

Intoxicated workers: findings from a national Australian survey

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ABSTRACT

Aims To identify prevalence of alcohol and drug use and intoxication at work. **Participants** A total of 9828 Australian workers ≥ 14 years old. **Setting** Australia 2007. **Measurements** Work-place alcohol use and drug use, intoxication at work, industry and occupation of employment. **Design** Secondary analysis of a large nationally representative survey involving descriptive and weighted multivariate logistic regressions. **Findings** Differential patterns were identified by drug type, worker characteristics and occupational setting, controlling for demographic variables. Nearly 9% of workers surveyed (8.7%) usually drank alcohol at work and 0.9% usually used drugs at work. Attending work under the influence of alcohol was more prevalent (5.6%) than attending work under the influence of drugs (2.0%), and significantly more likely among young, male, never married workers with no dependent children. Hospitality industry workers were 3.5 times more likely than other workers to drink alcohol and two to three times more likely to use drugs at work or attend work under the influence of alcohol or drugs. Other high-risk industries and occupations included construction, financial services, tradespersons and unskilled workers. **Conclusion** More than one in 20 Australian workers admit to having worked under the influence of alcohol and almost one in 50 report attending work under the influence of psychoactive drugs. The rates are higher for some industries, such as the hospitality industry, than others.

Keywords Alcohol, drugs, employee, intoxication, safety, worker, workforce, workplace.

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INTRODUCTION

There is growing interest internationally in the role of the work-place in alcohol and drug issues. However, relatively little definitive research has been undertaken to guide prevention and intervention efforts. Available research indicates that workers' alcohol and drug consumption can have negative consequences for work-place safety [1] and productivity [2,3]. Moreover, alcohol and drug consumption patterns of workers vary significantly between work-force groups [4,5].

Research to date has focused largely on the overall alcohol and drug use of the work-force rather than use *in* the work-place. 'Work-place' use is defined as workers' alcohol and other drug use that occurs during work hours, just prior to commencing work, or just after work but before going home. 'Work-force' use is defined as

workers' overall alcohol and drug use that occurs at any time and largely reflects use outside work hours and away from the work-place. Distinguishing between work-place and work-force use is important when establishing work-place safety and productivity risk [6]. Workers who consume alcohol or drugs away from the work-place and do not return to work until consumption effects (e.g. intoxication, hangover, fatigue) have dissipated are unlikely to be a direct risk to safety or productivity. By contrast, consumption during (or just prior to) work hours is likely to produce a direct safety and/or productivity risk.

Despite the importance of the distinction between work-force and work-place alcohol and drug use, research concerning work-place use is relatively scarce and limited in scope. Internationally, most research has focused on overall use among the work-force rather

than work-place use. For example, work-force alcohol and/or drug use has been examined using nationally representative samples of Australian [5], Brazilian [7], Canadian [8], Hong Kong [9] and US [4] work-forces. In contrast, most research concerning work-place use has been restricted to the US and Australian contexts using population samples from specific occupational/industry groups.

US research concerning alcohol or drug use and intoxication during work hours is limited [6,10,11]. Frone [10] identified 10 studies that examined alcohol use at work, with prevalence rates of between 1.6% and 28.5%. Most involved small samples and were restricted to particular industry or occupational groups, limiting their generalizability to the wider work-force. Frone [11] further identified two studies of drug use at work using US national samples, with prevalence rates of 5–9.5% for males and 1–4.2% for females. However, these studies were more than 20 years old and restricted to workers under 30 years of age. To address these limitations, Frone conducted a national survey of 2829 US workers that examined work-place alcohol [10] and illicit drug [11] use. Results indicated that 3.1% of the work-force used drugs at work and 15% used alcohol at work. However, Frone's findings may have limited generalizability due to the sampling methodology used. Frone used a random digit-dial (RDD) methodology based on a systematic stratified sample of listed landline telephone numbers. RDD frameworks do not include digital and cellphone numbers [12,13], potentially reducing the sample by 30% [12], and are unlikely to be nationally representative, with measurable exclusion bias for younger, lower income, minority and rental households [13].

