



Have decreases in young workers' risky drinking resulted in an increase in illicit drug use?

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Abstract

Issues addressed: Recent reductions in young people's risky alcohol use have been widely documented but have not been examined among employed youth. Young workers' risky drinking may have corresponded with increased illicit drug use. This study investigated these issues.

Methods: Secondary analyses were conducted for 15-24 year old Australian workers using nationally representative data from 2007 to 2016. Frequency analyses examined alcohol and illicit drug use, Z scores assessed differences over time, and logistic regression examined predictors of illicit drug use.

Results: Risky drinking decreased significantly over time whilst low-risk drinking increased. This pattern was observed for both young workers and young employed illicit drug users. Whilst "any" illicit drug use did not change over time, methamphetamine use decreased, and cannabis and hallucinogen use increased. Drinking alcohol at risky levels (monthly) was associated with illicit drug use in 2016, as were being single and having high/very high levels of psychological distress.

Conclusions: Risky drinking reductions over time have not corresponded with increased illicit drug use. Nonetheless, as risky drinking remains high among young workers, and is strongly associated with illicit drug use, it warrants concerted health promotion efforts that may also help minimise illicit drug use.

So what?: Despite a reduction in young workers' risky alcohol consumption, risky drinking is still high and may impact the health and safety of workers and the wider community. As risky drinking is strongly associated with illicit drug use, workplaces could potentially play a vital role in combating alcohol and illicit drug misuse.

KEYWORDS

alcohol consumption, health behaviours, illicit drug use, workplaces

1 | INTRODUCTION

Reductions in youth alcohol consumption have been the subject of increasing interest over the past decade. A wide range of studies have documented increased rates of lifetime abstinence among young people, with concomitant decreases in age of uptake, episodic drinking and heavy drinking (although findings

regarding the latter have been equivocal).¹⁻⁶ These patterns have been observed relatively consistently across many sub-populations of youth (eg, by age, gender, ethnicity, sexual orientation, socio-economic status)⁷⁻¹¹ and in a variety of regions (eg, Europe, Australasia, North America, Scandinavia). Given the historically high rates of alcohol use among young people, and the associated severe health and social consequences,¹² these changing patterns

of consumption have important implications for public health and health promotion.

However, to date there has been insufficient investigation into the drinking patterns of young workers. It is currently unclear whether the declines in alcohol consumption observed in the general population of young people are also apparent among employed youth. This is an important omission. It is well-established that workplace culture and working conditions can shape employees' health behaviours, including alcohol consumption.¹³⁻¹⁸ Young workers may be particularly vulnerable to workplace influences regarding risky drinking due to the physical, psychological and social characteristics of adolescence and young adulthood (eg, increased boundary testing and risk taking, greater susceptibility to social influence processes in the workplace, poorer stress management and problem-solving capabilities¹⁹). While previously many of these traits and vulnerabilities were considered the exclusive purview of teenagers, delayed timing of role transitions (eg, completion of education, marriage, parenthood) in contemporary society²⁰ and neurobiological research on the timing of brain development²¹ suggest that the transition period from childhood to adulthood may extend throughout the twenties. Hence, adolescents and young adults may be at high risk of adopting problematic drinking patterns for at least a decade or more after joining the workforce.

A parallel issue warranting investigation is the prevalence of illicit drug use among young people. A number of researchers have explored potential *displacement effects*, whereby a decrease in risky alcohol consumption may be offset by increases in drug use. However, studies to date have found inconsistent results. For example, although increases in cannabis use (the most commonly used illicit drug) have been recorded among young people in some countries,^{9,22} decreases have been found in several others.^{1,11,22-24} Again, due to the unique nature of employees' characteristics and the conditions to which they are exposed, these issues require further exploration among young workers.

Given the considerable personal and business costs associated with employee substance use,^{25,26} the development of workplace strategies to prevent, identify and manage problematic use and promote healthy worker behaviours are an imperative. Accurate and up-to-date data regarding the patterns and predictors of substance use among young employees is vital to inform such efforts by managers and supervisors, occupational health staff and other professionals.

