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Which Australian Secondary School Students Are at Risk of Illicit Drug Use?

Running title: Australian students' illicit drug use

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Abstract

Introduction and aims: Over recent years, numerous school-based preventive strategies have been explored as possible options to address illicit drug use by young people. However, there is scope to extend current knowledge of which school students are most at risk of illicit drug-related harm. To investigate potential differential risk, the prevalence and patterns of illicit drug use of Australian secondary school students were examined according to demographic, school, economic, and licit drug use factors. **Design and methods:** Analyses were conducted on the 2005 Australian Secondary Students' Alcohol and Drug (ASSAD) survey. A total of 21,805 secondary school students aged 12-17 from 376 schools completed the pencil and paper classroom questionnaire.

Results: The greatest risk factors for students using illicit drugs were tobacco and alcohol use. Students with self-rated below average academic achievement, with more than \$20 a week of disposable income, and who were Indigenous were more likely to report illicit drug use.

Discussion and conclusions: While causal pathways could not be examined in the current data, and these relationships are likely to be complex and multi-directional, the findings indicate potentially at-risk populations who warrant extra support to address illicit drug-related harm.

Key words: Illicit drugs, schools, students, risk factors, questionnaires

Introduction

Illicit drug use costs the Australian community \$8.2 billion annually [1]. Targeting young people, largely through schools, is one popular strategy for reducing drug use in the general population. However, limited data is available on markers of risk and at risk subpopulations of school students.

Detailed information is available from international studies of young people's drug use, such as the Monitoring the Future study in the US [2]. However, these studies are not immediately generalisable to Australia. For example, Toumbourou and colleagues have found differences in patterns of drug use between US and Australian young people, with greater licit drug use and less illicit drug use in Australia compared to the US [3].

Research conducted on the Australian general population indicates that illicit drug use is associated with a range of risk and protective factors [4], with those exposed to multiple risk factors at greatest risk [4, 5]. Established risk factors that may apply to school students include social disadvantage, academic failure, lack of commitment to school, delinquency, parent-adolescent conflict, parental illicit drug use, mental health problems, and alcohol and tobacco use [4, 6, 7]. Data also indicates that illicit drug use is higher amongst males [8] and Indigenous students [9]. Protective factors include being born outside of Australia, degree of family attachment, and religious involvement [4, 10].

The most comprehensive and representative available data on Australian school students' illicit drug use is the Australian Secondary Students' Alcohol and Drug (ASSAD) survey [11]. The current study involves a secondary analysis of the 2005 ASSAD survey that

examined demographic, school, economic, and licit drug use factors that may predict illicit drug use. The aim was to identify at risk populations and potential risk factors for illicit drug use that may be amenable to interventions. While some of these variables have already been highlighted in the literature summarised above, the current analyses consider the unique contribution each of these variables may make to the prediction of illicit drug use, and allow more complex examination of patterns of drug use according to these variables than has previously been available.

Methods

Participants and Procedures

Data is from a 2005 cross-sectional survey of a representative sample of Australian secondary students. A stratified two-stage probability sampling methodology was used, with schools the first stage of sampling and students within schools the second stage. Schools were randomly sampled from each state and territory to ensure proportional representation from the three main education sectors (Government, Catholic, Independent).

Principals were requested to give permission to conduct the survey in their school. If a school declined study participation, the school nearest to them within the same education sector was approached. In total, 599 secondary schools were approached and 376 (63%) agreed to participate. A total of 22,694 students gave informed consent and were surveyed. Data reported here are based on 21,805 usable responses. A response rate for students was not calculable as data on the number of students present and able to participate could not be collected.

Students were randomly selected from the school roll by a researcher. The researchers then attended the school to administer the pencil and paper questionnaire. Anonymity and confidentiality was stressed during administration of the survey. Several strategies were used to enhance perceptions of confidentiality including: use of external research staff, administering the survey under test conditions, training research staff to only look at students' questionnaires when they asked a question, and providing blank envelopes for completed surveys. Because of individual school policy, 45% of students completed the questionnaire in the presence of teachers. When a teacher was present they remained seated at either the front or back of the room (analyses indicated that presence of a teacher was not related to the key illicit drug use outcome variable and did not alter the results of the logistic regression analysis presented here). As the national study was co-ordinated by the Cancer Council Victoria, the Human Research Ethics Committee of the Cancer Council Victoria approved the study.

