Estimating the cost of alcohol-related absenteeism in the Australian workforce: the importance of consumption patterns

Kenneth J Pidd, Jesia G Berry, Ann M Roche and James E Harrison

ABSTRACT

Objective: To estimate the extent and cost of alcohol-related absenteeism in the Australian workforce.

Design: A secondary analysis of select data obtained from 13 582 Australian workers (aged ⩾ 14 years) collected as part of the 2001 National Drug Strategy Household Survey.

Main outcome measures: Self-reported measures of alcohol-related absenteeism, illness or injury absenteeism and alcohol consumption categorised according to National Health and Medical Research Council (NHMRC) guidelines for short- and long-term risk.

Results: The use of self-reported measures of alcohol-related absenteeism resulted in an estimate of 2 682 865 work days lost due to alcohol use in 2001, at a cost of $437 million. The use of self-reported measures of illness or injury absenteeism to determine the extent of absenteeism attributable to alcohol use resulted in an estimate of 7 402 341 work days lost, at a cost of $1.2 billion. These estimates are about 12 to 34 times greater than previous estimates based on national data. Low-risk drinkers and infrequent or occasional risky and high-risk drinkers accounted for 49%–66% of alcohol-related absenteeism.

Conclusions: The extent and cost of alcohol-related absenteeism is far greater than previously reported, and more than half the burden of alcohol-related absenteeism is incurred by low-risk drinkers and those who infrequently drink heavily.

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Several studies have examined national datasets to determine the cost of lost productivity in the Australian workplace due to alcohol-related morbidity and mortality,[1-3] but only one of these included an estimate of alcohol-related absenteeism. That study estimated the cost of alcohol-related absenteeism (excluding lost productivity costs) in the financial year 1998–99 to be $35.2 million.[3]

However, that study may have seriously underestimated the extent and cost of alcohol-related absenteeism. The estimate was based on a previous study,[4] which identified that employees drinking at harmful levels (ie, men drinking more than six and women more than four standard drinks per day) were 1.2 times more likely to be absent from work than employees who were non-drinkers or low-risk drinkers. The odds ratio for alcohol-related absenteeism was determined using previous National Health and Medical Research Council (NHMRC) guidelines, which focused only on mean levels of consumption associated with chronic, long-term harm.[5]

Alcohol measures that only focus on long-term harm may fail to capture absenteeism related to more moderate or light drinking, or to occasional episodes of heavy drinking (eg, binge drinking). Contrary to traditional thinking in this area, a large proportion of alcohol-related absenteeism is due to alcohol hangovers, which are more common for light to moderate drinkers than for heavy drinkers.[6] Similarly, a recent report of meta-analyses and systematic reviews of research on alcohol consumption and burden of disease and injury concluded that, although the average volume of consumption is related to disease and injury, patterns of consumption have an additional effect on coronary heart disease and injury.[7] Thus, more appropriate measures for estimating the extent and cost of alcohol-related absenteeism assess the frequency and patterns of drinking by examining consumption associated with both short- and long-term harm.

To identify the extent and cost of alcohol-related absenteeism in the Australian workplace, using current NHMRC guidelines, we conducted a secondary analysis of select data from the 2001 National Drug Strategy Household Survey (NDSHS).[8]

METHODS

The 2001 NDSHS collected data on awareness, attitudes, and behaviour relating to alcohol, tobacco, and illicit drug use from 26 744 Australians aged 14 years and older. A multistage stratified sampling method was used, and data were weighted by age, sex and geographical region to be representative of the total population of Australia. Full details of the sampling and weighting procedure are available in the NDSHS Technical Report.[9]

Measures

Alcohol consumption

The 2001 NDSHS included a graduated frequency matrix of alcohol consumption and a question concerning respondents' previous day's alcohol consumption. These two questions enabled respondents to be classified into short- and long-term risk categories as defined by NHMRC guidelines (Box 1).[10] For short-term risk, respondents were further classified into mutually exclusive groups according to frequent (at least weekly), infrequent (at least monthly), or occasional (at least yearly) short-term risk consumption. A recent drinker was defined as a person who consumed a full serve of alcohol in the 12 months before the survey, and an abstainer was one who had never had a full serve of alcohol, or one who had consumed a full serve of alcohol but not in the 12 months before the survey.