Six peer-reviewed Australian studies have also examined work-place alcohol and/or drug use: alcohol consumption of train drivers [14] and police [15], alcohol and cannabis use of building trades apprentices [16], alcohol and illicit drug use of fishing industry workers [17], amphetamine use of long-distance truck drivers [18] and methamphetamine users who attend work under the influence [19]. These studies identified prevalence rates that varied from 3.1% to 56% for alcohol use at work and from 6.6% to 46% for drug use at work. However, these studies had relatively small sample sizes and/or were restricted to particular industry, occupational or drug using groups, limiting their generalizability to the wider Australian work-force. Thus, to date no large-scale nationally representative studies have been undertaken to examine work-place alcohol and drug use.

To address this deficit, a secondary analysis of Australian national household survey data was conducted. The aim was to identify alcohol and drug use and intoxication at work, and at-risk work-force groups.

METHOD

Design

Data on awareness, attitudes and behaviour relating to alcohol, tobacco and other drug use from 23 356 residents aged 12 years and over were collected in the 2007 National Drug Strategy Household Survey (NDSHS). Data were collected from householders in all States and Territories using two methods: (i) drop-and-collect self-report survey ($n = 19\,818$; response rate = 54%); and (ii) computer-assisted telephone interviews (CATI) ($n = 3538$; response rate = 39%). As not all key variables were used in the CATI method, only data from the drop-and-collect method were used. Initial and detailed findings of the 2007 NDSHS have been published elsewhere [20,21]. For the drop-and-collect method a multi-stage stratified sampling methodology was used. The sample was stratified by region (capital city and rest of each state) utilizing Australian Bureau of Statistics standard geographical classifications [22]. Within the capital city strata the sample was selected according to census collection districts and within the rest of state strata the sample was selected according to statistical local areas. Each district and area was selected with a probability proportional to the number of households at the 2001 Census. Data were weighted by age, sex and geographical region to be nationally representative. Sampling and weighting details are available elsewhere [23].

Demographic measures

The 2007 NDSHS demographic variables shown previously to be associated with alcohol and drug use [20,21] were used in the current study including: age, gender, marital status, education level, household income and dependent children.

Employment measures

Data utilized were from 2007 NDSHS employed (i.e. self-employed, employed for wages or salary) respondents aged 14 years and over. Employed respondents nominated the industry they worked in and their job title. Industry groups were determined using Australian and New Zealand Standard Industrial Classification (ANZSIC) codes [24], resulting in 12 groups.

Industry groups were further aggregated due to the low prevalence of illicit drug use or intoxication in some industries. Industries with the highest prevalence of work-place alcohol and drug consumption and intoxication (at least 25% above the sample mean) were hospitality, construction, financial services, transport and other service industries. The remaining industry groups (with lower prevalence rates) were combined into a single low-risk group, which was used as the reference

category for regression analysis. Low-prevalence industry groups included public administration and defence, agriculture, education, manufacturing, mining, retail, wholesale and health and community services. This method has been utilized elsewhere [10,11] to overcome any effect of the relationship between industry of employment and drug use or intoxication being obscured by higher level aggregation [11].

Occupational groups were determined using Australian Classification of Occupations (ASCO) codes [25]. This resulted in five occupational groups: professionals, managers, tradespersons, skilled workers and unskilled workers.

Alcohol consumption measures

Respondents were asked if they had ever tried alcohol and if they had had an alcoholic drink in the previous 12 months. If they responded 'yes', they were asked further questions about drinking frequency. Drinking frequency was categorized as daily, at least weekly and less than weekly. Respondents were asked about the number of standard drinks consumed on an average drinking occasion. Illustrations provided indicated the number of standard drinks in a specific glass or bottle.

Drug consumption measures

Questions were also asked about the non-medical use of: pain killers/analgesics; tranquillizers/sleeping pills; steroids; barbiturates; methamphetamine/amphetamine; cannabis; heroin; methadone; cocaine; lysergic acid diethylamide (LSD)/synthetic hallucinogens; ecstasy; ketamine; γ -hydroxybutyric acid (GHB); inhalants; and opiates/opioids. Respondents were asked if they had used these drugs: ever in their life-time; in the last 12 months; in the last month; or in the last week. Data on drug use in the last 12 months were used. Those who indicated that they had used a drug in the last 12 months were asked about the frequency of use, categorized as occasional (less than monthly), and monthly or more often. As relatively small proportions of workers reported using most drug types, a new composite variable (any non-medical use of a drug apart from alcohol or tobacco) was created.