Therefore, using nationally representative Australian data, this study sought to examine patterns of alcohol and illicit drug use among employed young people via the following research questions:

1. Has the proportion of young workers who drink at risky levels and who use illicit drugs changed over time?
2. Are declines in alcohol consumption among young workers offset by concomitant increases in illicit drug use?
3. What are the predictors of illicit drug use among employed young people in 2016?

2 | MATERIALS AND METHODS

Nationally representative data from 2007 and 2016 were subjected to secondary analyses to identify the patterns of risky alcohol and illicit drug use among young Australian workers, and to explore predictors of illicit drug use.

2.1 | Data source

Data were obtained from the National Drug Strategy Household Survey (NDSHS): a national Australian survey conducted every three years which examines awareness, attitudes and behaviour concerning alcohol, tobacco and illicit drugs. The NDSHS uses a multi-stage stratified sampling technique and weights data to be representative of the total Australian population. Response rates were 54% in 2007 and 51% in 2016, with associated sampling limitations noted. Full data and sampling procedures are available elsewhere.^{27,28}

Data from all participants who were aged 15-24 years and in paid employment at the time of survey completion constituted the primary sample, corresponding to 1134 individuals in 2007 and 876 individuals in 2016. In recognition of the high rates of alcohol and drug use present among 20-30 year olds,²⁸ and the substantial number of Australians who do not complete formal education until well into their 20s,²⁹ 25 years was chosen as the cut-off in order to capture young people who had recently entered the workforce and may be at risk of problematic alcohol or other drug use. For comparison purposes, select analyses were additionally run on all 15-24 year olds in the NDSHS (2007: n = 2666; 2016: n = 2282).

2.2 | Measures

2.2.1 | Demographic characteristics

Demographic characteristics of interest were sex (female vs male), remoteness (metropolitan (major city) vs nonmetropolitan (inner regional/outer regional/rural/remote)), marital status (married/de factor vs unmarried), any dependent children (yes vs no), socio-economic status (low (1st-2nd quintiles) vs high (3rd-5th quintiles)), and psychological distress (low/moderate (score = 15-21) vs high/very high (score = 22-50)).^{30,31}

All variables for 2007 and 2016 were classified and coded utilising the same methodology to ensure comparability, with the exception of remoteness which used different classifications (2007: Australian Standard Geographical Classification;³² 2016: Australian Statistical Geography Standard³³) to account for changes in population size and infrastructure over time.³⁴

2.2.2 | Alcohol and drug use

For consistency with Australia's Alcohol Guidelines³⁵ (the current version at the time of writing), data from both waves were coded

into three mutually exclusive monthly alcohol use categories: (a) abstainers (including ex-drinkers), (b) low-risk drinkers (those who consume four or less standard drinks on a single occasion at least once per month), and (c) risky drinkers (those who consume five or more standard drinks on a single occasion at least once per month).

Respondents who had used at least one of 13 drugs (cannabis, ecstasy, amphetamines, cocaine, hallucinogens, inhalants, heroin, ketamine, gamma-hydroxybutyrate (GHB), tranquillisers, steroids, methadone, injecting drugs) for nonmedical purposes in the past 12 months were coded into the category "used any drug". Those who had not used any of the 13 drugs in the past 12 months were coded into the category "did not use any drug". This dichotomous variable was labelled "any drug use in the past year". In addition to this variable, separate analyses were conducted on the most common individual drugs used in the past 12 months in 2007 and 2016 (cannabis, cocaine, hallucinogens, ecstasy) and methamphetamine (due to its political relevance in Australia). Painkillers and opioids were excluded from the analysis as these were not consistently defined across the two survey waves: For instance, misuse of paracetamol was included in 2007 but excluded in 2016.

2.3 | Analyses

Data were analysed using SPSS version 25. Using weighted data, frequency analyses explored the distribution of demographic characteristics, alcohol consumption and drug use in the 2007 and 2016 samples.

