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Alcohol and other substance use among medical and law students at a UK university: a cross sectional questionnaire survey

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Abstract

Purpose of the study: To examine the use of alcohol and other substances among medical and law students at a United Kingdom (UK) university.

Study Design: Anonymous cross sectional questionnaire survey of first, second, and final year medical and law students at a single UK university.

Results: 1242 of 1577 (78.8%) eligible students completed the questionnaire. Over half of first and second year medical students (first year 53.1%, second year 59.7%, final year 35.9%) had an Alcohol Use Disorder Identification Test (AUDIT) score suggestive of an alcohol use disorder (AUDIT ≥ 8), compared to over two thirds of first and second year law students (first year 67.2%, second year 69.5%, final year 47.3%). Approximately one quarter of medical students (first year 26.4%, second year 28.4%, final year 23.7%) and over one third of first and second year law students (first year 39.1%, second year 42.4%, final year 18.9%) reported other substance use within the past year. Over one third of medical students (first year 34.4%, second year 35.6%, final year 46.3%) and approximately half or more of law students (first year 47.2%, second year 52.7%, final year 59.5%) had a Hospital Anxiety and Depression Scale anxiety score suggestive of a possible anxiety disorder.

Conclusions: Study participants had high levels of substance misuse and anxiety. Some students' fitness to practice may be impaired as a result of their substance misuse or symptoms of psychological distress. Further efforts are needed to reduce substance misuse and to improve the mental wellbeing of students.

Introduction

The misuse of alcohol and other substances has previously been shown to be common among university students in the United Kingdom (UK).[1–4] The consequences of alcohol misuse in particular include physical health problems and poor academic performance.[5,6]

There is comparatively little research looking at substance use among the distinct group of UK medical students. This is concerning, given that most medical students will go on to work as medical doctors. Doctors' own substance misuse may impair their fitness to practice and limit recognition of problem substance use in their own patients.[7–10]

There have not been any published reports looking at substance use among UK medical students since 2001; it is not known whether patterns of use have changed since then. Recent research from elsewhere in the world, suggests that medical students' substance use is still an issue.[11–15]

Knowledge of current levels of substance use among UK medical students would inform preventive practice in this area. There is some evidence that hazardous drinking (60 g of ethanol or more per drinking session at least 2-3 times per month) at medical school is predictive of later hazardous drinking, underscoring the importance of these efforts.[16]

We carried out a prospective cross sectional questionnaire survey study in order to determine whether UK medical students' alcohol and other substance use has changed since 2001. We also aimed to determine how medical students' alcohol use relates to other substance use and mental health. We surveyed law students in order to compare patterns of use among medical students with those of students with similar professional and academic obligations.

Methods

Eligibility and recruitment

The study took place at a single public university which has between 20,000 and 30,000 students. All first, second, and final year medical and law students were eligible to participate. There were no exclusion criteria. Permission to survey the students was obtained from senior medical and law school officials. Ethical approval was obtained from the host university (reference number 00730/2014).

Second and final year students were recruited in April 2014, and first year students in October 2014. These dates were chosen to match those of previous studies.[17,18] A member of the research team (JF) attended a compulsory lecture/seminar to explain the study and distribute the questionnaires. Students were given an anonymous paper questionnaire as well as a Change4Life (www.nhs.uk/change4life) leaflet and contact details for the university's student support service. Students were not permitted to take their questionnaire home or fill it in elsewhere. Students that were absent received an email with a link to an anonymous web version of the questionnaire, with three automatic reminder emails.

Participation in the study was voluntary; no financial incentive was given. Written consent was not obtained due to the anonymous nature of the study. Students were deemed to have given consent if they completed a paper or web questionnaire.

