

Use of crystal methamphetamine and other club drugs among high school students in Vancouver and Victoria

A recent survey suggests that students who identify themselves as gay or bisexual are at increased risk of using club drugs.

ABSTRACT

Background: The prevalence and correlates of British Columbian adolescents' use of four "club" drugs—crystal methamphetamine (MA), MDMA ("ecstasy"), ketamine, and gamma-hydroxybutyrate (GHB)—remain poorly defined. This is partly because past surveys have measured drug use in aggregate categories rather than by specific drug. In addition, little research has been done regarding anecdotal evidence suggesting increased risk of drug use among gay and bisexual youth. The purpose of our study was to consider this and to assess the prevalence, characteristics, and correlates of use of each of these four club drugs separately among grade 9 to 12 students.

Methods: In 2003 we conducted a pilot-project survey of a convenience sample in six schools in Vancouver and Victoria using a confidential self-administered questionnaire to assess students' demographic characteristics, sexual orientation, and substance use.

Results: Among 607 students surveyed (mean age 15.9 years), 81 students (13.6%) reported previous use of MA (5%), ecstasy (12%), ketamine (4%), or GHB (4%). Most of this use appeared to be experimental or occasional within a context of multidrug use; every MA user but one reported also using alcohol and marijuana. In multivariate analyses adjusted for age, a twofold greater risk for use of ecstasy was observed among girls. The 2.5% of students who identified themselves as gay or bisexual had significantly elevated risk of previous year use of MA (odds ratio [OR] 26.28), ecstasy (OR 3.29), and ketamine (OR 8.26).

Conclusions: School-based initiatives may fail to reach many regular MA users. Interventions and clinical assessments involving youths attending high school should address the individual's use of multiple drugs rather than MA or any other club drug specifically. Targeted substance abuse research and intervention initiatives appear warranted for students who identify themselves as gay or bisexual.

Background

Crystal methamphetamine (MA) is a powerfully addictive central nervous stimulant that is typically inhaled (snorted), smoked, eaten, or injected. Heavy MA use can lead to serious consequences, including paranoia, psychosis, depression, violence, and death.¹ In recent years, there have been widespread reports of substantial increases in MA use and increasing attention has been paid to its health effects on youth and young adults in BC. Use of MA represents a shift from organic stimulants (for example, cocaine) to those easily synthesized in makeshift home laboratories. Crystal methamphetamine has a higher dependence liability: the single-isomer MA is more potent

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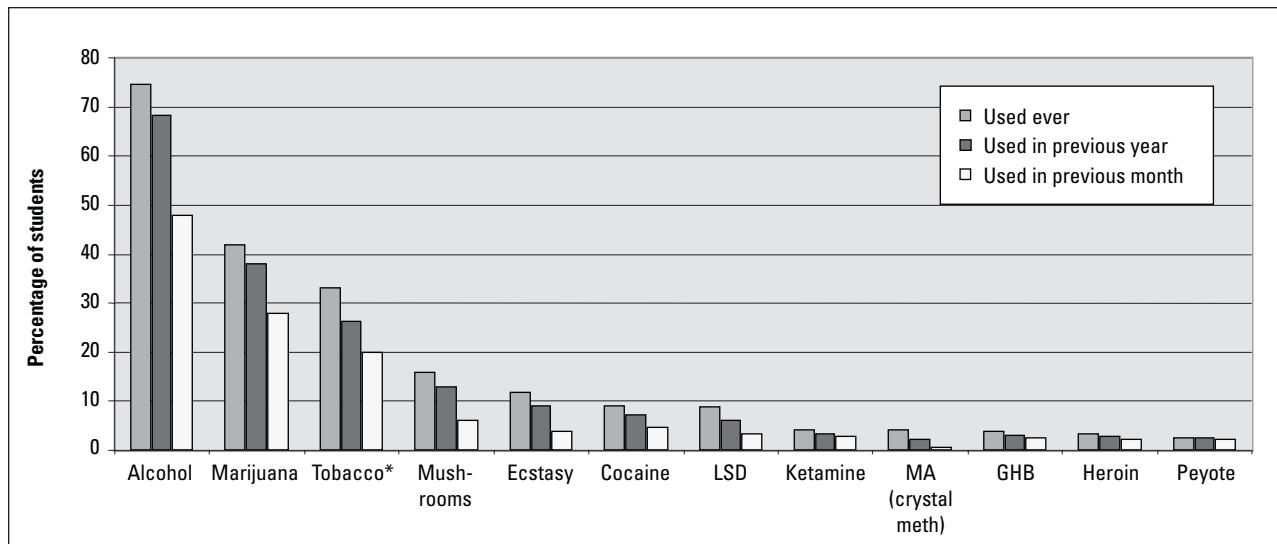


Figure. Prevalence of substance use reported by Vancouver and Victoria grade 9 to 12 school survey participants, by drug and timing of use.

