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Evidence for Significant Polydrug Use Among Ecstasy-Using College Students

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Abstract

Ecstasy (MDMA) has been added to the spectrum of illicit drugs used by college students. In this study, the authors estimated the prevalence of ecstasy use within a large college student sample and investigated the polydrug-use history of those ecstasy users. They administered an anonymous questionnaire to college students ($N = 1,206$) in classrooms at a large university in the mid-Atlantic United States. The overall student response rate was 91%. Nine percent of the sample reported lifetime ecstasy use. Because 98% of ecstasy users had used marijuana, the authors compared polydrug use between ecstasy users and individuals who had used marijuana but not ecstasy. Ecstasy users, as compared with these marijuana users, were significantly more likely to have used inhalants (38% vs. 10%), LSD (38% vs. 5%), cocaine (46% vs 2%), and heroin (17% vs 1%) in the past year. Significant polydrug use among college student ecstasy users has important implications for their substance abuse treatment.

Keywords

club drugs; drug use; ecstasy; MDMA; polydrug use

Ecstasy, or MDMA (3,4-methylenedioxymethamphetamine), is a methamphetamine derivative that has both stimulant and mild hallucinogenic effects. It is usually taken orally in tablet or capsule form and often used in combination with other drugs.^{1,2} In most regions of the United States, ecstasy is the most frequently used of the “club drugs,” drugs that are consumed at “raves” (all-night dance parties frequently attended by young adults).³

However, ecstasy use is not confined to raves and extends to suburban and rural settings, including college campuses.⁴ Several population-based surveys document the prevalence of ecstasy use among adolescents and young adults. According to 2002 data from the Monitoring the Future (MTF) study,⁵ a nationally representative survey of US high school and college students, 12.7% of college students in the United States used ecstasy at least once in their lifetime⁶ (see Figure 1). According to the 2002 National Survey of Drug Use and Health (NSDUH, formerly the National Household Survey on Drug Abuse),⁷ 15% of the population aged 18 to 25 years had tried ecstasy at least once in their lifetime, and almost 6% had used it in the past year. From 1996 to 2002, the use of ecstasy by 18- to 25-year-olds increased more than 200%.^{7,8}

However, the rate of increase in ecstasy use among youths and young adults during the past 2 years appears to be slowing, as evidenced by both the NSDUH and the MTF Study, which estimate that 7.5% of high school seniors in 2004 had tried ecstasy at least once in their lifetime.^{6,7–9} The Drug Abuse Warning Network (DAWN), which documents drug-related emergency department mentions in major metropolitan areas of the United States, noted a sharp increase in ecstasy-related drug mentions between 1994 and 2001 and a decrease in the past 2 years.¹⁰ Anecdotal evidence from the Community Epidemiology Work Group (CEWG), which has a diverse set of members that includes ethnographers and researchers that track recent drug trends in major metropolitan areas, highlights the widespread diffusion of ecstasy from the rave scene into more mainstream settings, including college campuses.¹¹ The DEA similarly reports that, in addition to underground raves, nightclubs, and private residences, college campuses are popular settings in which ecstasy is used and sold.²

Although there have been few studies of college students in the United States that confirm the findings of these population-based trends, existing research suggests that ecstasy use among college students rose until about 2001 and has been decreasing every year since. A study of undergraduate students at Tulane University revealed an increase in lifetime ecstasy use from 16% in 1986 to 24% in 1990.¹² A more recent study of a nationally representative sample of college students documented a 69% increase in ecstasy use from 1997 to 1999.¹³

In addition, findings from nationally based surveys of US college students such as MTF,⁵ the National College Health Assessment,¹⁴ and the Core Survey¹⁵ suggest that, in addition to alcohol use, increased ecstasy use and other club drug use—along with consumption of additional illicit drugs, such as marijuana and hallucinogens—have become an important concern. Such concern is reflected by the Healthy Campus 2010¹⁶ identification of “Alcohol and Other Drugs” as one of the 11 high-priority health issues for campus settings, as well as its declaration of “Substance Abuse” as 1 of the 28 focus areas of accomplishing the 2 overarching goals of increasing quality and years of healthy life and eliminating health disparities.^{16,17}