Questionnaire

The questionnaire was based on one used by two of the study authors (DNB, FK) in previous studies.[17,18] Participants were asked about their demographics, mental health, smoking, and alcohol and other substance use. The questionnaire included: the 10-item Alcohol Use Disorders Identification Test

(AUDIT),[19] the 12-item General Health Questionnaire (GHQ),[20] and the Hospital Anxiety and Depression Scale (HADS).[21]

The AUDIT is considered to be the gold standard for alcohol screening in healthcare settings.[22] The tool has previously been used to screen students.[23] The AUDIT is comprised of ten questions and is scored on a scale of 0-40. The questions can be grouped into three domains: recent alcohol use (1-3), dependence symptoms (4-6), and alcohol-related problems (7-10).[24] A score of eight or more is referred to as a positive screen and is suggestive of an underlying alcohol use disorder. A score of 8-15 is suggestive of hazardous drinking, 16-19 harmful drinking, and 20 or more dependent drinking.[24] The AUDIT has a sensitivity and specificity of 92% and 94%, respectively.[19]

The 12-item GHQ can be scored in a number of different ways. We used the GHQ scoring method (0-0-1-1), which is scored on a scale of 0-12. A score of two or more is suggestive of an underlying psychiatric disorder.[20]

The HADS anxiety and depression components are scored separately, on scales of 0-21. A score of eight or more for either component is suggestive of a possible anxiety or depressive disorder.[21,25]

The web version of the questionnaire was constructed using the Qualtrics platform (Qualtrics; Provo, Utah, United States of America). Both versions of the questionnaire were set out in the same manner.

Measures

The main outcome measures were AUDIT score and past year or lifetime use of other substances. Secondary outcome measures included smoking, GHQ score, and HADS anxiety and depression scores.

Statistical analysis

Modifications to the raw data were limited to algebraic operations, continuous to categorical transformations, and the combining of categories. Basic

descriptive statistics were obtained to characterize demographics, mental health, smoking, alcohol use, and other substance use.

Logistic regression analysis was used to examine factors associated with having a possible alcohol use disorder, as defined by an AUDIT score of eight or more. We developed a model based on the results of two studies of medical students which found evidence of associations between smoking and cannabis use and alcohol misuse.[17,18] We included a term for smoking (never/ever) and a term for lifetime cannabis use (never/ever). We included terms for HADS anxiety and depression scores (0-7/8-21), as the impact of participants' mental health on their alcohol use was of interest to us. The model also included demographic variables – age (continuous), ethnicity (non-white/white), and gender (female/male). We did not use stepwise variable addition or elimination. Separate models were obtained for each year group. Goodness of fit was assessed using the Hosmer-Lemeshow test. Collinearity was measured using the variance inflation factor. Second and final year law students were excluded from this part of the analysis because of their small group sample sizes.

P-values less than 0.05 were considered to be significant. Missing values were excluded from statistics and statistical tests. All analyses were carried out using SPSS software versions 23 and 24 (IBM Corp; Armonk, New York, United States of America).

Results

Study sample

The questionnaire was completed by 1242 of 1577 (78.8%) eligible medical and law students. The response rates for first, second, and final year medical students were 100% (313/313), 94.5% (311/329), and 74.0% (265/358), respectively. The response rates for first, second, and final year law students were 85.9% (201/234), 54.5% (110/202), and 29.8% (42/141), respectively. We

were unable to determine whether survey respondents differed from non-respondents due to the anonymous nature of the study.

Demographics

Demographic details are presented in Table 1. We compared our sample to the corresponding Higher Education Statistics Agency demographic profiles for 2013/14.[26] The percentages of female students in all medical student and the first and second year law student groups were similar to the UK averages of 56.2% for medical/dental students and 60.5% for law students, respectively. The percentage of female final year law students was higher in our sample. The percentages of ethnic minority background students were lower among final year medical and second year law students, compared to the UK averages of 32.5% for medical/dental students and 33.3% for law students.

Mental health

Participant GHQ and HADS scores are presented in Table 1. Over half of first and final year medical students (first year 50.2%, second year 45.3%, final year 54.9%) and all law student groups (first year 54.0%, second year 56.8%, final year 68.4%) had a GHQ score suggestive of a psychiatric disorder. Over one third of medical students (first year 34.4%, second year 35.6%, final year 46.3%) and approximately half or more of law students (first year 47.2%, second year 52.7%, final year 59.5%) had a HADS anxiety score suggestive of a possible anxiety disorder. Over one tenth of final year medical (first year 7.3%, second year 8.5%, final year 13.0%) and second and final year law students (first year 9.4%, second year 13.5%, final year 10.8%) had a HADS depression score suggestive of significant depression.

More second and final year medical students (first year 2.4%, second year 7.7%, final year 8.8%) were prescribed sedatives or antidepressants in the past year, compared to law students (first year 4.8%, second year 5.4%, final year 2.7%).

