Nonmedical drug use among adolescent students: highlights from the 1999 Ontario Student Drug Use Survey

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Abstract

Background: During the 1990s, rates of nonmedical drug use among adolescents escalated. We assessed data from 5 cycles of the Ontario Student Drug Use Survey for overall trends in the proportion of students reporting illegal drug use between 1991 and 1999.

Methods: The survey is a repeated, cross-sectional, 2-stage cluster-design survey of students enrolled in grades 7, 9, 11 and 13. Outcome measures were prevalence of use of 17 drugs, including alcohol and tobacco, over the 12 months preceding the survey.

Results: The rates of drug use increased between 1993 and 1999. The 95% confidence intervals (CIs) for the differences in proportions between 1997 and 1999 indicated significant increases in the overall use of 6 drugs: alcohol (95% CI_{diff} 6.1, 1.9–10.3), cannabis (95% CI_{diff} 46.3, 0.2–8.4), glue (95% CI_{diff} 2.3, 1.3–3.3), other solvents (95% CI_{diff} 5.0, 3.1–6.3), barbiturates (95% CI_{diff} 1.9, 0.4–3.4) and hallucinogens such as mescaline and psilocybin (95% CI_{diff} 3.5, 0.8–6.9). Fewer grade 7 students in 1999 than in earlier cohorts reported using alcohol or cigarettes by age 9.

Interpretation: The public health implications of the findings are mixed. On the positive side, there is no evidence of increases in early onset of drug use. On the negative side, the overall proportion of students reporting illegal drug use has continued to rise.

The start of the 1990s witnessed a renewed cycle of rising drug use by adolescents. This resurgence has been fairly global, with increases documented in the United States, Australia, Europe and Canada.[1–8] For example, in the United States, between 1991 and 1999 the proportion of students who reported using marijuana in the year before being surveyed increased from 6.2% to 16.5% among those in grade 8, from 16.5% to 32.1% among those in grade 10 and from 23.9% to 37.8% among those in grade 12.[3] The use of cigarettes in the 30 days before the survey among students in the 3 grades increased from 14.3% to 17.5%, from 20.8% to 25.7% and from 28.3% to 34.6% respectively.[3] Similar increases have been noted in Canadian samples.[2,5]

Monitoring this resurgence is of some importance to health care professionals with adolescent patients. Indeed, alcohol and substance use disorders are among the most prevalent mental health conditions in young people.[9–11] Thus, any increase in the size of the population becoming heavily involved with alcohol and other drugs has clinical implications for future service needs. We performed a study to examine overall trends in nonmedical drug use among adolescents between 1991 and 1999.

Methods

We analysed data from 5 school surveys conducted between 1991 and 1999. The data were derived from the Ontario Student Drug Use Survey, a repeated cross-sectional survey of Ontario students in grades 7, 9, 11 and 13.[12] The survey, conducted every 2 years since 1977, is funded by the Centre for Addiction and Mental Health, Toronto (formerly by the

Addiction Research Foundation of Ontario), and is the longest ongoing study of adolescents in Canada.

The 1999 survey cycle, which used a 2-stage cluster design (school, class), included 4894 students in grades 7 to 13 from 38 school boards, 111 schools and 285 classes. Because earlier cycles included students in grades 7, 9, 11 and 13 only, we restricted attention to the 2868 students in these grades who responded to the survey. Self-administered questionnaires, which promote anonymity,[13–15] were administered by staff of the Institute for Social Research, York University, Toronto, on a classroom basis.

Use in the 12 months before the survey was defined as follows: for tobacco, use of more than 1 cigarette; for alcohol, any use excluding a sip; and for other drugs, any use at least once. (Further details regarding the study are available from the authors on request.)

All estimates were weighted, and variance and statistical tests were corrected for the complex sample design. To assess the statistical significance of differences in proportions between years, we constructed 95% confidence intervals (CIs) around the difference $P_1 - P_2$. Thus, differences significant at the $p < 0.05$ level are indicated when 0 is outside the confidence bound.[16] Although pooled trend analysis was also feasible, the data points were not numerous, and our specific interest was on 2 contrasts, 1999 versus 1997, and 1999 versus 1993.

Results

The total number of respondents in grades 7, 9, 11 and 13 over the years 1991–1999 ranged from 2868 to 3990, with student completion rates (i.e., eligible students/completions) ranging from 76% to 83%. Reasons for noncompletion included absenteeism (about 14%) and absence of parental consent (about 9%).