Potential intoxication measures

Respondents were asked to indicate, from 10 options, activities undertaken in the last 12 months while under the influence of alcohol or drugs. Data on attending work under the influence were included. Respondents were asked to indicate, from 11 locations, where they used alcohol or drugs. Only 'use at work' was included.

Statistical analysis

Data were analysed using SPSS version 17.0 Complex Samples. An established weight [21] was used to estimate

national percentages. Where appropriate, 95% confidence intervals were calculated. All regression analyses utilized weighted data and accounted for the survey design (stratum and primary sampling unit). Such an approach is likely to result in fewer biased estimates compared to unweighted analysis [26].

Weighted bivariate logistic regressions were used to examine the contribution of demographic, alcohol or drug consumption, and work-group variables to workplace consumption and intoxication. Weighted multivariate logistic regressions examined the contribution of industry and occupation variables on each measure of work-place consumption and intoxication, while controlling for demographic and consumption variables. Variables that contributed significantly to work-place consumption and intoxication in the bivariate regressions were entered into the multivariate regression model. Overall model fit for the bivariate and multivariate regressions was assessed using adjusted Wald *F*-tests. Details of the sampling design (i.e. stratum and primary sampling unit) were incorporated into the regression.

RESULTS

Sample population

Just over half the respondents were aged 14 years and over [mean = 41.9 years, standard deviation (SD) = 12.8 years; range = 14–87 years] and employed [55.6%, survey $n = 9828$ estimated population $n = 9\ 160\ 695$, standard error (SE) = 102 508] (Table 1).

Work-place alcohol and drug consumption and intoxication

Nearly one in 10 workers (8.7%) reported usually drinking at work, 0.9% reported usually using drugs at work and 5.6% and 2.0% reported attending work under the influence of alcohol or a drug, respectively. Of those who reported usually using alcohol or drugs at work, 16.9% and 49.6% attended work under the influence of alcohol or drugs, respectively.

Cannabis was used by the largest proportion of workers in the last 12 months, followed by ecstasy, painkillers/analgesics, meth/amphetamine and cocaine (Table 2). Fewer than 1% of the work-force used other types of drugs. Drug use at work varied according to drug type (Table 2). More workers used painkillers/analgesics and meth/amphetamine at work than away from work, and fewer workers used cannabis or ecstasy at work compared to their use away from work.

The proportions of workers who drank or used drugs at work, or attended work under the influence of alcohol or drugs, varied by industry group (Table 3) and occupation (Table 4).

Table 1 Demographic characteristics of employed respondents to the 2007 National Drug Strategy Household Survey (NDSHS) aged 14 years or older.

