1 **Academic and personal problems among Australian university**

2 **students who drink at hazardous levels: web-based survey**

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19 **Running title:** Alcohol-related problems among university students

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21

Acknowledgements

Abstract

Issue addressed: Australian university students consume large amounts of alcohol. There is little published information about personal and academic problems associated with this behaviour. We sought to estimate the prevalence, and identify variables associated with, alcohol-related problems among undergraduate hazardous drinkers.

Methods: The control group members (942 undergraduates, 53.3% male, mean age 19.4 years) of an Internet-based intervention trial, who scored ≥8 on the Alcohol Use Disorders Identification Test, completed two validated questionnaires about their experience of alcohol-related problems in the preceding four weeks. Regression models were used to identify associations between individual characteristics and alcohol-related problems.

Results: One-quarter of participants had missed a class (25.6%) and/or had been unable to concentrate in class (25.7%), and 45% reported that their drinking had impacted negatively on their learning or grades. The most frequent non-academic problems were hangovers (74.8%), blackouts (44.8%), emotional outbursts (30.5%), vomiting (28.1%), arguments (20.2%) and drink-driving (23.2%). Male gender, lower age, being a smoker, being in the Faculty of Health (versus Humanities) and living in shared housing (versus with parents/guardians) were each associated with alcohol-related problems, while year of study had no association.

Conclusions: There is a high prevalence of preventable alcohol-related problems among undergraduates drinking at hazardous levels and a need for restriction of the availability and promotion of alcohol as well as intervention for individuals at high risk.

So What? Universities have a duty of care to large populations of young people drinking at hazardous levels and should make greater efforts to address hazardous alcohol consumption.

Introduction

Hazardous drinking is common among university students [1-3], including in Australia [3]. In New Zealand and the USA the prevalence of alcohol use disorders is substantially higher in university students than in the non-student population of the same age [4, 5]. In addition, students experience the 'secondhand' effects of others' drinking , including damaged property and being assaulted [3]. Firsthand alcohol-related problems are known to be very common, including blackouts, injury, suicide attempts, and unintended sexual activity. Harm to others (i.e., interpersonal and sexual violence) and harm to tertiary institutions (e.g. property damage and student attrition has also been extensively documented in other countries [6, 7].

Young male students are more likely to experience 'public domain' consequences [7] such as aggression and property destruction [7, 8], while young female students more often experience personal adverse events but frequently do not report them[7]. Hazardous drinking is also correlated with drink-driving (including as a "designated driver") [9], smoking [10, 11] and illicit drug use [12]. Increased alcohol consumption reduces time spent studying [13, 14] and intellectual functioning [15, 16], and is correlated with lower academic achievement [17].

These problems have not been recently investigated in Australia in population-based (i.e., based on random sampling) studies with reasonable response rates. We sought to estimate the prevalence and correlates of acute alcohol-related personal and academic problems among undergraduates.

Methods

Participants

The sample comprised undergraduates aged 17–24 years who were: enrolled full-time at a university in Perth, Western Australia, studying on campus.

79

Procedure

81 A random sample of 13,000 full-time undergraduates aged 17–24 years were sent a

82 personally addressed letter by the research team, inviting them to participate in an online

83 survey about alcohol [18]. The letter explained that they would soon receive a hyperlink to the

84 questionnaire in an email message, that responses would be confidential and that the

85 research team was independent of the university administration. Students were offered the

86 opportunity to win 1 of 40 A$100 gift vouchers for participating. After one week, a reminder

87 email was sent to those who had not yet responded, encouraging completion of the

88 questionnaire. A second reminder was sent 10 days later. Of those invited, 7,237 responded

89 (a 56% response rate) and completed a baseline assessment of past and current alcohol

90 use, tobacco use and secondhand effects of drinking [3]. Through this process, 2,435 students

91 (34% of the respondents) were identified as drinking at hazardous levels (a score of ≥8 on

92 the Alcohol Use Disorders Identification Test [19]), and enrolled in a randomised controlled trial

93 of a brief online alcohol intervention [20], which included a screening only control group ($n =$

94 1184).