Absenteeism

The 2001 NDSHS asked all respondents to report the number of days missed from work, school, Technical and Further Education (TAFE) college, or university due to their personal use of alcohol in the 3 months before the survey. The number of days missed for each alcohol consumption risk category was multiplied by four to determine annual alcohol-related absenteeism. To calculate the extent and cost of alcohol-related absenteeism, the number of days off for each risk category was totalled and multiplied by $162.81 (1 day's wage plus 20% employer on-costs, based on the average weekly income in 2001).[11] Average income multiplied by days lost has been used in previous studies to determine the economic cost of alcohol-related absenteeism,[12,13] and it has been argued that this method is likely to produce conservative economic estimates that may be of more use to human resource

1 National Health and Medical Research Council (NHMRC) Australian alcohol guidelines[10]*

Risk of short-term harm	Low risk	Risky	High risk
Men	Up to 6 (on any one day, no more than 3 days per week)	7–10 (on any one day)	11 or more (on any one day)
Women	Up to 4 (on any one day, no more than 3 days per week)	5–6 (on any one day)	7 or more (on any one day)
Risk of long-term harm	**Low risk**	**Risky (Hazardous†)**	**High risk (Harmful†)**
Men: on average day	Up to 4 (per day)	5–6 (per day)	7 or more (per day)
Men: overall weekly level	Up to 28 (per week)	29–42 (per week)	43 or more (per week)
Women: on average day	Up to 2 (per day)	3–4 (per day)	5 or more (per day)
Women: overall weekly level	Up to 14 (per week)	15–28 (per week)	29 or more (per week)

* Numbers are standard drinks (10 g [12.5 mL] alcohol). † Old (1992) NHMRC terminology which only applied to long-term risk. ◆

decisionmakers than estimates focusing on the overall cost to the national economy.[13]

All respondents were asked to report days missed from work, school, TAFE college, or university due to any illness or injury in the previous 3 months. To determine annual illness or injury absenteeism, results for each alcohol consumption risk category were multiplied by four. The extent of illness or injury absenteeism attributable to alcohol use was calculated by estimating the difference in mean days off for each alcohol consumption risk category compared with abstainers. The cost of this excess absenteeism was calculated by multiplying the excess illness or injury absenteeism for each risk category by $162.81 (as above).

Analyses

Data were analysed using the "svy" suite of commands in Stata version 8.2 (StataCorp, College Station, Tex, USA) to enable analyses to take account of the complex sample design. Only respondents coded as working full-time or part-time for pay were included in the analyses.

RESULTS

Just over half the respondents were employed either full-time or part-time (51%; respondents $n = 13\,582$; estimated population $n = 8\,129\,232$) and 10.6% (95% CI, 9.9%–11.2%) of these were abstainers (respondents $n = 1369$; estimated population $n = 858\,243$). Of the 12 213 (estimated population $n = 7\,270\,989$) employed recent drinkers, 52.2% (95% CI, 51.1%–53.2%) drank at short-term low-risk levels, 8.7% (95% CI, 8.1%–9.3%) drank at short-term risky or high-risk levels frequently (at least weekly), 18.7% (95% CI, 17.9%–19.6%) drank at short-term risky or high-risk levels infrequently (at least monthly), and 20.4% (95% CI, 19.6%–21.3%) drank at short-term risky or high-risk levels occasionally (at least yearly). Most employed recent drinkers drank at long-term low-risk levels (87.7%; 95% CI, 87.0%–88.4%), 8.9% (95% CI, 8.3%–9.5%) drank at long-term risky levels, and 3.4% (95% CI, 3.0%–3.8%) drank at long-term high-risk levels.

Alcohol-related absenteeism

Of 12 449 employees asked about alcohol-related absenteeism in the previous 3 months, 11 608 responded (estimated population $n = 7\,495\,508$), of which 3.5% (respondents $n = 415$; estimated population $n = 267\,973$) reported missing at least 1 work day because of their alcohol use. There were 841 non-responders to this question, of which a smaller proportion were abstainers (1.8%; 95% CI, 1.0%–3.1%) compared with responders (11.7%; 95% CI, 11.0%–12.5%). Apart from this, patterns of alcohol consumption for responders and non-responders were similar. For the estimated population, 670 716 (95% CI, 510 363–831 070) work days were missed because of personal alcohol use in the previous 3 months. Multiplying the weighted estimate by four indicated that 2 682 865 work days were missed annually because of personal alcohol use. A significantly larger percentage of men (4.2%; 95% CI, 3.6%–4.9%) than women (2.5%; 95% CI, 2.1%–3.0%) reported missing at least 1 work day because of their alcohol use ($F_{1.0,11\,593} = 17.27$; $P < 0.001$). Significant differences were observed between age groups, with the likelihood of missing a work day because of alcohol use declining with age ($F_{4.8,55\,766} = 31.95$; $P < 0.001$).