Smoking

Figures for smoking are presented in Table 2. The prevalence of current smoking was lower among medical students (first year 2.6%, second year 4.8%, final year 3.5%), compared to law students (first year 10.6%, second year 19.0%, final year 12.5%).

Alcohol use

Participant AUDIT scores are presented in Table 2. Over half of first and second year medical students (first year 53.1%, second year 59.6%, final year 35.9%) scored positive for an alcohol use disorder, compared to over two thirds of first and second year law students (first year 67.2%, second year 69.5%, final year 47.4%). More than one tenth of first and second year law students had scores indicative of alcohol dependence. Median AUDIT scores were lower among medical students (first year 8, second year 9, final year 6), compared to law students (first year 11, second year 10, final year 7).

A breakdown of AUDIT scores is given in Supplementary Table 1. The higher scores among second year medical students appear to be driven by higher typical quantities, more frequent impaired control over drinking and increased salience of drinking, and a greater burden of alcohol-related problems (apart from injuries). The higher scores among first year law students appear to be driven by greater proportions of these students reporting drinking four or more times a week, typically drinking seven or more drinks, and weekly or daily/almost daily heavy drinking, compared to medical students. Higher scores among second year law students appear to be driven by a wider range of reported behaviours. Greater proportions of law students in all three year groups reported recent alcohol-related injuries, compared to medical students.

Other substance use

Approximately one quarter of medical students (first year 26.4%, second year 28.4%, final year 23.7%) and over one third of first and second year law students (first year 39.1%, second year 42.4%, final year 18.9%) reported other

substance use within the past year (Table 3). Cannabis was the most commonly used substance. The second and third most commonly used substances were cocaine, ecstasy, and nitrous oxide. The prevalence of lifetime use of other substances was highest among final year medical (first year 35.1%, second year 39.1%, final year 57.0%) and first and second year law students (first year 45.7%, second year 52.7%, final year 26.3%). The three most commonly used substances were the same as for past year use.

Regression analysis

Among first year medical and first year law students, age, cannabis use, ethnicity, and smoking were significantly associated with having a possible alcohol use disorder (AUDIT ≥ 8) (Table 4). Among second year medical students, cannabis use, ethnicity, and smoking were significant. Among final year medical students, only cannabis use and HADS depression score were significant. All significant associations were positive apart from those for age and HADS depression score.

Discussion

We found that 53%, 60%, and 36% of first, second, and final year medical students, respectively, scored positive for an alcohol use disorder. This compares to 57% and 47% for second and final year students, respectively, in a previous UK study.[27] In contrast, one longitudinal UK study found that the prevalence of alcohol misuse increased over time.[18] Our findings suggest that medical students are less likely to engage in drinking patterns suggestive of an alcohol use disorder, compared to law students. The results of our regression analyses suggest that a culture of drinking among junior university students may lead to more homogenized patterns of alcohol consumption among those with differing backgrounds. This is in keeping with previous research which suggests that some students come to university with pre-existing high levels of alcohol misuse.[17]

We found that 26%, 28%, and 24% of first, second, and final year medical students, respectively, reported using other substances within the past year. Cannabis was by far the most commonly used substance. These figures are similar to those found for cannabis use in two UK studies[17,18] but lower than the 33% reported for illicit substance use among the students in another UK study.[28] Our findings suggest that the prevalence of other substance use among medical students is less than that of the law students at the same university. This suggests that perhaps medical students are more aware of the possible dangers of other substance use. Indeed, we found that the prevalence of novel psychoactive substance use, apart from nitrous oxide, was low.

The prevalence of a possible anxiety disorder was higher among the final year medical students in our study (46%) compared to a previous UK study (28%).[18] The prevalence of a possible depressive disorder was also higher (13% versus 5%).[18] Final year medical students with a HADS depression score suggestive of a possible depressive disorder were less likely to have a possible alcohol use disorder. This was not found in other UK studies.[18,28] The medical profession is under much strain, and it could be that stress-related mood symptoms and excessive drinking are related to these work pressures. Indeed, burnout and stress have been shown to be related to excessive drinking among medical students elsewhere.[29]

Study strengths include the anonymous nature of data collection and the good response rates among medical and first year law students. Study findings are comparable to previous UK studies.[17,18] Our study has limitations. The response rate for final year medical students was relatively low. Time pressure may have been a factor as students were surveyed the month before their final exams. Also, there were no compulsory lectures during the survey period. The response rates for second and final year law students were very low. We were unable to determine whether survey non-responders differed from responders. We note that there is also the potential for recall and social

desirability biases. Our figures are likely to underestimate the true prevalence of substance misuse in the context of significant social desirability bias. There may be differences between the students in our study and those from other universities, and this may limit generalizability.

