

Recent substance use and high levels of psychological distress among secondary school students in New South Wales

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Abstract: In 2002, the NSW Department of Health, in conjunction with The Cancer Council NSW, carried out the NSW School Students Health Behaviours Survey. The methodology and summary descriptive results have been previously described [NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *NSW Public Health Bull* 2004; 15(S-2): 1–86]. In the survey, 18% of NSW secondary school students reported high levels of psychological distress, 30% reported recently using alcohol, 13% reported recently using tobacco, and 9% reported recently using cannabis. With regard to the other illicit drugs, 2.0% reported recently using amphetamines, 1.0% cocaine, 1.4% hallucinogens (LSD, heroin) and 1.9% ecstasy. The survey did not, however, examine associations between substance use and high levels of psychological distress. These associations are described in this article.

In 2002, the NSW Department of Health, in conjunction with The Cancer Council NSW, carried out the NSW School Students Health Behaviours Survey.¹ Previous interstate and overseas studies have identified an association between substance use and psychological distress in adolescents.^{2–5} A cross-sectional survey of Victorian secondary school students found that students reporting high levels of anxiety and depression were almost twice as likely to report using tobacco after controlling for potential confounders including year level, sex, alcohol use and parental tobacco use.⁶ A United Kingdom study of adolescents aged 13–15 years found that both regular tobacco users and regular alcohol users were four times more likely to have a psychiatric disorder. They also found that regular

tobacco users who also used cannabis or cannabis and alcohol were seven and 14 times more likely to have a psychiatric disorder, respectively.⁷ In a recent prospective cohort study, cannabis use was also found to moderately increase the risk of psychotic symptoms in young people but with a much stronger effect in those with evidence of predisposition for psychosis.⁸

However, interpretation and comparison of these various studies are made difficult because of the varying definitions and methods used to assess substance use and mental health problems. The basis for this association, including its causation and strength, is unclear, as is the effect of the possible interaction between the various substances and of confounders such as age and sex.

A recent review of cannabis use concluded that although an association between cannabis use and depression and anxiety existed in adolescents it had not been established whether the relationship was causal.⁹ Several alternative hypotheses have been cited in the literature to explain the associations between substance use and mental health disorders other than a causative one. These include:

- (1) the self-medication theory, which states that drug abuse is driven by attempts to alleviate psychological distress;
- (2) a reciprocal relationship between the two where unhappiness brings about substance use, which in turn results in unhappiness, which may then result in symptoms greater than the sum of their individual effects;
- (3) substance use reflects a ‘willingness to contravene the law’; and
- (4) substance misuse is the result of other confounding features in their lives, which cause psychological distress and substance use.⁹

The school setting provides an opportunity to further examine the association between substance use and high psychological distress across a broad range of adolescents. No recent studies on this association in Australia have been published. This article explores whether there are associations between substance use, either alone or in combination, and high psychological distress in NSW secondary school students aged 12–17 years. It considers the strength of any such associations, and discusses the impli-

cations of any associations for ongoing monitoring, and policy and program development.

Methods

Measures

High psychological distress was based on the student reporting feelings of depression, anxiety, stress, or being in trouble about their behaviour in the last six months, using three questions from the Western Australian Child Health Survey (WACHS),¹⁰ which were based on items adapted from the Achenbach Child Behaviour Checklists and the Mental Health Inventory.^{11–13} Those who had experienced a problem were asked ‘how bad’ it was for them at the time. A student who responded ‘almost more than I can take’ to any of the three problems was considered to have experienced high psychological distress.

Recent substance use included alcohol in the last week, tobacco smoking in the last week, cannabis in the last four weeks, and ‘other illicit drugs’ (including amphetamines, cocaine, LSD, heroin, ecstasy only) in the last four weeks.

Socioeconomic status was determined by allocating students to quintiles based on postcode, ranked from least to most disadvantaged, using the Index of Relative Socio-Economic Disadvantage.¹⁴

Age was dichotomised into two groups (12–15 years and 16–17 years). These age groups correspond approximately to junior and senior secondary school years.

Source of data

The source of data was the NSW School Students Health Behaviours Survey 2002 (HOIST).¹⁵ The survey instrument was a self-administered questionnaire, which had a core questionnaire and two supplementary questionnaires. The recent substance use questions were included in the core questionnaire and the psychological distress questions were included in one of the supplementary questionnaires. This gave a sample of 3506 students who had completed both the recent substance use and psychological distress questions.