*Called *cigarettes* on the questionnaire.

than the mixed-isomer amphetamines previously in circulation and MA users typically ingest larger doses.

The recreational use of other club drugs, so named because of their frequent use at adolescents' dance events (called "raves") and other dance venues, particularly gay clubs, has increased substantially since the mid-1990s.^{2,3} In the present study, we include the following club drugs: 3,4-methylenedioxymethamphetamine (MDMA, commonly known as "ecstasy"), an amphetamine analog with sympathomimetic properties; ketamine, a derivative of phencyclidine hydrochloride used clinically as a dissociative anesthetic; and gamma-hydroxybutyrate (GHB), a gamma-aminobutyric acid (GABA) analog with sedative properties.^{3,4} The Internet has facilitated dissemination of recipes for home synthesis of some of these drugs and so they are likely to continue to be readily available. Importantly, health care providers need to be aware that approximately half the tablets and capsules presently sold in BC as ecstasy contain methamphetamine; and

since 1999, increasing proportions contain ketamine.⁵

The determination of the prevalence and correlates of adolescents' use of MA, ecstasy, ketamine, and GHB individually is important but has been hindered by past surveys that have tended to measure drug use in aggregate categories ("methamphetamine, speed, or ecstasy") or have employed broad and relatively technical wording ("amphetamines").^{2,6,7} Before we undertook our survey in 2003, information from BC youth drug treatment facilities, early psychosis programs, and our clinical experience suggested an elevated prevalence of MA use among gay and bisexual youth, but relevant data were unavailable. We therefore decided to conduct a pilot-project cross-sectional survey using youths' own language and including questions about sexual orientation to measure the respective prevalence, patterns, and correlates of use of MA, ecstasy, ketamine, and GHB among high school students in Vancouver and Victoria, BC.

Methods

Between March and June 2003, grade 9 to 12 students in Victoria and Vancouver voluntarily completed an anonymous and confidential pilot-project questionnaire. The study protocol was approved by the UBC Behavioural Ethics Board and school boards in Vancouver and Victoria. Passive consent was obtained from parents and no incentives were provided (*passive consent*=parents were notified by newsletter that the study was being conducted and were instructed to contact the school if they opposed their child's participation.)

In Victoria, a team that included school district officials, board members, principals, and a study investigator (D.M.) selected two Victoria high schools to best represent a cross-section of the district's school-attending population. Within each school, the team selected a sample of students in each of grades 9 to 12 from among those students randomly assigned to attend compulsory Career and Personal Planning classes that semester. In Vancouver, a study investigator

Table 1. Characteristics of crystal methamphetamine (MA) use among 27 students reporting any previous use.

Age of first use, mean years (standard deviation)		14.7 (1.3)
Most recent use, n (%)	During previous month	5 (18.5)
	During previous year	14 (55.6)
	More than one year ago	12 (44.4)
Mode of use, n (%)	Smoke	19 (70.4)
	Inhale	14 (51.9)
	Eat	8 (29.6)
	Inject	0
	Other	3 (11.1)
Maximum frequency during previous use, n (%)	Daily	4 (15.4)
	Weekly	2 (7.7)
	Monthly	7 (26.9)
	Less than monthly	13 (50.0)
Maximum days awake during previous use, median (IQR)		3 (2, 4)
History of alcohol or substance abuse treatment, n (%)		5 (18.5)

(I.M.) selected four schools to ensure participant heterogeneity with respect to geographic location and family income. Within each school, the investigator and principal selected one homeroom class in each of grades 9 to 12 and administered the survey to all four classes in a single day. After each survey, a brief information session about MA was provided. In both school districts, a standard protocol for administration of the survey ensured students' privacy and their understanding that participation was voluntary and strictly confidential.

We used a 15-item questionnaire to measure age, race-ethnicity, sexual orientation (heterosexual, homosexual—"lesbian, gay, queer"—bisexual, or questioning/unsure); and time of most recent substance use (within the last week, month, year, or more than one year ago). Students reporting previous use of MA were asked their age of first use, frequency and mode of use, and number of consecutive days awake while using.

We compared groups using Pearson's chi-square or Fisher's exact test for categorical variables and Wilcoxon rank sum tests for continuous variables. We evaluated potential correlates of substance use (age, gender, and sexual orientation) using adjusted odds ratios and 95% confidence intervals, computed with multivariate logistic regression models.