The medical and law students in our sample had high levels of alcohol and other substance misuse. These students are at risk of substance-related harm. Many students also reported anxiety symptoms. Some students' fitness to practice may be impaired as a result of their substance misuse or symptoms of psychological distress, and this may jeopardize their career progression. It is important that medical and law students with substance use or mental health problems are given the support and treatment that they need. Randomized trials are needed to determine which interventions are effective in these groups. We note that the host university has developed a cross-university multi-disciplinary alcohol working group in order to drive preventive work around alcohol consumption amongst students and staff. This group is seen as an example of good practice in the region.

Key messages

- The prevalence of alcohol and other substance misuse is high among medical and law students at a single UK university.
- First and second year medical students appear to be less likely to misuse substances, compared to law students at the same university.
- Further efforts are needed to reduce substance misuse and to improve the mental wellbeing of students.

Further research questions

- What is the trajectory of alcohol use among those transitioning from UK medical schools to professional practice?
- How do UK medical students' attitudes toward alcohol and other substance use relate to their patterns of use over time?

- What interventions are most effective in reducing substance misuse and promoting mental wellbeing among medical students?

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Contributors DNB was the chief investigator, project manager, and study guarantor. All members of the team helped to design the study, which was based on previous work carried out by DNB and FK. JF collected and entered the data. PB analyzed the data. All authors had access to the data. All authors contributed to the writing of the paper and approved the final manuscript.

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Competing interests All authors have completed the ICMJE uniform disclosure form. EK has disclosed that she is employed by the host university. All other authors declare no support from any organization for the submitted work, no financial relationships with any organizations that might have an interest in the submitted work in the previous three years, no relationships or activities that could appear to have influenced the submitted work.

Ethical approval This study obtained ethical approval from the host university (reference number 00730/2014).

Transparency declaration DNB affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

Data sharing No additional data available.

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Tables

Table 1 – Demographics and mental health, by group and year

Variable	Values	Medicine 1st Year n (%)	Medicine 2nd Year n (%)	Medicine Final Year n (%)	Law 1st Year n (%)	Law 2nd Year n (%)	Law Final Year n (%)
Age	≤ 19	251 (85.7)	71 (24.8)	0 (0)	155 (83.3)	28 (30.4)	1 (2.7)
	20-24	36 (12.3)	200 (69.9)	164 (66.7)	27 (14.5)	63 (68.5)	33 (89.2)
	25-29	5 (1.7)	11 (3.8)	72 (29.3)	4 (2.2)	0 (0)	3 (8.1)
	30-34	0 (0)	3 (1.0)	8 (3.3)	0 (0)	1 (1.1)	0 (0)
	≥ 35	1 (0.3)	1 (0.3)	2 (0.8)	0 (0)	0 (0)	0 (0)
Gender	Female	149 (50.9)	149 (52.1)	141 (56.9)	115 (61.8)	57 (62.0)	30 (78.9)
	Male	144 (49.1)	137 (47.9)	107 (43.1)	71 (38.2)	35 (38.0)	8 (21.1)
Ethnicity	White	209 (71.3)	216 (75.8)	199 (80.2)	140 (75.7)	82 (89.1)	29 (78.4)
	Black	8 (2.7)	1 (0.4)	8 (3.2)	7 (3.8)	1 (1.1)	1 (2.7)
	Asian	48 (16.4)	35 (12.3)	19 (7.7)	16 (8.6)	1 (1.1)	3 (8.1)
	Chinese	11 (3.8)	15 (5.3)	11 (4.4)	14 (7.6)	2 (2.2)	3 (8.1)
	Mixed	14 (4.8)	15 (5.3)	10 (4.0)	5 (2.7)	4 (4.3)	1 (2.7)
	Other	3 (1.0)	3 (1.1)	1 (0.4)	3 (1.6)	1 (1.1)	0 (0)
	Not known	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.1)	0 (0)
GHQ	0-1	145 (49.8)	156 (54.7)	111 (45.1)	86 (46.0)	38 (43.2)	12 (31.6)
	2-12	146 (50.2)	129 (45.3)	135 (54.9)	101 (54.0)	50 (56.8)	26 (68.4)
HADS-Anxiety	0-7	189 (65.6)	181 (64.4)	132 (53.7)	95 (52.8)	43 (47.3)	15 (40.5)
	8-10	54 (18.8)	48 (17.1)	56 (22.8)	46 (25.6)	23 (25.3)	10 (27.0)