Data analysis

The data were analysed using SAS version 8.02.¹⁶ The SURVEYMEANS procedure was used to calculate the estimated prevalence and 95% confidence intervals for all students and for students by age and sex. Cox’s proportional hazard regression model, with time fixed at 1, was used to calculate estimated prevalence rate ratios and their 95% confidence intervals separately for each subgroup using SUDAAN where there were sufficient clusters within the strata and to adjust for socioeconomic status.¹⁷

The analysis was weighted to adjust for differences between the survey sample and the target population of secondary school students caused by stratification and clustering in the

survey design and non-response. The data were analysed, stratifying by school sector (government, Catholic and independent) and level (junior secondary, up to year 10, and senior secondary, years 11 and 12), and clustering by the individual school from which the student came.

Results

Recent substance use

Almost 36% (35.6%) of all students reported using substances recently. Twenty-three percent reported using only one substance (17.4% alcohol, 3.4% tobacco, 1.2% cannabis and 0.7% other illicit drugs) (Table 1).

A significantly higher proportion of students aged 16–17 years used any substances recently (49.1%) compared with 13–15 year olds (30.4%). This age difference was consistent for any tobacco use (24.7% versus 9.6%), drinking any alcohol (38.3% versus 25.3%), and using two or more substances (17.9% versus 7.1%).

There was no significant difference seen in the recent use of any substances according to sex except for a higher proportion of males (11.2%) using any cannabis compared with females (7.4%).

High psychological distress

High psychological distress was reported by 17.5% of secondary school students in the 2002 survey. A significantly higher proportion of females (21.5%; 95% CI: 19.0–24.0%) had high psychological distress compared with males (13.5%; 95% CI: 11.3–15.6%). This difference was present in both substance users and non-users. There was no difference in high psychological distress between the 12–15 years and 16–17 years age groups.

Recent substance use and high psychological distress

Of all students, 8.4% (95% CI: 7.1–9.7%) had both recently used substances and experienced high psychological distress, 27.1% (95% CI: 24.8–29.5%) of all students had recently used substances and not suffered from high psychological distress, while 8.9% (95% CI: 7.1–9.7%) of all students had high psychological distress but had not recently used substances. Just over half of students (55.4%; 95% CI: 52.7–58.1%) had neither recently used substances nor suffered from high psychological distress.

Almost one quarter (23.7%) of students who recently used substances had experienced psychological distress, compared with 13.8% among students who had not recently used substances. Of students with high psychological distress almost half (48.2%; 95% CI: 42.2–54.2%) had used substances recently compared with 33.0% (95% CI: 30.0–36.0%) of students without high psychological distress.

As the proportion of students with high psychological dis-

Table 1. Recent substance use for all students and by age and sex, NSW, 2002

Substance use pattern	Males % (95% CI)	Females % (95% CI)	12–15 years % (95% CI)	16–17 years % (95% CI)	All students % (95% CI)
Any substance	34.9(31.0–38.8)	36.2(33.0–44.0)	30.4(27.5–33.2)	49.1(43.6–54.5)	35.6(32.7–38.4)
Alcohol only	18.5 (16.3–20.8)	16.3 (14.0–18.5)	17.0(15.0–18.1)	19.6(16.1–23.2)	17.4 (15.8–19.0)
Any alcohol	29.8 (27.1–32.5)	28.0 (25.2–30.8)	25.3(22.3–27.8)	38.3(32.3–43.8)	28.9 (26.9–30.8)
Tobacco only	2.2 (1.3–3.1)	4.7 (3.0–6.3)	2.4 (1.6–3.1)	6.3 (3.5–9.0)	3.4 (2.5–4.4)
Any tobacco	12.2 (10.1–14.3)	15.4 (12.9–17.8)	9.6(7.9–11.3)	24.7(19.5–29.8)	13.8 (12.2–15.4)
Cannabis only	1.6 (0.8–2.4)	0.9 (0.4–1.4)	1.0(0.6–1.5)	1.8(0.2–3.4)	1.2 (0.8–1.7)
Any cannabis	11.2 (9.2–13.2)	7.4 (5.8–9.0)	7.8 (6.6–9.2)	13.2(8.5–17.7)	9.3 (8.0–10.6)
Illicit drugs only	0.7 (0.3–1.1)	0.7 (0.2–1.2)	0.9(0.5–1.3)	0.3 (0–0.7)	0.7 (0.4–1.0)
Any other illicit	4.6 (3.4–5.9)	3.1 (1.9–4.2)	3.3(2.5–4.1)	5.3(3.1–7.4)	3.9 (3.0–4.7)
Two substances	4.7(3.6–5.8)	3.4(2.2–4.5)	3.9(2.9–4.8)	4.6(2.4–6.8)	4.1(3.1–5.0)
Three substances	5.1(3.6–6.6)	2.7(1.7–3.7)	2.7(2.0–3.5)	6.9(4.9–9.0)	3.9(3.1–4.7)
All drugs (alcohol, tobacco, illicit drugs and cannabis)	1.0 (0.5–1.5)	1.2 (0.4–2.0)	0.8(0.5–1.2)	1.9(0.1–3.6)	1.1 (0.6–1.6)
More than one substance	9.9(8.2–11.6)	10.3 (8.0–12.5)	7.1 (5.7–8.4)	17.9(13.5–22.3)	10.1(8.4–11.8)
No substances	63.1 (60.2–65.9)	64.4 (61.4–67.4)	68.8(66.0–72.0)	50.7(45.3–56.0)	63.7 (61.7–65.8)