Z scores were calculated (using unweighted population counts) to assess significant changes over time. Binary logistic regression explored the predictors of drug use in 2016 (unweighted data).

3 | RESULTS

3.1 | Sample characteristics

In both 2007 and 2016, the majority of young workers lived in metropolitan areas, were unmarried, had no dependent children, were of high SES and had low/moderate levels of psychological distress. The sample was primarily male in 2007 but evenly split between males and females in 2016. Relative to the 2007 young workforce, in 2016 there were significantly more female, unmarried, low SES and high psychologically distressed young workers; ($P < .01$) whilst the high proportion of metropolitan workers and workers with no dependent children remained unchanged over time.

The total population of young Australians showed similar trends to the young working population over time, with the exception that there was no decrease in the proportion of males in the young general population (Table 1).

In 2007, young workers who had used an illicit drug in the past 12 months were more likely to be male, metropolitan based, unmarried, with no dependent children, have high SES and low/moderate psychological distress. In 2016, the profile for young workers who used illicit drugs was statistically similar to 2007, with the exception

TABLE 1 Demographic profile of young^a people, young^a workers and young^a workers who use illicit drugs^b, 2007 versus 2016

Demographic	Young people				Young workers				Young workers who use illicit drugs ^b			
	2007	2016	Significance testing		2007	2016	Significance testing		2007	2016	Significance testing	
	%	%	Z	P	%	%	Z	P	%	%	Z	P
Sample size ^c	n = 2,666	n = 2,282	na	na	n = 1,134	n = 876	na	na	n = 307	n = 287	na	na
Male	51.5	53.5	-1.40	.16	57.5	50.5	3.12	<.01	62.9	51.4	2.83	<.01
Metropolitan	71.7	73.3	-1.26	.21	69.5	70.0	-0.24	.81	72.9	75.7	-0.78	.44
Unmarried	88.2	93.8	-6.70	<.01	84.0	91.6	-5.05	<.01	86.3	94.5	-3.35	<.01
No dependent children	90.7	90.0	0.81	.42	92.2	92.6	-0.33	.74	94.5	94.1	0.21	.83
Low SES ^d	33.6	41.3	-5.58	<.01	34.1	41.9	-3.58	<.01	28.6	34.8	-1.62	.11
Low/moderate psychological distress	85.5	78.9	6.07	<.01	88.7	79.9	5.45	<.01	78.8	74.5	1.24	.21

Abbreviation: SES, socioeconomic status.

^aYoung defined as 15-24 years.

^bAny drug use means use of at least one of the following drugs for nonmedical purposes: cannabis, ecstasy, methamphetamine, cocaine, hallucinogens, inhalants, heroin, ketamine, GHB, tranquilisers, steroids, methadone and/or injectable drugs.

^cThe n's for some demographic items are lower than the total sample size due to item nonresponse.

^dLow: 1st or 2nd quintile.

Source: Australian Institute of Health and Welfare (2008). National Drug Strategy Household Survey 2007: Confidentialised unit record file. Canberra: Available from the Australian Data Archive. Australian Institute of Health and Welfare (2017). National Drug Strategy Household Survey 2016: Confidentialised unit record file. Canberra: Available from the Australian Data Archive.

of a significant increase in the proportion of unmarried workers and a significant decrease in the proportion of male workers (Table 1).

3.2 | Alcohol and illicit drug use

In 2007, 61.0% of young workers drank alcohol at risky levels at least monthly; this decreased significantly to 47.0% in 2016 ($P < .01$). Correspondingly, there were significant increases in low-risk drinking (2007:29.9% vs 2016:39.5%, $P < .01$) and abstinence (2007:9.2% vs 2016:13.5%, $P < .01$). In contrast, although the general population of 15-24 year olds showed similar reductions in monthly risky drinking and increases in abstaining from alcohol between 2007 and 2016, the proportion of monthly low-risk drinkers remained unchanged (Table 2).