Measures

Illicit drugs. Students indicated if they had used each of the illicit drugs in the past year ("illicit drugs" is meant as including tranquillisers, even though some are available via prescription. The exact wording for tranquillisers was "sleeping tablets, tranquillisers or sedatives, such as Valium, Serepax or Rohypnol (rohies, barbs) other than for medical reasons"). Students choose a response from "none", "once or twice", "three to five times", "six to nine times", "10-19 times", "20-39 times" and "40 or more times." For opioids and tranquillisers students were asked to report on non-medical use. Medicinal use, particularly for opioids, is likely to be low in this population.

Licit drugs. Students indicated if they had used tobacco or alcohol in their lifetime (never, once or twice, less than 10 cigarettes/alcoholic drinks, more than 10 cigarettes/alcoholic drinks and more 100 cigarettes), in the past year (yes or no), in the past 4 weeks (yes or no), and the number of cigarettes/alcoholic drinks consumed on each of the seven days preceding the survey. Students smoking any cigarettes in the past 7 days were termed current smokers while those consuming alcohol in this period are referred to as current drinkers. Male students consuming 7 or more drinks on any day in the preceding week and females consuming 5 or more on any day were defined as risky drinkers, as per the NHMRC Australian Alcohol Guidelines [12] at the time of the study for drinking at levels of risk for short-term harm.

Demographic and background variables. Students reported their age, gender, Indigenous status (non-Indigenous, Aboriginal, Torres Strait Islander, both Aboriginal and Torres Strait Islander – for statistical reasons, these last three categories were collapsed into ‘Indigenous’), self-rated academic performance (above average, average, below average), whether English was the main language spoken at home (yes, no), and amount of weekly pocket money they had to spend on themselves (\$0-\$20; \$21-\$60; \$61 and over). Students also reported their residential postcode from which their Index of Relative Socio-Economic Disadvantage (IRSD) [13], was derived. The distribution of IRSD scores was examined and quartiles determined.

Analyses

The statistical package STATA [14] was used for data analysis. Sample weights accounting for state, school type, age and gender were used to bring the achieved sample into line with the population distribution.

Cross-tabulations were used to examine the association between illicit drug use and demographic and licit drug use variables. Multivariate logistic regression was used to examine association of use of any substance in the past year (yes/no) and the demographic and licit drug use factors. Analyses adjusted for clustering of student data within schools. For all analyses design-based statistics and associated p-values are reported.

Results

The prevalence of illicit drug use among the students surveyed is shown in Table 1 below. Cannabis, inhalants, and tranquillisers were the most commonly used illicit drugs. All drugs showed a trend of increasing prevalence with age, with highest use in this age group typically seen at 16 or 17 years of age, with the exception of inhalants, which decreased in prevalence with age. However, since reported prevalence of lifetime use of inhalants also decreases with age [11], this decrease may be due to a difference in the understanding of ‘inhalants’ with increasing age. More detailed prevalence information is available in the full ASSAD report [11] (<http://bit.ly/aWrDYQ>).

[Insert Table 1 about here]

Demographic factors

Indigenous students had higher rates of use of all drugs (see Table 2). Speaking a language other than English at home was associated with a higher prevalence of inhalants, cocaine, ecstasy, and opiates, but a lower prevalence of cannabis and tranquillisers.

Academic performance

Illicit drug use increased as self-rated academic performance decreased (see Table 2).

Education sector

Use of any drug was higher among Government schools than Catholic or Independent schools, largely due to an increased prevalence of cannabis use in Government schools (see Table 2).