Table 1 shows the prevalence of use of the 17 drugs assessed between 1991 and 1999. The 95% CIs for the differences in proportions between 1997 and 1999 (column 6) indicate significant increases in the overall use of 6 drugs: glue (95% CI_{diff} 2.3, 1.3–3.3), other solvents (95% CI_{diff} 5.0, 3.1–6.3), alcohol (95% CI_{diff} 6.1, 1.9–10.3), hallucinogens such as mescaline and psilocybin (95% CI_{diff} 3.5, 0.08–6.9), barbiturates (95% CI_{diff} 1.9, 0.4–3.4) and cannabis (95% CI_{diff} 4.3, 0.2–8.4). No drug declined significantly in use between 1997 and 1999.

Between 1993 and 1999 the proportion of students reporting use increased for 9 drugs (Table 1, Fig. 1): tobacco (95% CI_{diff} 4.5, 0.08–8.9), alcohol (95% CI_{diff} 9.0, 5.1–13.3), cannabis (95% CI_{diff} 16.5, 12.5–20.5), glue (95% CI_{diff} 2.2, 1.2–3.2), other solvents (95% CI_{diff} 5.0, 2.3–7.3), hallucinogens (95% CI_{diff} 10.5, 7.2–13.8), cocaine (95% CI_{diff} 2.6, 1.0–4.2), PCP (phencyclidine) (95% CI_{diff} 2.6, 1.5–3.7) and MDMA (methylenedioxymethamphetamine, also known as "ecstasy") (95% CI_{diff} 4.2, 1.9–6.5).

The prevalence of episodes of heavy drinking (consumption of 5 or more drinks on a single occasion at least once during the 4 weeks before the survey) also increased over the study period. The proportion of students reporting

Table 1: Proportion of Ontario students in grades 7, 9, 11 and 13 who reported using nonmedical drugs in the year before being surveyed, 1991–1999

	Year; % of students (and 95% confidence interval)						
Drug	1991 *n = 3945*	1993 *n = 3571*	1995 *n = 3870*	1997 *n = 3990*	1999 *n = 2868*	1999 v. 1997	1999 v. 1993
Tobacco	21.7 (20.3–23.1)	23.8 (21.3–26.3)	27.9 (26.2–29.6)	27.6 (26.0–29.2)	28.3 (24.8–32.1)		*
Alcohol	58.7 (55.6–61.8)	56.5 (53.9–59.1)	58.8 (56.7–60.9)	59.6 (57.6–61.6)	65.7 (62.5–68.8)	‡	‡
Cannabis	11.7 (10.1–13.3)	12.7 (11.4–14.0)	22.7 (20.0–25.4)	24.9 (23.3–26.5)	29.2 (25.6–33.1)	*	‡
Glue	1.1 (0.8–1.4)	1.6 (1.2–2.0)	2.4 (2.0–2.8)	1.5 (1.2–1.8)	3.8 (3.0–4.9)	†	†
Other solvents	1.6 (1.2–2.0)	2.3 (1.7–2.9)	2.9 (2.4–3.4)	2.6 (2.0–3.2)	7.3 (6.0–8.9)	‡	‡
Barbiturates	2.2 (1.7–2.7)	3.0 (2.5–3. 5)	2.7 (2.1–3.3)	2.5 (2.0–3.0)	4.4 (3.1–6.0)	†	
Heroin	1.0 (0.5–1.5)	1.2 (0.7–1.7)	2.0 (1.4–2.6)	1.8 (1.5–2.1)	1.7 (1.2–2.4)		
Methamphetamine	1.8 (1.1–2.5)	2.0 (1.6–2.4)	4.6 (3.4–5.8)	3.6 (3.0–4.2)	5.1 (3.4–7.6)		
Stimulants	4.0 (3.1–4.9)	5.4 (4.4–6.4)	6.3 (5.3–7.3)	6.6 (5.8–7.4)	7.6 (6.0–9.6)		
Tranquillizers	1.6 (1.2–2.0)	1.1 (0.7–1.5)	1.6 (1.1–2.1)	1.7 (1.4–2.0)	2.4 (1.4–4.1)		
LSD	5.2 (4.2–6.2)	6.9 (5.6–8.2)	9.2 (7.1–11.3)	7.6 (6.8–8.4)	6.5 (4.8–8.9)		
Other hallucinogens	3.3 (2.7–3.9)	3.1 (2.3–3.9)	7.6 (5.7–9.5)	10.1 (8.9–11.3)	13.6 (10.7–17.1)	*	‡
Cocaine	1.6 (1.2–2.0)	1.5 (1.1–1.9)	2.4 (2.0–2.8)	2.7 (2.4–3.0)	4.1 (2.8–5.9)		†
Crack cocaine	1.0 (0.7–1.3)	1.0 (0.7–1.3)	1.7 (1.4–2.0)	2.2 (1.6–2.8)	2.3 (1.6–3.3)		
PCP	0.5 (0.3–0.7)	0.6 (0.3–0.9)	1.7 (0.9–2.5)	2.0 (1.4–2.6)	3.2 (2.3–4.4)		‡
Crystal methamphetamine	0.8 (0.2–1.4)	1.2 (0.6–1.8)	1.1 (0.6–1.6)	–§	1.5 (0.6–3.6)		
MDMA	–§	0.6 (0.2–1.0)	1.8 (1.0–2.6)	3.1 (1.8–4.4)	4.8 (3.0–7.5)		‡