95

96 One month after the intervention, all trial participants ($n = 2,435$) were sent a letter and then

97 an email containing a hyperlink to an online follow-up questionnaire. Included with the letter

98 was a AUD6 sandwich voucher that could be redeemed irrespective of further participation.

99 There were 942 control group participants followed up (i.e., 80% of the control group). These

100 recruitment and follow-up procedures are described in detail elsewhere [18, 20] and illustrated in

101 Figure 1.

102

Ethics statement

104 The study was approved by the Curtin University Human Ethics Committee (Approval no.

105 HR 189/2005) and respondents provided informed consent to participate.

106

107 ***INSERT - FIGURE 1***

108

109 **Measures**

110 The baseline data collected from students included age, gender, citizenship (Australian or

111 New Zealand resident versus non-resident), year level of degree (first, second, third, fourth

112 or higher), faculty of enrolment (Business, Engineering & Science, Health, or Humanities),

113 residence (living in a shared house, with a parent(s) or guardian(s), as a boarder or alone or

114 with partner/children), and smoking status.

115

116 The one-month questionnaire included items on the following: the frequency of alcohol

117 consumption in the previous four weeks (range, 0–28 days); the number of standard drinks

118 consumed on a typical occasion; the Academic Role Expectations and Alcohol Scale

119 (AREAS) [21], a validated measure consisting of four items assessing the frequency of

120 academic problems as a result of drinking and one item rating the extent to which drinking

121 negatively affecting learning and grades; and the Alcohol Problems Scale (APS) [21], a

122 validated 14-item checklist of harms experienced as a result of drinking. Possible responses

123 for the APS were 'yes', 'no' and 'prefer not to answer'. All items had a four-week reference

124 period.

125

126 **Data analysis**

127 Multinominal logistic regression models were used to assess associations of hypothesised

128 explanatory variables and academic problems (AREAS). Binary logistic regression models

129 were used to test for associations of hypothesised explanatory variables with personal

130 problems (items from the APS). A full model includes all of the demographic variables,

131 smoking status, drinking frequency, typical occasion quantity and experimental group. User-

132 defined parsimonious models were used, in which only variables with a p value < 0.05 from

133 Wald tests after estimation were retained in the final models.

134

135 Analysis shows that of the 942 participants, 0.85% of participants missed one or more

136 questions on alcohol-related problems or said that they 'prefer not to answer', and these

137 values were coded as missing. A p value < 0.05 was regarded as significant. All analyses

138 were performed using Stata SE 12.0 (StataCorp LP, College Station, Texas, USA).

139

140 **Results**

141 **Demographics**

142 Of 942 participants 58.2% were aged 17-19 years (mean 19.4, SD 1.8) and 53.3% were

143 male. Australian or New Zealand citizens comprised 94.8% of the respondents, and most

144 lived with their parent(s) or guardian(s) (66.7%) (**Table 1**). Current smokers made up 16.5%

145 of the participants.

146

147 *INSERT - TABLE 1*

148

149 **Alcohol-related academic problems**

150 In the preceding four weeks, as a result of drinking, 14.9% of participants reported being late

151 for class at least once, 25.6% had missed a class, 25.7% had been unable to concentrate in

152 class and 10.4% had failed to complete an assignment on time (**Table 2**). Almost half the

153 participants (45%) thought that their drinking had impacted negatively on how much they had

154 learned or their grades, and 5.6% reported the impact as 'quite a lot' and 1.7% as 'a great

155 deal'.

156

157 Multinominal logistic regression models show that the frequency of drinking and the amount

158 of alcohol consumed on a typical drinking occasion were significantly associated with study

159 behaviour (**Table 3**). The more frequently participants drank the more likely they were to

160 have been late for class, to have missed a class and/or to have been unable to concentrate.

161 The greater the consumption per typical drinking occasion the more likely participants were

162 to have missed a class or failed to complete an assignment on time. For example (**Table 3**,

163 model 2), students who drank more frequently were significantly more likely to have missed

164 a class four or more times (relative risk ratio (RRR) = 1.12 [95% confidence interval (CI) =

165 1.06–1.19]) as were those who consumed larger quantities (1.13 [1.06–1.21]).