With the increase in use and availability of ecstasy, researchers have documented both positive and negative social and physiological effects that have implications for college student health. Ecstasy users and certain Web sites (eg, <http://www.erowid.org>, <http://thedeia.org>, <http://ecstasy.org/experiences/index.html>) often promote ecstasy use as involving positive effects, including enhancing mood, energy, sociability, mental clarity, sensory perceptions, and sexual sensations, which outweigh the negative effects.^{18–23} There are also several Web sites that advertise herbal ecstasy and ecstasy cigarettes as legal alternatives to MDMA, with similar positive physiological effects and fewer negative effects (eg, <http://www.blissherbs.com>, <http://www.herbalecstasy.info>, <http://www.herbalsmokeshack.com>). However, researchers have documented adverse effects of ecstasy use in human clinical studies. These findings support the concerns that researchers, health care providers, and health care educators have regarding ecstasy use among the college student population.^{19–22,24–33} In addition, similar to other recreational drugs used on college campuses, ecstasy is a disinhibitory agent, and researchers have speculated that it promotes high-risk sexual behaviors and associated consequences, including unwanted pregnancy and sexually transmitted diseases.^{34–36}

Another implication of ecstasy use by college students is that, as the earlier observation regarding the population's illicit drug use might suggest, the substance is often associated with the use of other drugs (ie, polydrug use). Studies of rave attendees and juvenile offenders have found that ecstasy users typically have a history of other illicit drug use.^{3,37–40} Researchers investigated a hypothesized temporal pattern of drug use in ecstasy users using latent class analysis. In this study, the researchers found that adolescent ecstasy users

began using alcohol, then cigarettes, cannabis, amphetamines, and ecstasy, and finally heroin.⁴¹

The health effects described above also suggest that ecstasy and polydrug use can negatively impact student learning, academic achievement, and ability to continue college. According to the National Institute on Drug Abuse (NIDA),⁴ ecstasy can impair mental abilities, memory, and information processing in the hours after taking the drug and possibly for a longer period in regular users. Although the negative relationship between alcohol abuse and academic performance in terms of low grades, poor attendance, and falling behind in class is well documented in alcohol-abuse literature,^{42–47} researchers speculate that ecstasy use and other illicit drug use might also have similar negative consequences.¹⁵ Anecdotal accounts suggest that many students who withdraw from college have alcohol and other drug problems.^{48,49}

To our knowledge, researchers have not extensively studied ecstasy use and its associated polydrug use patterns in college students. Given the numerous potential consequences attributed to ecstasy use, it is critical to discern whether these consequences are in part attributable to the use of multiple drugs, rather than to ecstasy alone. The present study was a first step in this line of research and aimed to estimate the prevalence of ecstasy use and examine associated polydrug use histories in a large survey of college students.

METHODS

Sample

We used multistage probability sampling, with classes as the primary sampling unit, to select a random group of students at a large university in the mid-Atlantic region of the United States, which has a demographically diverse student body that consists of more than 33,000 students. Thirty-seven (59%) of the 63 classes (both undergraduate and graduate) selected agreed to participate, with an average of 32 students per class. To the best of our knowledge, there were no common characteristics linking the nonparticipating classes. We randomly chose the classes from 13 colleges, and although 9 of the 13 colleges were represented at the classroom level, students from all 13 colleges were represented in the sample. This is possible because students from each college are allowed to take classes in different colleges. A total of 1,323 enrolled undergraduate and graduate students agreed to participate, and 1,206 students completed the survey for an overall student response rate of 91%.

Data Weighting

Students who were enrolled in a large number of classes were more likely to be selected for participation, thus potentially biasing the results in favor of students who were enrolled in larger number of classes. We therefore used a design weight to adjust for the number of classes attended. The design weight is the reciprocal of the number of courses for which the student is enrolled. Likewise, we applied design weights for the demographic variables to help ensure that the demographic characteristics of the students who participated in this survey were a reflection of the general college student population at this particular university.

