years old in Australia.

Methods: Cross-sectional online survey with convenience sample of university students. Unadjusted ordinal logistic regressions were performed to explore associations between student characteristics and frequency of alcohol consumption as well as number of standard drinks consumed. Logistic regressions adjusted for student characteristics were performed to assess associations between alcohol consumptions and alcohol-related harm.

Results: Of the respondents (n=486), 82% consumed alcohol, of which 50% consumed more than two standard drinks on any day. Age was significantly associated with amount consumed and blackout. Students aged 31-50 years were less likely to consume more than two standard drinks on any day (odds ratio, OR: 0.62, 95% confidence interval (95%CI): 0.40, 0.97); and less likely to experience blackout (OR: 0.45; 95%CI: 0.25, 0.83) than those aged 18-20 years. Interestingly, reducing consumption to no more than once a month, when compared to more than twice a month, reduced risk of blackout only for those aged less than 31-50 years old (adjusted OR: 0.22; 95% CI: 0.04, 1.13).

Conclusions: Older university students are less likely to drink more than two standard drinks on any day than their younger counterparts.

So what? It is recommended that interventions target younger students, however, older students may assist in understanding factors that influence low risk alcohol consumption.

Keywords: Alcohol, University students, Alcohol-related-harms
INTRODUCTION

Prevalence of current alcohol consumption in Australia is one of the highest globally, with three in every four (77%) Australians reporting consumption of alcohol in the past 12 months. This is similar to Australian university studies which have reported that between 70% and 90% of students consumed alcohol in the past 12 months.

In Australia, the health and societal costs of alcohol harms are estimated to be about $14 billion. The Australian National Health and Medical Research Council Alcohol Guidelines to reduce health risks (AAG) recommend consuming no more than two standard drinks on any day to reduce the risk of alcohol-related disease or injury over lifetime, or no more than four standard drinks on any occasion to reduce risk of injury or death on that occasion. The recently revised draft AAG propose there is no level of alcohol consumption that can be recommended as safe and there is no global consensus on safe levels of alcohol consumption.

Although the proportion of Australians who exceeded the alcohol lifetime risk guidelines from 2013 to 2016 declined by 1%, the proportion that frequently consumed high levels of alcohol (consuming 11 or more drinks at least once a month) remained the same. However, alcohol consumption varied across age groups with 42% of 18-24 year olds reporting drinking at a single occasion risky level (more than 4 standard drinks at least once a month); 36% of 25-29; 32% of 30-39; and 30% of those aged 40-49 years.

Australian university students report consuming alcohol in excess of the AAG with an average of five and nine standard drinks commonly consumed on any occasion by female and male students, respectively. Drinking in excess of the AAG has been associated with the need for medical attention and hospitalisation due to alcohol related injury, along with verbal and physical abuse, feelings of fear, emotional and sexual harm and unprotected and regretted sex among university students.

Despite awareness of related health risks, a perceived inescapable Australian drinking culture, enhanced social status and motivation to become intoxicated have been reported as key reasons for alcohol consumption among younger (<25 years old) university students. The drinking behaviour of older students is less studied but may provide insights into development of adequate policy at universities and the wider community to reduce alcohol consumption.

A number of strategies such as encouraging alternatives to alcohol; controls on promotion of alcohol; resources for policy implementation; and developing policy for the local contexts, have been put
forward to reduce alcohol-related harm amongst young Australian university students. There is need
to also investigate the alcohol consumption of mature-aged university students and the associated
alcohol-related harms and responses. Understanding older university students drinking behaviour
may help to shape targeted and more effective policy or interventions at university settings to reduce
alcohol consumption and alcohol-related harms. This study aimed to assess alcohol consumption and
alcohol-related harms among a group of Australian university students aged 18-50 years.