Note: Recent substance use included alcohol in the last week, tobacco smoking in the last week, cannabis in the last four weeks, and 'other illicit drugs' (amphetamines, cocaine, LSD, heroin, ecstasy) in the last four weeks.
 Data source: 2002 New South Wales School Students Health Behaviours Survey (HOIST, Health Outcomes Information and Statistics Toolkit).
 Analysis: NSW Health Survey Program, Centre for Epidemiology and Research, NSW Department of Health.
 CI, confidence interval.

tress who had only used one drug recently (alcohol only, 20%; tobacco only, 21.7%; cannabis only, 22.7%; other illicit drugs only, 32%) was not significantly different from students with any recent use of that substance whether alone or in combination with other substances (any alcohol, 24.1%; any tobacco, 28.2%; any cannabis,

27.5%; any other illicit drugs, 33.6%), comparisons of high psychological stress in users and non-users was completed using 'any' recent use of a substance (Table 2).

Overall, the prevalence of high psychological distress was higher in recent substance users (23.7%) compared with

Table 2. High psychological distress by recent substance use for all students and by age and sex, NSW, 2002

Substance	Males % (95% CI)	Females % (95% CI)	12–15 years % (95% CI)	16–17 years % (95% CI)	All students % (95% CI)
Any substance	17.3 (13.2–21.4)	30.3 (26.4–34.2)	22.7 (19.2–26.1)	25.3 (19.2–31.2)	23.7 (20.6–26.7)
Alcohol only	15.3 (10.3–20.3)	25.5 (19.0–31.9)	19.7(15.3–24.1)	20.8(14.5–27.0)	20.0 (16.0–24.1)
Any alcohol	17.7 (13.7–21.6)	31.0 (26.8–35.2)	23.5 (19.7–27.3)	25.3 (20.8–29.8)	24.1 (21.2–27.1)
Tobacco only	19.9 (1.9–37.9)	22.5 (8.2–36.8)	12.9(3.3–22.4)	30.3(7.0–53.6)	21.7 (10.4–32.9)
Any tobacco	17.7 (13.7–21.6)	31.0 (26.8–35.2)	27.4 (21.6–33.2)	29.0 (20.2–37.8)	28.2 (23.1–33.3)
Cannabis only	16.0 (0.0–41.3)	35.0 (6.0–63.9)	18.4(0.8–36.0)	29.1 (0–84.4)	22.7 (3.1–42.4)
Any cannabis	17.8 (10.2–25.5)	42.1 (32.9–51.3)	28.2 (20.6–35.8)	26.4 (14.7–38.1)	27.5 (20.9–34.1)
Other illicit only	17.2 (0.0–42.2)	47.2 (10.4–83.9)	27.4(4.2–50.6)	32.4(0–74.0)	32.0 (9.9–54.1)
Any other illicit	29.2 (16.7–41.8)	40.3 (24.9–55.8)	34.1 (22.8–45.3)	32.9 (13.4–52.5)	33.6 (23.4–43.9)
Two substances	14.2(6.8–21.6)	37.1(22.7–51.4)	26.0(16.9–35.0)	18.7(4.3–33.2)	23.7(16.1–31.3)
Three substances	24.2(11.0–37.4)	33.2(18.9–47.4)	30.6(20.0–41.3)	24.0(8.2–40.0)	27.3(17.5–37.5)
All four substances	32.3(12.7–52.0)	65.3(46.8–83.8)	50.2(29.0–71.3)	50.7(17.0–84.4)	50.4(32.0–68.8)
More than one substance	23.8 (15.8–31.7)	38.1 (31.1–45.1)	33.3 (25.3–41.4)	28.7(21.5–35.9)	31.0 (26.0–36.2)
No substances	11.2(9.0–13.4)	16.4 (13.4–19.5)	13.2 (10.9–15.5)	13.8 (11.3–20.7)	13.8(12.0–15.7)

Note: Recent substance use included alcohol in the last week, tobacco smoking in the last week, cannabis in the last four weeks, and 'other illicit drugs' (amphetamines, cocaine, LSD, heroin, ecstasy) in the last four weeks.
 Data source: 2002 New South Wales School Students Health Behaviours Survey (HOIST, Health Outcomes Information and Statistics Toolkit).
 Analysis: NSW Health Survey Program, Centre for Epidemiology and Research, NSW Department of Health.
 CI, confidence interval.