	11-21	45 (15.6)	52 (18.5)	58 (23.6)	39 (21.7)	25 (27.5)	12 (32.4)
HADS-Depression	0-7	267 (92.7)	259 (91.5)	214 (87.0)	163 (90.6)	77 (86.5)	33 (89.2)
	8-10	12 (4.2)	15 (5.3)	17 (6.9)	12 (6.7)	8 (9.0)	2 (5.4)
	11-21	9 (3.1)	9 (3.2)	15 (6.1)	5 (2.8)	4 (4.5)	2 (5.4)

GHQ = General Health Questionnaire, HADS = Hospital Anxiety and Depression Scale

Table 2 – Smoking and alcohol use, by group and year

Variable	Values	Medicine 1st Year n (%)	Medicine 2nd Year n (%)	Medicine Final Year n (%)	Law 1st Year n (%)	Law 2nd Year n (%)	Law Final Year n (%)
Smoking	Never	171 (56.4)	131 (44.9)	101 (39.6)	72 (38.1)	32 (32.0)	15 (37.5)
	Tried a few	117 (38.6)	136 (46.6)	129 (50.6)	85 (45.0)	44 (44.0)	18 (45.0)
	Ex-regular	7 (2.3)	11 (3.8)	16 (6.3)	12 (6.3)	5 (5.0)	2 (5.0)
	Current	8 (2.6)	14 (4.8)	9 (3.5)	20 (10.6)	19 (19.0)	5 (12.5)
AUDIT score	Negative (0-7)	137 (46.9)	113 (40.4)	159 (64.1)	60 (32.8)	29 (30.5)	20 (52.6)
	Hazardous (8-15)	128 (43.8)	120 (42.9)	84 (33.9)	71 (38.8)	43 (45.3)	16 (42.1)
	Harmful (16-19)	16 (5.5)	25 (8.9)	2 (0.8)	22 (12.0)	13 (13.7)	1 (2.6)
	Dependence (20-40)	11 (3.8)	22 (7.9)	3 (1.2)	30 (16.4)	10 (10.5)	1 (2.6)
	Positive (8-40)	155 (53.1)	167 (59.6)	89 (35.9)	123 (67.2)	66 (69.5)	18 (47.4)