METHODS

Study design and setting
This online cross-sectional study was conducted at an Australian metropolitan university. An email
invitation to participate was sent to 3,000 randomly selected students aged 18-50 years by the
University’s Office of Strategy and Planning, who had access to students’ email addresses. To recruit
a representative sample of students, the researchers worked in consultation with the office, which is
responsible for analysis and projection of student data, and were able to provide the appropriate
sample size considering the university student population profile using stratified sampling technique.
The strata included various ages group (young; mature-aged students), gender (male; female; others
or prefer to not say), country of birth (Australia; other countries), education level (undergraduate;
postgraduate). The initial email contained information about the study, participants’ rights and a link
to access the online questionnaire which was administered through Qualtrics XM. The anti ballot-
stuffing option was enabled in Qualtrics to prevent duplicate entries. The IP addresses were also
checked to ensure the ‘Prevent ballot box stuffing’ option worked. The unique participant identifiers
were also checked to ensure there were no duplicate entries. None of the completed survey was a
duplicate. The instrument was tested for face and content validity using an expert panel comprised
health promotion academics and practitioners and university students. Relevant questions were
extracted from previously validated questionnaires retrieved from an extensive literature review.
The panel assessed the questionnaire to ensure the questions informed the objectives. Reliability
test was conducted with a sample of university students (intraclass correlations range from 0.57 to
0.90) indicating adequate level of reliability. Non-respondents were sent follow up emails at one
week and ten days after the original message, which contained a copy of the original link to the survey
and information about the study. Participant consent was provided prior to completing the online
questionnaire. Ethics approval was received from the University Human Research Ethics Committee
(approval number: DHS-272-15).
Variables

Collected data included demographic characteristics (age, gender, country of birth, education level, self-rated health) and tobacco use. These are the independent variables. The dependent variables were alcohol consumption (frequency of alcohol consumption; number of standard drinks on any day) as well as alcohol-related harms (regretted sex; blackout; injury). To reduce participant burden, hazardous alcohol consumption was assessed via a subscale of the Alcohol Use Disorders Identification Test (AUDIT), the three item AUDIT-C scale to assess hazardous alcohol consumption or active alcohol disorders. The three items are: 1) “How often do you have a drink containing alcohol?”; 2) “How many standard drinks containing alcohol do you have on a typical day?”; and 3) “How often do you have six or more drinks on a single occasion?” (to assist participants in reporting consumption, a standard drinks chart was included in the survey to help them understand the concept of standard drinks). An additional two questions from the full AUDIT were asked which relate to harmful consumption: 8) “How often during the last year have you been unable to remember what happened the night before because you had been drinking?” (blackout); and 9) “Have you or someone else been injured as a result of your drinking?” (injury). Consistent with previous research, a question was included regarding unwanted sex because of alcohol consumption (regretted sex) from the Second Australian Study of Health and Relationships and the 2013 National Survey of Australian Secondary Students and Sexual Health.

Statistical analysis

Descriptive statistics were generated for student characteristics. Since the aim was to assess levels of alcohol consumption and associated alcohol-related harms, not to identify hazardous drinkers only, total score of the AUDIT-C was not calculated nor analysed. Instead, frequency of alcohol consumption was re-categorised into ‘never drank’; ‘less than or once a month’; ‘at least twice a month’. The number of standard drinks on any day was re-categorised into ‘none’; ‘one to two standard drinks’ (within AAGs for lifetime risk); and ‘more than two standard drinks’. Questions regarding alcohol-related outcomes (regretted sex, blackout, injury) were coded as binary variables (yes; no). Unadjusted ordinal logistic regressions were performed to explore associations between student characteristics and frequency of alcohol consumption and number of standard drinks consumed on any day while unadjusted logistic regressions were performed to assess associations between student characteristics and presence of the alcohol-related harm (blackout, regretted sex and injury) individually. For each student characteristic, the sub-category that had the highest percentage was set as the reference group in the models. To determine associations between alcohol consumption and the associated harms for university students of different age groups, only the outcome variable
significantly associated with age in the univariate model was selected for further analyses. Similarly, student characteristics that were found to be significantly associated in the univariate models with both alcohol consumption and the selected outcome variable were adjusted in the final logistic regression models to assess associations between alcohol consumption and the associated harm. Since all of the never drinkers did not experience alcohol-related harms, a small number (randomly determined by the statistical software) of the never drinkers were randomly selected and recoded as experienced alcohol-related harms to provide an estimate for the effect of being an abstainer. Listwise deletion was applied in the models for variables with missing values. All statistical analyses were performed using Stata IC 14.2. Significance level was set at 0.05.

RESULTS

Of the 486 participants (response rate 16.2%: 486/3,000), half (49%) were aged between 21 and 30 years, and were mostly female (67%), undergraduate students (79%), with most self-reporting their health as at least fair (92%) (Table 1). In the past 12 months, 82% of participants reported consuming alcohol, 54% consumed alcohol at least twice a month and 50% consumed more than two standard drinks on any day (Table 1). As a result of alcohol consumption, 43% experienced regretted sex, 35% experienced blackout, and 12% experienced injury.

Older students (aged 31 to 50 years old), non-Australian students and postgraduate students were less likely to consume alcohol and high number of alcohol drinks on any occasion (Table 1). While gender and self-rated health were not found to be significantly associated with alcohol consumption, students who were current smokers were more likely to consume more standard drinks (OR: 2.43; p-value = 0.021).