Variable	%	Unweighted <i>n</i>	Estimated population total (SE) ^b
Gender			
Male	56.7	4941	5 197 411 (86 884)
Female	43.3	4887	3 963 284 (65 050)
Marital status			
Married/ <i>de facto</i>	69.2	6526	6 285 490 (92 271)
Separated/divorced/widowed	8.3	1223	754 486 (27 040)
Never married	22.5	2004	2 044 086 (57 377)
Dependent children			
Yes	48.6	4242	4 436 164 (85 976)
No	51.4	5559	4 558 308 (72 659)
Highest education level			
High school or less	35.8	3444	3 280 224 (67 808)
Certificate/Diploma	36.3	3528	3 326 088 (70 864)
Bachelor degree	17.3	1718	1 582 523 (50 577)
Masters degree or PhD	10.6	1138	971 860 (38 086)
Household income			
\$145 600 or more	15.7	1158	1 192 067 (47 178)
\$104 000–145 599	18.3	1422	1 385 724 (45 792)
\$67 600–103 999	32.0	2567	2 425 877 (58 188)
\$41 600–67 599	21.3	1863	1 614 999 (46 016)
\$20 800–41 599	10.4	1031	787 834 (30 606)
less than \$20 800	2.4	257	178 574 (13 418)
Drinking frequency			
Abstainer	10.8	977	98 381 (44 438)
≤monthly	17.5	1722	1 586 355 (46 484)
2–3 days a month	14.2	1341	1 285 634 (43 111)
1–2 days a week	23.1	2200	2 094 788 (54 585)
3–4 days a week	16.4	1619	1 494 215 (44 104)
Daily/almost daily	18.0	1894	1 638 850 (48 092)
Number of drinks			
1–2	40.1	4052	3 586 119 (66 634)
3–4	25.4	2255	2 271 279 (53 233)
5–6	12.4	1145	1 108 479 (39 320)
7–10	7.1	626	632 228 (29 971)
>10	4.0	319	355 030 (25 226)
Frequency of drug use			
Abstainer	85.1	8383	7 794 162 (98 270)
< monthly	10.3	981	940 453 (37 235)
≥monthly	4.7	464	426 079 (24 382)
Number of drugs used			
1	9.7	970	885 832 (34 351)
2	2.5	238	227 242 (17 724)
>2	3.1	271	288 560 (21 760)
Industry^a			
Low risk	53.0	5137	4 565 149 (75 205)
Hospitality	5.9	504	505 135 (28 397)
Construction	9.2	747	790 947 (34 702)
Financial services	18.1	1725	1 621 535 (47 445)
Transport	5.2	442	444 480 (24 088)
Other services	7.9	708	682 591 (30 238)
Occupation			
Professional	31.5	3043	2 657 586 (62 259)
Manager	11.7	1084	989 738 (38 846)
Tradesperson	9.1	685	769 932 (35 450)
Skilled worker	28.6	2669	2 407 572 (55 708)
Unskilled worker	19.0	1567	1 601 296 (53 143)

^aThe hospitality, construction, financial services, transport and other services industries have overall alcohol and drug prevalence rates that are 25% or more above the mean prevalence rates for low-risk industries. ^bData were weighted by age, sex and geographical region to be representative of the total population of Australia. SE: standard error.

Table 2 Proportions of employed respondents to the 2007 National Drug Strategy Household Survey (NDSHS) aged 14 years or older using drugs in the last 12 months and proportions of drug users who use at work by the five most commonly used drugs.

<i>Drug type</i>	<i>Use in last 12 months</i>		<i>Use at work</i>	
	<i>% (survey n)</i>	<i>Est. n (SE)</i>	<i>% (survey n)</i>	<i>Est. n (SE)</i>
Alcohol	90.0 (8924)	8 241 796 (91 010)	8.7 (763)	708 379 (32 119)
Cannabis	10.8 (1058)	1 027 432 (39 696)	1.9 (20)	21 904 (6 187)
Ecstasy	4.1 (405)	(411 504) (26 746)	1.7 (7)	3 439 (1 491)
Painkillers/analgesics	3.4 (267)	248 802 (18 232)	11.6 (31)	25 756 (5 402)
Meth/amphetamine	2.6 (256)	254 214 (19 462)	8.6 (22)	22 134 (1 495)
Cocaine	2.0 (198)	214 599 (20 158)	3.5 (7)	6 385 (3 519)
Non-medical use of any drug	9.0 (831)	793 102 (34 649)	0.9 (83)	79 279 (10 690)

SE: standard error

Table 3 Proportions of employed respondents to the 2007 National Drug Strategy Household Survey (NDSHS) aged 14 years or over, who used alcohol or drugs at work, or attended work under the influence of alcohol or drugs, by high-risk industries.