Box 2 displays the number of employed respondents by alcohol consumption risk category, together with the extent and cost of self-reported alcohol-related absenteeism for each risk category. Mean absenteeism due to personal alcohol use was lowest for employees drinking at short-term low-risk consumption levels, compared with employees who drank at short-term risky and high-risk levels. A similar trend was evident for long-term risk consumption levels. These trends remained when controlling for age and sex differences.

Drinkers consuming at low-risk levels for short-term harm, or drinking only infrequently (at least monthly) or occasionally (at least yearly) at short-term risky or high-risk levels accounted for 55% of the alcohol-related absenteeism costs. Drinkers at low risk for long-term harm accounted for 49% of the cost of alcohol-related absenteeism.

Absenteeism due to any illness or injury

Of 12 449 employees asked about illness or injury-related absenteeism in the previous 3 months, 10 786 responded (estimated population $n = 6\,955\,107$), of which 39.7% (respondents $n = 4328$; estimated population $n = 2\,760\,506$) reported missing at least 1 work day. There were 1663 non-responders to this question, of which a larger proportion were abstainers (20.1%; 95% CI, 17.8%–22.5%) compared with responders (10.5%; 95% CI, 9.6%–11.4%). Apart from this, patterns of alcohol consumption for responders and non-responders were similar. For the estimated population, 11 433 923 (95% CI, 10 650 190–12 217 660) work days were missed because of any illness or injury in the previous 3 months. Multiplying the weighted estimate by four indicated that 45 735 694 work days were lost because of any illness or injury each year. A significantly larger percentage of women (42.6%; 95% CI, 41.0%–44.2%) reported missing at least 1 work day, com-

2 Self-reported alcohol-related absenteeism in the previous 12 months by drinking risk category for employed respondents to the 2001 National Drug Strategy Household Survey*

	Respondents†	Estimated population (millions) (95% CI)	Mean alcohol-related days off (95% CI)	Adjusted mean alcohol-related days off‡ (95% CI)	Total alcohol-related days off for the estimated population§ (millions) (95% CI)	Total cost¶ ($ millions) (95% CI)
Short-term risk**						
Abstainers	1 243	0.848 (0.794–0.902)	0	0	0	0
Low risk	5 396	3.475 (3.385–3.564)	0.142 (0.037–0.246)	0.114 (0.048–0.180)	0.492 (0.129–0.855)	80.06 (20.93–139.2)
Occasional risky	1 242	0.787 (0.737–0.837)	0.169 (0.070–0.268)	0.160 (0.066–0.253)	0.133 (0.054–0.212)	21.67 (8.819–34.53)
Occasional high risk	830	0.527 (0.484–0.570)	0.357 (0.089–0.624)	0.323 (0.125–0.522)	0.188 (0.046–0.329)	30.59 (7.557–53.61)
Infrequent risky	1 232	0.788 (0.737–0.840)	0.415 (0.269–0.561)	0.326 (0.190–0.463)	0.327 (0.210–0.444)	53.26 (34.16–72.36)
Infrequent high risk	739	0.470 (0.429–0.511)	0.732 (0.481–0.983)	0.420 (0.254–0.587)	0.344 (0.223–0.465)	55.99 (36.28–75.69)
Frequent risky	577	0.361 (0.325–0.397)	1.253 (0.679–1.827)	1.147 (0.446–1.848)	0.452 (0.238–0.666)	73.59 (38.68–108.5)
Frequent high risk	349	0.240 (0.208–0.272)	3.116 (1.418–4.814)	1.606 (0.859–2.353)	0.747 (0.321–1.173)	121.6 (52.33–190.9)
Total††	11 608	7.496 (7.418–7.573)	0.358 (0.273–0.443)	0.350 (0.254–0.446)	2.683 (2.041–3.324)	437.0 (332.0–541.0)
Long-term risk						
Abstainers	1 243	0.848 (0.794–0.902)	0	0	0	0
Low risk	8 973	5.798 (5.707–5.890)	0.225 (0.174–0.276)	0.216 (0.157–0.275)	1.304 (1.007–1.601)	212.0 (164.0–261.0)
Risky	1 043	0.629 (0.583–0.675)	1.297 (0.642–1.953)	1.058 (0.535–1.580)	0.816 (0.397–1.235)	133.0 (64.60–201.0)
High risk	349	0.220 (0.191–0.249)	2.558 (0.861–4.255)	1.709 (0.809–2.609)	0.563 (0.176–0.950)	91.60 (28.70–155.0)
Total††	11 608	7.496 (7.418–7.573)	0.358 (0.273–0.443)	0.350 (0.254–0.446)	2.683 (2.041–3.324)	437.0 (332.0–541.0)