Non-Australian students were less likely to experience all alcohol-related harms (Table 1). Postgraduate students were less likely to report regretted sex (OR: 0.41; p-value = 0.001) and blackout (OR: 0.29; p-value <0.001) compared to undergraduate students. Students who rated their health as excellent/very good were less likely to report regretted sex (OR: 0.58; p-value = 0.007) than students who reported good/fair health. However, students who were current smokers were more likely to have regretted sex (OR: 2.72; p-value = 0.006) and experience blackout (OR: 2.04; p-value = 0.048) compared to non-smokers (Table 1).

Across all age groups, consuming fewer standard drinks was significantly associated with lower likelihood of blackout when compared to consuming more than two standard alcoholic drinks on any
occurrence (Table 2). After adjustment for student characteristics, likelihood of blackout was lower across all age groups (p<0.05). A similar trend was observed for consuming alcohol less frequently albeit the risk reduction was not significant for students aged 31 years old and above (AOR: 0.22; p-value = 0.07).

**DISCUSSION**

Studies between 2012 and 2017 which reported prior 12 month alcohol consumption among university students showed that consumption remained relatively high, between 70% and 90%. Prevalence of alcohol consumption among the cohort in the present study is comparable and remains high with 82% of students reporting alcohol consumption in the past 12 months and 50% consuming alcohol at levels above the AAG for lifetime risk of harm (more than two standards drinks on any day). These findings are consistent with those from previous Australian studies and reinforce recommendations for appropriately resourced, tailored interventions, in the university setting which integrate harm reduction strategies with comprehensive local policy that incorporates alcohol pricing strategies, reduced availability and marketing to combat an alcogenic environment and positive norms towards high levels of alcohol consumption among young students. This study found older students (aged 31-50) were less likely to consume a high number of standard drinks on any day. Previous research reports that mature-aged drinkers (aged 30-49) were more likely to switch to low-alcohol drinks or stop drinking than those aged 18-24. Understanding the motivators of such changes in behaviour may provide insights into the development of appropriate targeted university interventions to reduce alcohol consumption in the future.

As expected, the risk of alcohol-related disease and injury increases with the quantity of alcohol consumed on any day. In a broader context, as there is no safe level of alcohol consumption, findings from current study reinforce the need for ongoing public health commitment to raise awareness of the AAG with the intent to reduce alcohol-related harm from consumption above the recommended guidelines, particularly on young drinkers. This includes the need for personalised communications about alcohol associated harms because it has been found that concern for one’s own health has prompted at least 48% of recent drinkers who consumed at least one serve of alcohol in last 12 months to take action and reduce their alcohol consumption. These efforts need to work synergistically to combat ongoing and high exposure to alcohol advertising, which has been shown to increase the likelihood of consuming alcohol. As people in their thirties were more likely to reduce the amount they drank per session, they may aid in the design of personalised communications for younger drinkers to reduce their alcohol intake.
This was a cross-sectional survey and therefore was unable to report any causal effect. This indicates the need for longitudinal studies that can establish the temporal ordering between alcohol consumption and alcohol-related harms. A key limitation of this study is the low response rate of 16%, which may suggest bias and limit the generalisability of our findings. Nevertheless, similar response rates (5% and 15%) have been reported for other cross-sectional studies targeting university students. The current cohort also had similar characteristics as other university students. Additionally, variables (such as country of birth) were adjusted in this study to reduce potential confounding bias. Another strength of the study was the inclusion of mature-aged students as previous studies were primarily focused on young students. Future studies may recruit a more representative sample when exploring associations of other factors, including stress or work/study load during the semester, and their drinking behaviour in order to guide tailored, setting-based interventions.

**CONCLUSION**

This study adds to the body of evidence that older university students drink less than their younger counterparts. Encouraging adherence to the AAG to reduce associated harms amongst university students amidst a prevailing Australian alcohol drinking culture is challenging, but could be assisted by the experience of mature-aged university students. Findings reinforce the need for ongoing funding and resources for tailored, setting-based public health interventions, such as at universities, to reduce harms from alcohol consumption.

**REFERENCES**


Table 1: Summary statistics of student characteristics (n=486) and associations between student characteristics and alcohol consumption (frequency of alcohol consumption; number of standard drinks on any day) as well as alcohol-related harms (regretted sex; blackout; injury).

Table 2: Association between alcohol consumption and blackout by age groups with odds ratio (OR) and 95% confidence interval (95% CI) reported.