The use of any illicit drug in the past year by young workers did not change significantly between 2007 and 2016. By contrast, significant increases were seen between 2007 and 2016 in the use of cannabis (22.0% vs 26.7%, $P = .01$) and hallucinogens (2.6% vs 4.3%, $P = .04$), while a significant decrease was found for methamphetamine (5.3% vs 2.3%, $P < .01$). There was no change over time in the proportion of young workers using cocaine or ecstasy.

For the total population of young Australians, largely similar patterns but with slight variations were found. That is, there was no

change over time for any illicit drug use, including cannabis, hallucinogens or cocaine and use of methamphetamine and ecstasy decreased (Table 2).

3.3 | Illicit drug use by monthly alcohol use

Although the use of "any" illicit drugs did not increase significantly between 2007 and 2016 for all workers (Table 2), illicit drug use increased among young workers who drank alcohol at least monthly at low risk (9.2% vs 17.6%, $P < .01$) and risky levels (38.2% vs 47.2%, $P < .01$) (Table 3). Although young employed workers were more likely to be risky drinkers in both 2007 and 2016, the increase in illicit drug use over time was greater among low-risk drinkers (91% increase) than risky drinkers (24% increase).

Similar to the pattern observed among young workers overall regarding their use of alcohol (Table 2), employed young illicit drug users also showed significant reductions in risky drinking (2007:88.7%, 2016:74.2%, $P < .01$) and increases in low-risk drinking (2007:10.4%, 2016:23.0%, $P < .01$) over time (Table 3). In both 2007 and 2016, young employed illicit drug users were more likely to drink alcohol at risky levels, however the ratio of low risk to risky monthly drinkers among illicit drug users decreased from 1:9 in 2007 to 1:3 in 2016.

Drug use	Young people				Young workers			
	2007	2016	Significance testing		2007	2016	Significance testing	
	%	%	Z	P	%	%	Z	P
Alcohol (monthly)								
Abstainers	18.6	31.7	-10.54	<.01	9.2	13.5	-3.03	<.01
Low risk	34.4	34.9	-0.36	.72	29.9	39.5	-4.47	<.01
Risky	47.0	33.4	9.59	<.01	61.0	47.0	6.21	<.01
Drug (past year)								
Cannabis	18.3	19.5	-1.07	.28	22.0	26.7	-2.44	.01
Ecstasy	8.7	6.3	3.16	<.01	11.1	9.9	0.87	.38
Methamphetamine	4.2	1.9	4.59	<.01	5.3	2.3	3.40	<.01
Cocaine	3.4	3.8	-0.75	.45	4.9	6.7	-1.73	.08
Hallucinogens	1.9	2.7	-1.87	.06	2.6	4.3	-2.10	.04
Any ^b	22.1	22.3	-0.17	.87	26.3	29.8	-1.73	.08

TABLE 2 Alcohol and illicit drug use patterns of young^a people and young^a workers in 2007 and 2016

Note: Percentages may not tally to 100% due to rounding.

^aYoung defined as 15-24 years old.

^bAny drug use means use of at least one of the following drugs for nonmedical purposes: cannabis, ecstasy, methamphetamine, cocaine, hallucinogens, inhalants, heroin, ketamine, GHB, tranquilisers, steroids, methadone and/or injectable drugs.

Source: Australian Institute of Health and Welfare (2008). National Drug Strategy Household Survey 2007: Confidentialised unit record file. Canberra: Available from the Australian Data Archive. Australian Institute of Health and Welfare (2017). National Drug Strategy Household Survey 2016: Confidentialised unit record file. Canberra: Available from the Australian Data Archive.

TABLE 3 Young^a workers use of illicit drugs^b by monthly alcohol use status

Alcohol use (monthly)	All				Illicit drug users			
	Used an illicit drug: % yes		Significance testing				Significance testing	
	2007	2016	Z	P	2007	2016	Z	P
Abstainer	2.6 ^c	6.1	-1.15	.25	0.9 ^c	2.7	-1.66	.10
Low risk	9.2	17.6	-3.26	<.01	10.4	23.0	-4.12	<.01
Risky	38.2	47.2	-2.92	<.01	88.7	74.2	4.55	<.01

^aYoung defined as 15-24 years.