[Insert Table 2 about here]

Economic factors

Prevalence of use of any drug was higher among the most disadvantaged quartile of students compared to the three less disadvantaged quartiles, mainly reflecting the increased prevalence of inhalant use (see Table 3).

[Insert Table 3 about here]

All drugs except inhalants increased as disposable income available to students increased (see Table 3). However, age is likely to be a strong confound: older students are more likely to have more disposable income and are also more likely to use illicit drugs. To separate out the influence of age and disposable income, a logistic regression analysis was run on any drug use in the last year. After controlling for age, gender, and education sector, disposable income remained a significant predictor of drug use, with students receiving \$21-\$60 each week 1.6 times ($p < .001$, 95% CI = 1.5 – 1.8) more likely to have used any drug in the last year than

students who received \$0-\$20. Students receiving more than \$60 per week were 1.9 times ($p < .001$, 95% CI = 1.7 – 2.0) more likely to have used any drug in the last year than students receiving \$0-\$20.

Licit drug use

Tobacco and alcohol use predicted the use of all illicit drugs (see Table 4): the prevalence of use of all drugs was higher for current smokers and current drinkers, and students consuming alcohol at levels for short-term risk.

[Insert Table 4 about here]

Combined analysis

Table 5 shows the results of logistic regression analysis predicting use of any drug in the last year. The greatest predictors of drug use were tobacco and alcohol use (current and risky drinking), and academic performance. Students who smoked were almost six times as likely to have used illicit drugs in the last year, while students who had consumed a drink of alcohol in the last week were almost three times as likely to have used illicit drugs in the last year, and those consuming alcohol at risky levels in the past seven days were nearly twice as likely. Students who rated their academic performance as below average were twice as likely as students who rated their academic performance as above average to use any of the drugs in the last year.

[Insert Table 5 about here]

Discussion

The greatest risk factors for students using illicit drugs are tobacco and alcohol use. Previous research has identified tobacco and alcohol as associated with uptake of illicit drugs [15]. However, there is much debate about the “gateway hypothesis” [15, 16] – that alcohol and tobacco lead to increased illicit drug use, and this study, being cross-sectional, can not provide evidence for or against a causal pathway. However, at the least, tobacco and alcohol use can be viewed as a potential marker for risk of illicit drug use. The confound of the common practice of mixing tobacco with marijuana (reported by 64.8% of recent marijuana users [17]) also needs to be acknowledged as one potential driver of the relationship between tobacco and the use of illicit drugs. While marijuana was the most commonly used illicit drug, it was closely followed by inhalant and tranquilliser use, a pattern of results that differs slightly from other surveys of young people [e.g., 18]. The reason for this difference is not known, but may reflect differences in what substances were covered in the questions across the different surveys, differences in popularity or price of substances or differences in student honesty or accuracy, for example due to teacher presence or other situational factors.

Following tobacco and alcohol use, self-rated below average academic performance, having more than \$20 a week of disposable income, and being Indigenous were associated with greater likelihood of illicit use. Relationships between these factors and illicit drug use are likely to be complex and multi-directional. The relationship between illicit drug use and academic performance is likely to be especially complex; students performing poorly at school may be more likely to have a greater array of risk factors for illicit drug use, and illicit drug use may also contribute to poor academic performance.

The findings for disposable income and socioeconomic disadvantage indicate a complex picture of the influence of economic factors - while living in a more disadvantaged area may increase drug use, having money to spend on illicit drugs facilitates drug use. This suggests that community interventions targeting illicit drug use are better aimed at a diverse range of young people, rather than targeting areas of socioeconomic disadvantage.

The higher rates of illicit drug use among Indigenous students in mainstream schools is consistent with Forero et al.'s [9] earlier New South Wales-specific analysis of ASSAD data. It also accords with Pink and Allbon's [19] finding that Indigenous people may be almost twice as likely as non-Indigenous people to use illicit drugs. This may in part reflect other risk factors, such as socioeconomic disadvantage, and self-rated academic performance. Illicit drug use is also more common among individuals experiencing trauma and loss [20], hence the elevated rates of illicit drug use among Indigenous people may reflect inter-generational trauma caused by colonisation, loss of land and autonomy, the impact of the stolen generation, and high levels of grief and loss. Consequently, tackling drug use among Indigenous people is likely to require holistic approaches, and imposed interventions that contribute to trauma and loss of autonomy risk increasing, rather than decreasing, drug use.