Table 3. Prevalence rate ratios for high psychological distress by 'any' recent substance use for all students and by age and sex, NSW, 2002

Substance	Males PRR (95% CI)	Females PRR (95% CI)	12–15 years PRR (95% CI)	16–17 years PRR (95% CI)	All students PRR (95% CI)
Any alcohol	1.5 (1.2–2.0)	1.7(1.4–2.2)	1.7 (1.4–2.1)	1.4 (1.1–1.7)	1.6 (1.4–1.9)
Any other illicit	2.3 (1.5–3.6)	1.9(1.3–2.8)	2.2 (1.6–3.0)	1.6 (1.01–2.8)	2.0(1.5–2.7)
Any cannabis	1.4 (0.9–2.2)	2.1(1.7–2.7)	1.9(1.4–2.5)	1.3(0.9–2.1)	1.7(1.3–2.2)
Any tobacco	1.5 (1.2–2.0)	1.7(1.4–2.2)	1.8 (1.5–2.3)	1.6 (1.2–2.3)	1.8 (1.5–2.2)
Any substance	1.5 (1.2–2.0)	1.8(1.4–2.3)	1.7(1.4–2.1)	1.5(1.01–2.3)	1.7(1.4–2.1)
Any substance adjusted for SES	1.6(1.2–2.1)	1.8 (1.4–2.3)	1.7(1.4–2.1)	1.6 (1.1–2.3)	1.7 (1.4–2.1)
More than one substance	1.7 (1.2–2.4)	2.1(1.7–2.5)	2.1 (1.6–2.7)	1.5 (1.3–1.9)	1.9 (1.6–2.2)

Note: Recent substance use included alcohol in the last week, tobacco smoking in the last week, cannabis in the last four weeks, and 'other illicit drugs' (amphetamines, cocaine, LSD, heroin, ecstasy) in the last four weeks.
Data source: 2002 New South Wales School Students Health Behaviours Survey (HOIST, Health Outcomes Information and Statistics Toolkit).
Analysis: NSW Health Survey Program, Centre for Epidemiology and Research, NSW Department of Health.
PPR, prevalence rate ratio. CI, confidence interval. SES, socioeconomic status.

non-users (14.0%) (PRR 1.7; 95% CI: 1.4–2.1). This was consistent for alcohol (PRR 1.6; 95% CI: 1.4–1.9), tobacco (PRR 1.8; 95% CI: 1.5–2.2), cannabis (PRR 1.7; 95% CI: 1.3–2.2) other illicit drugs (PRR 2.0; 95% CI: 1.5–2.7) and two or more drugs (PRR 1.9; 95% CI: 1.6–2.2) (Table 3).

The association between high psychological distress and recent substance users of any of the four categories of substances was consistent for all students, younger (junior secondary), older (senior secondary), male and female students. The association between high psychological distress and recent use in all students, younger (junior secondary), older (senior secondary), male and female students was also consistent for use of any alcohol, use of any tobacco, use of any other illicit drugs and use of more than one substance. However, there was no association between high psychological distress and cannabis use in males or in students over 16 years. We were unable to examine this association by age and sex due to inadequate numbers of clusters within strata. The association with 'any' recent substance use was not affected when adjusted for socioeconomic status (Table 3).

Discussion

Recent substance use is associated with high psychological distress in NSW secondary school students for all substances. Just over 8% of NSW secondary school students were found to have both engaged in recent substance use and experienced high levels of psychological distress. This subgroup of students appears to constitute a potentially vulnerable minority of students in NSW schools that is at high risk of acute and long-term psychological and health problems.

Students who reported recent substance use were more likely to have high psychological distress than those who did not for all students, both sexes, and most age groups.

The results are consistent with a large number of studies.^{2–9} The strength of the association with high psychological distress found in this study in a school setting was, however, less than that reported for recent substance use in a community sample of teenagers aged 13–15 years with a psychiatric diagnosis based on structured interview.⁷ In contrast, the strengths of the associations between high psychological distress and recent substance use are similar to those found for adults and adolescents in Australia and the United States (odds ratio of about 1.5–2.0).^{18–24}

Although the substances studied have varying pharmacological effects, the strength of association found between high psychological distress and recent substance use did not vary significantly between substances. This suggests a non-pharmacological association and that the effect of recent substance use in this association represents a general type of behaviour rather than one related to the specific properties of a particular drug. Although no dose response curve was able to be determined, taking more than one drug did not make high psychological distress more likely.

As the NSW School Students Health Behaviours Survey is repeated every three years, it provides the opportunity to monitor the effectiveness of school programs by using as indicators the prevalence of recent substance use, high psychological distress, and both high psychological distress and recent substance use among students.

Conclusion

Recent substance use is associated with high psychological distress in NSW secondary school students for all substances. A significant minority of students appear to be at high risk. The lack of variation in the association between substances suggests a non-pharmacological association.

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