* Calculations were done with full precision, and results rounded for presentation. † 12 449 employees were surveyed; 841 were non-respondents. ‡ Age- and sex-standardised using the 2001 Australian population aged ⩾ 14 years.[14] § Total alcohol-related days off were not adjusted for age and sex differences. ¶ Total cost calculated at $162.81 per day, arbitrarily based on the 2001 average daily wage of $135.68 plus 20% employer on-costs ($27.13). ** Occasional = at least yearly; infrequent = at least monthly; frequent = at least weekly. †† The totals for short-term and long-term risk are the same as they involve the same population grouped according to different risk (ie, short- or long-term) categories of drinking. ◆

pared with men (37.6%; 95% CI, 36.1%–39.2%) ($F_{1.0,10\,771} = 18.8$; $P < 0.001$). Significant differences were observed between age groups, with the likelihood of missing a work day because of illness or injury declining with age ($F_{4.9,52\,654} = 58.1$; $P < 0.001$).

Mean differences between abstainers' and drinkers' (by consumption category) illness or injury absenteeism, and the costs associated with drinkers' excess absenteeism, are shown in Box 3. Mean absenteeism due to any illness or injury was lowest for employees drinking at short-term low-risk levels, compared with employees who drank at short-term risky and high-risk levels. A similar trend was evident for long-term risk consumption levels. These trends remained when controlling for age and sex.

Sixty-five per cent of the costs of illness or injury absenteeism were incurred by workers who drank at low-risk levels, or drank infrequently or occasionally at short-term risky or high-risk levels. Drinkers at low risk for long-term harm accounted for 66% of the cost of illness or injury absenteeism.

The different estimates of alcohol-related absenteeism costs obtained in our study and previous research[3] are summarised in Box 4. Our estimates of the costs attributed to alcohol-related absenteeism ranged from, on average, 12 to 34 times greater than the previous estimate,[3] depending on the type of absenteeism data used.

DISCUSSION

We analysed data from the 2001 NDSHS to estimate the extent and cost of alcohol-related absenteeism by comparing two different self-reported measures of absenteeism with current NHMRC alcohol consumption guidelines. Our results indicate that the cost of alcohol-related absenteeism is substantially higher than previously reported.

Based on self-reported days off work because of drinking, more than 2.5 million work days were missed in 2001, at an estimated cost of $437 million. Costs were also calculated for differences in the illness or injury-related absenteeism of drinkers and non-drinkers. Using this method, almost 7.5 million days off because of any illness or injury were estimated to be alcohol-related, at a cost of $1.2 billion. Together, these findings indicate the previous estimate of $35.2 million[3] appears to grossly underestimate the cost of alcohol-related absenteeism in the Australian workplace.

Limitations

Our findings are not without qualification. First, there is some evidence that the alcohol consumption measures used in the 2001 NDSHS substantially underestimated the total volume of alcohol consumed in Australia in 2001.[15]

Second, the method used to calculate the extent of annual absenteeism (ie, multiplying absences during a 3-month period by four) does not allow for seasonal differences in absenteeism rates. However, despite a paucity of Australian research concerning alcohol-related absenteeism and absenteeism in general, our finding of a total mean of 6.6 work days off per year because of any illness or injury is consistent with other sources of data concerning absenteeism during 2001.[16]

Third, the use of the average wage for 2001 to calculate the economic cost of alcohol-related absenteeism results in an arbitrary value that may underestimate or overestimate the actual costs. For example,

this method may overestimate costs as it uses average adult earnings, whereas younger respondents were more likely to be absent and these younger respondents may not have received an adult wage. Alternatively, this method may be an underestimate as there are likely to be additional administration and lost productivity costs associated with absenteeism.