166

167 Current smokers were also significantly more likely to have missed a class, but smoking

168 status was not significantly associated with other academic problems. Men were significantly

169 less likely to have been unable to concentrate in class (**Table 3**, model 3) on two (RRR =

170 0.50 [95% CI = 0.29–0.85]) or three (0.32 [0.15–0.69]) occasions than women.

171 The frequency of drinking and the amount of alcohol consumed on a typical occasion were

172 significantly associated with self-perceived impact on learning and grades (**Table 3**).

173 Smoking status, age, faculty and year level were not associated with this outcome. Students

174 who drank more frequently and/or consumed larger quantities of alcohol were more likely to

175 think that their drinking negatively affected their learning and grades.

176

177 ***INSERT - TABLE 2***

178

179 ***INSERT - TABLE 3***

180

181 **Alcohol-related personal problems**

182 The most frequently reported personal problem was 'hangover' (74.8%), followed by

183 'blackouts' (44.8%), 'emotional outbursts' (30.5%) and 'vomiting' (28.1%) (**Table 4**). About

184 23% of participants reported either driving a car after consuming too much alcohol to be able

185 to drive safely, or being a passenger when the driver had consumed too much alcohol.

186 Current smokers drank significantly more frequently (times/month, mean ± standard

187 deviation (SD): 11.0 ± 7.1) than non-smokers (8.0 ± 5.6) ($p < 0.001$); however, there was no

188 significant difference in the number of standard drinks consumed by smokers (7.6 ± 4.1) and

189 non-smokers (7.2 ± 4.6) ($p = 0.25$) on a typical occasion.

190

191 The frequency of drinking and the quantity of alcohol consumed on a typical day of drinking

192 were significantly associated with personal problems (**Table 5**). Students who drank more

193 frequently were more likely to report having all of the types of personal problems on the APS

194 except for being arrested, and those who consumed more alcohol were significantly more

195 likely to report having all of the types of personal problems except for drink-driving. Current

196 smokers, who drank more frequently than non-smokers, were more likely than non-smokers

197 to report being aggressive (OR = 2.04 [95% CI = 1.18–3.53]), being unable to pay bills (2.55

198 [1.54–4.25]), drink-driving (2.05 [1.40–3.01]) and/or being passengers of a drink-driver (1.72

199 [1.26–2.55]).

200

201 Students aged 20–24 were less likely to experience vomiting than 17–19 year olds (OR =

202 0.68 [95% CI = 0.50–0.92]). Older students were also less likely to report being physically

203 aggressive towards someone (OR = 0.79 [95% CI = 0.68–0.92]), regretting a sexual

204 encounter (0.87 [0.76–0.99]), stealing private or public property (0.73 [0.62–0.86]) or

205 committing an act of vandalism (0.70 [0.57–0.87]).

206

207 Men were less likely than women to report having hangovers (OR = 0.51 [95% CI = 0.37–

208 0.70]), emotional outbursts (0.29 [0.21–0.39]), arguments (0.65 [0.46–0.91]), blackouts (0.68

209 [0.49–0.94]) and an inability to pay bills (0.50 [0.31–0.80]), but they were more than twice as

210 likely to be physically aggressive towards someone (2.30 [1.35–3.92]) or steal (2.29 [1.31–

211 3.99]) and five times as likely to engage in vandalism (5.39 [2.23–13.01]). The type of

212 residence was associated only with sex-related harms, with students living with a parent(s)

213 or guardian(s) being less likely to report unhappy (OR = 0.55 [95% CI = 0.32–0.95]) or

214 regrettable (0.46 [0.29–0.73]) sexual encounters than those in shared houses. Students

215 living alone, with partners/children or as boarders were significantly more likely to report

216 unsafe sex than those in shared houses (2.55 [1.11– 5.83]). The faculty in which students

217 studied was associated only with blackouts, with students enrolled in the Faculty of Health

218 more likely to report blackouts than students from the Faculty of Humanities (1.72 [1.14–

219 2.59]).