<i>Industry^a</i>	<i>All</i>	<i>Usually use at work</i>		<i>Work under influence</i>	
		<i>Alcohol</i>	<i>Drugs</i>	<i>Alcohol</i>	<i>Drugs</i>
	<i>%</i>	<i>% (95% CI)</i>	<i>% (95% CI)</i>	<i>% (95% CI)</i>	<i>% (95% CI)</i>
Construction	9.2	10.6 (8.2–13.6)	1.5 (0.7–3.1)	6.0 (4.4–8.2)	4.8 (3.1–7.2)
Financial services	18.8	14.7 (12.8–17.0)	0.8 (0.4–1.6)	7.8 (6.4–9.4)	1.4 (0.9–2.4)
Hospitality	5.9	18.6 (14.4–23.8)	1.4 (0.6–3.3)	12.0 (8.5–16.7)	5.9 (3.8–9.1)
Services	7.9	11.0 (8.4–14.5)	0.3 (0.1–0.6)	7.5 (5.4–10.4)	2.5 (1.4–5.2)
Transport	5.2	2.5 (1.3–4.7)	1.9 (0.8–4.6)	7.2 (4.7–10.8)	2.5 (1.3–4.6)
Low-risk industries	53.0	5.6 (4.9–6.4)	0.6 (0.4–0.9)	3.9 (3.3–4.6)	1.2 (0.9–1.6)
All workers	100.0	8.7 (8.0–9.5)	0.9 (0.7–1.1)	5.6 (5.0–6.2)	2.0 (1.7–2.4)

^aThe hospitality, construction, financial services, transport and other services industries have overall alcohol and drug prevalence rates that are 25% or more above the mean prevalence rates for low-risk industries. CI: confidence interval.

The hospitality industry had the highest proportion of workers who reported alcohol or drug consumption at work and attending work under the influence. Tradespersons had the highest proportion of workers using drugs

at work or attending work under the influence of alcohol or drugs, while managers were the occupational group with the highest proportion of workers who usually used alcohol at work.

Table 4 Proportions of employed respondents to the 2007 National Drug Strategy Household Survey (NDSHS) aged 14 years or over, who used alcohol or drugs at work, or attended work under the influence of alcohol or drugs, by occupation.

Occupation	All	Usually use at work		Work under influence	
		Alcohol	Drugs	Alcohol	Drugs
		% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Manager	11.7	12.6 (10.3–15.4)	1.3 (0.7–2.5)	7.6 (6.0–9.8)	1.9 (1.1–3.5)
Professional	31.5	10.9 (9.6–12.3)	0.1 (0.0–0.3)	4.7 (3.8–5.7)	1.1 (0.7–1.7)
Tradesperson	9.1	9.7 (7.4–12.6)	1.8 (0.9–3.6)	7.4 (5.4–10.1)	4.3 (2.8–6.8)
Skilled worker	28.6	6.8 (5.6–8.3)	0.7 (0.4–1.3)	5.6 (4.5–6.9)	1.8 (1.3–2.4)
Unskilled worker	19.0	5.3 (4.0–7.0)	1.5 (0.9–2.4)	5.9 (4.5–7.6)	2.9 (2.0–4.1)

CI: confidence interval.

The multivariate model

A series of bivariate logistic regressions were conducted to identify demographic, industry, occupation and overall alcohol and drug consumption variables that were predictors of alcohol and drug use and intoxication in the work-place. Multivariate logistic regressions were then conducted where all significant bivariate predictors were entered simultaneously for each consumption and intoxication variable (Table 5).

Significant predictors of alcohol use at work were being younger, male, only educated to the certificate/diploma level, drinking weekly or more often, using drugs, employment in the hospitality, construction, financial services, other service industries and being employed as a professional or manager ($F_{35, 1403} = 7.1$, $P < 0.001$) (Table 5). Significant predictors of drug use at work were being younger, using more than two types of drugs, and being employed as a tradesperson or unskilled worker ($F_{26, 764} = 4.7$, $P < 0.001$).

Significant predictors of attending work under the influence of alcohol were being younger, male, single, separated, widowed or divorced, having no dependent children, drinking once a week or more often, drinking three or more drinks per drinking occasion and employment in the hospitality or financial services industries ($F_{33, 1402} = 12.7$, $P < 0.001$). Significant predictors of attending work under the influence of drugs were being younger, separated, divorced or widowed, having a household income between \$20 800 and \$103 999, drinking only one or two days a week, using more than two types of drugs and employment in hospitality industry ($F_{34, 695} = 5.5$, $P < 0.001$).