AUDIT = Alcohol Use Disorders Identification Test

Table 3 – Other substance use, by group and year

Variable	Values	Medicine 1st Year n (%)	Medicine 2nd Year n (%)	Medicine Final Year n (%)	Law 1st Year n (%)	Law 2nd Year n (%)	Law Final Year n (%)
Any	Past year	78 (26.4)	81 (28.4)	59 (23.7)	72 (39.1)	39 (42.4)	7 (18.9)
	Lifetime	104 (35.1)	110 (39.1)	142 (57.0)	84 (45.7)	49 (52.7)	10 (26.3)
Amphetamines	Past year	5 (1.7)	2 (0.7)	7 (2.8)	9 (4.9)	8 (8.8)	1 (2.7)
	Lifetime	7 (2.4)	8 (2.9)	17 (6.9)	7 (3.8)	8 (8.7)	2 (5.3)
Anabolic steroids	Past year	1 (0.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Lifetime	1 (0.3)	0 (0)	1 (0.4)	2 (1.1)	0 (0)	0 (0)
Benzodiazepines or Z-drugs	Past year	5 (1.7)	4 (1.4)	6 (2.4)	3 (1.6)	3 (3.3)	1 (2.7)
	Lifetime	6 (2.0)	4 (1.4)	13 (5.3)	3 (1.7)	3 (3.3)	0 (0)
Cannabis	Past year	66 (22.4)	68 (23.9)	46 (18.5)	56 (30.4)	34 (37.4)	6 (16.2)
	Lifetime	89 (30.3)	99 (35.2)	132 (53.0)	74 (40.4)	47 (50.5)	10 (26.3)
Cathinones	Past year	1 (0.3)	3 (1.1)	1 (0.4)	3 (1.6)	3 (3.3)	0 (0)
	Lifetime	3 (1.0)	7 (2.5)	16 (6.6)	3 (1.7)	4 (4.4)	0 (0)
Cocaine	Past year	12 (4.1)	11 (3.9)	13 (5.3)	14 (7.7)	13 (14.3)	3 (8.1)
	Lifetime	12 (4.1)	12 (4.3)	37 (15.1)	17 (9.3)	12 (13.0)	3 (7.9)
Ecstasy	Past year	18 (6.1)	27 (9.5)	11 (4.4)	20 (10.9)	18 (20.0)	4 (10.8)
	Lifetime	23 (7.9)	32 (11.4)	34 (13.8)	24 (13.2)	24 (25.8)	6 (15.8)
GBL or GHB	Past year	2 (0.7)	1 (0.4)	1 (0.4)	0 (0)	1 (1.1)	0 (0)
	Lifetime	3 (1.0)	1 (0.4)	0 (0)	0 (0)	1 (1.1)	0 (0)
Ketamine	Past year	6 (2.0)	6 (2.1)	4 (1.6)	7 (3.8)	9 (10.0)	1 (2.7)
	Lifetime	6 (2.1)	9 (3.2)	19 (7.8)	8 (4.4)	10 (10.9)	2 (5.3)
LSD	Past year	6 (2.1)	0 (0)	3 (1.2)	5 (2.7)	3 (3.3)	1 (2.8)

	Lifetime	7 (2.4)	1 (0.4)	4 (1.7)	7 (3.9)	4 (4.3)	2 (5.3)
Mushrooms	Past year	9 (3.1)	13 (4.6)	1 (0.4)	5 (2.7)	4 (4.4)	2 (5.4)
	Lifetime	12 (4.1)	18 (6.5)	21 (8.6)	6 (3.3)	8 (8.7)	2 (5.3)
Nitrous oxide	Past year	26 (8.9)	26 (9.2)	11 (4.5)	29 (15.8)	10 (11.2)	3 (8.1)
	Lifetime	30 (10.2)	31 (11.1)	22 (9.1)	29 (15.9)	10 (11.1)	2 (5.3)
Opioids	Past year	2 (0.7)	1 (0.4)	1 (0.4)	1 (0.6)	0 (0)	0 (0)
	Lifetime	4 (1.4)	4 (1.4)	5 (2.1)	3 (1.7)	0 (0)	0 (0)
Piperazines	Past year	2 (0.7)	0 (0)	0 (0)	0 (0)	2 (2.2)	0 (0)
	Lifetime	2 (0.7)	0 (0)	0 (0)	0 (0)	2 (2.2)	0 (0)
Synthetic cannabinoids	Past year	1 (0.3)	1 (0.4)	0 (0)	4 (2.2)	2 (2.2)	0 (0)
	Lifetime	1 (0.3)	2 (0.7)	1 (0.4)	1 (0.6)	4 (4.4)	0 (0)

GBL = gamma-butyrolactone, GHB = gamma-hydroxybutyric acid, LSD = lysergic acid diethylamide

Table 4 – Logistic regression analysis for having a possible alcohol use disorder (AUDIT ≥ 8), by group and year