220

221 *INSERT - TABLE 4*

222

223 *INSERT - TABLE 5*

224

Discussion

226 This study identified that a significant proportion of university students who drink at

227 hazardous levels experience alcohol-related problems, with the most frequent being

228 hangovers, blackouts, emotional outbursts, vomiting, arguments and drink-driving.

229 Consistent with other studies those who consumed more alcohol and drank more frequently

230 were more likely to experience alcohol-related personal and academic problems.

231

232 Men were more than twice as likely to be physically aggressive or steal and over five times

233 as likely to engage in vandalism as women. While other studies have not been limited to

234 hazardous drinkers this gender difference is consistent [7, 8, 21]. Interestingly, there were no

235 significant gender differences in the likelihood of participants to report unsafe, unhappy or

236 regrettable sex. Although gender convergence in student drinking behaviour has been widely

237 noted in the literature, primarily because of increases in binge drinking among young women

238 [22, 23], our previous research from the same overall sample [3] found significant differences in

239 the quantities consumed by men and women [3]. The women in that study consumed less

240 alcohol than the men (mean volume per typical occasion of 5.1 versus 8.7 standard drinks);

241 however, biological differences in metabolic processing, body weight and fat-to-water ratios

242 mean that women can typically achieve the same level of intoxication while consuming less

243 alcohol [8, 24]. Women in the current study were more likely than men to experience blackouts,

244 potentially increasing their vulnerability to sexual coercion [25].

9

245

A large proportion of participants (approximately 23%) reported drink-driving or being a

passenger of a drink-driver. As the current study was based at a predominantly commuter

university, the prevalence of drink-driving raises duty-of-care concerns about alcohol

availability on campus. Research is needed to determine where drinking is occurring on or

near campus, the pattern and intensity of consumption, and how students are being

transported from the campus area.

252

Although many participants reported that their drinking impacted negatively on their learning,

the actual experience of alcohol-related problems may not lead to behaviour change.

Despite experiencing negative consequences, many students continue to drink; however,

some may change their drinking habits [26]. These changes may result from weighing up the

positive and negative consequences [27]. In addition, drinking alcohol tends to provide

immediate positive reinforcement to the drinker, whereas negative impacts may become

apparent over the long term [28]. In a study of 263 undergraduates that explored the nature

and frequency of positive and negative alcohol-related consequences, Park and colleagues

[26] found that students reported positive consequences more frequently and more strongly

than negative consequences. It is also important to note that students may not agree on

what constitutes a negative consequence. Mallett and colleagues [27] studied college students'

perceptions of the positivity and negativity of alcohol-related consequences and found that

several 'negative' consequences such as blackouts, hangovers and waking up in someone

else's bed, were rated as 'positive' by a significant proportion of the sample. Additionally,

cognitive impairment, although traditionally considered to be a negative consequence of

excessive drinking, may not be viewed as negative by all drinkers [8]. This idea is supported

by the findings of Polizzotto et al. [29], who found that the broad awareness of harms related to

binge drinking did not affect participation; rather, vomiting and losing consciousness were

seen as 'badges of honour'. Therefore, using negative consequences as deterrents in

272   campus-based interventions may be unwise, given that students may perceive some

273   consequences as neutral or positive [27].

274

275   The current study has several limitations. First, the participants were a screened sub-sample

276   from a larger study with a 56% response rate. Although this response rate is higher than

277   many surveys of university populations [30], it remains likely that estimates will be biased by

278   selective non-response [31]. The larger study had a higher proportion of younger students,

279   women and Australian/New Zealand residents than the wider university population; however,

280   there were no significant differences in alcohol consumption measures between early and

281   late survey respondents [3], and there was no evidence that the 20% of control participants

282   lost to follow-up in the trial were different at baseline from those who were followed up [20].

283   Accordingly, the prevalence estimates may not be severely biased.

284

285   This study assessed alcohol-related problems only among students who had been identified

286   as drinking at hazardous levels and therefore does not offer comparison with the experience

287   of moderate drinkers. Given that this study found that more frequent and greater alcohol

288   consumption increased the likelihood of harm, it is likely that more moderate drinkers have a

289   lower prevalence of such problems, as found in most other studies [32-34]. Many students

290   (including non-drinkers) experience harm caused by the drinking behaviour of others [3, 35],

291   and these secondhand effects remain an important justification for population intervention

292   strategies. Notably, alcohol-related problems were reported only for the preceding four

293   weeks such that the prevalence of harms across the entire year is substantially higher.