DISCUSSION

This study represents one of the most comprehensive analyses of alcohol and drug consumption and intoxication in the work-place (in contrast to overall patterns of use by the work-force) currently available. Multivariate analyses indicated significant differential alcohol and drug use patterns in terms of drug type, worker characteristics and occupational setting. That is, engagement in these potentially hazardous behaviours is not distributed evenly across drug types, workers or occupations and industry groups, but predicted by a number of individual and work-place contextual factors.

Differences by drug type

In contrast to the attention often focused on drug use in the work-place, alcohol use and intoxication at work was found to be significantly more prevalent than work-place drug use and intoxication. Nearly 10 times more workers (one in 10) usually used alcohol at work, compared to workers who usually used drugs at work (one in 100). Similarly, nearly three times more workers attended work under the influence of alcohol (one in 20), compared to workers who attended work under the influence of drugs (one in 50).

The relatively large proportion of respondents who reported drinking at work may exemplify a popular practice of drinking with co-workers after work (e.g. [14–16]). While this pattern of drinking occurs outside working hours, it none the less has implications for safety, productivity and duty of care as it often occurs on the employer's premises in car parks, lunch rooms or

Table 5 Multivariate logistic regressions predicting alcohol and drug use at work, and attending work under the influence of alcohol or drugs, among the Australian work-force, by occupational and demographic variables.

Predictor		Use at work		Work under the influence	
		Alcohol	Drugs	Alcohol	Drugs
Gender	Female	RG	RG	RG	RG
	Male	1.38**	0.87 NS	1.68***	1.66 NS
Age ^a		0.97***	0.96***	0.97***	0.95***
Marital status ^b	Married	0.95 NS	RG	RG	RG
	Ever married	RG	0.58 NS	1.46*	2.26*S
	Single	0.96 NS	0.68 NS	1.51*	0.82 NS
Dependent children	Yes	RG	RG	RG	RG
	No	1.12 NS	1.75 NS	1.3*	1.18 NS
Education level	Postgraduate	1.45 NS	–	–	RG
	Undergraduate	1.08 NS	–	–	0.43 NS
	Certificate/diploma	1.51*	–	–	1.03 NS
	≤High school	RG	–	–	0.94 NS
Household income	<\$20 800	RG	RG	RG	2.53 NS
	\$20 800–41 599	1.45 NS	–	1.39 NS	2.98*
	\$41 600–67 599	1.74 NS	–	0.81 NS	2.71*
	\$67 600–103 999	1.97 NS	–	1.10 NS	2.97*
	\$104k–145 999	2.31 NS	–	0.92 NS	2.31 NS
	≥\$145 600	2.29 NS	–	1.59 NS	RG
Drinking frequency	None		RG		RG
	≤Monthly	RG	0.54 NS	RG	0.42 NS
	2–3 days a month	1.05 NS	0.34 NS	1.63 NS	0.28 NS
	1–2 days a week	1.67**	0.43 NS	2.85**	1.60*
	3–4 days a week	1.71**	0.40 NS	5.29***	0.25 NS
	Daily/almost daily	1.93**	0.73 NS	7.80***	0.33 NS
Number of drinks consumed	None		RG		RG
	1–2	RG	0.89 NS	RG	1.01 NS
	3–4	1.26 NS	0.54 NS	1.89***	0.98 NS
	5–6	1.15 NS	0.85 NS	3.43***	1.42 NS
	7–10	1.09 NS	1.25 NS	3.68***	1.74 NS
	>10	1.23 NS	1.90 NS	6.31***	2.05 NS
Frequency of drug use	None	RG		RG	
	<Monthly	0.25 NS	RG	0.46 NS	RG
	≥Monthly	0.28*	1.26 NS	0.44 NS	7.08***
Number of drugs used	None	RG		RG	
	1	5.28*	RG	1.60 NS	RG
	2	5.51*	1.27 NS	1.65 NS	1.63 NS
	>2	3.98**	12.61***	3.28 NS	6.03***
Industry ^c	Low-risk industries education	RG	RG	RG	RG
	Hospitality	3.45***	0.76 NS	2.27**	2.71*
	Construction	1.75**	0.56 NS	0.95 NS	1.57 NS
	Financial services	2.21***	1.01 NS	1.73**	0.46*
	Transport	0.53 NS	1.86 NS	1.44 NS	0.78 NS
	Other services	1.85**	0.78 NS	1.50 NS	0.76 NS
Occupation	Professional	2.18**	RG	RG	RG
	Manager	1.61*	8.80 NS	1.23 NS	0.96 NS
	Tradesperson	1.50 NS	7.93**	1.06 NS	1.03 NS
	Skilled worker	1.42 NS	3.54 NS	1.22 NS	1.16 NS
	Unskilled worker	RG	7.54*	1.04 NS	1.21 NS