Variable	Medicine 1st Year		Medicine 2nd Year		Medicine Final Year		Law 1st Year	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Age								
Continuous	0.72 (0.58-0.89)	0.002	0.92 (0.82-1.03)	0.161	1.02 (0.92-1.14)	0.724	0.71 (0.54-0.93)	0.013
Cannabis use								
Never	1 (reference)	0.035	1 (reference)	0.032	1 (reference)	0.001	1 (reference)	0.032
Ever	2.17 (1.06-4.48)		2.15 (1.07-4.34)		3.19 (1.61-6.33)		2.99 (1.10-8.14)	
Ethnicity								
Non-white	1 (reference)	<0.001	1 (reference)	0.003	1 (reference)	0.118	1 (reference)	<0.001
White	3.58 (1.84-6.98)		2.70 (1.41-5.15)		1.96 (0.84-4.55)		6.60 (2.56-16.99)	
Gender								
Female	1 (reference)	0.613	1 (reference)	0.510	1 (reference)	0.089	1 (reference)	0.716
Male	1.16 (0.65-2.08)		1.21 (0.69-2.13)		1.68 (0.92-3.07)		1.17 (0.50-2.77)	
HADS-Anxiety								
0-7	1 (reference)	0.064	1 (reference)	0.840	1 (reference)	0.101	1 (reference)	0.799
8-21	0.54 (0.28-1.04)		0.94 (0.50-1.75)		1.69 (0.90-3.17)		1.12 (0.48-2.60)	
HADS-Depression								
0-7	1 (reference)	0.575	1 (reference)	0.968	1 (reference)	0.017	1 (reference)	0.966
8-21	1.46 (0.39-5.50)		1.02 (0.35-2.96)		0.28 (0.10-0.80)		1.03 (0.24-4.39)	
Smoking								
Never	1 (reference)	<0.001	1 (reference)	<0.001	1 (reference)	0.130	1 (reference)	0.031
Ever	5.80 (2.92-11.52)		4.10 (2.21-7.63)		1.77 (0.85-3.70)		2.66 (1.09-6.49)	

AUDIT = Alcohol Use Disorders Identification Test, CI = confidence interval, HADS = Hospital Anxiety and Depression Scale, OR = odds ratio

Supplementary Table 1 – AUDIT question responses, by group and year

Question and item content[24]	Values	Medicine 1st Year n (%)	Medicine 2nd Year n (%)	Medicine Final Year n (%)	Law 1st Year n (%)	Law 2nd Year n (%)	Law Final Year n (%)
1. Frequency of drinking	Never	37 (12.8)	22 (7.8)	22 (8.8)	12 (6.5)	0 (0)	0 (0)
	Monthly or less	18 (6.3)	41 (14.6)	40 (16.0)	14 (7.5)	11 (11.8)	9 (23.7)
	2-4 times a month	76 (26.4)	92 (32.7)	110 (44.0)	37 (19.9)	32 (34.4)	16 (42.1)
	2-3 times a week	142 (49.3)	110 (39.1)	69 (27.6)	92 (49.5)	42 (45.2)	10 (26.3)
	4 or more times a week	15 (5.2)	16 (5.7)	9 (3.6)	31 (16.7)	8 (8.6)	3 (7.9)
2. Typical quantity	1 or 2 drinks	43 (16.9)	41 (15.7)	76 (33.0)	22 (12.5)	9 (9.8)	10 (27.0)
	3 or 4	86 (33.7)	72 (27.6)	81 (35.2)	35 (19.9)	34 (37.0)	16 (43.2)
	5 or 6	74 (29.0)	84 (32.2)	47 (20.4)	52 (29.5)	23 (25.0)	6 (16.2)
	7 to 9	27 (10.6)	49 (18.8)	18 (7.8)	36 (20.5)	20 (21.7)	4 (10.8)
	10 or more	25 (9.8)	15 (5.7)	8 (3.5)	31 (17.6)	6 (6.5)	1 (2.7)
3. Frequency of heavy drinking	Never	63 (22.1)	46 (16.5)	35 (14.2)	29 (15.8)	7 (7.4)	8 (21.6)
	Less than monthly	62 (21.8)	72 (25.9)	117 (47.6)	33 (18.0)	29 (30.5)	15 (40.5)
	Monthly	80 (28.1)	74 (26.6)	70 (28.5)	39 (21.3)	30 (31.6)	11 (29.7)
	Weekly	78 (27.4)	84 (30.2)	24 (9.8)	72 (39.3)	27 (28.4)	3 (8.1)
	Daily or almost daily	2 (0.7)	2 (0.7)	0 (0)	10 (5.5)	2 (2.1)	0 (0)
4. Impaired control over drinking	Never	236 (83.4)	206 (74.9)	207 (84.1)	144 (79.6)	69 (72.6)	29 (78.4)
	Less than monthly	37 (13.1)	38 (13.8)	29 (11.8)	21 (11.6)	15 (15.8)	4 (10.8)
	Monthly	9 (3.2)	20 (7.3)	7 (2.8)	9 (5.0)	5 (5.3)	2 (5.4)
	Weekly	1 (0.4)	10 (3.6)	3 (1.2)	4 (2.2)	3 (3.2)	1 (2.7)