294

295   Conclusions

296   University administrators should be concerned by the high prevalence of preventable

297   alcohol-related problems, and their impact on academic performance and student welfare.

298   Further examination of student drinking through multi-institutional and longitudinal studies

299   would improve knowledge of modifiable environmental risk factors and the effectiveness of

300   policies. Evidence-based environmental [36] and individual level [37] interventions exist but the

301   research is limited almost entirely to the USA. Efforts to adapt, develop, and evaluate

302   interventions for the Australian context, including vocational training institutes (TAFE

303   colleges), are urgently needed. This will require partnership between institutions, scientists,

304   and funding agencies.

305

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404

405   **FIGURE**

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407


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         ┌─────────────────────────┐
         │   Invited to participate, │
         │      n = 13000            │
         └─────────────────────────┘
                     │                    ┌─────────────────────────────┐
                     │                    │ No response, n = 5623        │
         ┌─────────────────────────┐      │ Incomplete, n = 140          │
         │   Completed survey,      │      └─────────────────────────────┘
         │      n = 7237 (56%)      │
         └─────────────────────────┘      ┌─────────────────────────────┐
                     │                    │ Screened negative, n = 4802  │
         ┌─────────────────────────┐      └─────────────────────────────┘
         │    Screened positive     │
         │    and randomised,       │
         │      n = 2435 (34%)      │
         └─────────────────────────┘
```

Invited to participate, *n* = 13000

No response, *n* = 5623

Incomplete, *n* = 140

Completed survey, *n* = 7237 (56%)

Screened negative, *n* = 4802

Screened positive and randomised, *n* = 2435 (34%)

Allocated to control group (assessment only), n=1184

Allocated to intervention group (motivational feedback), *n* = 1251

*Completed follow-up assessment at 1 month, *n* = 942 (80%)

Lost to follow-up at 1 month, *n* = 242: reason unknown in all cases.

Completed follow-up assessment at 1 month, *n* = 962 (77%)

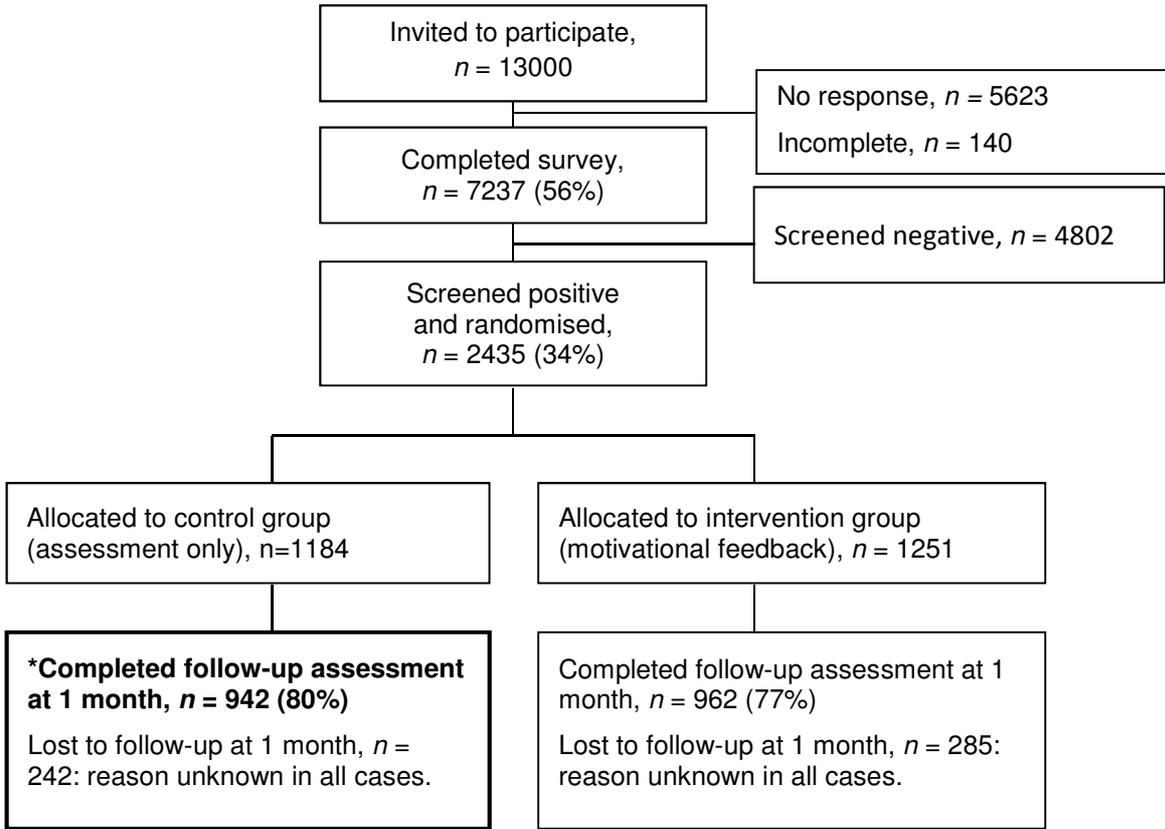Lost to follow-up at 1 month, *n* = 285: reason unknown in all cases.

421   **Sample analysed for this study*

422

423   **Figure 1.** Intervention trial and group allocation

424

425 **TABLES**

426 **Table 1** Demographics, smoking status and alcohol use.