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$. RG: reference group. ^aAge was measured as a continuous variable. The odds ratio for age indicates the change in odds with each unit (year) increase in age. ^bMarital status: married = married/*de facto* relationship; ever married = divorced/widowed/separated; single = never married. ^cThe hospitality, construction, financial services, transport and other services industries have overall alcohol and drug prevalence rates that are 25% or more above the mean prevalence rates for low-risk industries. NS: not significant.

change rooms. In 2006–07, there were 295 Australian work-place fatalities [27]. Of these, 31.5% ($n = 93$) were the result of a car accident while travelling to or from work. Thus, this broader concept of drinking *in* the work-place was incorporated within the NDSHS measure of drinking *at* work. Appreciating the important distinction between work-force alcohol and drug use (i.e. workers' overall patterns of use) and work-place use is crucial.

The most commonly used drugs in the work-place were cannabis, ecstasy, painkillers/analgesics and meth/amphetamines, with larger proportions of workers using painkillers/analgesics and meth/amphetamines at work compared to cannabis and ecstasy. This pattern does not correspond with general community data which indicate that cannabis and ecstasy are the illicit drugs used by the largest proportions of Australians [20]. The heavier work-place use of painkillers and stimulants suggests that factors within the work-place (e.g. drug testing, long hours, physical strain) influence the types of drugs workers use at work. If this is the case, these findings have two important implications. First, policy and practice responses that focus on individual workers may only have a limited effect. Secondly, such drug use patterns may be amenable to change through work-place policy and structural reform.

Worker differences

Patterns of use were associated with the demographic profile of workers. In general, workers who were younger, male, never married, frequent drinkers and had no dependent children were more likely to drink at work or attend work under the influence of alcohol than other workers. Similarly, workers who were more likely to use drugs at work or attend work under the influence of drugs were younger, male, and used more than two types of drugs (i.e. polydrug use).

Work-place differences

An important finding of this study was the highly differentiated pattern of use by industry groups. In particular, hospitality industry workers were identified as a high-risk group for alcohol and drug use at work and attending work under the influence of alcohol or drugs. Compared to workers employed in low risk industries, hospitality industry workers were 3.5 times more likely to drink alcohol and two to three times more likely to use drugs at work or attend work under the influence of alcohol or drugs. This finding is consistent with previous Australian research that found hospitality industry workers were significantly more likely to be regular risky drinkers [5], and US research that has identified a larger proportion of accommodation and food industry workers use illicit drugs and are heavy alcohol users compared to other

industries [4]. Such findings have led to recent intervention programmes for these specific workers [28].

After hospitality industry workers, financial services industry workers had the highest prevalence of alcohol use at work and attending work under the influence of alcohol. While there may be a level of tolerance for alcohol use at work within hospitality industry settings (e.g. bars, pubs, night clubs, restaurants), the high prevalence of use among financial services industry workers is particularly concerning. Other work-force industry at-risk groups included workers employed in construction and service industries. This finding also reflects US [4] and Canadian [29] research that identifies construction workers as a high-risk group for heavy alcohol use in general.

Among occupational groups, managers and professionals were high prevalence groups for alcohol use at work. Again, this finding corresponds with US research that identifies workers in managerial occupations as a high-risk group for problem drinking [30]. This counter-intuitive finding has important implications for work-place cultural norms and role modelling in relation to alcohol. Conversely, tradespersons and unskilled workers stood out as high-risk groups for drug use at work.

Together, these findings provide scope to establish profiles of at-risk workers and work-force groups that can be used to inform the development and implementation of targeted interventions.