^bUsed at least one of the following drugs in the past year for nonmedical purposes: cannabis, ecstasy, methamphetamine, cocaine, hallucinogens, inhalants, heroin, ketamine, GHB, tranquilisers, steroids, methadone and/or injectable drugs.

^cEstimate has a relative standard error between 25%-50% and should be used with caution.

Source: Australian Institute of Health and Welfare (2008). National Drug Strategy Household Survey 2007: Confidentialised unit record file. Canberra: Available from the Australian Data Archive. Australian Institute of Health and Welfare (2017). National Drug Strategy Household Survey 2016: Confidentialised unit record file. Canberra: Available from the Australian Data Archive.

3.4 | Associations with illicit drug use

A binary logistic regression was performed to assess the relationship between demographic characteristics and illicit drug use in 2016 among young workers. The overall model was significant at $P < .01$ ($\chi^2(7) = 99.31$), indicating that the model was able to distinguish between respondents who did and did not use any illicit drugs in the past year.

In 2016, illicit drug use was significantly more likely among participants who used alcohol at risky levels monthly (OR = 4.28, 95%CI: 3.04-6.02); were unmarried (OR = 1.80, 95%CI: 1.02-3.17), and had high or very high levels of psychological distress (OR = 1.70, 95%CI: 1.15-2.50) (Table 4).

4 | DISCUSSION

This study examined whether the decline in risky alcohol use among young Australians was also apparent among employed youth, and whether any observed declines are accompanied by an increase in illicit drug use. As with the wider population, significant reductions in risky alcohol consumption were found among young workers over the period 2007 to 2016 with a concomitant increase in low-risk drinkers. Correspondingly, among young employed illicit drug users there were significantly more low-risk and fewer risky drinkers over time. At the young worker level, these results do not suggest that decreases in alcohol use were offset by increases in illicit drug use, especially as use of illicit drugs overall did not increase during this time period, variations across specific drugs notwithstanding (eg, use of cannabis and hallucinogens increased, while methamphetamine decreased).

Previous research has proposed a number of different explanations to account for the observed decreases in youth alcohol consumption.³⁶ These include stricter parenting behaviours,^{1,4,37}

TABLE 4 Demographic associations with illicit drug^a use by young^b workers, 2016

Variables in the binary logistic regression model	2016			
	P	OR	95% CI	
			Lower	Upper
Sex: male	.62	1.09	0.78	1.51
Remoteness: nonmetropolitan	.13	0.76	0.53	1.09
Marital status: single	.04	1.80	1.02	3.17
Dependent children: yes	.62	1.17	0.62	2.21
SES: high	.16	1.28	0.91	1.81
Psychological distress: high/very high	.01	1.70	1.15	2.50
Alcohol risk (monthly): risky	.00	4.28	3.04	6.02

Note: Reference categories: Female; metropolitan; married or de facto; no dependent children; low SES (1st or 2nd quintile); low/moderate psychological distress; low-risk alcohol use (monthly).

Abbreviation: SES, socioeconomic status.

^a Illicit drug use refers to use in the previous 12 months of at least one of the following drugs for nonmedical purposes: cannabis, ecstasy, methamphetamine, cocaine, hallucinogens, inhalants, heroin, ketamine, GHB, tranquilisers, steroids, methadone and/or injectable drugs.

^bYoung defined as 15-24 years.

Source: Australian Institute of Health and Welfare (2008). National Drug Strategy Household Survey 2007: Confidentialised unit record file. Canberra: Available from the Australian Data Archive. Australian Institute of Health and Welfare (2017). National Drug Strategy Household Survey 2016: Confidentialised unit record file. Canberra: Available from the Australian Data Archive.

changes in alcohol policy and/or public health intervention efforts;^{1,3,11,38-41} an “extended childhood” whereby “adult” behaviours such as alcohol consumption are delayed;⁴² or conversely, an “early adulthood” whereby younger people adopt more responsible behaviours earlier.⁴³ Other explanations include changes to social

norms,^{2,3,10} economic conditions,^{44,45} or leisure activities (ie, internet and social media).^{23,46} Whichever factors are driving change, it would appear that the same or similar drivers are playing out with similar effect among the employed population of young people, rather than being counteracted by workplace cultural influences.