Characteristic	Proportion of participants (%)*
Age	
17–19	58.2
20–24	41.8
Gender	
Female	46.7
Male	53.3
Citizenship	
Australian/New Zealand citizen	94.8
Non-citizen	5.2
Year level	
1st year	26.8
2nd year	31.4
3rd year	28.4
4th year or above	13.4
Faculty	
Humanities	19.4
Business	20.6
Engineering & Science	31.6
Health	28.4
Residence status	
Shared house	26.8
With parent(s) or guardian(s)	66.7
Other (alone, partner/children, boarder)	5.6
Unknown	0.9
Current smoker	
No	83.2
Yes	16.5
Unknown	0.2
Age, mean (SD) (years)	19.4 (1.8)
Number of days per month on which alcohol consumed, mean (SD)	8.5 (5.9)
Number of drinks containing alcohol on a typical day when having alcohol, mean (SD)	7.2 (4.5)

427 *n = 942

17

428 **Table 2** Frequency of academic problems related to drinking (according to the AREAS) in
429 the previous four weeks.

Academic problem	Not at all (%)	Once (%)	Twice (%)	Three times (%)	Four or more times (%)
Late for class, $n = 942$	85.1	8.6	3.4	1.2	1.7
Missed a class, $n = 942$	74.4	13.2	6.8	3.2	2.4
Unable to concentrate in class, $n = 939$	74.3	12.7	6.9	3.4	2.7
Failed to complete an assignment on time, $n = 942$	89.6	6.7	2.1	1.0	0.6

430

Table 3 Association of demographics, smoking status, alcohol use and experimental group with alcohol-related academic problems (AREAS) among students drinking at hazardous levels.

Model	Once, compared with 'not at all' RRR [95% CI]	Twice, compared with 'not at all' RRR [95% CI]	Three times, compared with 'not at all' RRR [95% CI]	Four or more times, compared with 'not at all' RRR [95% CI]
Model 1: Late for class, $n = 941$				
Current smoker	1.65 [0.94–2.87]	1.99 [0.88–4.51]	2.06 [0.56–7.55]	2.37 [0.81– 6.93]
Drinking frequency	1.06 [1.02–1.10][b]	1.11 [1.06–1.17][c]	1.16 [1.08–1.26][c]	1.14 [1.06–1.21][c]
Typical amount	1.05 [1.00–1.10][a]	1.13 [1.06–1.20][c]	1.09 [0.98–1.20]	1.05 [0.96–1.16]
Model 2: Missed a class, $n = 940$				
Current smoker	1.69 [1.03–2.76][a]	2.63 [1.46–4.75][c]	3.17 [1.43–7.03][b]	2.63 [1.03–6.69][a]
Drinking frequency	1.05 [1.01–1.08][b]	1.06 [1.02–1.10][b]	1.08 [1.02–1.14][b]	1.12 [1.06–1.19][c]
Typical consumption	1.05 [1.01–1.09][a]	1.08 [1.03–1.14][b]	1.07 [1.00–1.16]	1.13 [1.06–1.21][c]
Model 3: Unable to concentrate in class, $n = 939$				
Male (female, RRR = 1)	0.72 [0.48–1.08]	0.50 [0.29–0.85][a]	0.32 [0.15–0.69][b]	0.62 [0.26–1.46]
Drinking frequency	1.06 [1.02–1.09][c]	1.09 [1.05–1.13][c]	1.11 [1.05–1.16][c]	1.12 [1.06–1.18][c]
Typical consumption	1.03 [0.98–1.08]	1.11 [1.05–1.17][c]	1.13 [1.05–1.20][c]	1.15 [1.07–1.23][c]
Model 4: Failed to complete an assignment on time, $n = 941$				
Current smoker	2.25 [1.25–4.07][b]	2.44 [0.90–6.58]	3.33 [0.83–13.31]	0.91 [0.10–8.48]