Fourth, the definition of abstainers used by the NDSHS did not allow for the identification of ex-drinkers who may have ongoing alcohol-related health issues. The inclusion of this type of respondent in the abstainer category may have resulted in an underestimate of illness or injury absenteeism attributed to alcohol use.

Confounders may have also played a role. In our study, age and sex differences were observed for both measures of absenteeism, and Australian prevalence data[16] indicate alcohol consumption patterns differ by age and sex. However, our examination of absenteeism data indicates that the trend for mean days off to increase with levels of risk consumption remains, even when age and sex differences are taken into account.

The indirect calculation of alcohol-related absenteeism using drinkers' excess illness or injury absenteeism relative to abstainers needs to acknowledge a range of additional potential confounders. Drinkers, for instance, are more likely than abstainers to be smokers,[17] and smokers are known to have higher levels of absenteeism than non-smokers.[18] Similarly, depression is associated with both absenteeism[19] and alcohol consumption.[20] There may be a range of health and lifestyle differences between drinkers and abstainers that account for differences in illness or injury absenteeism. The attribution of drinkers' absenteeism and associated costs using this proxy method may be less precise than estimates based on self-reports of alcohol-related absences.

Implications

Despite these qualifications, our findings warrant a re-think of the effect of drinking on absenteeism. In addition, our findings

3 Illness or injury absenteeism in the previous 12 months by drinking risk category for employed respondents to the 2001 National Drug Strategy Household Survey*

	Respondents†	Estimated population (millions) (95% CI)	Total days off for the estimated population (millions) (95% CI)	Mean days off (95% CI)	Adjusted mean days off (95% CI)‡	Difference (risk category – abstainers) (95% CI)	Excess days off for the estimated population (millions) (95% CI)	Total cost§ ($ million) (95% CI)
Short-term risk¶								
Abstainers	940	0.64 (0.59 to 0.69)	3.54 (2.64 to 4.44)	5.51 (4.17 to 6.86)	5.81 (3.85 to 7.77)	—	—	—
Low risk	5 063	3.26 (3.17 to 3.35)	19.04 (17.06 to 21.02)	5.84 (5.25 to 6.43)	5.96 (5.22 to 6.70)	0.33 (–1.15 to 1.78)	1.06 (–0.86 to 2.99)	173.0 (–140.0 to 486.4)
Occasional risky	1 190	0.75 (0.70 to 0.80)	4.78 (3.68 to 5.88)	6.35 (4.96 to 7.75)	6.81 (5.19 to 8.44)	0.84 (–1.10 to 2.78)	0.63 (–0.42 to 1.68)	102.9 (–68.40 to 274.2)
Occasional high risk	802	0.51 (0.47 to 0.55)	4.09 (3.11 to 5.08)	8.06 (6.23 to 9.89)	6.55 (4.81 to 8.30)	2.55 (0.27 to 4.82)	1.29 (0.36 to 2.23)	210.5 (58.57 to 362.5)
Infrequent risky	1 186	0.76 (0.71 to 0.81)	5.00 (4.07 to 5.94)	6.59 (5.45 to 7.74)	6.64 (4.58 to 8.71)	1.08 (–0.69 to 2.85)	0.82 (–0.05 to 1.69)	133.4 (–8.680 to 275.4)
Infrequent high risk	719	0.46 (0.42 to 0.50)	3.57 (2.83 to 4.31)	7.80 (6.33 to 9.27)	5.74 (4.71 to 6.78)	2.29 (0.30 to 4.28)	1.05 (0.37 to 1.73)	170.6 (60.13 to 281.0)
Frequent risky	557	0.35 (0.31 to 0.38)	3.30 (2.18 to 4.43)	9.57 (6.47 to 12.68)	9.87 (7.28 to 12.46)	4.06 (0.68 to 7.45)	1.40 (0.32 to 2.49)	228.3 (51.97 to 404.7)
Frequent high risk	329	0.23 (0.20 to 0.26)	2.41 (1.48 to 3.33)	10.52 (6.75 to 14.29)	8.36 (6.22 to 10.49)	5.01 (1.00 to 9.01)	1.15 (0.27 to 2.02)	186.4 (43.52 to 329.4)
Total**	**10 786**	**6.96 (6.88 to 7.03)**	**45.74 (42.60 to 48.87)**	**6.58 (6.13 to 7.02)**	**6.77 (6.11 to 7.43)**	**1.17 (–0.25 to 2.56)**	**7.40 (4.31 to 10.50)**	**1205 (721.3 to 1689)**
Long-term risk								
Abstainers	940	0.64 (0.59 to 0.69)	3.54 (2.64 to 4.44)	5.51 (4.17 to 6.86)	5.81 (3.85 to 7.77)	—	—	—
Low risk	8 518	5.51 (5.42 to 5.60)	35.27 (32.60 to 37.95)	6.40 (5.93 to 6.88)	6.40 (5.80 to 7.01)	0.89 (–0.54 to 2.32)	4.92 (2.30 to 7.53)	801.0 (374.0 to 1230)
Risky	998	0.60 (0.55 to 0.64)	5.10 (3.88 to 6.32)	8.53 (6.61 to 10.46)	7.92 (6.40 to 9.45)	3.02 (0.67 to 5.37)	1.80 (0.64 to 2.97)	294.0 (105.0 to 483.0)
High risk	330	0.21 (0.18 to 0.24)	1.82 (0.99 to 2.66)	8.79 (4.96 to 12.62)	7.62 (4.34 to 10.90)	3.28 (–0.78 to 7.34)	0.68 (–0.12 to 1.48)	111.0 (–20.00 to 241.0)
Total**	**10 786**	**6.96 (6.88 to 7.03)**	**45.74 (42.60 to 48.87)**	**6.58 (6.13 to 7.02)**	**6.77 (6.11 to 7.43)**	**1.17 (–0.25 to 2.56)**	**7.40 (4.31 to 10.50)**	**1205 (721.3 to 1689)**