Understanding the factors associated with illicit drug use among young workers is also important. In this study, illicit drug use was found to be associated with risky alcohol use, being single and having high/very high levels of psychological distress. At one level, these findings are unremarkable, as they have been identified previously as risk factors. What is notable here is the concentration of risk-taking behaviours. It is well established that risky behaviour often occurs in clusters. That is, if a young person engages in risky behaviour in one domain they are highly likely to also engage in risk-taking behaviours across a range of other domains. Hence, even though there was an overall decrease in risky drinking among young workers, those young people who continued to drink at risky levels were at elevated risk of using illicit drugs, even though the proportion of illicit drug users who were risky drinkers significantly decreased over time risky drinking per se was still a significant predictor of illicit drug use.

Similarly, the changing prevalence of marital status among young workers is worthy of note. As young people marry at a significantly later age than previously this increases the likelihood that they may participate in a range of risky behaviours. It is also important to note the strong association found between psychological distress and illicit drug use. While, the causal pathways between illicit drug use and psychological distress are unclear it is noted that mental health problems among young are high and increasing.⁴⁷ The latter highlights the scope for health promotion interventions in this area. Recent research demonstrates the successes that can be achieved in workplace interventions, particularly among vulnerable workforce groups.⁴⁸ Effective strategies have also been identified to address barriers to dealing with alcohol and drug issues in the workplace such as concerns over confidentiality breaches or negative repercussions from employers.⁴⁹

4.1 | Implications for health promotion

While results of this study are encouraging in terms of the reductions in risky drinking observed among young workers, there remains cause for concern. Rates of risky consumption continue to be high in this cohort, with potential negative consequences for workers' health, safety and wellbeing,^{14,50,51} as well as for workplace productivity.^{25,52,53} Also of concern is the finding that illicit drug use is strongly predicted by risky alcohol use, suggesting concurrent use.

Present results indicate that broader social norms and cultural expectations may partially underlie the observed reductions in risky drinking. These findings should encourage organisations to implement complementary in-house policies and procedures to bolster broader efforts to prevent, identify and address problematic substance use. The workplace holds considerable scope as a prevention

and intervention site for young employees who use alcohol or drugs problematically. Strategies implemented within the workplace have potential to promote healthier behaviours, as well as to identify and manage problematic use. Despite this, the workplace is often overlooked and/or under-utilised as an intervention site.⁵⁴

4.2 | Limitations

The usual limitations associated with self-reported alcohol consumption apply to the data source for this study. Small cell sizes precluded more detailed sub-group analyses from being undertaken; they also resulted in limited statistical power and potentially increased the risk of Type II error. The 14-25 year old age group is notoriously hard to recruit in national surveys and thus are underrepresented in the NDSHS. Although weighting methods were utilised, caution is nonetheless required in the interpretation of results. Furthermore, the use of a cross sectional survey at two time points limits the ability to more effectively assess whether those who decreased their risky drinking chose to commence using illicit drugs. Longitudinal cohort research is thus vitally important to more thoroughly explore this issue. Future research with a larger sample of employed youth is also warranted for more in-depth analyses.

4.3 | Conclusions

Overall, significant decreases in risky alcohol use were found for young workers aged 15-24 years, corresponding with wider population trends. However, levels of risky drinking remained concerningly high. Encouragingly, this study found little evidence of reductions in risky alcohol use being offset by increases in illicit drug use by this population. Nonetheless, risky drinking was strongly associated with illicit drug use which in turn was also associated with psychological distress. Combined, these findings provide useful guidance for potential workplace health promotion interventions among young workers.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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