Note: LSD = lysergic acid diethylamide, PCP = phencyclidine, MDMA = methylenedioxymethamphetamine ("ecstasy").
*$p < 0.05$ for difference between confidence intervals.
†$p < 0.01$ for difference between confidence intervals.
‡$p < 0.001$ for difference between confidence intervals.
§Estimate suppressed (less than 0.5%).

heavy drinking episodes between 1991 and 1999 was as follows: 22.0% in 1991, 17.7% in 1993, 20.5% in 1995, 24.3% in 1997 and 28.2% in 1999 (95% CI_{diff} 6.2, 3.4–8.9). Moreover, the prevalence of frequent heavy drinking episodes (consumption of 5 or more drinks on a single occasion 4 or more times during the 4 weeks preceding the survey) also increased: 5.5% in 1991, 3.7% in 1993, 4.2% in 1995, 5.3% in 1997 and 7.0% in 1999 (95% CI_{diff} 1.5, 0.3–2.7).

Despite increases in the prevalence of drug use, 26.8% of the students in 1999 reported no use of drugs (including alcohol and tobacco) during the year before the survey, and another 23.9% restricted their use to alcohol. Just over 1 in 3 (38%) reported use of an illicit substance during the year before the survey. Still, from 1993 to 1999, the proportion of students reporting the use of 4 or more drugs increased from 8.0% to 17.4% (95% CI_{diff} 9.4, 7.3–11.5).

Between 1997 and 1999 the prevalence of use of 5 drugs increased among male students (alcohol, cannabis, glue, other solvents and barbiturates), and the prevalence of use of 2 drugs increased among female students (glue and other solvents). No drug declined in use.

The prevalence of use of 2 drugs (glue and other solvents) increased among students in grades 7 and 9 between 1997 and 1999, and the prevalence of use of 3 drugs (solvents other than glue, barbiturates and hallucinogens) increased among students in grade 11.

Despite increases in the prevalence of drug use, some positive age trends were evident. Compared with earlier cohorts, fewer students in 1999 reported early onset of use of alcohol, tobacco and cannabis. Specifically, 5% of the grade 7 students in 1999 smoked cigarettes by grade 4 (about age 9), as compared with 7% of grade 7 students in 1997, 8% in 1993 and 16% in 1981 (95% CI_{diff} 11.0, 7.9–14.1); 13% of grade 7 students in 1999 used alcohol for the first time by grade 4, as compared with 19% in 1981 and in 1997 (95% CI_{diff} 6.0, 2.2–9.8); and 2% of the grade 7 students in 1999 used cannabis by grade 6 (about age 11), as compared with 5% in 1997 and 8% in 1981 (95% CI_{diff} 6.0, 3.7–8.3).

Interpretation

Nonmedical drug use among Ontario students increased between 1997 and 1999, a continuation of a trend that began about 1993. Our findings must be understood within the limitations of the data. First, the estimates are based on self-reporting of drug use and cannot be readily verified. Although we must accept underestimates of drug use, this should not bias estimates of trends if underreporting remains stable.[17] We cannot completely eliminate the possibility that changes in self-reported rates of drug use are influenced by changes in social acceptance. However, we have shown in earlier work that trends in other stigmatized behaviours (e.g., delinquency) do not necessarily vary with trends in drug use.[18]