* Calculations were done with full precision, and results rounded for presentation. † 12 449 employees were surveyed; 1663 were non-respondents. ‡ Age- and sex-standardised using the 2001 Australian population aged ⩾ 14 years.[14] § Arbitrarily based on the 2001 average daily wage of $135.68 plus 20% employer on-costs ($27.13). ¶ Occasional = at least yearly; infrequent = at least monthly; frequent = at least weekly. ** The totals for short-term and long-term risk are the same as they involve the same population grouped according to different risk (ie, short- or long-term) categories of drinking. ◆

4 Annual cost of alcohol-related absenteeism using different data

Data	Measure of alcohol consumption	Annual cost estimate ($ million)
2001 National Drug Strategy Household Survey: self-reported alcohol-related absenteeism	Short- or long-term risk	437
Self-reported illness or injury absenteeism (comparing mean difference between abstainers' and drinkers' absenteeism)	Short- or long-term risk	1 205
Collins & Lapsley's[3] estimate	Chronic high-risk drinkers only	35.2

provide a disaggregated quantification of the effect of workers' drinking patterns. In this way, it is possible to identify which drinking patterns are most costly. Contrary to common perception, we found that at least half the cost was due to low-risk and infrequent, or occasional, risky and high-risk drinkers. This is due to the much larger numbers of workers who drink at these levels, compared with the number of workers who frequently drink at risky or high-risk levels. This scenario has been described as the preventive paradox[21] and supports previous workplace research indicating a larger proportion of alcohol-related problems are due to the much larger numbers of light and moderate drinkers than heavy drinkers.[22]

Our findings have important implications for workplace policy and intervention strategies to minimise the extent and cost of alcohol-related absenteeism. The results highlight the need to take a "whole-of-workplace" approach when designing and implementing alcohol-related intervention strategies. Traditionally, workplace interventions have focused on employees who drink heavily or have been identified as "problem drinkers". Although these employees are of concern, our results demonstrate that low-risk drinkers and those who drink at risky or high-risk levels relatively infrequently also need to be considered.

Our study highlights the importance of using alcohol measures that capture overall patterns of consumption, and is consistent with research that indicates a large proportion of alcohol-related absenteeism may be due to the alcohol hangovers of light to moderate drinkers.[6] Our findings are also congruent with research that indicates patterns of consumption that alternate between periods of nil or moderate consumption and infrequent bouts of heavy consumption may increase the risk of illness and injury.[7]

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COMPETING INTERESTS

None identified.

AUTHOR DETAILS

Kenneth J Pidd, PhD, Senior Research Officer[1]
Jesia G Berry, BHSc(Hons), GDPH, Research Officer[2]
Ann M Roche, PhD, Director[1]
James E Harrison, MB BS, MPH, Director[2]

1 National Centre for Education and Training on Addiction, Flinders University, Adelaide, SA.
2 Research Centre for Injury Studies, Flinders University, Adelaide, SA.

Correspondence: ken.pidd@flinders.edu.au

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