Questionnaire

This study is a further analysis of a survey of student drug use conducted in 1998 at a large mid-Atlantic university campus. We wrote a report for campus administrators on the results of the study in 1998. We collected the data to learn about alcohol and drug use patterns among the campus community. We obtained Institutional Review Board approval to collect

nonidentifiable data and to investigate alcohol and drug use among the student body. For the current study, we reexamined the data with a specific focus on ecstasy use and its relationship to polydrug use.

This survey measured students' knowledge of campus policies and services regarding alcohol and other drugs, their attitudes about alcohol and other drug use, and their self-reported alcohol and other drug use. The questionnaire was anonymous; we collected no names or other identifying information.

Measures

We defined recent use of a drug as use at least once in the past year. We defined lifetime use as use at least once in one's lifetime. We included recent and lifetime use of the following drugs in the current analyses: ecstasy, alcohol, marijuana, cocaine, heroin, LSD, other hallucinogens (eg, PCP, mushrooms), and inhalants. Only lifetime—and not recent—use of tobacco was measured in the questionnaire and was included in the current study.

Procedure

Prior to our administration of the survey, the university's Institutional Review Board approved the study. Once we gained permission to access the classes, a staff member gave a standardized verbal introduction to the classes. The introduction included identification of the survey sponsors, emphasis of the voluntary nature of the study and the confidentiality and anonymity of the responses, description of the study's purpose, and instructions for recording responses on the ScanTron answer sheet. The survey required about 35 minutes to complete.

Data Analysis

We used descriptive statistics to produce frequency distributions of demographic characteristics and the use of ecstasy and other types of drugs by the students in the sample. Because a preliminary examination of the data revealed that 98% of ecstasy users had used marijuana at least once in their lifetime, we decided to compare ecstasy users with nonusers of both ecstasy and marijuana as well as with a third group—students who use marijuana but not ecstasy. In this way, we could compare the demographic and polydrug use characteristics of the following 3 groups: (1) nonusers of both ecstasy and marijuana; (2) marijuana users who never used ecstasy; and (3) ecstasy users, regardless of other drug use. We performed chi-square tests to measure the significance of any observed differences between the latter 2 groups.

RESULTS

Approximately half of survey respondents were male, and 38% were aged younger than 21 years. The majority was white (60%); 13% were African American. About 1 in 5 students reported that ecstasy was easy to access. Of the total sample, 9.4% of students reported using ecstasy at least once in their lifetime. Table 1 presents demographic and drug-use characteristics of the 3 subsamples studied. Comparing the 2 drug-using groups, we observed that lifetime ecstasy users were more likely to have used cocaine, heroin, LSD, other hallucinogens, and inhalants in both the past year and in their lifetime ($p < .001$) than were their counterparts who only used marijuana. For example, 46% of individuals who had a lifetime history of ecstasy use had used cocaine in the past year, whereas only 2% of those students who had used marijuana at least once in their life, but who had not used ecstasy, had used cocaine. The corresponding percentages for past-year heroin use were 17% for ecstasy users and 1% for marijuana users. The 2 latter groups did not differ with regard to their use of alcohol or tobacco, age, gender, or race.

DISCUSSION

These findings suggest that about 1 in 10 of these college students in 1998 tried ecstasy at least once in their life, and college student ecstasy users are more likely than are their non-ecstasy-using marijuana-using counterparts to have used cocaine, heroin, LSD, other hallucinogens, and inhalants. These findings are consistent with reports in the literature of polydrug use among ecstasy users in other populations.^{3,37–40} Attempts to understand the consequences of ecstasy use must therefore control for the probability that these persons are also experiencing the effects of other drug use.

There is a growing awareness of ecstasy use among youth in the United States—yet there has been little behavioral and social science research on this drug problem. More research on college students is needed because they constitute a population at high risk for drug use. The new freedoms associated with the college experience often extend to experimenting with illicit drugs for the first time or to augmenting high school substance-use patterns.⁵⁰

Many of the prevailing researchers who have studied the short- and long-term risk factors, patterns, and consequences of drug use in the college student population have focused on alcohol and illicit drugs other than ecstasy.^{51–53} Much of the existing research on the short-term and long-term risk factors, patterns, and consequences of alcohol and illicit drug use focuses on a younger precollege student population.^{54–59} Findings from this younger population might not apply to an older, more homogeneous group of academically achieving young adults transitioning to college life. Increased understanding of the prevalence and patterns of ecstasy use in the college student population is important, given its prevalence, the dangers of use, and the potential for polydrug use.