Drinking frequency	1.00 [0.96–1.05]	1.08 [1.01–1.14][a]	1.09 [1.00–1.19][a]	1.09 [0.98–1.21]
Typical consumption	1.05 [1.00–1.11]	1.14 [1.06–1.23][c]	1.10 [0.99–1.23]	1.18 [1.06–1.31][b]

Model 5: Negative impact on learning and grades, $n = 939$
Direction from 'not at all', 'a little', 'quite a lot', to 'a great deal': OR [95% CI]

Drinking frequency	1.08 [1.05–1.10][c]
Typical consumption	1.14 [1.11–1.18][c]

The results of models 1–4 are derived from multinominal regressions. The data are presented as the relative risk ratio (RRR) and 95% confidence interval (CI) for the groups who rated their experience as 'once', 'twice', 'three times' or 'four or more times' compared with those who said 'not at all' (RRR = 1). The results of model 5 were derived from an ordered logistic regression, and the data are presented as the odds ratio (OR) and 95% CI. Each model included the following variables: age, gender, citizenship, year level, faculty, residence status, smoking status, drinking frequency and the amount of alcohol consumed on a typical occasion. Only variables with a p value <0.05 in Wald tests remained in the final model and are reported in the table. [a]$p < 0.05$, [b]$p < 0.01$, [c]$p < 0.001$.

442   **Table 4** Prevalence of alcohol-related personal problems (according to the APS) in the
443   previous four weeks.

Personal problem	'Yes' (%)
You had a hangover, $n = 940$	74.8
You had an emotional outburst, $n = 939$	30.5
You experienced vomiting, $n = 939$	28.1
You had an argument, $n = 939$	20.2
You were physically aggressive towards someone, $n = 938$	9.3
You had a period of time that you could not remember (blackout), $n = 939$	44.8
You were unable to pay your bills as a result of spending too much money on alcohol, $n = 937$	9.3
You had unsafe sex, $n = 937$	9.7
You were in a sexual situation you weren't happy about at the time, $n = 935$	7.1
You had a sexual encounter you later regretted, $n = 936$	11.1
You suffered an injury that required medical attention, $n = 938$	2.8
You drove a car after you had perhaps had too much to drink to be able to drive safely, $n = 933$	23.2
You were a passenger in a vehicle where the driver had perhaps had too much to drink to be able to drive safely, $n = 936$	22.7
You stole private or public property, $n = 939$	8.3
You committed an act of vandalism, $n = 938$	5.2
You were removed or banned from a pub or club, $n = 939$	5.9
You were arrested, $n = 939$	0.8

Table 5 Association of demographics, smoking status, alcohol use and experimental group with alcohol-related personal problems (APS) among students drinking at hazardous levels.

Problem	Drinking frequency OR [95% CI]	Amount of alcohol OR [95% CI]	Current smoker OR [95% CI]	Age* OR [95% CI]	Male OR [95% CI]	Other demographics OR [95% CI]