Multivariate analysis indicated students who spoke English at home were more likely to use illicit drugs in the last year compared to students who spoke a language other than English. This matches the findings of the Drug and Alcohol Multicultural Education Centre (DAMEC) non-age specific New South Wales survey [21], which found all of the groups studied (Chinese, Vietnamese, Spanish, Italian, Arabic, and Pasifika) had lower rates of illicit drug use than the NSW average. The DAMEC survey also highlights the variation in drug use patterns across culturally diverse groups, which is important to acknowledge when presenting

pooled findings. Analysis of individual drug types indicated that differences in the prevalence of specific illicit drugs do not follow an easily interpretable pattern.

There were only minor variations in illicit drug use according to education sector. However, research on school tobacco policies indicate that schools can influence students' tobacco use through comprehensive and enforced school policies [22]. Evans-Whipp and colleagues [22] note that little is documented on what constitutes effective school policy concerning illicit drug use.

Limitations

As schools were used as the basis for surveying adolescents, young people not attending secondary schools are excluded. In 2005 the school retention rate to Year 12 was 75% (ABS 2006). As adolescents who do not complete secondary school are more likely to use substances [23], our study is likely to underestimate the prevalence of substance use among this age cohort. The ranges and strengths of the predictor variables (such as socioeconomic status and licit drug use) are also likely to be different for young people not attending school, so the findings may not be directly applicable to this population.

It is possible that students may exaggerate or conceal their use of illicit substances, leading to slightly inflated or deflated estimates. However, previous work has indicated that the vast majority of students answer questionnaires like the one used in this study honestly [24]. The inability to calculate response rates also leaves unclear the extent to which students may have opted not to participate in the survey.

Finally, it is possible that selection bias operated on the schools participating in the survey. Schools with high substance use rates or a strong emphasis on academic performance may have been more likely to refuse participation.

Conclusion

This research points to the association between young people's alcohol and tobacco use and their illicit drug use. Indigenous students and poor academic performers are also at-risk populations who warrant extra support to address illicit drug-related harm. Causal pathways could not be examined in these analyses, and further research is needed to understand which factors are causal and amenable to intervention.

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Table 1

Percent of students using illicit drugs in the last year

Substance	Percent used in the last year						All Students	<i>Note.</i> 'Any drug' refers to use of any of the drugs appear ing in this table.
	12	13	14	15	16	17		
Cannabis	2.9%	6.7%	12.7%	18.8%	24.7%	25.3%	14.2%	
Inhalants	15.7%	15.3%	16.6%	12.5%	8.3%	5.9%	12.9%	
Cocaine	1.0%	1.3%	3.1%	3.1%	2.9%	2.1%	2.2%	
Hallucinogens	1.1%	1.3%	3.0%	3.5%	3.5%	2.9%	2.5%	
Amphetamines	2.0%	2.3%	4.3%	5.6%	6.4%	5.4%	4.2%	
Ecstasy	1.2%	1.3%	3.4%	4.1%	4.9%	5.0%	3.2%	
Tranquillisers	5.6%	8.5%	10.5%	10.0%	10.1%	9.5%	9.0%	
Opiates	1.1%	1.3%	2.5%	2.3%	2.1%	1.0%	1.7%	
Any drug	20.6%	24.5%	29.0%	31.9%	34.9%	33.5%	28.5%	

Table 2

Percentage of students using each drug in the last year according to different demographic characteristics