This study is among the first to examine ecstasy use patterns in a college student population and has relevance to the work of college health practitioners, counselors, and prevention educators. A major strength lies in the large sample size and high response rate, suggesting that the results may be generalizable beyond the population surveyed.

One limitation of this study, inherent in the use of self-report measures, is the potential for social-response bias (ie, the tendency for subjects to underreport drug use). Although we assured the students of the anonymity of their responses, the ordering of the questions may have influenced their answers. In the survey, the students were first presented with questions regarding their knowledge of drug policies prohibiting the illegal use of alcohol or other drugs on campus facilities and residences, followed by questions on drug use. Students who violate these policies can face considerable sanctions. It is possible that placing these questions before those asking about drug use might have resulted in underreporting of their drug use. However, it is unlikely that the degree of underreporting would be any different between marijuana users who did and did not use ecstasy, which was the primary focus of this study.

In this study, we observed a high prevalence of ecstasy use among college students. Given the increased prevalence of ecstasy use since 1998 and its potentially negative psychosocial and medical consequences, this study should be replicated in public and private college student populations at public and private colleges across the United States. Such studies can provide a foundation for future longitudinal investigations of college student ecstasy use, including risk factors, health and behavioral consequences of use, physiological dependence, and the temporal association between ecstasy use and behavioral consequences (eg, high-risk sexual activity, poor academic and work performance). Such long-term research can provide a better conceptual understanding of the relationship of ecstasy use to a host of other variables, including gender, age, ethnicity, grade point average, and family history of drug use. Moreover, from a policy standpoint, this evidence indicates that college administrators

should be aware of the extent of polydrug use and its possible impact on student retention, as well as of a host of other known consequences of alcohol and drug use. Early detection of drug problems and related behavioral consequence should be part of the overall campus goals to reduce student dropouts and to improve quality of student life.

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FIGURE 1.
Percentage of lifetime ecstasy use among students in college, 12th grade, and 10th grade.
Adapted from data from Johnston, O'Malley, and Bachman, "Monitoring the Future
National Survey Results on Drug Use, 1975–2002, Volumes 1 and 2," 2003. Available
online at <http://monitoringthefuture.org/pubs.html.monographs>

TABLE 1

Demographic Characteristics and Alcohol and Other Drug Use of 3 Groups Studied

Variable	Group 1, % Ecstasy – Marijuana – (<i>n</i> = 557)	Group 2, % Ecstasy – Marijuana + (<i>n</i> = 444)	Group 3, % Ecstasy + (<i>n</i> = 108)	Comparison between Groups 2 and 3, <i>p</i>
Demographic characteristic				
Aged 18–25 years	63	75	67	.10
Male	48	52	63	.06
White	48	75	68	.10
Past-year alcohol/drug use				
Alcohol	78	96	99	.21
Marijuana	zero by definition	57	83	< .001 [†]
Cocaine	0	2	46	< .001 [†]
Heroin	0	< 1	17	< .001 [†]
LSD	0	5	38	< .001 [†]
Other hallucinogens (e.g., PCP, mescaline)	0	2	26	< .001 [†]
Inhalants	< 1	10	38	< .001 [†]
Lifetime drug use				
Tobacco	37	87	88	.96
Alcohol	88	100	99	.44
Marijuana	zero by definition	100	98	.02 [†]
Cocaine	0	9	66	< .001 [†]
Heroin	0	1	19	< .001 [†]
LSD	< 1	19	72	< .001 [†]
Other hallucinogens (eg, PCP, mescaline)	0	6	48	< .001 [†]
Inhalants	< 1	10	38	< .001 [†]

Note. Percentages listed represent the proportion of the group that exhibited the characteristic on the left. For example, 63% of Group 1 was aged 18–25 years; 75% of Group 2 was aged 18–25 years, etc.

[†] Statistically significant differences ($p < .05$).