Implications for policy and practice

The findings presented here have important implications for work-place alcohol- and drug-related policy and practice. First, drinking at work and attending work under the influence of alcohol was relatively high compared to work-place drug use and attending work under the influence of drugs. This finding stands in stark contrast to the growth of work-place drug testing which targets illicit drugs and the virtual neglect of alcohol use as a work-place hazard.

Discrepancies in the proportions of workers using at work and attending work under the influence have important implications for work-place policies and practice. In the case of drugs, only half those who used at work also reported attending work under the influence. It appears that a substantial proportion of workers may underestimate the extent to which their drug use at work may negatively affect work-place safety. In the case of alcohol, only 17% of workers who used alcohol at work also reported that they had attended work under the influence of alcohol. Only a small proportion of workers who drink at work acknowledged that this can result in intoxication at work. It may be that they usually drink only one or two drinks at work and believe that such low levels of drinking have no negative work-place conse-

quences or it may be due to an underestimation of the intoxicating effects of alcohol. Alternatively, it may be that most of these workers drink alcohol at work (e.g. in the car park, lunch room or locker room), but as this drinking occurs after work ceases they may not consider it drinking *at* work. Either way, the substantial discrepancy between the proportion of workers who drink or use drugs at work and the proportion of workers who appear not to associate this with potential impairment has implications for strategies designed to reduce alcohol- and drug-related harm in the work-place.

Future research

While different groups have been shown to have significantly different work-place alcohol and drug use patterns, little is known about the contribution of work-place factors to these patterns, or work-place safety and productivity [1,6,31]. Theoretical explanations of the relationship between the work-place and alcohol or drug use have focused on the role of work-place controls, work stress and alienation, availability of substances in the work-place and the work-place culture [31–35]. There has been some research applying these theoretical explanations to an examination of workers' alcohol and drug use (e.g. [36–38]). However, this research is scarce, limited to alcohol and examines relatively small samples in particular industry/occupation groups. Availability of alcohol and drugs, work conditions and promotion of alcohol (and drug) consumption in hospitality work-place settings, as found here, may explain high prevalence rates within that industry. However, potential work-related predictors such as work-place availability, work-place culture, working conditions and control factors were not measured. Further research is needed to examine these issues more closely.

In addition, little is known about the extent to which workers' overall alcohol and drug consumption patterns affect work-place safety and productivity. Australian work-place injury research indicates alcohol contributes to around 5% of all work-place fatalities [39,40]. However, this research is dated, focused on alcohol only and could not verify blood alcohol levels in a large proportion of cases. No studies have examined the national prevalence of drug-related fatal or non-fatal work-place injuries. In relation to absenteeism, some research [2,41–43] has used nationally representative samples to examine the extent of alcohol-related absenteeism, but there appears to be no studies that have examined the extent of drug-related absenteeism.

Methodological issues

The response rate for this sample was relatively low (54%). However, the multi-stage stratified sampling

methodology utilised is likely to ensure households that received the survey were representative of all Australian households. Moreover, a weight based on the sampling methodology was applied to ensure that data were representative of the national population. Despite this, the implications of a low response rate are widely acknowledged [44]. Heavier alcohol or drug users may have been disinclined to participate. Non-participation may be associated with variables of interest, resulting in non-response bias [45] and an underestimation of work-place alcohol or drug consumption and attending work under the influence. Non-response may also reflect the sensitive nature of the questions asked and reluctance to admit using drugs or being under the influence at work. However, self-reports of drug use have been shown to demonstrate reasonable reliability and validity when compared with biomarkers and collateral interviews [46]. In addition, while the low response rate may have affected absolute prevalence rates reported, it is unlikely to have affected the observed differential patterns of use and intoxication across work-force groups.

CONCLUSION

Alcohol use at work is widespread, in contrast to the relatively low prevalence of drug use. Patterns of work-place drug use also vary greatly from overall community and work-force patterns of use, suggesting the importance of the need to address work-place cultural and contextual factors. Together, these findings provide a useful basis for the development of improved and refined work-place research and interventions.

Declarations of interest

None.

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