	N	Cannabis	Inhalants	Cocaine	Hallucinogens	Amphetamines	Ecstasy	Tranquillisers	Opiates	Any drug
Indigenous status										
non-Indigenous	20,712	15.2%	11.8%	2.0%	2.3%	4.2%	3.0%	8.8%	1.5%	28.2%
Indigenous	881	28.2%	19.7%	7.4%	8.5%	11.9%	8.5%	17.3%	7.7%	38.7%
Design based F ($df_1=1, df_2=371$)		100.5***	40.9***	85.5***	107.5***	89.2***	61.3***	58.4***	169.8***	45.6***
Language spoken at home										
English only	18,761	16.3%	11.4%	2.0%	2.5%	4.4%	3.1%	9.4%	1.6%	28.7%
Other language	2,985	12.1%	16.0%	3.3%	2.8%	4.8%	4.2%	7.7%	2.4%	27.8%
Design based F ($df_1=1, df_2=371$)		21.9***	28.9***	18.1***	0.4	0.9	8.1**	9.0**	8.4**	0.8
Self-rated academic performance										
Above average	9,047	11.6%	9.8%	1.8%	2.2%	3.3%	2.6%	7.6%	1.2%	23.2%
Average	11,254	17.2%	13.0%	1.9%	2.3%	4.6%	3.1%	9.4%	1.7%	30.8%
Below average	1,386	31.1%	20.9%	7.0%	7.3%	11.5%	8.8%	18.0%	5.1%	45.8%
Design based F^1		177.5***	63.3***	75.9***	61.3***	92.4***	62.0***	71.7***	56.5***	160.7***
Education sector										
Government	12,941	15.8%	13.6%	2.3%	2.6%	4.5%	3.3%	9.1%	2.1%	29.9%
Catholic	4,968	11.7%	13.1%	1.9%	2.3%	3.5%	3.0%	7.9%	1.3%	26.7%
Independent	3,996	11.7%	10.1%	2.2%	2.3%	4.0%	3.1%	10.0%	1.1%	25.7%
Design based F^2		5.1**	4.6*	0.3	0.3	1.1	0.2	1.9	6.9**	5.3**

Note. 'Any drug' refers to the use of any of the drugs listed in the table.

* $p < .05$, ** $p < .01$, *** $p < .001$.

¹ $df_1 = 1$, df_2 ranged between 712 and 741

² $df_1 = 1$, df_2 ranged between 626 to 746

Table 3

Percentage of students using each drug in the last year according to socioeconomic disadvantage and disposable income

	N	Cannabis	Inhalants	Cocaine	Hallucinogens	Amphetamines	Ecstasy	Tranquillisers	Opiates	Any drug
SES quartiles										
Quartile 1: Most disadvantaged	5,358	15.0%	15.0%	2.0%	2.1%	3.9%	3.0%	9.3%	1.9%	31.2%
Quartile 2	5,187	15.0%	13.2%	2.7%	3.1%	4.7%	3.3%	9.3%	2.1%	29.6%
Quartile 3	5,485	13.3%	11.6%	2.0%	2.4%	4.2%	3.2%	8.7%	1.6%	26.2%
Quartile 4: Least disadvantaged	5,204	13.0%	11.5%	1.9%	2.1%	3.6%	3.0%	8.3%	1.1%	26.5%
Design-based F^1		1.3	4.0**	1.6	2.8*	1.4	0.2	0.8	3.5*	5.9***
Disposable income per week										
\$0-\$20	11,756	8.8%	12.0%	1.2%	1.5%	2.5%	1.4%	6.9%	1.1%	22.6%
\$21-\$60	5,823	21.2%	12.8%	2.7%	3.1%	5.7%	4.3%	11.2%	1.9%	34.0%
\$61+	4,117	27.6%	11.5%	4.2%	5.0%	8.4%	7.0%	12.6%	3.3%	38.4%
Design-based F^2		419.0***	1.7	67.1***	71.1***	123.5***	148.6***	75.2***	43.7***	216.4***

Note. 'Any drug' refers to the use of any of the drugs listed in the table.

* $p < .05$, ** $p < .01$, *** $p < .001$.