Results

The 607 student respondents had a mean age of 15.9 years (range 13 to 19); 54% were male and most were either white (identified as "caucasian" on the survey) (45%) or Asian (39%). The [Figure](#) shows the prevalence of students' self-reported use of specific substances by drug and timing of last use (ever, previous year, previous month). Alcohol consumption was most common, with 415 students (68%) reporting its use during the previous year and 292 (48%) during the previous month. More students smoked marijuana (28%) than tobacco (20%) during the previous month.

Five percent of students reported previous use of MA, half during the previous year. Only 0.8% reported using MA during the previous month ([Table 1](#)). Most users had smoked or snorted the drug; none reported injecting it. Half of the 27 students reported their peak frequency of MA use to be less than once per month. The median peak number of days awake on the drug was 3, but ranged from 1 to 12. Five users (19%), all of whom used MA during the previous year, reported previous treatment for alcohol or substance use.

Although 12% of students had previous experience with ecstasy, including 9% during the previous year, only 4% reported its use during the previous month. In contrast, among the smaller number of students reporting any previous use of ketamine (4%) or GHB (4%) most reported its use during the previous month (3% and 3%).

Previous use of any of these four drugs—MA, ecstasy, GHB, or ketamine—was reported by 13.6% of students. Of these students, 10.7% reported use in the previous year and 4.5% reported use during the previous month; these students exhibited a distinct pattern of use of many of the 12 licit and illicit substances included in the [Figure](#). The median (interquartile range) number of substances previously used by students with MA or club drug experience was 6 (4, 8) and for those students without drug experience it was 1 (0, 2) ($P < .0001$). Similarly, greater numbers of substances were reportedly used during the previous month by students who used MA or club drugs during the same time frame (median 7 [5, 11]) than by students who did not (median 1 [0, 2]) ($P < .0001$). All but one MA user reported use of alcohol and marijuana during the previous month.

In multivariate logistic regression analyses, the 15 students (2.5%) who identified themselves as gay or bisexual had markedly increased risk for reported use of MA, ecstasy, and ketamine (Table 2). Their increased risk for use of GHB was based on small counts and did not reach statistical significance. In these analyses, lifetime and previous year use of ecstasy were both positively associated with age, and female students had an approximately twofold greater risk for its use.

Conclusions

The results of our study of grade 9 to 12 students in Vancouver and Victoria indicate that most students (86%) surveyed had never used MA, ketamine, GHB, or ecstasy. Only 5% of students had ever used MA, including 5 (0.8%) who had used MA during the previous month. This infrequency of MA use was not attributable to previous substance abuse treatment. We conclude that most MA use was experimental or occasional; its regular use among the youths we surveyed in BC schools appears to be rare. Our results indicate that school-based programs are unlikely to reach very many youth in BC who regularly use MA.

Use of MA and club drugs among high school students we surveyed was strongly associated with the use of multiple licit and illicit substances. Indeed, every MA user except one reported consuming alcohol and marijuana during the same time frame. Thus, school-based initiatives that aim to prevent problematic use of MA and other club drugs should not target any of these drugs individually; instead, they should aim to identify and modify risk factors for individuals' use of multiple substances (including alcohol, tobacco, and marijuana).

Our finding that most regular use of MA and other club drugs is reported by an identifiable subgroup of

Table 2. Adjusted* odds for BC students' substance use, by drug and timing of use.

	Lifetime use of drug OR (95% CI)	Previous year use of drug OR (95% CI)
Crystal methamphetamine (MA)		
Age (per year increase)	1.56 (1.09–2.25) [†]	1.34 (0.82–2.21)
Female gender	0.79 (0.33–1.85)	0.67 (0.20–1.85)
Homosexual or bisexual self-identity	17.02 (4.83–60.01) [†]	26.28 (6.13–112.57) [†]
Ecstasy		
Age (per year increase)	1.43 (1.14–1.79) [†]	1.34 (1.04–1.71) [†]
Female gender	1.82 (1.06–3.13) [†]	2.00 (1.10–3.70) [†]
Homosexual or bisexual self-identity	4.89 (1.63–14.67) [†]	3.29 (0.98–11.05) [†]
Ketamine		
Age (per year increase)	0.83 (0.57–1.21)	0.73 (0.48–1.10)
Female gender	1.30 (0.53–3.23)	1.15 (0.44–3.03)
Homosexual or bisexual self-identity	9.44 (2.62–34.06) [†]	8.26 (1.98–34.34) [†]
Gamma-hydroxybutyrate (GHB)		
Age (per year increase)	0.85 (0.58–1.25)	0.71 (0.46–1.09)
Female gender	1.00 (0.40–2.48)	0.84 (0.31–2.33)
Homosexual or bisexual self-identity	4.44 (0.89–22.18)	2.70 (0.32–23.11)

* Adjusted for each of the other two variables in the table

† Statistically significant correlate ($P < .05$)