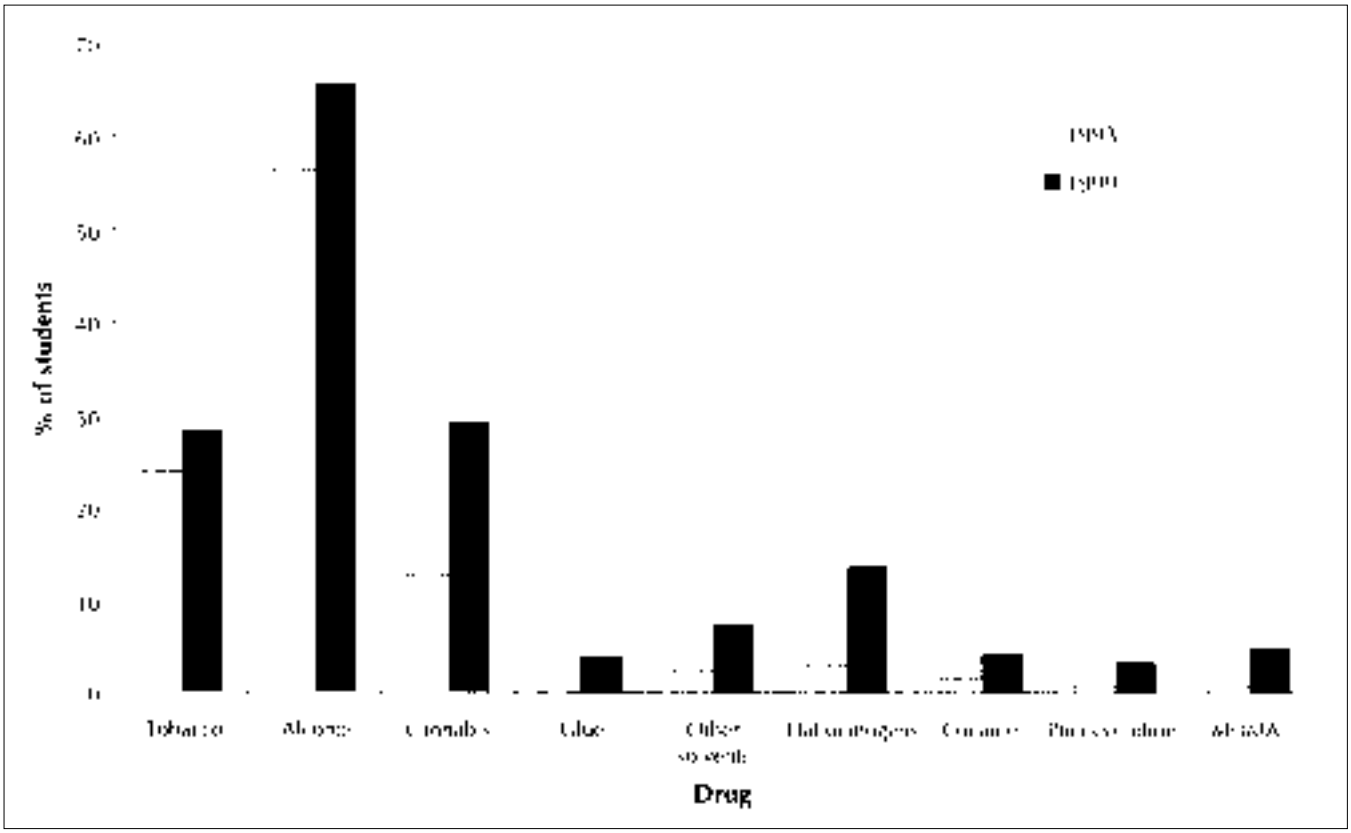

Fig. 1: Proportion of students reporting nonmedical drug use in 1993 and 1999. MDMA = methylenedioxymethamphetamine ("ecstasy").

From a public health viewpoint, the survey findings are mixed. On a positive front, there was no evidence that the proportion of students who use tobacco, alcohol or cannabis by age 9 is increasing. This finding is important because early onset of drug use is an influential predictor of future drug problems.[19] And despite overall increases in drug use, a sizeable proportion of the students did not use illicit drugs.

However, there are several findings that should serve as flags for health care professionals. First and foremost, cigarette smoking was by far the greatest public health issue impinging on the future health of this population. The 1999 rate of almost 30% remains 3 times higher than the goal of 10% for the year 2000 set by the Ontario Premier's Council on Health Strategy in 1991.[20]

Second, more students than in earlier cohorts were involved in heavy drinking episodes. This increase occurred in both the prevalence and frequency of heavy drinking.

Third, the use of several drugs increased between 1997 and 1999, and there was a marked upswing in drug use between 1993 and 1999. Between 1997 and 1999 the use of inhalants increased significantly among grade 7 students, the youngest in the survey. The ray of light is that, despite increases in rates of use, early onset did not increase. Continued monitoring will inform us whether the trend will continue.

Competing interests: None declared.

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