¹ $df_1 = 1$, df_2 ranged between 1,004 and 1,092

² $df_1 = 1$, df_2 ranged between 721 to 738

Table 4

Percentage of students using each drug in the last year according to use of tobacco or alcohol

	N	Cannabis	Inhalants	Cocaine	Hallucinogens	Amphetamines	Ecstasy	Tranquillisers	Opiates	Any drug
Tobacco use										
Not smoked in past week	19,670	8.5%	11.7%	1.1%	1.3%	2.2%	1.4%	7.2%	0.9%	23.5%
Current smoker ^a	2,163	69.4%	25.2%	12.6%	14.4%	23.4%	19.7%	25.8%	9.6%	77.1%
Design based <i>F</i> (<i>df</i> ₁ = 1, <i>df</i> ₂ = 371)		2,972.6***	157.7***	580.9***	615.1***	1,188.8***	1,280.2***	491.3***	446.9***	1,605.8***
Alcohol use										
Not consumed alcohol in past week	15,022	5.4%	10.7%	0.7%	0.6%	1.5%	0.7%	5.9%	0.6%	19.4%
Current drinker ^a	6,785	36.2%	18.4%	5.9%	7.2%	10.8%	9.2%	16.6%	4.5%	51.2%
Design based <i>F</i> (<i>df</i> ₁ = 1, <i>df</i> ₂ = 371)		2,241.8***	94.4***	383.4***	365.0***	563.0***	647.5***	354.2***	227.2***	1,379.3***
Risky alcohol use										
Non-drinkers or low risk drinkers	19,697	10.0%	12.5%	1.4%	1.6%	2.8%	1.9%	7.8%	1.2%	24.9%
Risky drinkers	2,108	58.8%	17.6%	10.3%	12.4%	19.0%	16.9%	21.3%	7.5%	67.0%
Design based <i>F</i> (<i>df</i> ₁ = 1, <i>df</i> ₂ = 371)		1,748.6***	18.7***	446.6***	524.8***	671.8***	824.4***	224.4***	218.4***	908.6***

Note. 'Any drug' refers to the use of any of the drugs listed in the table.

*** $p < .001$.

^a current smoker/drinker = had consumed tobacco/alcohol on at least one of preceding seven days.

Table 5

Multivariate logistic regression analysis results for factors predicting use of any illicit drug in the last year¹

Predictor	Odds Ratio	95% CI	p
Indigenous	1.25	1.01 - 1.55	.044
Speaks English at home	1.15	1.02 - 1.30	.023
Smoked in last seven days	5.30	4.58 - 6.14	<.001
Drank in last seven days	2.58	2.34 - 2.85	<.001
Risky drinker ²	1.76	1.51 - 2.04	<.001
Age³			
12 - 13	reference		
14 - 15	1.02	0.90 - 1.10	0.784
16-17	0.82	0.71 - 0.94	0.006
Gender			
Female	reference		
Male	1.12	1.02 - 1.22	.012
Academic ability			
Above average	reference		
Average	1.34	1.21 - 1.48	<.001
Below average	2.04	1.73 - 2.40	<.001
Disposable income			
\$0-\$20	reference		
\$21-60	1.27	1.13 - 1.42	<.001
\$61 +	1.35	1.20 - 1.51	<.001
Education sector			
Government	reference		
Catholic	.89	0.79 - 0.99	.037
Independent ⁴	.99	0.85 - 1.15	.897
Disadvantage quartile			
1 (Most disadvantaged)	reference		
2	.93	0.81 - 1.07	.306
3	.78	0.68 - 0.89	<.001

4 (Least disadvantaged)	.83	0.71 - 0.97	.018
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¹OR's adjusted for all other variables in the table.

²Risky drinking defined as: for males consuming 7 or more drinks on any one day in the previous week and for females consuming 5 or more drinks on any one day in the previous week.

³The relationship between age and drug use appears reversed due to masking effects by alcohol use variables.

⁴While independent schools had a significantly lower rate of drug use than government schools, the odds ratio was not significant. Further logistic regressions indicated that the effect of education sector on drug use is mediated by alcohol and tobacco use in the last week and self-rated academic performance.