Most MA use was experimental or occasional; its regular use among the youths we surveyed in BC schools appears to be rare.

high-risk multidrug users supports the recommendation from the 2004 Western Canadian Summit on Methamphetamine that “a methamphetamine-specific school-based prevention program is not indicated, but methamphetamine should be part of a comprehensive in-school prevention program addressing substance use issues in general.”⁸ While some strategies can effectively reduce drug use among adolescents, it is well established that most school-based drug use prevention programs, including fear-based

campaigns, are ineffective⁹ and poorly implemented.¹⁰ If monies are to be spent on MA prevention through schools, programs should be evidence-based and should involve skill-building and delivery of messages by peers.^{11–13}

A unique strength of the present study is that we measured the relationship between sexual orientation and substance use. The small number of students (2.5%) who identified themselves as gay or bisexual were at greatly increased risk for reporting use of MA, ecstasy, and ketamine, and

they more commonly reported use of GHB as well. Interestingly, most of these students were girls who identified themselves as bisexual. This novel finding is consistent with results from a probability survey of adults in Chicago¹⁴ and warrants further research to investigate the possibility of an elevated risk of club drug use among bisexual girls and women. It remains unclear whether these elevated risks reflect early contact with social networks with higher prevalence of substance use^{3,14} or predisposition to substance use owing to problems with early self-identification as gay or bisexual.¹⁵

Elevated substance use among self-identified gay and bisexual individuals is consistently observed in the few school and population-based surveys that have examined this question.¹⁴⁻¹⁷ Clearly, the identification of modifiable antecedents of heavy drug consumption among gay and bisexual students represents an important opportunity and priority for substance use prevention research and initiatives.

Another strength of our survey was assessment of MA, ecstasy, GHB, and ketamine individually. These disaggregated measures were essential for discerning differing patterns of use among club drugs and their respective association with sexual identity.

As with all school-based survey results, ours are subject to the limitations inherent in self-reported data and are likely to underreport stigmatized substance use. Our results are also unlikely to generalize to youth having an inconsistent connection to school. As well, the prevalence of MA and club drug use among BC students may vary geographically.

Perhaps the most important limitation of this study is our nonrandom selection of schools surveyed, which violates the assumptions underlying

RESOURCES

BC Alcohol and Drug Information Referral Service

Free, 24-hour information and referral line for providers and patients.
Lower Mainland 604 660-9382
Elsewhere in BC 1 800 663-4242

British Columbia Ministry of Health

Report describing an integrated BC strategy for crystal methamphetamine and other amphetamines. www.vch.ca/publications/docs/info/industry/Crystal_Meth.pdf

Crystal Meth Anonymous (CMA)

Organization offering local support group meetings.
604 633-4242
www.crystalmeth.org (click on "Looking for a Meeting?")

Medscape

Article about crystal methamphetamine for clinicians (Colfax GN. Methamphetamine: Important Clinical Guidance for Healthcare Providers.) Free Medscape site registration is required to view this article.
www.Medscape.com

New York Crystal Meth Anonymous Intergroup

Web site with self-assessment information.
www.nycma.org/lit_downloads/NYCMA_Addict.pdf

Pacific AIDS Education and Training Centre

Fact sheet for clinicians working with methamphetamine users.
www.aidsetc.org/pdf/p02-et/et-03-00/methusers.pdf

U.S. National Institute on Drug Abuse

Drug-specific fact sheets (including sheets about crystal methamphetamine, ecstasy, GHB, and ketamine).
www.nida.nih.gov/DrugPages

Vancouver Methamphetamine Response Committee (MARC)

Web site with broad information content, including treatment referrals and supports.
www.Methfacts.org

statistical tests used to compare groups. Although our use of a convenience sample (i.e., those subjects available to us) limits generalizability, the prevalence of smoking and other drug use we observed is highly similar to that reported from probability samples of BC students.^{6,18}

In summary, this 2003 pilot-project survey of selected high school students in Vancouver and Victoria suggests that use of MA, ecstasy, GHB, and ketamine is low. Most use of these drugs appears to be experimental or occasional and part of a pattern of use of multiple substances. However, we noted a markedly elevated risk for use

of these drugs among students who identified themselves as gay or bisexual. We conclude that sexual orientation questions should be added to large, representative surveys of substance use among BC high school students in the future.⁶ We also conclude that school-based interventions should be evidence-based and should not address MA or any other club drug in isolation. Greater benefit is likely to be gained by identifying and modifying determinants of multidrug use among high-risk individuals, including high school students who identify themselves as gay or bisexual.

Disclaimer

The views expressed in this article are those of the authors alone and not necessarily those of the institutions and agencies with which they are affiliated.

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Competing interests

None declared.

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Additional reading

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