Hangovers	1.06 [1.03–1.09][c]	1.18 [1.12–1.23][c]	-	-	0.51 [0.37–0.70][c]	-
Outbursts	1.05 [1.02–1.07][c]	1.06 [1.02–1.09][c]	-	-	0.29 [0.21–0.39][c]	-
Vomiting	1.02 [1.00–1.05][a]	1.10 [1.07– 1.14][c]	-	Age (17–19, reference OR = 1) 20–24: 0.68 [0.50–0.92][a]	-	-
Arguments	1.08 [1.05–1.11][c]	1.10 [1.06–1.14][c]	-	-	0.65 [0.46–0.91][a]	-
Aggression	1.07 [1.03–1.11][c]	1.14 [1.09–1.19][c]	2.04 [1.18–3.53][a]	0.79 [0.68–0.92][b]	2.30 [1.35–3.92][b]	-
Blackouts	1.05 [1.03–1.08][c]	1.18 [1.14–1.23][c]	-	-	0.68 [0.49–0.94][a]	Faculty (Reference: Humanities,) Business 1.03 [0.66–1.61] Eng & Sci 1.43 [0.94–2.18] Health 1.72 [1.14–2.59][a]
Unpaid bills	1.05 [1.02–1.09][b]	1.09 [1.04–1.14][c]	2.55 [1.54–4.25][c]	-	0.50 [0.31–0.80][b]	-
Unsafe sex	1.09 [1.05–1.12][c]	1.13 [1.08–1.18][c]	-	-	-	Residence (Shared house, reference OR = 1) With parent/guardian: 0.80 [0.48–1.33] Other: 2.55 [1.11–5.83][a]
Unhappy sex	1.09 [1.05–1.13][c]	1.09 [1.04–1.14][c]	-	-	-	Residence (Shared house, reference OR = 1) With parent/guardian: 0.55 [0.32–0.95][a] Other: 0.61 [0.18–2.14]
Regrettable sex	1.06 [1.03–1.09][c]	1.10 [1.06–1.15][c]	-	0.87 [0.76–0.99][a]	-	Residence (Shared house, reference OR = 1) With parent/guardian: 0.46 [0.29–0.73][c]

Other: 0.46 [0.16–1.37]

Injuries	1.07 [1.01–1.13][a]	1.11 [1.05–1.19][b]	-	-	-	-
Driving a car	1.06 [1.03– 1.08][c]	-	2.05 [1.40–3.01][c]	-	1.71 [1.24–2.37][c]	-
Passenger in a car	1.05 [1.02–1.08][c]	1.11 [1.07–1.14][c]	1.72 [1.26–2.55][b]	-	-	-
Theft	1.09 [1.05–1.13][c]	1.11 [1.06–1.16][c]	-	0.73 [0.62–0.86][c]	2.29 [1.31–3.99][b]	-
Vandalism	1.09 [1.05–1.14][c]	1.09 [1.03–1.15][b]	-	0.70 [0.57–0.87][c]	5.39 [2.23–13.01][c]	-
Ban from pub	1.08 [1.04–1.12][c]	1.14 [1.09–1.20][c]	-	-	-	-
Arrest	-	1.23 [1.12–1.36][c]	-	-	-	-

446 The results are derived from binary logistic regression analysis and presented as the odds ratio (OR) and 95% confidence interval (CI) for participants who said that they had
447 experienced alcohol-related harms compared with those who said they did not. The full model included the following variables: age, gender, citizenship, year level, faculty,
448 residence status, smoking status, drinking frequency and the amount of alcohol consumed on a typical occasion. Only variables with a p value <0.05 in Wald tests remained in
449 the final model and are reported in the table. [a]$p < 0.05$, [b]$p < 0.01$, [c]$p < 0.001$. *Age was entered into regression models as a continuous variable, with the exception of the
450 model for 'vomiting', in which age was grouped into two categories on the basis of preliminary results obtained during the model building process.

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