	Daily or almost daily	0 (0)	1 (0.4)	0 (0)	3 (1.7)	3 (3.2)	1 (2.7)
5. Increased salience of drinking	Never	197 (69.9)	140 (50.7)	177 (72.0)	96 (52.5)	44 (46.3)	23 (62.2)
	Less than monthly	65 (23.0)	83 (30.1)	64 (26.0)	48 (26.2)	36 (37.9)	9 (24.3)
	Monthly	17 (6.0)	34 (12.3)	4 (1.6)	25 (13.7)	9 (9.5)	3 (8.1)
	Weekly	3 (1.1)	19 (6.9)	1 (0.4)	14 (7.7)	4 (4.2)	2 (5.4)
	Daily or almost daily	0 (0)	0 (0)	0 (0)	0 (0)	2 (2.1)	0 (0)
6. Morning drinking	Never	276 (97.5)	272 (98.2)	241 (98.0)	170 (93.4)	87 (91.6)	36 (97.3)
	Less than monthly	5 (1.8)	3 (1.1)	5 (2.0)	9 (4.9)	3 (3.2)	1 (2.7)
	Monthly	2 (0.7)	1 (0.4)	0 (0)	0 (0)	3 (3.2)	0 (0)
	Weekly	0 (0)	0 (0)	0 (0)	3 (1.6)	0 (0)	0 (0)
	Daily or almost daily	0 (0)	1 (0.4)	0 (0)	0 (0)	2 (2.1)	0 (0)
7. Guilt after drinking	Never	170 (60.1)	138 (49.8)	174 (70.7)	89 (48.6)	44 (46.3)	17 (45.9)
	Less than monthly	83 (29.3)	94 (33.9)	61 (24.8)	54 (29.5)	31 (32.6)	16 (43.2)
	Monthly	22 (7.8)	34 (12.3)	11 (4.5)	25 (13.7)	11 (11.6)	3 (8.1)
	Weekly	7 (2.5)	11 (4.0)	0 (0)	10 (5.5)	7 (7.4)	1 (2.7)
	Daily or almost daily	1 (0.4)	0 (0)	0 (0)	5 (2.7)	2 (2.1)	0 (0)
8. Blackouts	Never	128 (45.2)	98 (35.5)	137 (55.9)	64 (35.6)	31 (32.6)	20 (54.1)
	Less than monthly	107 (37.8)	107 (38.8)	92 (37.6)	57 (31.7)	40 (42.1)	14 (37.8)
	Monthly	30 (10.6)	52 (18.8)	14 (5.7)	32 (17.8)	19 (20.0)	2 (5.4)
	Weekly	18 (6.4)	18 (6.5)	2 (0.8)	22 (12.2)	3 (3.2)	1 (2.7)
	Daily or almost daily	0 (0)	1 (0.4)	0 (0)	5 (2.8)	2 (2.1)	0 (0)

9. Alcohol-related injuries	No	215 (75.4)	207 (74.5)	199 (80.9)	111 (60.7)	53 (55.8)	24 (64.9)
	Yes, but not in the last year	27 (9.5)	25 (9.0)	38 (15.4)	13 (7.1)	12 (12.6)	9 (24.3)
	Yes during the last year	43 (15.1)	46 (16.5)	9 (3.7)	59 (32.2)	30 (31.6)	4 (10.8)
10. Others concerned about drinking	No	270 (95.1)	248 (89.9)	239 (97.2)	160 (87.4)	85 (90.4)	37 (100.0)
	Yes, but not in the last year	3 (1.1)	6 (2.2)	5 (2.0)	8 (4.4)	2 (2.1)	0 (0)
	Yes during the last year	11 (3.9)	22 (8.0)	2 (0.8)	15 (8.2)	7 (7.4)	0 (0)

AUDIT = Alcohol Use Disorders Identification Test